ISSN 1916-9736 (Print)
ISSN 1916-9744 (Online)

GLOBAL JOURNAL OF HEALTH SCIENCE

Vol. 6 No. 3, May 2014

CANADIAN CENTER OF SCIENCE AND EDUCATION®

Editorial Board

Contents

Contents

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Enhanced Auditory Arousal Increases Intake of Less Palatable and Healthier Foods

Gregory J. Privitera[1], Melissa Diaz[1] & Meagan C. Haas[1]

[1] Department of Psychology, Saint Bonaventure University, New York, USA

Correspondence: Gregory J. Privitera, Department of Psychology, Saint Bonaventure University, 3261 West State Street, St. Bonaventure, New York 14778, USA. E-mail: gprivite@sbu.edu

Received: November 26, 2013 Accepted: December 13, 2013 Online Published: Januray 23, 2014

doi:10.5539/gjhs.v6n3p1 URL: http://dx.doi.org/10.5539/gjhs.v6n3p1

Abstract

Two experiments were conducted to test a prediction of the arousal hypothesis that increased arousal will increase intake of less palatable and healthy foods. In both experiments, arousal was manipulated by adjusting the volume of a movie (soft, loud volume) while participants consumed foods. In Experiment 1, participants ate fresh (palatable) or stale (less palatable) popcorn during a 9-minute movie played at a soft or loud volume. Experiment 2 used the same procedures with healthier foods (carrot sticks and apple slices). Partial support for the arousal hypothesis in Experiment 1 showed that participants consumed more stale but not fresh popcorn in the loud (high arousal) versus soft (low arousal) volume group. These findings suggest that low but not high palatable foods are susceptible to manipulations of arousal. Consistent with this interpretation, Experiment 2 showed that high but not low environmental arousal increased intake of the fruits and vegetables, which are typically rated as lower in palatability compared to high fat foods. These results show that high arousal in an eating-typical environment increases intake of less palatable foods, and healthy foods (i.e., fruits and vegetables). Increasing the availability of healthier foods in a loud food environment can have a positive impact on increasing intake of fruits and vegetables in that environment.

Keywords: arousal hypothesis, healthy foods, volume, consumption, palatability

1. Introduction

Many studies show that the food environment (a place where food is actually consumed) can substantially influence food intake and consumption volume of food, which can lead to overeating and subsequent obesity (Drewnowski, 2004; Swinburn, Sacks, McPherson, Finegood, Moodie, & Gortmaker, 2011). Because intake of unhealthy foods is associated with rising rates of obesity in the U.S. (Wadden, Brownell, & Foster, 2002), a lot of attention has focused to how environmental factors contribute to food intake and diet (Befort, Nazir, & Perri, 2012; Chang & Christakis, 2002). Particular attention has been focused to the microscale food environment, which is the immediate surroundings within which people consume foods and drinks (Sobal & Wansink, 2007). Features in this environment that can influence the amount of food consumed include the setup of the room itself (Painter, Wansink, & Hieggelke, 2002; Stroebele & de Castro, 2004), the furniture in the room (Privitera, Cooper, & Cosco, 2012), the container in which food is stored or served (Wansink & Kim, 2005), and features of the food itself (Geier, Rozin, & Doros, 2006; Kral & Rolls, 2011; Spiegel, 2000).

An additional feature in a microscale environment that can influence intake is the background noise in that environment. Many people consume foods and drinks in a noisy environment, such as while listening to music or watching TV (Bellisle & Dalix, 2001; Bellisle, Dalix, & Slama, 2004; Blass, Anderson, Kirkorian, Pempek, Price, & Koleini, 2006). To explain these effects, the arousal hypothesis posits that any environmental cue that causes increased arousal will amplify an individual's behavior towards an external event or object (Smith & Curnow, 1965). Thus, in a microscale food environment this hypothesis predicts that participants will increase intake of foods, possibly even healthier foods, in a loud food environment (high arousal) compared to a lower volume food environment. The food is the external object upon which participants amplify their behavior (i.e., eating).

Studies supporting the arousal hypothesis demonstrate that increased auditory stimulation (Bellisle et al., 2004), and the tempo and rhythm of music (Sloboda, 1991; Van der Zwaag, Westerink, & Broek, 2011) can increase food intake and food choice (Milliman, 1982). Further evidence shows that participants spend more time eating

at a restaurant (Caldwell & Hibbert, 2002) and spend more time drinking (Guegen, Jacob, Le Guellec, Morineau, & Lourel, 2008) or drinking at a faster rate (Stafford & Dodd, 2013) in a loud versus low volume environment. However, other researchers report that the time spent eating food and the size of food portions was not impacted by the speed or tempo of music, even when overall intakes were higher in the presence of music (Stroebele & de Castro, 2006). These results suggest that the effects of arousal on food intake may have certain limiting factors to which the arousal effect is restricted.

One possible factor tested here is the type of food consumed in a loud versus a low volume environment. Many studies show that taste alone can control food intake in a variety of settings when the taste itself is highly preferred (Drewnowski, 1997; Mela & Sacchetti, 1991). Therefore, we hypothesized that taste, and not arousal, will control food intake for highly preferred foods, whereas arousal will control food intake when foods are not highly preferred. In an exploratory analysis, we manipulated whether participants consumed fresh (good taste) or stale (poor taste) high-fat popcorn in a loud or low volume setting in Experiment 1. The implications for the findings in Experiment 1 led to the prediction that high arousal will increase intake of healthier foods, such as fruits and vegetables, which according to the Centers for Disease Control and Prevention are underconsumed in the U.S. (Tolhill, 2005). In Experiment 2, we therefore conducted the same study design, except that fruits and vegetables were used to test if high arousal (i.e., loud volume) could increase intake of theses generally less preferred but healthier foods, compared to foods that are high in fat (Drewnowski, 1997; Privitera, 2008).

2. Experiment 1

2.1 Methods

2.1.1 Participants

A total of 80 participants (44 women, 36 men) were recruited through university classroom visits and sign-up sheets. Participant sample characteristics were (*M*±SD) age (20.3±1.6 years), weight (77.6±8.6 kg), height (176.5±5.6 cm), and BMI (24.9±2.0 kg/m^2). The 80 participants passed an initial screening used to determine if individuals qualified to participate. Only those who were non-smokers in general good health with no physical or doctor diagnosed food allergies, medical conditions including pregnancy and eating disorders, or dietary restrictions were included in data analyses. Because individuals with a history of dieting can be insensitive to flavor-based learning (Brunstrom, Downes, & Higgs, 2001), all participants scoring 9 or higher on the Restraint Scale of the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) were excluded. Hunger states also influence flavor-based learning (Yeomans & Mobini, 2006; Yeomans, 2006), so participants who ate within two hours of the study were also excluded. In addition, all participants reported having no history of impaired hearing.

2.1.2 Setting and Foods

Auditorium Setting. A video clip was presented in an auditorium theater setting for all groups. The auditorium had three sections of seating separated by two stair isles with a large screen projector to the front of the room and surround sound throughout the room. All participants sat in the middle, front two rows where the volume was consistent—the decibels (db) of the movie did not vary within each volume group. The distance from the seating area to the viewing screen was approximately 3.7 m to 6.1 m.

Movie Clip. The movie was a commercial-free 9-minute video clip of "Americas Funniest Home Videos." This movie was used because it did not have a story line, which made it easy to understand without having to follow a story line. The volume of the movie was made soft (low volume; 50 db) or loud (high volume; 80 db) to manipulate arousal. Participants reported that the volume was not aversive or distracting at each decibel level. Only high and low volume (i.e., arousal) groups were included to explore differences in intake between groups with obvious differences in volume.

Popcorn. The foods used were 45 grams of fresh or stale (one-week old) Orville Redenbacher's Movie Theatre Butter popcorn (ConAgra Foods, Inc., Omaha, NE, wt/vol). The stale popcorn was popped and then stored at room temperature in sealed containers one week prior to the experiment. The size of a portion was 45 grams for each participant. "Seconds" were allowed upon request only if the participant consumed the entire first portion. Amount consumed was recorded as the difference in weight (g) of the portion pre-post movie. Spillage was accounted for before recording differences in the weights of the popcorn because the participants were in identifiable locations in the auditorium.

2.1.3 Procedures

Participants were observed in groups of 8 to 10 at a time between 3:00 PM and 5:00 PM EST, were asked to sit in the middle front two rows of the auditorium, and then read and signed an informed consent prior to watching

the movie. The db of the movie did not vary in the front two rows so all participants experienced the same db volume (soft or loud, depending on group assignment). Participants were randomly assigned to groups (n = 20 per group) based on the volume of the movie (soft, loud) and the freshness of the popcorn served (fresh, stale). Group Soft-Fresh consumed fresh popcorn during a movie played at 50 db. Group Soft-Stale consumed stale popcorn during a movie played at 50 db. Group Loud-Fresh consumed fresh popcorn during a movie played at 80 db. Group Loud-Stale consumed stale popcorn during a movie played at 80 db. Otherwise, all procedures were the same for all groups.

Each participant received the same sized container filled with either fresh or stale popcorn and then were played the movie clip at a soft or loud volume, depending on group assignment. Prior to the movie, participants completed an affect grid (Russell, Weiss, & Mendelsohn, 1989), which is used to record changes in both mood and arousal. To check hunger states, participants also completed a rating scale from 1 = *not hungry at all* to 7 = *very hungry* to the following item: "How hungry are you at this moment?" After the movie, participants completed the same affect grid, and again rated their hunger state, and also the palatability of the popcorn by stating their level of agreement from 1 (*not at all*) to 7 (*very good*) to the following single item: "The popcorn tasted good." In addition, they completed the Estimated Daily Intake Scale for Fat (EDIS-F; Privitera & Freeman, 2012) to estimate daily intake of fat, which was included as a covariate in statistical analyses because the test food used was a high fat food (65% of calories in the popcorn come from fat). Higher scores on the EDIS-F indicate greater daily intake of fat. Once completed, participants were given a debriefing form, thanked for their time, and dismissed. The university's Institutional Review Board approved all procedures.

2.1.4 Data Analyses

A two-way between-subjects analysis of covariance (ANCOVA) was computed with movie volume (loud, soft) and popcorn (fresh, stale) as the between-subjects factors, and BMI and EDIS-F scores as the covariates. Gender was included as a factor, but removed when it showed no significance with effects reported here. Hence, all analyses reported here did not vary by gender, and also include statistical control for participant differences in BMI and daily intake of fat. The dependent variables were popcorn intake (g), and ratings of palatability, mood, and arousal. Tukey's HSD was used as the post hoc test. All tests were conducted at a .05 level of significance.

2.2 Results

As shown in Figure 1, with food intake as the dependent variable, a significant freshness × volume interaction was evident, $F(1, 74) = 6.98$, $p = .01$ ($R^2 = .09$). Simple main effect tests showed that popcorn intakes did not differ between the soft and loud volume groups when fresh popcorn was consumed ($p = .50$). For participants eating stale popcorn, however, intake was greater in the loud volume ($M = 21.45$, SD = 8.92 grams) versus soft volume ($M = 13.30$, SD = 4.35 grams) group, Tukey's HSD, $p < .05$.

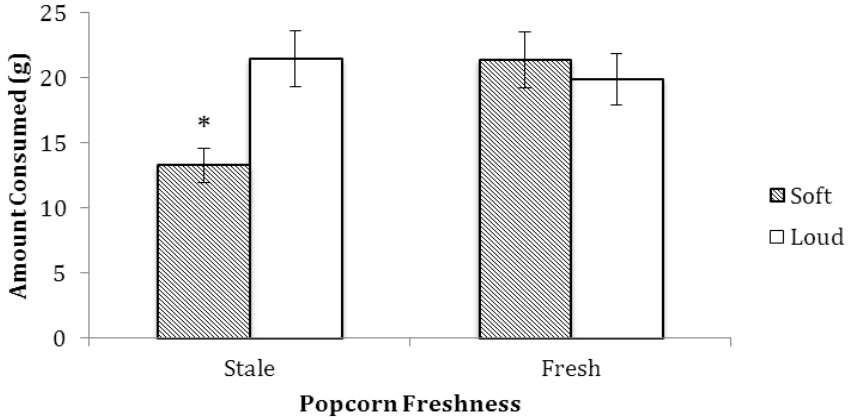


Figure 1. Total amount consumed (g) of fresh and stale popcorn in the soft and loud volume groups in Experiment 1. An asterisk indicates significance at $p = .01$. Vertical bars indicate standard error of the mean (SEM)

With palatability as the dependent variable, a significant freshness × volume interaction was evident, $F(1, 74) = 6.28$, $p = .014$ ($R^2 = .09$). Simple main effect tests showed that palatability ratings did not differ between the soft

and loud volume groups when fresh popcorn was consumed (p = .43). For participants eating stale popcorn, however, palatability ratings were greater in the loud volume (M = 5.60, SD = 1.50) versus soft volume (M = 4.20, SD = 1.51) group, Tukey's HSD, $p < .05$.

Pre-movie mood and arousal scores did not significantly differ between groups ($p > .40$). Post-movie analyses with mood as the dependent variable showed a significant main effect of freshness, F(1, 74) = 6.02, p = .016 (R^2 = .08), with participants reporting higher mood after eating fresh (M = 2.13, SD = 1.62) versus stale popcorn (M = 1.23, SD = 1.48). With arousal as the dependent variable, a main effect of volume was significant, F(1, 74) = 4.43, p = .039 (R^2 = .06), confirming the arousal manipulation, showing that participants reported being more aroused in the loud (M = 2.03, SD = 1.94), compared to the soft volume (M = 1.08, SD = 1.39) groups. Changes in hunger ratings did not vary by group ($p > .50$).

3. Experiment 2

The results in Experiment 1 show only partial support for the arousal hypothesis. Specifically, the arousal hypothesis was supported only for the stale popcorn groups: When popcorn was stale, increased arousal (80 db movie) increased intake and perceived palatability and mood. No effect on intake was observed in the fresh popcorn groups. A possible explanation for this outcome is that when the taste of a food is very good (such as for fresh popcorn), then taste, and not arousal controls food intake. However, when palatability or taste is low, arousal is more salient and therefore has greater control over food intake.

An implication of the outcome in Experiment 1 is that increased arousal should also be able to enhance intake of healthier, typically less palatable foods—compared to high fat, high sugar foods (Privitera, 2008; Privitera, Antonelli, & Creary, 2013). If true, then increased arousal could effectively enhance intake of healthier foods, when these foods are made available during a movie. This possibility was tested in Experiment 2. Specifically, we tested the hypothesis that increased arousal can increase intake of fruits (i.e., apple slices) and vegetables (i.e., carrot sticks) in the same setting as described for Experiment 1.

3.1 Method

3.1.1 Participants

A total of 43 participants (23 women, 20 men) were recruited through university classroom visits and sign-up sheets. Participant sample characteristics were (M±SD) age (20.6±1.7 years), weight (79.8±7.8 kg), height (175.2±6.4 cm), and BMI (25.0±2.4 kg/m^2). All participants were selected for Experiment 2 using the same criteria as described for Experiment 1.

3.1.2 Setting and foods

The setting was the same as described in Experiment 1. The foods used in Experiment 2, were sweet red apple slices (Country Fresh, Inc., Houston, TX, wt/vol) and baby-cut carrots (Bolthouse Farms, Inc., Bakersfield, CA, wt/vol). Pre-sliced apples and baby-cut carrots were used to ensure that all cuts of the fruits and vegetables were similar and to avoid bruising of the apples. The foods were approximately 6 calories per slice or cut and allowed for a comparable portion size across both foods.

3.1.3 Procedures

Same as described in Experiment 1, except that participants were given portions of apple slices and carrot sticks simultaneously. Portions were 10 apples slices and 10 carrot sticks each placed in front of a participant in separate small paper bowls. Hence, participants were assigned to one of two groups: Low arousal (soft volume; 50 db; n = 22) and high arousal (loud volume; 80 db; n = 21). Amount consumed of apple slices and carrot sticks (in g) in each group were recorded. The university's Institutional Review Board approved all procedures.

3.1.4 Data Analyses

A one-way between-subjects ANCOVA was computed with groups (soft, loud volume) as the between-subjects factor and BMI as the covariate. Intakes of apple slices (g), carrot sticks (g), and total intakes (g), and ratings of mood, arousal, and palatability were the dependent variables. Gender was included as a factor, but removed when it showed no significance with effects reported here. All tests were conducted at a .05 level of significance.

3.2 Results

With food intake as the dependent variable, a significant effect of arousal was evident for total intake, F(1, 39) = 7.42, p = .01 (R^2 = .20), for intake of apple slices, F(1, 39) = 4.16, $p < .05$ (R^2 = .11), and for intake of carrot sticks, F(1, 39) = 4.93, p = .03 (R^2 = .17). As shown in Figure 2, results show that intakes of apple slices, carrot sticks, and total intakes were higher in the loud volume (high arousal) versus the soft volume (low arousal)

group.

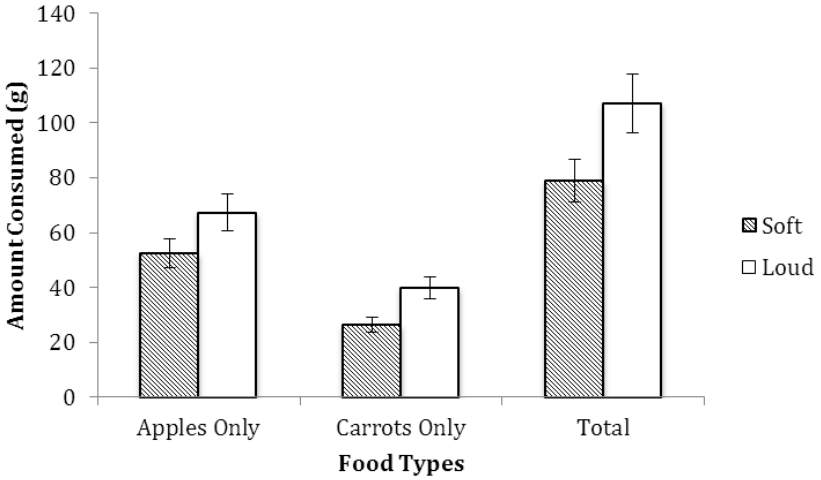


Figure 2. Total amount consumed (g) of apples, carrots, and total intake in the soft and loud volume groups in Experiment 2. For each food type, significantly more food was consumed in the loud vs. soft volume groups. Vertical bars indicate SEM

Pre-movie mood and arousal scores did not significantly differ between groups ($p > .55$). Post-movie analyses with mood as the dependent variable showed no significant effects of volume, $p = .60$, with mood being similar in the soft and loud volume groups. With arousal as the dependent variable, an effect of volume was significant $F(1, 39) = 4.79$, $p = .035$ ($R^2 = .11$), confirming the arousal manipulation, showing that participants reported being more aroused in the loud ($M = 2.91$, SD = 2.35), compared to the soft volume group ($M = 1.19$, SD = 2.23). Palatability ratings for apples ($p = .94$) and carrots ($p = .23$) also did not significantly differ between groups. Changes in hunger ratings did not vary by group ($p > .35$).

4. General Discussion

The hypothesis that increased arousal will enhance intake of less palatable and healthy foods was tested. In two experiments, participants were given foods to eat during a short movie clip that was played at a soft (low arousal) or loud (high arousal) volume. The results in Experiment 1 showed support for this hypothesis with stale (less palatable) popcorn, but not with fresh popcorn. In Experiment 2, the results showed support for the arousal hypothesis using healthy foods (i.e., carrot sticks and apple slices).

The results in Experiment 1 suggest that when food tastes really good, then taste alone, and not arousal (an environmental factor) controls food intake, as is supported by many studies showing strong preferences for the taste of highly palatable high fat foods (Drewnowski, 1997; Mela & Sacchetti, 1991). Hence, arousal influenced intake of stale, but not fresh popcorn, during the movie clip in Experiment 1 because the stale popcorn was less palatable, setting the occasion for arousal to control food intake. Consistent with this interpretation, Experiment 2 showed that participants consumed more carrot sticks and apple slices in a high versus low arousal group. While fruits and vegetables can taste good, their taste is typically rated lower than the taste of high fat foods (Drewnowski & Greenwood, 1983; Drewnowski, 1997; Privitera, 2008).

The effects of changes in mood and perceived palatability of foods also varied between the experiments. In Experiment 1, a high arousal group showed increased intake of stale popcorn, and also increased positive mood and higher palatability ratings of the food consumed compared to a low arousal group. Based on these results, we can surmise that increased intake of stale popcorn was modified by the arousal, and also modified by the increased mood and perceived palatability of the foods (Drewnowski, 1997; Mela et al., 1991; Privitera, 2008). Hence, we cannot be fully certain that arousal alone caused the increased intake. In Experiment 2, however, only intake differed between the low and high arousal groups—no changes were observed in mood and perceived palatability of the foods. Hence, even in the absence of changes in mood and food palatability, enhanced arousal increased intake of the test foods in Experiment 2 (i.e., carrot sticks and apple slices). The pattern of results observed here demonstrate that arousal was sufficient to increase intake of healthy foods and leads to the prediction that increasing arousal in the food environment will increase intake of less palatable foods to include increased intake of fruits and vegetables, as was specifically shown in Experiment 2.

The immediate surroundings of a food environment include the room itself, the furniture, the food container, and the food itself (Sobal & Wansink, 2007). The setting used in Experiments 1 and 2 had the same immediate surroundings, but varied on the arousal (noise) level in the surroundings. Environmental factors can have a substantial impact on consumption volume and food intake (Drewnowski, 2004; Swinburn et al., 2011), even for healthy foods (Privitera & Creary, 2013). In this study, we show for the first time that people will eat more fruits and vegetables in a highly arousing (i.e., loud) environment, which is a common setting for eating foods (Bellisle & Dalix, 2001; Bellisle et al., 2004; Blass et al., 2006). Considerable data coming from the Centers for Disease Control and Prevention show that fruits and vegetables are underconsumed in the U.S. (Tohill, 2005). Hence, a key implication for the pattern of data demonstrated here is that increasing the availability of healthier foods in a loud microscale food environment (i.e., a common eating setting) may have a positive impact on increasing intake of fruits and vegetables in that environment.

5. Limitations and Conclusion

In two experiments, we tested the hypothesis that increased arousal will enhance intake of less palatable and healthy foods. The results showed that increased arousal increased intake of less palatable popcorn (i.e., stale popcorn), and healthier foods, which taste good, but are typically rated as less palatable or less liked than high fat foods such as fresh popcorn. Whether these findings may have been influenced by the type or genre of movie presented, or whether these findings are also likely to occur when people are alone in the room cannot be determined based on the procedures used here. Further studies are needed to better understand the possible mechanisms causing this effect, and to extend the ecological validity of these findings by testing across a variety of eating-typical settings and situations.

References

Befort, C. A., Nazir, N., & Perri, M. G. (2012). Prevalence of obesity among adults from rural and urban areas of the United States: Findings from NHANES (2005-2008). *The Journal of Rural Health, 28*(4), 392-397. http://dx.doi.org/10.1111/j.1748-0361.2012.00411.x

Bellisle, F., Dalix, A., & Slama, G. (2004). Non food-related environmental stimuli induce increased meal intake in healthy women: Comparison of TV viewing versus listening to a recorded story in laboratory settings. *Appetite, 43*, 175-180. http://dx.doi.org/10.1016/j.appet.2004.04.004

Bellisle, F., & Dalix, A. (2001). Cognitive restraint can be offset by distraction, leading to increased meal intake in women. *American Journal of Clinical Nutrition, 74*, 197-200.

Blass, E., Anderson, D., Kirkorian, H., Pempek, T., Price, I., & Koleini, M. (2006). On the road to obesity: TV viewing increases intake of high- density foods. *Physiology & Behavior, 88*, 597-604. http://dx.doi.org/10.1177/0002716207308681

Brunstrom, J. M., Downes, C. R., & Higgs, S. (2001). Effect of dietary restraint on flavour-flavour learning. *Appetite, 37,* 197-206.

Caldwell, C., & Hibbert, S. A. (2002). The influence of music tempo and musical preference on restaurant patrons' behavior. *Psychology & Marketing, 19*(11), 895-917. http://dx.doi.org/10.1002/mar.10043

Chang, V. W., & Christakis, N. A. (2002). Medical modeling of obesity: A transition from action to experience in a 20th century American medical textbook. *Sociology of Health and Illness, 24*(2), 151-177. http://dx.doi.org/10.1111/1467-9566.00289

Drewnowski, A. (2004). Obesity and the food environment: Dietary energy density and diet costs. *American Journal of Preventative Medicine, 27*, 154-162. http://dx.doi.org/10.1016/j.amepre.2004.06.011

Drewnowski, A. (1997). Taste preferences and food intake. *Annual Review of Nutrition, 17*, 237-253. http://dx.doi.org/10.1146/annurev.nutr.17.1.237

Drewnowski, A., & Greenwood, M. R. (1983). Cream and sugar: human preferences for high-fat foods. *Physiology & Behavior, 30*, 629-633. http://dx.doi.org/10.1016/0031-9384(83)90232-9

Geier, A. B., Rozin, P., & Doros, G. (2006). Unit bias: A new heuristic that helps explain the effect of portion size on food intake. *Psychological Science, 17*(6), 521-525. http://dx.doi.org/10.1111/j.1467-9280.2006.01738

Gueguen, N., Jacob, C., Le Guellec, H., Morineau, T., & Lourel, M. (2008). Sound level of environmental music and drinking behavior: A field experiment with beer drinkers. *Alcoholism: Clinical and Experimental Research, 32*(10), 1-4. http://dx.doi.org/10.1111/j.1530-0277.2008.00764.x

Kral, T. V. E., & Rolls, B. J. (2011). Portion size and the obesity epidemic. In John Cawley (Ed.), *The Oxford Handbook of the Social Science of Obesity – The Causes and Correlates of Diet, Physical Activity, and Obesity* (pp. 367-384). Oxford University Press, Oxford, England.

Mela, D. J., & Sacchetti, D. A. (1991). Sensory preferences for fats: relationships with diet and body composition. *American Journal of Clinical Nutrition, 53*, 908-915.

Milliman, R. E. (1982). Using background music to affect the behavior of supermarket shoppers. *Journal of Marketing, 46*, 86-91.

Painter, J. E., Wansink, B., & Hieggelke, J. B. (2002). How visibility and convenience influence candy consumption. *Appetite, 38*, 237-238.

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology*, *57*(3), 493-502. http://dx.doi.org/10.1037/0022-3514.57.3.493

Privitera, G. J., & Creary, H. E. (2013). Proximity and visibility of fruits and vegetables influences intake in a kitchen setting among college students. *Environment and Behavior, 45*(7), 876-886. http://dx.doi.org/10.1177/0013916512442892

Privitera, G. J., Antonelli, D. E., & Creary, H. E. (2013). The effect of food images on mood and arousal depends on dietary histories and the fat and sugar content of foods depicted. *Journal of Behavioral and Brain Science, 3*, 1-6. http://dx.doi.org/10.4236/jbbs.2013.31001

Privitera, G. J., Cooper, K. C., & Cosco, A. R. (2012). The influence of eating rate on satiety and intake among participants exhibiting high dietary restraint. *Food & Nutrition Research, 56*, 10202. http://dx.doi.org/10.3402/fnr.v56i0.10202

Privitera, G. J., & Freeman, C. S. (2012). Validity and reliability of an estimated daily intake scale for fat. *Global Journal of Health Science, 4*(2), 36-41. http://dx.doi.org/10.5539/gjhs.v4n2p36

Privitera, G. J. (2008). *The psychological dieter: It's not all about the calories*. Lanham, MD: University Press.

Sloboda, J. A. (1991). Music structure and emotional response: Some empirical findings. *Psychology of Music, 19*, 110-120.

Smith, P. C., & Curnow, R. (1965). "Arousal Hypothesis" and the effects of music on purchasing behavior. *Journal of Applied Psychology, 50*(3), 255-256.

Sobal, J., & Wansink, B. (2007). Kitchenscapes, Tablescapes, platescapes, and foodscapes: Influences of microscale built environments on food intake. *Environment and Behavior, 39*, 124-142. http://dx.doi.org/10.1177/0013916506295574

Spiegel, T. A. (2000). Rate of intake, bites, and chews—the interpretation of lean-obese differences. *Neuroscience and Biobehavioral Reviews, 24*, 229-37. http://dx.doi.org/10.1016/S0149-7634(99)00076-7

Stafford, L. D., & Dodd, H. (2013). Music increases alcohol consumption rate in young females. *Experimental and Clinical Psychopharmacology, 21*(5), 408-415. http://dx.doi.org/10.1037/a0034020

Stroebele, N., & de Castro, J. M. (2006). Listening to music while eating is related to increases in people's food intake and meal duration. *Appetite, 47*, 285-289. http://dx.doi.org/10.1016/j.appet.2006.04

Stroebele, N., & de Castro, J. M. (2004). Effect of ambience on food intake and food choice. *Nutrition, 20*, 821-838. http://dx.doi.org/10.1016/j.nut.2004.05.012

Stunkard, A. J., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research, 29*(1), 71-83.

Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity epidemic: Shaped by global drivers and local environments. *Lancet, 378*(9793), 804-14. http://dx.doi.org/10.1016/S0140-6736(11)60813-1

Tolhill, B. C. (2005). *Dietary intake of fruits and vegetables and management of body weight*. Background paper for Joint FAO/WHO Workshop on Fruit and Vegetables for Health. Presented in September 2004, Kobe, Japan.

Van der Zwaag, M. D., Westerink, J. H. D. M., & Broek, E. L. (2011). Emotional and psychophysiological responses to tempo, mode, and percussiveness. *Musicae Scientiae, 15*(2), 250-269. http://dx.doi.org/10.1177/1029864911403364

Wadden, G. D., Brownell, K. D., & Foster, G. D. (2002). Obesity: Responding to the Global Epidemic. *Journal of Consulting and Clinical, 70*(3), 510-525. http://dx.doi.org/10.1037/0022-006X.70.3.510

Wansink, B., & Kim, J. (2005). Bad popcorn in big buckets: Portion size can influence intake as much as taste. *Journal of Nutrition Education and Behavior*, *37*(3), 242-245. http://dx.doi.org/10.1016/S1499-4046(06)60278-9

Yeomans, M. R. (2006). The role of learning in development of food preferences. In R. Shepherd & M. Raats (Eds.), *Psychology of food choice* (pp. 93-106). Wallingford, Oxford: CABI.

Yeomans, M. R., & Mobini, S. (2006). Hunger alters the expression of acquired hedonic but not sensory qualities of food-paired odors in humans. *Journal of Experimental Psychology: Animal Behavior Processes, 32*(4), 460-466. http://dx.doi.org/10.1037/0097-7403.32.4.460

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Intestinal Parasitic Infestation in Combatants and Their Families: A Hospital-Based Study in Mid-Western Regional Police Hospital, Nepal

Damodar Paudel[1], Myo Nyein Aung[2,3,4], Bindhya Sharma[5], Thin Nyein Nyein Aung[6] & Saiyud Moolphate[4]

[1] Mid-West Regional Police Hospital, Nepalgunj, Nepal

[2] Department of Public Health, Juntendo University Graduate School of Medicine, Tokyo, Japan

[3] Boromarajonani College of Nursing, Nakhon Lampang, (BCNLP), Thailand

[4] Department of Public Health, Faculty of Science and Technology, Chaingmai Rajabhat University, Chaing Mai, Thailand

[5] Christian-Albrechts University, Kiel, Germany

[6] University of Medicine, Mandalay, Myanmar

Correspondence: Dr. Myo Nyein Aung, Research Co-ordinating Unit, Boromarajonani College of Nursing Nakhon Lampang, 268 Parkam Road, Tambol Hauwieng, Muang District, Lampang, 52000, Thailand. Tel: 66-5422-6254. Fax: 66-5422-5020. E-mail: dr.myonyeinaung@gmail.com

Received: December 31, 2013 Accepted: January 21, 2014 Online Published: January 23, 2014

doi:10.5539/gjhs.v6n3p9 URL: http://dx.doi.org/10.5539/gjhs.v6n3p9

Abstract

Objective: To find out the scenario of intestinal parasitic infestation in combatants and their families in the setting of Mid-Western Regional Police Hospital (MWRPH), Nepal.

Study Design: Cross-sectional study.

Methods: All 2005 patients presented with the complaint of abdominal pain, diarrhoea, frequent defecation, blood in stool, or black stool from August 2007 to February 2011 were offered a stool examination. About 10g of fresh stool was collected in a clean, dry bottle. Two slides from each specimen were examined applying light microscope in 10 and 40 uvf at Banke, Nepalgunj hospital laboratory.

Result: Among 2005 patients, 928 (46.28%) were infested with either helminths and/or protozoa. 96% were single infestation. The most common infestation was *Ascaris lumbricoides* (48.06%) and the second was hook worm (18.97%). Most common protozoal infestations were *Entamoeba histolytica* (12.92%) and *Giardia lamblia* (9.49%). Helminthic infestations peaked in cool months and protozoal infestations were rather steady throughout the year.

Conclusion: Very high parasitic infestation in least developed mid- western Nepal may need urgent public health intervention.

Keywords: intestinal parasitic infestation**,** helminth, protozoa, Ascaris, Nepal, Nepalgunj

1. Introduction

Parasitic diseases caused by helminthes and protozoa are common and current health problems in tropics. Soil-transmitted helminthic infections (STH) are very common in the poorest countries where sanitation is poor and human faeces contaminate the soil. Two billion people are affected by single or multiple soil transmitted helminthic diseases and 135,000 died annually (WHO, 2013). Likewise, protozoal infections are common in people living in places with poor sanitation, unsafe water and limited access to basic health care (Gunduz, Demirel, Inceboz, Tosun, & Yereli, 2005).

The global burden by disability-adjusted-life year (DALY) of soil transmitted helminthic diseases is comparable to tuberculosis and malaria (Jex et al., 2011). Creeping impact of these parasitic infestations insidiously affects women and children's health, reduce work productivity of adults and thus, impair economic growth of poor countries (WHO, 2012). Worm infestations cause anemia and poor pregnancy outcome in women and,

malnutrition, poor physical growth, and psychological cognitive underdevelopment in children (Anderson, 1982; Yap et al., 2012). Those impacts are often less visible and usually have a low priority. Nepal is a poor country with high burden of intestinal parasitic diseases in children, adult and elderly population (Gyawali, Amatya, & Nepal, 2009; Shakya, Rai, Singh, & Shrestha, 2006).

The aim of our study is to find out the seasonal trends of parasitic infections in Nepalese police combatant and their families in mid-western region of Nepal. The findings aimed to alert the respective authorities to strengthen effective control and intervention measures in study site region which has lowest human development index in the country.

2. Methods

This cross-sectional study was conducted in Midwestern Regional Police Hospital (MWRPH), Karkado, Banke district, Nepal. Ethical clearance was obtained by the permission of hospital.This hospital provides free health service to the servicing polices, retired polices and their families.

We performed stool examination of 2005 patients from August 2007 to February 2011. Stool examination was confined to the patients presented to MWRPH with the complaint of abdominal pain, diarrhoea, frequent defecation, blood in stool, or black stool.

Stool examination Procedure: Ten gram of fresh or routine stool was collected in a clean, dry capped plastic container. The consistency (solid, semisolid or liquid) and the color of the stool were recorded. Wet mount method was applied; small amount of stool was mounted in one drop of normal saline with a wooden stick. Mounted stool was covered with cover slip and the bubble was omitted. Each specimen was examined under a light microscope at x10 for the helminthes ova and the cover slip was slightly pressed and removed excess liquid x40 objectives with immersion oil seen for protozoa's.

Data analysis applied STATA version 11. Descriptive statistics, such as percentages, mean or median, standard deviation or interquartile range, were used to summarize the data. Chi-square test or Fisher's exact test were used to detect differences for comparing proportions of category variables. T-test was used to detect differences for continuous variables with normal distribution. P value less than 0.05 was taken as statistic significant. Age groups were categorized as in WHO soil transmitted helminthic (STH) infection report (WHO, 2012).

3. Results

Median age of police combatants and their family members was 25 years, ranging from the youngest being 0.98 year to the oldest 75 years old. Most of the patients were male (Table 1). Interquartile range respectively for male and female patients were 22-32 and 20-38 years, while the median age for both gender was 25 years.

Among 2005 cases screened, 928 patients (46.28.3%) were infested with parasites in any of three forms: cyst, trophozoite or ova.

Table 1. Characteristic of the study population

	Number	Percentage
Total (N)	2005	100
Female	389	19.40
Male	1605	80.05
Age Median (min-max))	25 (0.98-75)	
0-4	71	3.54
5-14	88	4.39
15 and above	1846	92.07
Rank		
Helper	65	3.24
Constable	1204	60.05
Junior officer	267	13.32
Senior officer	33	1.65
Retired police or, Family member*	429	21.40

*means family members of combatants

3.1 Infestation Rate

Overall, 46.28% of the screened patients were infested with helminths or protozoa or both (Table 2). Infestation rate was different across the age groups. School going age (5-14 years) group were most infested (54.55%) while preschool children aged 0-5 years were less infested (39.44%). Infestation rate among the adolescent and adult (age ≥15 years group) was 46.15%.

Infestation rate among female patients were higher than that among the male. Moreover, the infestation rate among non-gazetted junior officers was significantly higher than the other ranked combatants. Infestation rate was statistically different within the different categories of rank significantly (Pearson $chi^2 = 17.67$, P-value = 0.003). However, the distribution of mixed infection, helminthic and protozoal infections were not different statistically among any categories (Table 2).

Table 2. Intestinal parasitic infection among combatants and their families in mid-western region of Nepal (2007-2011) by different categories

	Total N	Infestation rate n(%)	Mixed Infection n(%)	Helminthic Infection n (%)	Protozoal Infection n (%)
Total	2005	928(46.28)	77(8.30)	640(68.97)	211(22.74)
Age (years)					
0-4	71	28(39.44)	3(10.71)	16(57.14)	9(32.14)
5-14	88	48(54.55)	3(6.25)	30(62.50)	15(31.25)
15 and above	1846	852(46.15)	71(8.33)	594(69.72)	187(21.95)
Gender					
male	1605	725(45.17)	55(7.59)	497(68.55)	173(23.86)
female	389	197(50.64)	21(10.66)	139(70.56)	37(18.78)
Rank		*			
Helper	65	29 (44.62)	2(6.90)	18(62.07)	9(31.03)
Constable	1204	527(43.77)	42(7.97)	364(69.07)	121(22.96)
Junior officer	267	142(53.18)	9(6.34)	106(74.65)	27(19.01)
Senior officer	33	9(27.27)	0(0.00)	6(66.67)	3(33.33)
Retired police or, Family member	429	216(50.35)	23(10.65)	143(66.20)	50(23.15)

Note * Infestation rate among five different categories of ranks was significantly different. Pearson $chi^2 = 17.67$ P= 0.003

3.2 Spectrum of Parasitic Infestation

Ascaris lumbricoides was the most common infestation, the second was hook worm infestation, the third was *Entamoeba histolytica* (12.92%), the fourth was *Giardia lamblia* (9.49%) and the fifth was mixed protozoal and helminthic infection (Table 2). The number and proportion of helminthic infestation were much more than the protozoal infection. Almost half of infestations were Ascaris and almost one fifth of them were hookworm. Detail distributions of infecting parasites were shown in Table 3.

Table 3. Spectrum of intestinal parasitic infestation among combatants and their families in mid –western region of Nepal

Types Infestation			**n**	**% of infestations**	**% of number screened**
Ascaris lumbricoides			446	48.06	22.24
Ancylostoma duodenale (hook worm)			176	18.97	8.78
Trichuris trichiura			3	0.32	0.15
Hymenolepis nana			15	1.62	0.75
Entamoeba histolytica cyst			108	11.64	5.39
Entamoeba histolyticaTrophozoites			10	1.08	0.50
Giardia lamblia cyst			69	7.44	3.44
Giardia lamblia trophozoites			19	2.05	0.94
Trichomonas intestinalis			4	0.43	0.20
Trichomonas homonis			1	0.11	0.05
Mixed helminthic and protozoa infection			77	8.30	3.84
Types of mixed infestations (n=77)	**n=(77)**	**%**			
Entamoeba histolytica and Giardia lamblia	4	5.19		0.43	
Entamoeba histolyticaand hook worm dual infection	12	15.58		1.29	
Entamoeba histolytica and Hymenolepis nana	4	5.19		0.43	
Entamoeba histolytica and Ascaris lumbricoides	25	32.47		2.69	
Ascaris lumbricoides and Giardia lamblia	22	28.57		2.37	
Ascaris lumbricoides and hookworm	10	12.99		1.08	
Total infestation			928	100	46.28
No infestation			1077		53.72
Total	2005		2005		100

3.3 Annual Trend and Seasonal Variation of the Parasitosis

Parasitic infestation rate among the patients presented to MWRPH with the complaint of abdominal pain, diarrhoea, frequent defecation, blood in stool, or black stool were persistently high year-round. Helminthic infection ranged from lowest (20%) in April to highest 42.75% in November. Protozoal infection ranged from the lowest of (4.73%) in December to highest of (18.1%) in April.

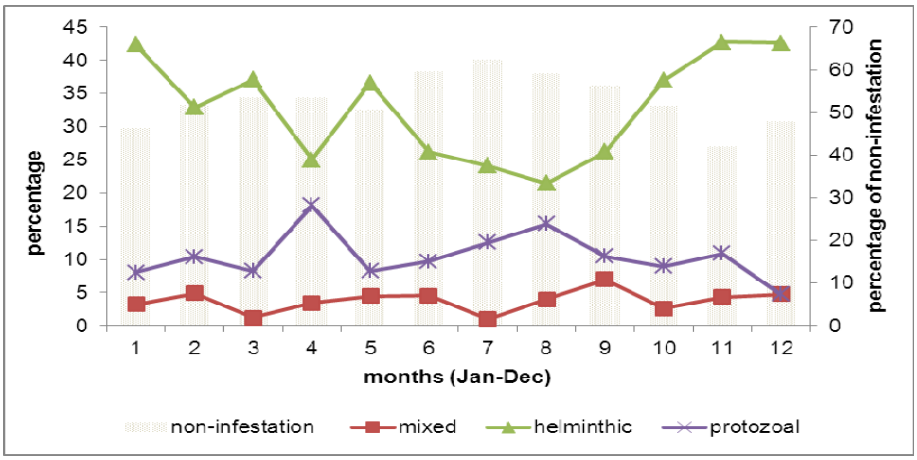


Figure 1. Seasonal trend of helminthic, protozoal and mixed infection throughout the year among combatants and their families, a total of 2005 persons with abdominal and bowel symptoms, in mid-western region of Nepal (2007-2011)

Monthly infestation rate of helminthic, protozoal and mixed infection were displayed in separate lines to compare the seasonal trend (Figure 1). The trend of helminthic infestation began to rise in September, continued throughout autumn until the highest in November (42.75%), December (42.6%) and January (42.4%). Afterwards, it declined in summer months until the lowest in August, with a small peak in May.

Protozoal trend is low and stable year round. Its peaks in April and August coincide with troughs of the helminthic infestation. It gradually declined to the lowest in winter months of the years: December, January and February (Figure 1). Overall, the number of mixed infections is lower than the helminthic and protozoal infection. Its trend was low in March and July, while overall trend of mixed infestations peaked in September. It was generally stable at less than 10% throughout the year.

4. Discussion

Overall, prevalence of parasitic infestation rate in this study was much higher (46.28%) than those reported in previous studies (Gunduz et al., 2005; Gyawali et al., 2009; Khanal, Rai, Khanal, & Ghimire, 2011). It underscored the high burden of intestinal parasitic infection especially STH in the mid-western region of Nepal and the need of multiple interventions.

The majority of the current study population was adults. Thus, the finding might reflect the burden of helminthic and protozoal infection in working age group in mid-western region of Nepal. Moreover, current study included women and children who were the family members of policemen (Table 1).

The infestation rate of overall parasitosis was higher among the women and 70% of those infestations were helminthic infection (Table 2). A previous study of enteropathogens in diarrheal stool samples in Kathmandu, Nepal reported gender indifference (Ono et al., 2001). However, helminthic infection was not included in that previous report. Therefore, helminthic infestation and its burden in mid-western region of Nepal could be the reason for the gender difference in infestation rate reported by current study finding. Given that helminthic infestation rate was higher among the female and the interquartile range of age among the female was 20-38 years, it could worsen prevalence of iron deficiency anemia among Nepalese women and result in poor pregnancy outcomes (Christian, Khatry, & West, 2004; Larocque, Casapia, Gotuzzo, & Gyorkos, 2005; Marahatta, 2007). The women living in the poverty pockets may have low knowledge of the diseases. Culturally tailored, gender sensitive interventions are necessary.

Among the different age groups, parasitic infestation was highest in school going aged children (5-14 years) (Table 2). Helminthic infestation was found in more than 60% of the cases and the remaining 30% was protozoal infestation. This finding was concurrent with previous study finding in western region of Nepal (Mukhopadhyay, Wilson, Chawla, VS, & Shivananda, 2008). Playing in contact with soil might cause contaminated with egg or larva of *A lumbricoides* and hook worm. Worm infestation in school going age results in poor school performance and absenteeism (WHO, 2012). It can cause the long term under-development of psychomotor and physical growth (Oberhelman et al., 1998). A national strategic plan of six monthly anthelminthic intervention targeting for children under 5 years of age has been started years ago in Nepal, but the impact on school children were not known yet (WHO, 2008).

Helminthic infestations were influenced by socio-economic status of the community (Lancet, 2004). In the current study, rank of the policemen reflects their living standard. Junior officers were infested most (Table 2). Sanitation facility differed among the families by rank. Unpaved barrack and the barefoot walking habit enhance the chance of STH such as ascariasis and hookworm.

Transmission of worms and parasites rely on people behavior of toileting, hand washing and nail trimming of children (Gyawali et al., 2009; Shrestha, Narayan, & Sharma, 2012). Recent WHO UNICEF update on progress of drinking water and sanitation 2012 reported that population practicing open defecation was as high as 57% in the rural area of Nepal in 2010. Until recently, 28% of households had no latrine and 27% had temporary pit latrine and 46% had private latrine with septic tank in the study site area, Nepalgunj municipality (Asian Development Bank, 2011). Such situation maintains contamination of the soil with human faeces and favours transmission dynamic of STH (Brooker, Clements, & Bundy, 2006; Lancet, 2004).

In the current study a seasonal trend of helminthic infestation, protozoa infestation and mixed infection were sorted by data collected for three years. Helminthic trend peaked in autumn (September to November) (Figure 1). Free-living infective stages of soil transmitted helminths such as *A lumbricoides* and *T trichiura* and their maximum development occur at 28° to 32°C (Beer, 1976). Temperature less than 5°C and more than 38^0 are unfavorable for the development. Similarly hookworm ova could not resist the temperature more than 40^0 centigrade, *A lumbricoides* eggs are more resistant to extreme temperatures (Beer, 1976). The helminthic trend in

current finding saw peaks in the month of cool weather (28° to 32°C) and troughs in extremely hot summer time which usually is as hot as 38°C. Although there is seasonal fluctuation of the STH, the prolonged life span of the adult worm (1-10) years will maintain the endemicity.

Moreover, the survival and the fastest growth of larvae and ova of the parasites depend on the humidity. The higher the humidity, the better the embryogenesis of the ova of the helminthes (Brooker et al., 2006). Land surface temperature of Banke and nearby districts ranging from 5° to 46°C is favorable for the infective stage of helminth and protozoa. Consequently higher infection intensity per host and increment of the reproductive form of the parasites will maintain infection prevalence in population (Anderson, 1982; Anderson & May, 1992; Pavlovski, 1966).

In the current study population, the number of children was less than adults. Such an age distribution may result in a low prevalence of protozoal and mixed infection unlike some previous reports in Nepal (Shrestha, et al., 2012). Moreover, our finding showed a year- round persistent trend of protozoal infestation (Figure 1). The sewage system in least developed Nepalgunj has been poor for decades (Asian Development Bank, 2011). It might contribute environmental sources of infection. The cysts of E *histolytica,* the most common type of protozoa in current place (Table 3), withstand the desiccation and changes in the humidity and the temperature. However, the reason why seasonal trends of helminthic and protozoal infection seemed opposite to each other was not explainable by literature (Figure 1).

4.1 Limitation

This study site hospital in poor setting had limited laboratory facility of microscopic examination. Helminthic infection could be underestimated because of simple microscopic examination, and protozoa infection could be overestimated as we could not apply *E. histolytica*–specific antigen detection or polymerase chain reaction techniques to exclude E. *dispar* cysts (Haque, Huston, Hughes, Houpt, & Petri, 2003).

5. Conclusion

Despite the limitations, current study would point up the burden of worm infestation among combatants, women and children in their families in a least developed area of Nepal. It calls for an environmental survey in the study area which will directly claim for an investment to improve proper sanitary system. Moreover, interventions to promote people's knowledge, personal hygienic behavior, and sanitation facilities are necessities to abolish open defecation habit, and consequent soil contamination. The concerning agencies should start all possible interventions to improve the environment as soon as possible.

Acknowledgements

All the staffs in MWRPH performing this work were heartily acknowledged. Dean Professor Yaowalark Sukthana, Professor Yukifumi Nawa, Faculty of Tropical Medicine, Mahidol University, Thailand and Dr. Thaworn Lorga, Boromarajonani College of Nursing, Nakhon Lampang, (BCNLP), Thailand were acknowledged for persistent inspiration and advices.

Funding: None

Competing interests: None declared

Ethical approval: Not required

References

Anderson, R. (Ed.). (1982). The population dynamics and control of hookworm and roundworm infection. In *Chapman and Hall* (pp. 67-109).

Anderson, R. M., & May, R. M. (1992). Infectious diseases of humans: dynamics and control. *Australian Journal of Public Health, 16*, 208-212. http://dx.doi.org/10.1111/j.1753-6405.1992.tb00056.x

Asian Development Bank (2011). Technical Assistance Consultant's Report: Nepal: Integrated Urban Development Project. Retrieved from http://www2.adb.org/Documents/Reports/Consultant/NEP/42161/42161-012-nep-tacr.pdf

Beer, R. J. (1976). The relationship between Trichuris trichiura (Linnaeus 1758) of man and Trichuris suis (Schrank 1788) of the pig. *Res Vet Sci, 20*(1), 47-54.

Brooker, S., Clements, A. C. A., & Bundy, D. A. P. (2006). Global Epidemiology, Ecology and Control of Soil-Transmitted Helminth Infections. *Advances in Parasitology, 62*, 221-261.

Christian, P., Khatry, S. K., & West, K. P. Jr. (2004). Antenatal anthelmintic treatment, birthweight, and infant

survival in rural Nepal. *Lancet, 364*(9438), 981-983. http://dx.doi.org/10.1016/s0140-6736(04)17023-2

Gunduz, T., Demirel, M. M., Inceboz, T., Tosun, S., & Yereli, K. (2005). Prevalence of intestinal parasitosis in children with gastrointestinal symptoms associated with socio-economic conditions in Manisa region. *Turkiye Parazitol Derg, 29*(4), 264-267.

Gyawali, N., Amatya, R., & Nepal, H. P. (2009). Intestinal parasitosis in school going children of Dharan municipality, Nepal. *Trop Gastroenterol, 30*(3), 145-147.

Haque, R., Huston, C. D., Hughes, M., Houpt, E., & Petri, W. A. (2003). Amebiasis. *New England Journal of Medicine, 348*(16), 1565-1573. http://dx.doi.org/10.1056/NEJMra022710

Jex, A. R., Lim, Y. A. L., M. Bethony, J., Hotez, P. J., Young, N. D., & Gasser, R. B. (2011). Chapter 4 - Soil-Transmitted Helminths of Humans in Southeast Asia—Towards Integrated Control. *Advances in Parasitology, 74*, 231-265.

Khanal, L. K., Rai, S. K., Khanal, P. R., & Ghimire, G. (2011). Status of intestinal parasitosis among hospital visiting patients in Deukhury Valley, Dang, Nepal. *Nepal Med Coll J, 13*(2), 100-102.

Lancet, T. (2004). Thinking beyond deworming. *The Lancet, 364*(9450), 1993-1994.

Larocque, R., Casapia, M., Gotuzzo, E., & Gyorkos, T. W. (2005). Relationship between intensity of soil-transmitted helminth infections and anemia during pregnancy. *Am J Trop Med Hyg, 73*(4), 783-789.

Marahatta, R. (2007). Study of anaemia in pregnancy and its outcome in Nepal Medical College Teaching Hospital, Kathmandu, Nepal. *Nepal Med Coll J, 9*(4), 270-274.

Mukhopadhyay, C., Wilson, G., Chawla, K., VS, B., & Shivananda, P. (2008). A 6 year Geohelminth infection profile of children at high altitude in Western Nepal. *BMC Public Health, 8*(1), 98.

Oberhelman, R. A., Guerrero, E. S., Fernandez, M. L., Silio, M., Mercado, D., Comiskey, N., ... Mera, R. (1998). Correlations between intestinal parasitosis, physical growth, and psychomotor development among infants and children from rural Nicaragua. *Am J Trop Med Hyg, 58*(4), 470-475.

Ono, K., Rai, S. K., Chikahira, M., Fujimoto, T., Shibata, H., Wada, Y., ... Uga, S. (2001). Seasonal distribution of enteropathogens detected from diarrheal stool and water samples collected in Kathmandu, Nepal. *Southeast Asian J Trop Med Public Health, 32*(3), 520-526.

Pavlovski, E. (Ed.). (1966). *Natural Nidality of Transmissible Diseases.* Urbana: University of Illinois Press.

Shakya, B., Rai, S. K., Singh, A., & Shrestha, A. (2006). Intestinal parasitosis among the elderly people in Kathmandu Valley. *Nepal Med Coll J, 8*(4), 243-247.

Shrestha, A., Narayan, K. C., & Sharma, R. (2012). Prevalence of intestinal parasitosis among school children in Baglung districts of Western Nepal. *Kathmandu Univ Med J (KUMJ), 10*(37), 3-6.

UNICEF & WHO (2012). Progress on drinking water and sanitation update 2012. Retrieved February 4th, 2013, from http://www.unicef.org/media/files/JMPreport2012.pdf

WHO (2008). Photo stories: Nepal: ensuring a worm-free childhood. Retrieved April 8th, 2013, from http://www.who.int/features/2008/worm_control/en/

WHO (2013). Intestinal worms. Retrieved from http://www.who.int/intestinal_worms/en/

WHO. (2012). World Health Organization: Eliminating soil-transmitted helminthiases as a public health problem in children progress report 2001–2010 and strategic plan 2011–2020. Retrieved April 8th, 2013, from http://whqlibdoc.who.int/publications/2012/9789241503129_eng.pdf

Yap, P., Furst, T., Muller, I., Kriemler, S., Utzinger, J., & Steinmann, P. (2012). Determining soil-transmitted helminth infection status and physical fitness of school-aged children. *J Vis Exp,* 66, e3966. http://dx.doi.org/10.3791/3966

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Association between Socio-Demographics and Alcohol Dependence among Individuals Living in an Indian Setting

B. T. Vignesh[1,2], Awnish K. Singh[2], S. K. Mohan[1, 2], Shruti Murthy[2] & Ashish Joshi[3]

[1] Saveetha Medical College & Hospital, Saveetha University, Chennai, India

[2] Foundation of Healthcare Technologies Society, New Delhi, India

[3] Centre of Global Health and Development, College of Public Health, University of Nebraska Medical Centre, Omaha, USA

Correspondence: Ashish Joshi, MD, PhD, MPH, Assistant Professor, Centre for Global Health and Development and Department of Health Services Research Administration, College of Public Health, University of Nebraska Medical Centre. Tel: 1-402-559-2327. E-mail: ashish.joshi@unmc.edu

Received: October 28, 2013 Accepted: December 2, 2013 Online Published: January 23, 2014

doi:10.5539/gjhs.v6n3p16 URL: http://dx.doi.org/10.5539/gjhs.v6n3p16

Abstract

Background: Alcohol use is on the rise worldwide and urgent steps are required to curb this growing burden of alcohol consumption. Alcohol drinking leads to serious social, physical and mental consequences.

Objective: The objective of this pilot study is to examine association between socio-demographics and severity of alcohol dependence among individuals obtaining treatment at alcohol de-addiction center.

Methods: This pilot cross sectional study was conducted in September 2013 in South India. A convenient sample of 100 participants was enrolled. Individuals aged 30 years and above, receiving treatment from de-addiction center and providing written informed consent were eligible for the study. A modified version of previously validated questionnaires was used for gathering information on socio-demographic characteristics, severity of alcohol dependence (using Alcohol Dependent Scale [ADS] and Short Alcohol Dependence Data questionnaire [SADD]), motivational incentives for alcohol quitting and challenges faced while quitting alcohol.

Results: All participants were males with mean age of 43 years (SD = 6.5 years). Significant association was seen between ADS and annual income ($p = 0.001$), education ($p = 0.001$), occupation ($p < 0.0001$) and work timing ($p < 0.0001$). Similar results were seen with SADD scores. Family support (100%) and health (60%) were reported to be the most important motivating factors for quitting alcohol.

Discussion: Results showed an urgent need of interventions that are family centered and focus on unskilled, less educated individuals having high work stress. Public health interventions should not only be home based, but should also include worksite awareness initiatives. A national policy is needed to promote alcohol quitting and to bring awareness regarding the consequences of alcohol consumption on individual's life.

Keywords: alcohol drinking, alcohol dependence, motivation, socio-demographics, alcohol quitting

1. Introduction

Alcohol drinking is common practice in many parts of the world. Nevertheless, its consumption leads to serious social, physical and mental consequences (World Health Organization [WHO], 2011). Prior studies have shown that alcohol use exposes the individual to acute health conditions like road traffic accidents and risk of acquiring chronic diseases. Alcoholism is a progressive disease in which individual has been unable to quit drinking and continues to drink even after knowing its harmful effects. Individual faces problem in controlling the drinking, is preoccupied with alcohol, is drinking more to get the desired effect and if stops drinking, individual will face alcohol withdrawal symptoms (Mayo clinic, 2012; Hoffman & Tabakoff, 1996). An alcoholic can't predict the amount, duration and consequences of alcohol drinking consistently (Mayo clinic, 2012; "Alcoholism", 2013).

The worldwide prevalence of alcohol use disorders among the individuals attained at the age of 15 years and above was estimated to range from 0% to 16% (WHO, 2004). The highest prevalence was observed in Eastern Europe. It was depicted that the proportion of males with alcohol use disorder was estimated to be highest in Eastern European countries, in parts of South-East Asia and in some countries in the Americas. In Eastern

European countries, selected countries in the Americas and Western Pacific Region were estimated of having highest prevalence of alcohol use disorders among females (WHO, 2004). Global per capita consumption is found to be 6.13 liters for individuals aged 15 or above. More than quarter (28.6%) of it is homemade and illegally produced alcohol. It was found that from the total recorded alcohol consumption, spirits are highest (45.7%), followed by beer (36.3%) and wine (8.6%). All other beverages share 10.5% of the total recorded alcohol ("Alcoholism", 2013).

The American Medical Association classifies alcoholism to have 2 components including both physical and mental. Physiological mechanism that leads to the condition of alcoholism is not well understood ("Alcoholism", 2013). Socio-demographics, mental health and family history are potential influencers for the risk of alcoholism (Chen, Storr, & Anthony, 2009). It is revealed in research that individuals with moderate drinking habit are less likely to develop an alcohol use disorder. The drinking level for men are less than 4 drinks in a day and less than 14 drinks in a week and for women it is less than 3 drinks and less than 7 drinks in a week (National Institute of Health [NIH]). Individuals drinking above these levels are considered heavy or "at risk" drinkers and if an individual alcohol concentration level reaches 0.08g/dl in blood in 2 hours of drinking, it is considered as binge drinking (NIH).

Several research studies have been done In India to estimate the prevalence of alcohol use (Gururaj, Murthy, Girish & Benegal, 2011). Previous study shows that 35% individuals reported alcohol use in past year and 14% were consuming regularly (Gururaj et al., 2011; John et al., 2009). Similarly results of another study showed that 15% of the respondents consumed alcohol under the influence of familial status or peer pressure (John et al., 2009; Sarangi, Acharya, & Panigrahi, 2008). Findings of another study in the urban slums of Faridabad showed the prevalence of alcohol consumption to be 26% in males in the year 2006 (Gururaj et al., 2011). Countrywide survey of households for Alcohol and drug abuse (2003) showed that the prevalence of alcohol use was 21.4% (Sarkar et al., 2013). An earlier study done on individuals visiting de-addiction center in West Bengal found that 85% of the participants consuming alcohol were in the age group of 20-49 years (Sarkar et al., 2013). A prior study in the past has shown that 25% of the patients with bipolar and alcohol use disorder had attempted suicide (Oquendo et al., 2010). Prior study has shown that college students with parental history of alcohol-related problems drink more or have more alcohol related problems than their peers from non-alcoholic families (Gupta, Saxena, Pednekar, & Maulik, 2003). In another study, age of initiation of alcohol drinking was found to be strong predictor of alcohol misuse at age 17-18 (Baer et al., 2002). Results have also shown that people with alcohol dependence take sick leave more frequently than other employees (Hawkins et al., 1997). In India about 40% of work accidents have been attributed to alcohol use (Skinner & Horn, 1984) and family members may suffer with substantial mental health problems such as depression, irritability and anxiety (Hawkins et al., 1997). Alcohol use disorder leads to unemployment, lower wages and medical expenses along with legal charges which in turn force the individual to live poor social life (Hawkins et al., 1997). The average estimate of social and economic cost of alcohol use in industrialized countries ranges from 1.1% of GDP in Canada to 5-6% in cases of Italy (Hawkins et al., 1997). With increasing purchasing power developing countries like India are not far behind in alcohol misuse. Considering the impact of alcohol abuse in the developing nation like India where alcohol is one of the major sources of revenue there is a special need for understanding the various methods to control its consumption and for promoting individuals to quit it.

To our knowledge, our pilot study is the first of its kind in India to examine association between the socio-demographics and the severity of alcohol dependence among individuals obtaining treatment for alcohol use disorder.

2. Methods

A pilot cross sectional study was performed during September 2013 at outpatient department (OPD) of Saveetha Medical College, Chennai, India. A convenient sample of 100 participants was enrolled in this pilot study. Individuals age 30 years and above and receiving treatment from OPD for alcohol use disorder were eligible to participate in the study. Participants were informed about the study purpose before their enrollment in the study. Individuals who were mentally or physically challenged were excluded from participating in the study. All the individuals visiting the OPD for treatment of alcohol use disorder were approached and among them who were satisfying the eligibility criteria and provided the written consent were enrolled in the study until the desired sample of 100 was reached. In the process 28 individuals who were found eligible but refused to participate were excluded from the study. The study protocol was approved by the Institutional Review Board of the Foundation of Healthcare Technologies Society, New Delhi (IRB#FHTS/031/2013) and conforms to the provisions of the Declaration of Helsinki (as revised in Tokyo 2004).

2.1 Data Collection Tools

Information on the following variables was gathered in the study by face to face interview of the participants.

(a) Socio-demographic characteristics: Information was gathered about age (years), gender, educational status [Grade 1-5, Grade 6-8, Grade 9-10, Grade 11-12, Graduate or above and no education], marital status (single/married/divorce or separated/widow), annual household income, household location or settings(rural, urban), type of family (joint, nuclear, broken, extended), number of family members, occupation status (semi-professional to professional, skilled worker, unskilled, unemployed) (Kumar, Gupta, & Kishore, 2012) and work shift timings (morning, evening, night, alternate, day).

(b) Alcohol Dependence Scale (ADS): The ADS provides a quantitative measure of the severity of alcohol dependence consistent with the concept of the alcohol dependence syndrome. The 25 items cover alcohol withdrawal symptoms, impaired control over drinking, awareness of a compulsion to drink, increased tolerance to alcohol, and salience of drink-seeking behavior. The ADS is widely used as a research and clinical tool, and studies have found the instrument to be reliable and valid. It is a 25 item questionnaire used to gather information regarding the alcohol dependence. Dichotomous items were scored 0, 1; three-choice items were scored 0, 1, 2; and four-choice items were scored 0,1,2,3. In each case higher the value greater the dependence. Total score ranges from 0-47 (Skinner & Horn, 1984).

(c) Short Alcohol Dependence Data Questionnaire (SADD): It is used to measure the severity of alcohol dependence (Rosa-Oliveria et al., 2011). Behavioral and subjective aspects of alcohol dependence, with adequate construct validity and high correlation with other instruments. The SADD seems to be relatively immune to social-cultural influences and can be used in different settings (Rosa-Oliveria et al., 2011). Information was gathered regarding the alcohol dependence by using 15 items questionnaire (Never, sometimes, often and nearly always). Items were scored from 0-3. The score of 15 items was summed to get the range of 0-45. Scale totals were interpreted as follows: 1-9 low dependence, 10-19 medium dependence, and 20 or greater high dependence (Moderation Management [MM]).

(d) Incentives and Challenges: Information was gathered using 2 item open ended questionnaire that recorded the possible motivational reasons for quitting alcohol and the associated challenges faced in quitting alcohol.

2.2 Statistical Analysis

Descriptive analysis was performed using univariate statistics to report means and standard deviations for the continuous variables and frequency distribution for the categorical variables. Chi-square analysis was performed to compare the frequency of categorical variables. Correlation and analysis of variance was performed to determine association between alcohol severity and socio-demographic characteristics. Content analysis of the open ended data was performed to identify the common themes that emerged from the analysis. All analysis was performed using SPSS version 16.

3. Results

Results show that all of the participants were male with average age of the participants was 43 years (SD = 6.5), most of them were married, having nuclear family with an average family size of 4 (SD = 1). 68% of them were from rural areas. Half of the participants had less than primary education. 58% of the participants were skilled worker, half of the respondents were working in morning shift with an average annual household income of 93,737 INR (SD = 102133) (Table 1).

Table 1. Socio-demographics characteristics

Variables	Results
Socio-Demographics	
Age(years)	Mean= 43; SD=6.5
Type of Family	
Nuclear	90 (90%)
Joint	9 (9%)
Missing	1 (1%)
Household location or setting	
Rural	68 (68%)
Urban	30 (30%)
Missing	2 (2%)
Family size	Mean=4; SD=1
<5	61 (61%)
≥5	38 (38%)
Missing	1 (1%)
Annual household income, INR*	Mean =93,737; SD=1,02,133
<50000	12 (12%)
50000-60000	41(41%)
>60000	46 (46%)
Missing	1(1%)
Marital Status	
Married	90 (90%)
Single	6 (6%)
Divorced/Separated	1(1%)
Missing	1(1%)
Highest Education level of participant	
Primary (1^{st}-5^{th})	51(51%)
Middle (6^{th}-8^{th})	11(11%)
High school (9^{th}-10^{th})	15(15%)
Intermediate (11^{th}-12^{th}) or equivalent	13(13%)
Graduate or Postgraduate	6 (6%)
Missing	4(4%)
Occupation	
Skilled worker	58(58%)
Unskilled worker	41(41%)
Missing	1(1%)
Shift of work	
Morning	51(51%)
Evening	9(9%)
Night	12(12%)
Alternate	7(7%)
Day	9(9%)
Missing	12(12%)

*INR: Indian National Rupees

Results showed that the average ADS score was 23 (SD = 6). Results showed that 39% of the participants drank enough to get drunk during their last time of drinking. 27% of the participants reported drinking throughout the day. 50% of them reported having hangovers on Sunday or Monday mornings. 76% of the participants use to gulp drinks and 59% of them cannot stop after one drink. 54% of the participants reported frequent trembling of hands and 55% of them had the tendency to have physical sickness as a result of drinking. 45% of the participants agreed to have reported several episodes of delirium tremens. 59% of them reported delusion once or several times after drinking. More than half of them (57%) had fear of not having drink at the time of need. Only 16% of the participants never had blackouts ("loss of memory" without passing out) as a result of drinking and 21% of them had blackouts that lasted a day or more. 66% of them reported tachycardia and palpitation once or several times (Table 2).

Table 2. Alcohol dependence scale (ADS)

Alcohol Dependence Scale	Results (%)
How much did you drink the last time you drank?	
Enough to get high or less	28 (28%)
Enough to get drunk	39 (39%)
Enough to pass out	32 (32%)
Missing	1 (1%)
Do you often have hangovers on Sunday or Monday mornings?	
No	50 (50%)
Yes	50 (50%)
Have you had the "shakes" when sobering up (hands tremble, shake inside)?	
No	22 (22%)
Sometimes	24 (24%)
Often	54 (54%)
Do you get physically sick (e.g., vomit, stomach cramps) as a result of drinking?	
No	18(18%)
Sometimes	55(55%)
Almost every time I drink	27 (27%)
Have you had the "DTs" (delirium tremens) – that is, seen, felt or heard things not really there; felt very anxious, restless, and over excited?	
No	55(55%)
Sometimes	34(34%)
Several times	11(11%)
When you drink, do you stumble about, stagger, and weave?	
No	23(23%)
Sometimes	42(42%)
Often	34(34%)
Missing	1(1%)
As a result of drinking, have you felt overly hot and sweaty (feverish)	
No	27 (27%)
Once	32(32%)
Several times	41(41%)
As a result of drinking, have you seen things that were not really there?	
No	41(41%)
Once	26(26%)
Several times	33(33%)
Do you panic because you fear you may not have a drink when you need it?	
No	42(42%)

Yes	57(57%)
Missing	1(1%)
Have you had blackouts ("loss of memory" without passing out) as a result of drinking?	
No, never	16(16%)
Sometimes	39(39%)
Often	32(32%)
Almost every time I drink	13(13%)
Do you carry a bottle with you or keep one close at hand?	
No	39(39%)
Some of the time	39(39%)
Most of the time	22(22%)
After a period of abstinence (not drinking), do you end up drinking heavily again?	
No	29(29%)
Sometimes	47(47%)
Almost every time I drink	24(24%)
In the past 12 months, have you passed out as a result of drinking?	
No	31(31%)
Once	40(40%)
More than once	27(27%)
Missing	2(2%)
Have you had a convulsion (fit) following a period of drinking?	
No	32(32%)
Yes	37(37%)
Several times	31(31%)
Do you drink throughout the day?	
No	73(73%)
Yes	27(27%)
After drinking heavily, has your thinking been fuzzy or unclear?	
No	14(14%)
Yes, but only for a few hours	35(35%)
Yes, for one or two days	32 (32%)
Yes, for many days	19 (19%)
As a result of drinking, have you felt your heart beating rapidly?	
No	34 (34%)
Yes	46 (46%)
Several times	20 (20%)
Do you almost constantly think about drinking and alcohol?	
No	40 (40%)
Yes	59 (59%)
Missing	1(1%)
As a result of drinking, have you heard "things" that were not really there?	
No	32 (32%)
Yes	39 (39%)
Several times	29 (29%)
Have you had weird and frightening sensations when drinking?	
No	26 (26%)
Once or twice	46 (46%)
Often	28 (28%)

As a result of drinking have you "felt things" crawling on you that were not really there (e.g., bugs, spiders)?	
No	55(55%)
Yes	30 (30%)
Several times	15(15%)
With respect to blackouts (loss; of memory)	
Have never had a blackout	19 (19%)
Have had blackouts that last less than an hour	40 (40%)
Have had blackouts that last for several hours	20 (20%)
Have had blackouts that last a day or more	21(21%)
Have you tried to cut down on your drinking failed?	
No	39 (39%)
Once	43(43%)
Several times	18(18%)
Do you gulp drinks (drink quickly?)	
No	24(24%)
Yes	76(76%)
After taking one or two drinks, can you usually stop?	
No	59 (59%)
Yes	41(41%)

The average SADD scores was 18 (SD = 4). Results showed that 61% of the participants felt that sometimes getting drunk is more important than the next meal while 33% of them agreed that they drink always in morning, afternoon and evening. More than half of them (53%) reported that sometimes they drink as much as they want irrespective of their next day assignments. 42% of the participants drink alcohol irrespective of its affects. Thirty-four per cent of the participants knew that they won't be able to stop drinking after beginning while 39% of them never tried to control it. 78% of them reported forgetting things in next morning after having heavy drinks (Table 3).

Table 3. Short Alcohol Dependence Data (SADD) questionnaire

SADD	**Results (%)**				
	Never	Sometime	Often	Nearly always	Missing
Do you rind difficulty in getting the thought of drinking out of your mind?	17(17%)	73(73%)	8(8%)	2(2%)	
Is getting drunk more important than your next meal?	14(14%)	61(61%)	18(18%)	6(6%)	1(1%)
Do you plan your day around when and where you can drink?	26(26%)	33(33%)	35(35%)	6(6%)	
Do you drink in the morning, afternoon and evening?	26(26%)	19(19%)	21(21%)	33(33%)	1(1%)
Do you drink for the effect of alcohol without caring what the drink is?	39(39%)	26(26%)	19(19%)	15(15%)	1(1%)
Do you drink as much as you want irrespective of what you are doing the next day?	22(22%)	53(53%)	14(14%)	11(11%)	
Given that many problems might be caused by alcohol do you still drink too much?	18(18%)	26(26%)	42(42%)	13(13%)	1(1%)
Do you know that you won't be able to stop drinking once you start?	20(20%)	27(27%)	17(17%)	34(34%)	2(2%)
Do you try to control your drinking by giving it up completely for days or weeks at a time?	39(39%)	28(28%)	21(21%)	12(12%)	
The morning after a heavy drinking session do you need your first drink to get yourself going?	29(29%)	49(49%)	10(10%)	12(12%)	
The morning after a heavy drinking session do you wake up with a	25(25%)	24(24%)	44(44%)	7(7%)	

definite shakiness of your hands?					
After a heavy drinking session do you wake up and retch or vomit?	38(38%)	24(24%)	13(13%)	24(24%)	1(1%)
The morning after a heavy drinking session do you go out of your way to avoid people?	35(35%)	28(28%)	26(26%)	10(10%)	1(1%)
After a heavy drinking session do you see frightening things that later you realize were imaginary?	22(22%)	49(49%)	20(20%)	8(8%)	1(1%)
Do you go drinking and the next day rind you have forgotten what happened the night before?	22(22%)	28(28%)	30(30%)	20(20%)	

3.1 Stratified Analysis

The ADS scores were stratified to 4 categories to assess the level of alcohol dependence It was found that majority (65%) of the individuals had substantial level of alcohol dependence (score 22-30), 15% had intermediate level of alcohol dependence (score 14-21), 13% had low level of alcohol dependence (score 1-13) and 3% had severe level of alcohol dependence (score 31-47). Similar results were seen with the SADD scores. It was found that 46% of the study participants had high dependence (score of ≥ 20), 40% had medium dependence (score 10-19), and 6% had low dependence (score 1-9).

3.2 Association between Socio-Demographics and ADS and SADD Scores

Results showed significant association between ADS and annual income ($p = 0.001$), education ($p < 0.0001$) and work timing ($p < 0.0001$). Similar results were seen for SADD scores (Table 4). In addition, marital status ($p = 0.04$) and occupation ($p = .008$) was also found significantly associated with SADD scores. No other significant association was seen with ADS or SADD scores.

Table 4. Association between Socio-demographics and ADS and SADD scores

Socio-demographic characteristics	ADS* Score	SADD‡Score
Age	r=0.14; p=0.14	r=0.14; p=0.17
Family size	r=0.01; p=0.85	r=0.13; p=0.19
Annual income	r=-0.34; p=0.001	r=-0.29; p=0.005
Family type	F=2.3; p=0.10	F=1.2; p=0.3
Location	F=2.1; p=0.12	F=0.8; p=0.43
Marital status	F=2.1; p=0.09	F=2.8; p=0.04
Education	F=5.6; p<0.0001	F=8.7; p<0.0001
Occupation	F=2.8; p=0.07	F=5; p=0.008
Work timings	F=5; p<0.0001	F=4.2; p=0.002

*ADS: Alcohol Dependence Scale ‡Short Alcohol Dependence Data questionnaire (r= Pearson correlation coefficient; F= F test statistic of ANOVA)

Results of various ADS categories showed that individuals with less education (80%, n = 41; p< .0001) and work timings of evening (100%, n = 9; p = .01) or alternate shifts (92%, n = 11; p = .01) were significantly associated with high alcohol dependence. Family type (p = .23), location (p = .13), marital status (p = .12) and occupation (p = .07) were not significantly associated with high alcohol dependence.

Similar results were seen among individuals with high alcohol dependence using various score categories of SADD. Participants who were married (51%, n = 43; p = .008), less educated (59%, n = 29; p< .0001) and working in night (54%, n = 7; p = .04); alternate (73%, n = 8; p = .04) or evening (44%, n = 4; p = .04) shifts (Figure 1), showed significant alcohol dependence. Occupation (p = .08), Family type (p = .10) and household location (p = .40) did not show any significant association.

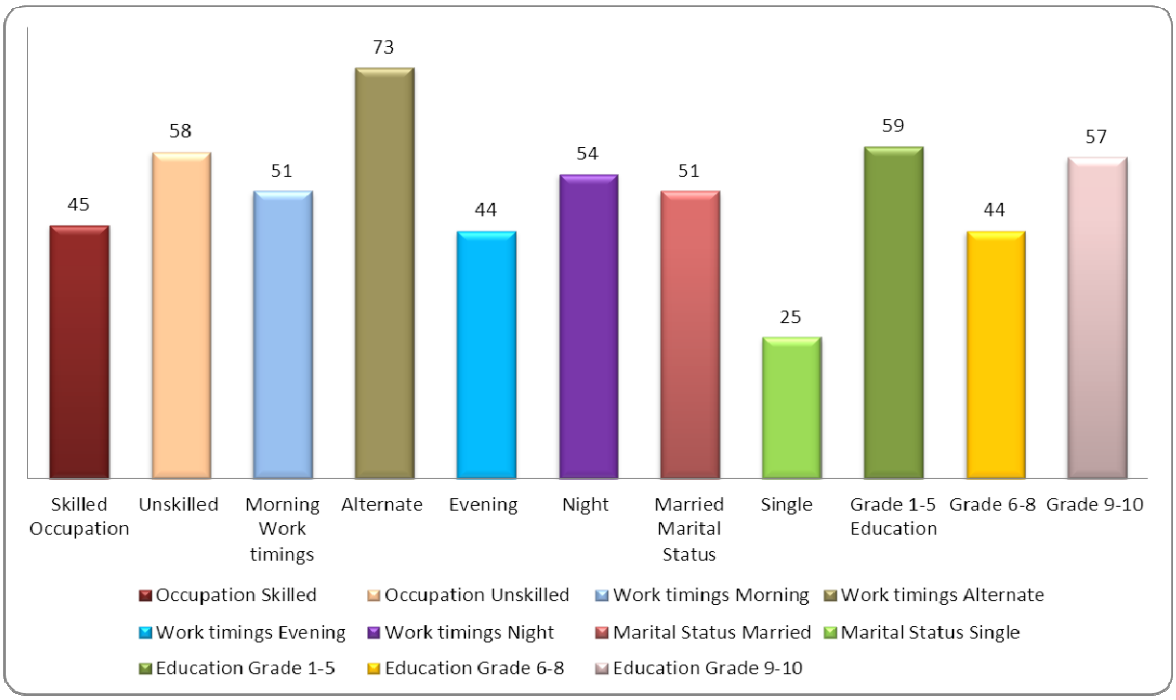


Figure 1. Frequency distribution of high alcohol dependence individuals

3.3 Motivations for Leaving Alcohol

Results showed that 100% of the individuals reported that family support was the biggest motivation for them to quit alcohol use. Health (60%) was the second most important motivating factor for individuals to quit alcohol. Results showed that family centered intervention with increased awareness about the health consequences after high consumption of alcohol are needed. Other motivations included access to better surroundings or environment (27%), or by increasing the costs of alcohol purchases (16%). The major challenge for the individuals not able to quit alcohol was due to increased work stress (52%), addiction to alcohol (46%), peer pressure (14%) and emotional behaviors (14%). The results suggest need for an intervention programs that should not only be home based but should also include work site initiatives that will help individuals to reduce alcohol dependence.

4. Discussion

Alcohol use is on the rise worldwide and urgent steps are required to curb this growing burden of alcohol consumption (Smith, 2008). Our pilot study is an attempt to evaluate the severity of alcohol dependence among the alcoholics visiting the OPD of Saveetha Medical College in Chennai, India. To our knowledge, this is the first study to evaluate the association between socio-demographics and alcohol dependence scores in an Indian population. Results showed that more than half of the population had either medium level of alcohol dependence (40%) or high level alcohol dependence on SADD (46%). More than half of them (65%) had substantial level of alcohol dependence and 3% of them had severe level of alcohol dependence on ADS. This shows very high severity of dependence on alcohol among the participants. Almost all individuals visiting the OPD for treatment of alcohol use disorder were male which can be attributed to social barriers, obstructing the females to visit OPD fro treatment.

Past study in Mumbai, reported 19% current use of alcohol among the participants and history of past use was reported in 5% of the participants (WHO, 2004).

Results of our study showed significant association between SADD Score and annual income ($p = 0.005$), marital status ($p = 0.04$), education ($p < 0.0001$), occupation ($p = 0.008$) and work timings ($p = .002$). Similar results were seen with ADS and showed significant associations between ADS Score and annual income ($p = 0.001$), education ($p = 0.001$) and work timings ($p < 0.0001$). Globally it was observed that people with alcohol dependence take sick leave more frequently than other employee's (WHO, 2004). In past study it was found that men with lower education and lower standard of living were more likely to report a risky usual quantity of alcohol (C60g/drinking day) (Pillai et al., 2012). Past study showed that 55% caregivers of alcohol dependent

patients experienced it as a mild to moderate burden and 45% felt it as a significant burden (Swapna, Sudarshan, & Begum, 2012). In our study, family support, increased health awareness and greater financial burden were identified as the most common factors that would possibly motivate the individuals to quit alcohol. Stress and addiction were two major challenges faced by the participants in quitting alcohol. A study in slums of Kolkata revealed that 84% of the individuals were not concerned about their level of consumption (Ghosh, Samanta, & Mukherji, 2012). Our study showed that 12% of the individuals tried constantly to control drinking by giving it up completely for days or weeks at a time.

There were several limitations associated with our study. First it included smaller sample size, and the study design was cross sectional. This limits establishing causality and can only describe associations between the various variables and alcohol dependence. Further the study was limited to one geographical location so the results of the study cannot be generalized. Also the study included only males so the findings of our study may not be applicable to females. Study didn't included confounding factors like family history of alcohol consumption and childhood environment and their consideration in future studies will give deeper insight of the issue.

Results showed an urgent need of interventions that are family centered, target individuals who are unskilled, less educated, and have high work stress. Public health interventions should not only be home based but should also include awareness initiatives at the worksite. There is an urgent need to conduct a longitudinal study to examine a temporal relationship between high alcohol dependence and various multiple factors including socio-demographics, environmental, behavioral and work site related variables. A national policy needs to be formulated aimed to create awareness about moderation of alcohol consumption, associated health consequences, impact on family and friends and work productivity.

References

Alcoholism. Wikipedia; the free encyclopedia. Retrieved from http://en.wikipedia.org/wiki/Alcoholism

Baer, J. S. (2002). Student factors: Understanding individual variation in college drinking. *Journal of Studies on Alcohol and Drugs, 14*, 40.

Chen, C. Y., Storr, C. L., & Anthony, J. C. (2009). Early-onset drug use and risk for drug dependence problems. *Addict Behav, 34*(3), 319-322. http://dx.doi.org/10.1016/j.addbeh.2008.10.021

Ghosh, S., Samanta, A., & Mukherjee, S. (2012). Patterns of alcohol consumption among male adults at a slum in Kolkata, India. *Journal of health, population, and nutrition*, *30*(1), 73. http://dx.doi.org/10.3329/jhpn.v30i1.11279

Gupta, P. C., Saxena, S., Pednekar, M. S., & Maulik, P. K. (2003). Alcohol consumption among middle-aged and elderly men: a community study from Western India. *Alcohol and Alcoholism, 38*(4), 327-331. http://dx.doi.org/10.1093/alcalc/agg077

Gururaj, G., Murthy, P., Girish, N., & Benegal, V. (2011). Alcohol related harm: Implications for public health and policy in India. *NIMHANS,* 73. Retrieved from http://www.nimhans.kar.nic.in/cam/CAM/Alcohol_report_NIMHANS.pdf

Hawkins, J. D., Graham, J. W., Maguin, E., Abbott, R., Hill, K. G., & Catalano, R. F. (1997). Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of studies on alcohol, 58*(3), 280.

Hoffman, P. L., & Tabakoff, B. (1996). Alcohol dependence: a commentary on mechanisms. *Alcohol and Alcoholism, 31*(4), 333-340. http://dx.doi.org/10.1093/oxfordjournals.alcalc.a008159

John, A., Barman, A., Bal, D., Chandy, G., Samuel, J., Thokchom, M., ... Balraj, V. (2009). Hazardous alcohol use in rural southern India: nature, prevalence and risk factors. *The National Medical Journal of India, 22*, 123-125.

Kumar, N., Gupta, N., & Kishore, J. (2012). Kuppuswamy's socioeconomic scale: Updating income ranges for the year 2012. *Indian J Public Health, 56*, 103-4. http://dx.doi.org/10.4103/0019-557X.96988

Mayo Clinic. (2012). Alcoholism Definition. Retrieved from http://www.mayoclinic.com/health/alcoholism/DS00340

NIH. *Alcohol and health*. National institute on Alcohol Abuse and Alcoholism. Retrieved from http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/moderate-binge-drinking

Oquendo, M. A., Currier, D., Liu, S., Hasin, D., Grant, B., & Blanco, C. (2010). Increased risk for suicidal behavior in comorbid bipolar disorder and alcohol use disorders. *The Journal of clinical psychiatry, 71*(7), 902. http://dx.doi.org/10.4088/JCP.09m05198gry

Pillai, A., Nayak, M. B., Greenfield, T. K., Bond, J. C., Nadkarni, A., & Patel, V. (2013). Patterns of alcohol use, their correlates, and impact in male drinkers: a population-based survey from Goa, India. *Social Psychiatry and Psychiatric Epidemiology, 48*(2), 275-282. http://dx.doi.org/10.1007/s00127-012-0538-1

Rosa-Oliveira, L. Q., Presti, P. D. F., Antunes, I. R., Carbonari, G. C., Imada, A. C., Maeda, M. Y., ... Doering-Silveira, J. (2011). Reliability and dimensionality of the Short Alcohol Dependence Data (SADD) questionnaire in a clinical sample of hospitalized patients: using the SADD in a general hospital setting. *RevistaBrasileira de Psiquiatria, 33*(1), 68-71. http://dx.doi.org/10.1590/S1516-44462010005000020

Sarangi, L., Acharya, H. P., & Panigrahi, O. P. (2008). Substance abuse among adolescents in urban slums of Sambalpur. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine, 33*(4), 265.

Sarkar, A. P., Sen, S., Mondal, S., Singh, O. P., Chakraborty, A., & Swaika, B. (2013). A study on socio-demographic characteristics of alcoholics attending the de-addiction center at Burdwan medical college and hospital in West Bengal. *Indian journal of public health, 57*(1), 33.

Skinner, H. A., & Horn, J. L. (1984). *Alcohol Dependence Scale (ADS) user's guide*. Toronto: Addiction Research Foundation, 1-38.

Smith, R. (2008). *Alcohol consumption doubles since the 1960s*. The Telegraph. Retrieved from http://www.telegraph.co.uk/health/3333411/Alcohol-consumption-doubles-since-the-1960s.html

Swapna, B., Sudarshan, C. Y., & Begum, S. (2012). Burden on caregivers in bipolar affective disorder and alcohol dependence syndrome–is it same or different? *Int J Biol Med Res, 3*(3), 1992-1997.

The Short Alcohol Dependence Data Questionnaire. *Moderation Management*. Retrieved from http://www.moderation.org/Questionnaire.shtml

WHO. (2004). Prevalence of alcohol use disorder. Global health observatory. Retrieved from: http://www.who.int/gho/substance_abuse/burden/alcohol_prevalence/en/

WHO. (2004). *Summary of Global status report on alcohol*. Social and economic problems linked to alcohol use. Retrieved from www.greenfacts.org/en/alcohol

WHO. (2011). *Alcohol, Health Topics*. Retrieved from http://www.who.int/topics/alcohol_drinking/en/

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Development of Evidence-Based Health Policy Documents in Developing Countries: A Case of Iran

Mohammad Hasan Imani-Nasab[1], Hesam Seyedin[2], Reza Majdzadeh[3,4], Bahareh Yazdizadeh[3] & Masoud Salehi[5]

[1] Department of Health Services Management, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran

[2] Health Management and Economics Research Center, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran

[3] Knowledge Utilization Research Center, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

[4] Department of Epidemiology & Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

[5] Department of Statistics and Mathematics, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran

Correspondence: Hesam Seyedin, Health Management and Economics Research Center, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran. Tel: 98-218-867-1614. E-mail: h.seyedin@iums.ac.ir

Received: December 12, 2013 Accepted: January 24, 2014 Online Published: February 8, 2014

doi:10.5539/gjhs.v6n3p27 URL: http://dx.doi.org/10.5539/gjhs.v6n3p27

Abstract

Background: Evidence-based policy documents that are well developed by senior civil servants and are timely available can reduce the barriers to evidence utilization by health policy makers. This study examined the barriers and facilitators in developing evidence-based health policy documents from the perspective of their producers in a developing country.

Methods: In a qualitative study with a framework analysis approach, we conducted semi-structured interviews using purposive and snowball sampling. A qualitative analysis software (MAXQDA-10) was used to apply the codes and manage the data. This study was theory-based and the results were compared to exploratory studies about the factors influencing evidence-based health policymaking.

Results: 18 codes and three main themes of behavioral, normative, and control beliefs were identified. Factors that influence the development of evidence-based policy documents were identified by the participants: behavioral beliefs included quality of policy documents, use of resources, knowledge and innovation, being time-consuming and contextualization; normative beliefs included policy authorities, policymakers, policy administrators, and co-workers; and control beliefs included recruitment policy, performance management, empowerment, management stability, physical environment, access to evidence, policy making process, and effect of other factors.

Conclusion: Most of the cited barriers to the development of evidence-based policy were related to control beliefs, i.e. barriers at the organizational and health system levels. This study identified the factors that influence the development of evidence-based policy documents based on the components of the theory of planned behavior. But in exploratory studies on evidence utilization by health policymakers, the identified factors were only related to control behaviors. This suggests that the theoretical approach may be preferable to the exploratory approach in identifying the barriers and facilitators of a behavior.

Keywords: research utilization, policies, health policy, theory of planned behavior, Iran

1. Introduction

Evidence is experienced or observed facts that support a conclusion. Research evidence is the most convincing type of evidence. It plays an important role in every stage of the policy making process—from setting agendas and developing policies to implementing and evaluating them (Dobrow, Goel, & Upshur, 2004). Evidence-based

medicine approach was introduced in the 1990s (Claridge & Fabian, 2005). This approach entered the area of health policy soon and resulted in the development of various theories, frameworks, instruments, and processes (Lavis & Oxman, 2009; Orem et al., 2012; Packwood, 2002)

Publication of 2004 WHO report, the 58th World Health Assembly, and Bamako Declarations encouraged health systems to incorporate research evidence into health policymaking (World Health Organization [WHO], 2004, 2005, 2008). Accordingly, some changes were made in Iran's Health System (IHS). The most important ones were establishment of the National Institute of Health Research, Health Technology Assessment Office, and Health Policy Council in Iran's Ministry of Health (IMoH). Concurrent with these developments, the High Council of Health and Food Security, the highest health policy authority at the government, announced that it accepts only evidence-based policy documents (EBPDs) on its agenda (Iran's National Institute of Health Research, 2013; Iran's Supreme Council of Health, and Food Security, 2013; Larijani, Delavari, Damari, Moghadam, & Majdzadeh, 2009; Majdzadeh, Nedjat, Fotouhi, & Malekafzali, 2009).

IHS uses research evidence in different health policy mechanisms for delivery, financing, governance, and implementation of health policies. However, its efforts are not systematic, comprehensive, and well institutionalized. For example, adding new services to the Iranian primary healthcare system requires adequate evidence, but there is no such commitment at the hospital level. Health technology assessment projects are needed to import major medical equipment to the country. Production or import of new drugs also requires enough evidence, but these efforts were not made for every major drug or medical equipment.

Integration of health services and medical education in IHS provides an opportunity to bridge the know-do gap (Majdzadeh, Yazdizadeh, Nedjat, Gholami, & Ahghari, 2012). For example, scientific committees consisting of scholars and administrative experts have been working in the technical offices of IMoH to provide scientific support for health policies. Similar to the most developing countries, the Iranian health policy system is centralized. IMoH is the main authority for health policymaking. The Fifth Economic, Social, and Cultural Development Plan (2009-2014) mandates the components of IHS to adhere to the governance of IMoH (Iran's parliament [IP], 2009a). Medical universities act as IMoH executive arms. Recently, some efforts have been made to decentralize health policymaking. One example is the establishment of the board of trustees in medical universities (IP, 2009b).

1.1 Material Studied

Some studies have been carried out on the factors that influence evidence utilization by health policy makers. Lack of timely access to relevant evidence, use of jargon, limited time, poor search, critical appraisal, adaption skills, and lack of communication with researchers were identified as barriers to the use of evidence in health policy making (Albert, Fretheim, & Maïga, 2007; Bowen, Erickson, Martens, & Crockett, 2009; Campbell et al., 2009; Ellen et al., 2013; Hennink & Stephenson, 2005; Hyder et al., 2011; Jewell & Bero, 2008; Majdzadeh et al., 2012; Orem et al., 2012). Several strategies were suggested to address these barriers: access to databases that publish systematic reviews, reporting evidence in 1:3:25 format or policy briefs, empowerment training courses, and some techniques for contextualization including policy dialogue (The Canadian Health Services Research Foundation, 2009; Lavis et al., 2005; Lavis, Boyko, Oxman, Lewin, & Fretheim, 2009; Ward & Mowat, 2012).

Evidence shows that health systems fail to make optimal use of evidence (Hanney, Gonzalez-Block, Buxton, & Kogan, 2003; Innvær, Vist, Trommald, & Oxman, 2002; Lavis et al., 2005; Oxman, Lavis, & Fretheim, 2007). One effort to bridge the gap between knowledge and policy can be undertaken by the policy making organization (pull efforts) (Ellen, Lavis, Ouimet, Grimshaw, & Bédard, 2011). A review of the literature shows that successful implementation of strategies to reduce the know-do gap highly depends on identifying barriers and facilitators in each specific setting (Graham et al., 2006; Graham & Tetroe, 2007; Lavis, 2006).

1.2 Area Descriptions

We believe that it is unrealistic to expect policy makers to find and appraise evidence and adapt policies to local conditions. In fact, policy makers are the end-users of the evidence that is synthesized by their consultants or senior civil servants (SCSs).

Promotion of EBPDs that are well developed by SCSs and are timely available can reduce the barriers to evidence utilization by health policy makers. Studies have focused on the factors influencing the use of evidence in health policy. The present study is based onevidence-informed policymaking. This approach considers scientific evidence as only one of the inputs in the policy making process. It focuses on evidence-informed policy rather than evidence-based policy. Therefore, our focus in this study is on policy documents, an objective product, rather than the policy making which is a subjective process. This research was designed to study

barriers and facilitators of developing EBPDs from the perspective of their producers in IMoH.

2. Methods

A qualitative study with a framework analysis approach was used for data collection and analysis. Studies of the barriers and facilitators of a phenomenon are either exploratory or theory-based (Straus, Tetroe, & Graham, 2013). In this study, the theory of planned behavior (TPB) was used as a framework to identify barriers and facilitators in developing EBPDs. TPB is one of the most famous theories to explain human behavior (Duan & JIANG, 2008). This theory postulates three determinants of intention: attitude toward the behavior, subjective norm, and perceived behavioral control. The intention is a strong predictor of future behavior (Ajzen, 1991) (Figure 1). TPB has proved its power to predict behaviors in different areas, including health care (Eccles et al., 2006). This theory helps us identify the main factors that influence a behavior, while the exploratory approach may overlook some of these factors.

We conducted semi-structured interviews with a purposive sample of EBPDs producers, directors of technical offices (D), and their senior Technicians (T) in IMoH. Those with a minimum of five years' experience in policy development at the national level were interviewed. Snowball sampling was also used to identify key informants. IMoH consists of nine deputies, each deputy consists of a few bureaus/centers, and each bureau/center consists of several technical offices (IMoH, 2013). Technical offices are the starting point for developing an EBPD in IMoH.

An interview guide, informed by TPB, was developed and pilot-tested with 5 interviewees (Appendix). The interview guide included questions about the advantages and disadvantages of developing EBPDs, individuals or groups that approve or disapprove of EBPDs, and conditions that facilitate or hinder the development of EBPDs.

All interviews were conducted face-to-face by the first author (INMH) from January to February 2013. INMH has 12 years of experience in IHS. There was no communication between the interviewer and the participants prior to the study. To ensure confidentiality, all interviews were performed in the participant's individual office or in the meeting room with nobody else present. Interviews lasted between 32 and 78 minutes (53 min. on average). Verbal informed consent was obtained before recording the interviews by an electronic voice recorder. The data collection continued until the point of data saturation.

All of the recorded interviews were transcribed and coded based on framework analysis developed by Ritchie and Spencer. The key steps in framework analysis are: familiarization, identifying a thematic framework, indexing, charting, and mapping and interpretation (Ritchie & Spencer, 2002). Based on the aims of the study and familiarization, 18 codes and three themes of behavioral, normative, and control beliefs were identified. To establish inter-coder reliability, two members of the research team coded two interview transcripts and discussed and removed the inconsistencies (Carey, Morgan, & Oxtoby, 1996). Research findings were sent to the participants to get feedback on our interpretations and to ensure that their intentions and views were faithfully presented (Lincoln & Guba, 1985). A qualitative analysis software (MAXQDA-10) was used to apply the codes and manage the data. COREG (consolidated criteria for reporting qualitative research) checklist was used for reporting this study (Tong, Sainsbury, & Craig, 2007).

This study was based on theory and the results were compared to the findings of exploratory studies on the factors that affect evidence utilization by health policy makers. To this end, factors affecting evidence utilization by health policy makers were classified based on the TPB components (Albert et al., 2007; Bowen et al., 2009; Hennink & Stephenson, 2005; Hyder et al., 2011; Orem et al., 2012).

3. Results

We interviewed 23 producers of EBPDs in IMoH. Table 1 shows the characteristics of the participants.

Table 1. Characteristics of the participants

Characteristics	Experience (yrs.)		Background		Employment Status		Degree			Management Experience	
	5-10	11-16	Clinical	Non-Clinical	Technician	Faculty Member	MS	GP	PhD	Yes	No
Number	13	10	12	11	19	4	8	7	8	10	13

MS: Master of Science; GP: General Practitioner; PhD: Philosophy of Doctor.

Figure 1 presents our finding within the framework of TPB.

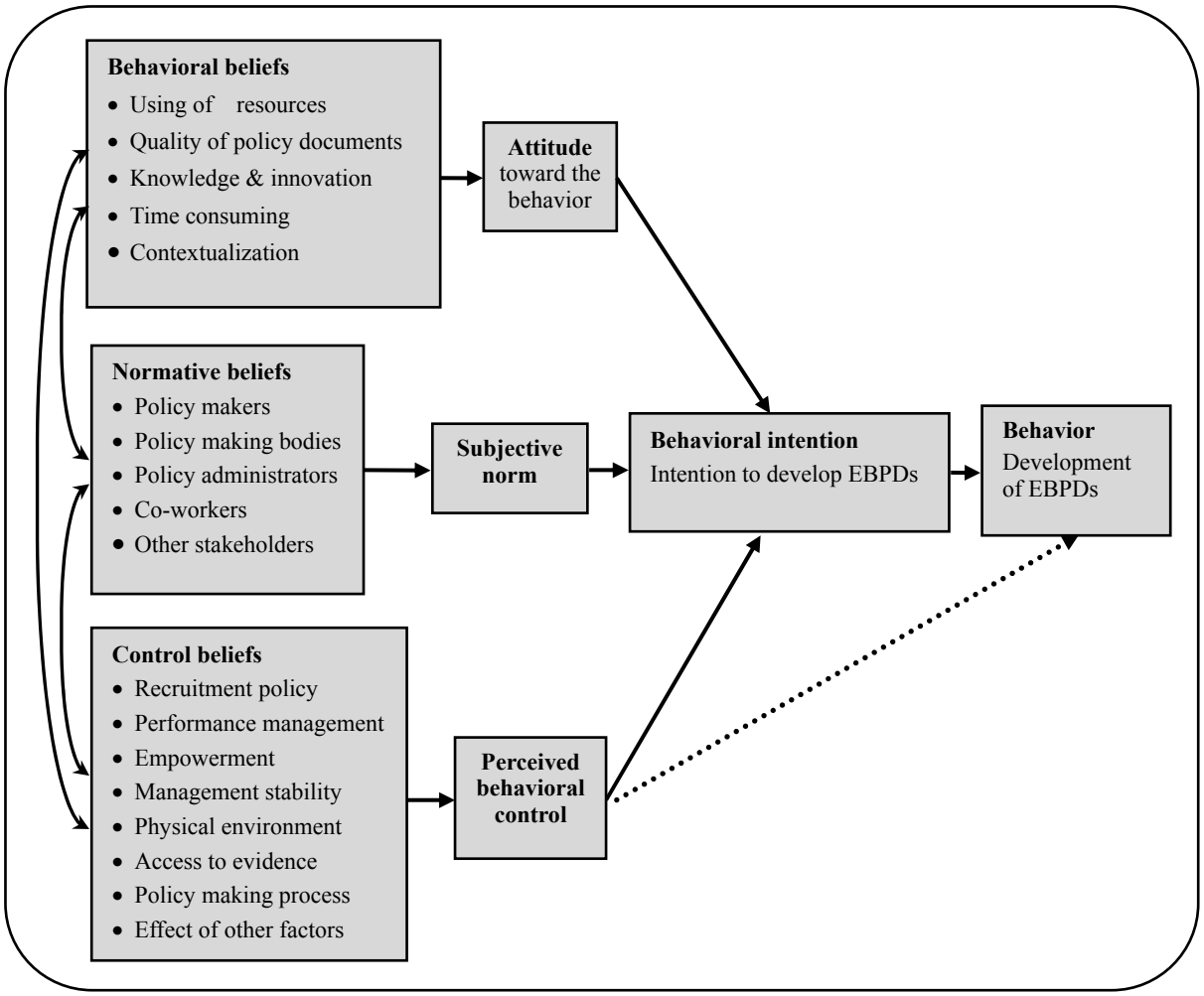


Figure 1. Factors affecting the development of evidence-based policy documents in Iran

3.1 Behavioral Beliefs

Behavioral beliefs refer to one's perception of the consequences of a particular behavior. The positive or negative evaluation of behavioral beliefs determines one's attitude toward the behavior (Ajzen, 1991) (Figure 1). Most of the participants believed that the development of EBPDs improves the quality of proposed policies. The interviewees believe that evidence can be used to inform all stages of the policy-making process (D_2& $T_{2, 7, 14}$). They believed that using valid evidence leads to correct identification of policy issues, adoption of the most effective policy options, selection of the best implementation strategy, and proper evaluation of policy effects. "*I think the best way to properly prioritize community health needs is to refer to evidence*" (T_{14}).

Some of the directors and the majority of the technicians believed that appropriate use of resources, both in the supply and the demand side, is a positive outcome of EBPDs. They argued that much money is spent on research, and it will be a waste of financial resources if the results are not put to practice ($T_{4, 11, 15}$). Interviewees believed that evidence utilization by policy making organizations results in the optimum use of financial resources in the health sector, especially in developing countries where resources are scarce ($D_{2, 5, 6}$).

Some technicians argued that they have always been concerned about financial losses caused by the proposed policy options to the health system and society ($T_{1, 2}$): "*What will happen if we don't support health policies by evidence and they are approved and implemented? Many valuable resources are devoted to them which could have been spent on appropriate policies which would work. This results in the waste of my country's resources*" (T_1). They also believed that EBPDs improve the opportunity-cost of financial resources in the health system ($T_{1, 11}$). "*Using of evidence leads to adoption of proper policies which won't need pilot implementation*" ($M_{5, 6}$).

The technicians mentioned that preparation of EBPDs results in the development of their knowledge and innovation ($T_{2, 3, 4, 5}$). They consider it a satisfying and motivating experience ($T_{1, 9, 10}$). Interviewees believed that

new learning experiences are the least benefit of evidence review regardless of its use in the policy making process ($T_{1, 9}$).

Most of the participants reported that developing EBPD is a time-consuming process. They believed that this may result in losing the chance to swiftly respond to problems. "*Developing EBPDs is often so slow that we get the feeling that we're losing opportunities*" (D_1).

One director and some technicians believed that developing EBPDs creates a tendency toward policies that are supported by international evidence, but may not be adaptable to the Iranian context (D_7 & $T_{4, 5, 9}$).

3.2 Normative Beliefs

Normative beliefs are perceptions of social pressure to perform or avoid a particular behavior. The positive or negative judgments about normative beliefs determine the prevailing subjective norm (Ajzen, 1991) (Figure 1). "*The attitude of policy makers towards evidence depends on the extent to which the issue is political. This means that if they are free of external pressure they will prefer evidence-based policy making*" (T_{15}).

Most of the interviewees believed that policy authorities such as the Parliament, the High Council of Health, and the Vice President of Strategy support EBPDs. But sometimes regional interests of some parliamentarians lead to their opposition against evidence that supports national interests (D_1 & $T_{3, 13}$). At times, non-governmental organizations such as patients associations and professional bodies such as Medical Associations oppose the use of evidence in health policy due to their interests ($D_{1, 7}$ & $T_{1, 4, 11}$). The participants believed that the scientific societies always support EBPDs ($T_{1, 8, 11}$).

Most of the interviewees believed that policy administrators often resist change. They argued that using evidence to support health policies can decrease the resistance ($D_{2, 5}$ & $T_{3, 8}$). The participants believed that those co-workers with EBPD skills support this behavior (T_8).

3.3 Control Beliefs

Control beliefs are people's perception of their control over their behavior. These beliefs are concerned with the perceived power of specific factors to facilitate or inhibit performance of the behavior (Ajzen, 1991) (Figure 1).

All of the interviewees noted the weaknesses in the performance measurement system and the poor relationship between compensation and performance. "*In our system, there is no process to encourage such behavior; there isn't a proper performance evaluation process for technicians and technical offices. Our system doesn't properly compensate the services of its employees*" (D_2).

Some interviewees believed that appointing faculty members as IMoH policy makers can facilitate the use of evidence in policy development (D_8 & $T_{1, 15}$). They also noted that skill in the development of EBPDs is not a "must" criterion for employment in IMoH (D_1 & $T_{6, 10, 14}$).

The participants noted lack of management stability as a barrier to the development of EBPDs ($D_{1, 4}$ & $T_{1, 7, 8, 11}$). "*Policy makers are now supporting this behavior, but there is no guarantee that future policy makers will have the same attitude*" (D_4).

The majority of interviewees believed that rejection of non-evidence-based policies by senior policy authorities can facilitate the development of EBPDs ($T_{1, 2, 3, 4, 5}$). But they did not consider it a common strategy for all IMoH bodies involved in policy making ($D_{4, 7}$ & T_2).

Most participants believed that empowering courses and workshops are essential to the development of EBPDs ($D_{3, 6}$ & $T_{2, 4, 6, 8}$), but not sufficient: "*A few evidence-based health policy workshops are held, but they are not practical and useful*" (T_8). Moreover, the majority of interviewees mention crowded workplace as a barrier to the development of EBPDs (D_2 & $T_{4, 5, 8}$).

Access to evidence was evaluated from three perspectives: stakeholders' view, current data on the organization, and research evidence. Lack of facilities such as teleconference and a database to identify researchers leads to inefficient use of researchers' and stakeholders' views ($D_{3, 5, 8}$ & $T_{2, 5, 6, 14}$). "*In the implementation of the family physician policy, we didn't consider the views of providers and receivers of services; so we couldn't identify the barriers to policy implementation correctly* (E_7)."

Another obstacle was lack of access to the full text of some articles ($T_{1, 2, 10}$). Some of the directors and technicians considered insufficient access to the current data of health system, especially the cost of services, as a barrier to developing EBPDs ($D_{2, 8}$ & $T_{1, 3, 10}$). "*To measure the cost-effectiveness of an intervention, we can simply use published evidence; but unfortunately, there are no valid data to estimate the cost of interventions*" (D_2).

Published studies about the factors that influence evidence utilization by health policy makers were exploratory. These studies did not use social cognitive theories as a framework for data collection and analysis. They also did not classify the driving factors as behavioral or subjective beliefs. In other words, all the factors identified in these studies were classified as control beliefs.

4. Discussion

This study provides insights about the factors that influence the development of evidence-based policy documents in a developing country. Published studies focused on the factors influencing use of evidence in health policy making. But this study focused on one step before the policy making which is development of policy document in the technical offices in IMoH. This phase is objective and is the end point of evidence-informed health policy making process.

In this study, improving the quality of policy documents, preventing the waste of resources, and developing knowledge and innovation were identified as positive behavioral beliefs, while being time-consuming and lacking adaptability were identified as negative behavioral beliefs. Positive attitude of health policy makers toward the use of evidence in policy making has been reported in some studies (Bowen et al., 2009; Jönsson, Tomson, Jönsson, Kounnavong, & Wahlström, 2007; Peirson, Ciliska, Dobbins, & Mowat, 2012). However, policymakers were concerned about the validity of the evidence (Hennink & Stephenson, 2005; Jönsson et al., 2007; Orem et al., 2012). Although policy makers may have a positive attitude toward evidence, in practice they prefer other factors such as pressure groups to evidence (El-Jardali et al., 2012; Hyder et al., 2011; Orem et al., 2012). Apparently, the reason that producers of policy documents insist on the use of evidence is that they are not under pressure by other factors. Lack of concern about political popularity can also play an important role in this regard. Some studies have also cited the time-consuming nature and contextualization of policies as challenges of evidenced-based policy making (Albert et al., 2007; Campbell et al., 2009; Dobrow et al., 2004).

Most of the interviewees believed policy authorities and scientific associations support EBPDs, while policy administrators, patients associations, and professional bodies tend to resist against evidence utilization in policy documents. The attitude of their co-workers and policy makers depends on the circumstances. Some studies have shown that political actors such as professional bodies do not value the evidence. Resistance of administrators against new policies has also been cited in the some studies (Bowen et al., 2009; Dobbins, Rosenbaum, Plews, Law, & Fysh, 2007; El-Jardali et al., 2012).

Among control beliefs, appointment of faculty members as health policy makers was identified as a facilitator of EBPDs. This is consistent with the results of other studies, as they suggest experience in the use of evidence in policy making as a criterion for appointing health policy makers (Majdzadeh et al., 2012; Orem et al., 2012).

Lack of evidence-based policy making (Dobbins et al., 2007; Majdzadeh et al., 2012) , rapid replacement of policy makers (Majdzadeh et al., 2012; Orem et al., 2012), poor knowledge and skills of policymakers in evidence utilization, and limited access to required evidence have also been reported as important barriers in the most studies related to the use of evidence by health policy makers (El-Jardali et al., 2012; Ellen et al., 2013; Koehlmoos, Rashid, Rahman, Cravioto, & Hanney, 2009; Majdzadeh et al., 2012).

Table 2 shows specific factors that affect the development of EBPDs as well as evidence utilization by heath policy makers. In this table, common factors affecting both the development of EBPDs and evidence utilization by health policy makers were excluded.

Table 2. The differences between the factors affecting the development of EBPDs and evidence utilization by health policy makers

Factors affecting the evidence utilization by policy producers	Factors affecting evidence utilization by heath policy makers
• Development of knowledge and innovation • Performance management • Physical environment • Recruitment of technicians • Co-workers	• Use of jargon • Evidence structure • Time constraint • Timely and relevant evidence • Administrative structure to support evidence-based policy making • Limited resources to support evidence-based policy making

One of the most popular frameworks for identifying the barriers to implementation of new interventions is developed by Hanson et al (Hanson, Ranson, Oliveira‐Cruz, & Mills, 2003). In this framework, the barriers to a change are identified in four levels—providers and recipients of services, organization, and the health system. Our findings covered all the components of this framework based on the theory of planned behavior (TPB) (see table 3). While the barriers identified in the exploratory studies on use of evidence by health policy makers were mostly related to the organization and health system levels, a few studies have reported barriers at the provider or recipient levels (Albert et al., 2007; Bowen et al., 2009; Hennink & Stephenson, 2005; Hyder et al., 2011; Orem et al., 2012). This finding poses the question whether using TPB as a framework for data gathering and analysis can help to identify the barriers to a particular behavior at all the levels of the health system.

We found that most of the barriers to develop EBPDs were control beliefs. The results of other studies support this finding, as they imply that the real challenges of research utilization in health policy are structural, environment, or system barriers (Bowen et al., 2009; Majdzadeh et al., 2012).

The factors identified in the studies on evidence utilization by health policy makers were classified as control beliefs. This finding implies one of the following hypotheses: (1) factors related to other components of TPB do not affect evidence utilization by health policy makers; (2) by not using TPB, these studies tend to neglect factors related to other components; or (3) the most important factors influencing evidence utilization by health policy makers and development of EBPDs are related to control beliefs. So other identified factors in this study do not have significant effects, but asking about them in the interviews resulted in talking about them.

Table 3. Factors affecting the development of EBPDs in the framework of Hanson et al. (2003)

Components of the framework	Findings of our study
Service providers	• Attitude and skills of the producers of EBPDs (behavioral beliefs+ skill)
Service recipients	• Attitude of health policy stakeholders (normative beliefs)
Organization	• Performance management, empowerment, physical environment, and technicians recruitment (control beliefs)
Health system	• Management stability, access to evidence, appointment of policy makers, and other factors (control beliefs)

Our findings cannot be generalized to other settings because of its design. Although lack of generalizability is the major limitation of qualitative studies, they can provide important insights into the factors that affect a phenomenon through in-depth interviews with key informants (Holloway, 2005).

5. Conclusion

In spite of the participants' concerns about time-consuming and contextualization, their attitude toward developing EBPDs was positive. We showed that not all the stakeholders of health policies support EBPDs. The main barriers to the development of EBPDs were related to control beliefs (barriers related to the organization and health system levels in Hanson's framework). This finding remind us of the 85:15 rule in Total Quality Management (TQM), which claims that 85% of quality problems are related to processes and systems, while employees may cause only 15% of quality problems (Deming, 1986). Our theory-based study identified the factors that influence the development of EBPDs in terms of all the components of TPB, while the factors identified the exploratory studies evidence utilization by health policy makers are only related to one of these components. This can suggest that theoretical approaches are preferable to exploratory ones in examining the factors that affect a behavior.

Acknowledgements

This study was part of a PhD thesis supported by Iran University of Medical Sciences (grant No: IUMS/SHMIS-2013/342). The authors would like to thank the following people: the directors of technical offices and their senior technicians in Iran's Ministry of Health and medical education who volunteered their time to participate in this study, Arash Rashidian and Fateme Rajabi for their comments on the interview guide and coding the data, Ali Omidnejad for English editing the paper and anonymous reviewers for valuable comments.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211. http://dx.doi.org/10.1016/0749-5978(91)90020-T

Albert, M., Fretheim, A., & Maïga, D. (2007). Factors influencing the utilization of research findings by health policy-makers in a developing country: the selection of Mali's essential medicines. *Health Research Policy and Systems, 5*(1), 2. http://dx.doi.org/10.1186/1478-4505-5-2

Bowen, S., Erickson, T., Martens, P. J., & Crockett, S. (2009). More than "using research": the real challenges in promoting evidence-informed decision-making. *Healthcare Policy, 4*(3), 69-84.

Campbell, D. M., Redman, S., Jorm, L., Cooke, M., Zwi, A. B., & Rychetnik, L. (2009). Increasing the use of evidence in health policy: practice and views of policy makers and researchers. *Australia and New Zealand Health Policy, 6*(1), 21. http://dx.doi.org/10.1186/1743-8462-6-21

Carey, J. W., Morgan, M., & Oxtoby, M. J. (1996). Intercoder agreement in analysis of responses to open-ended interview questions: Examples from tuberculosis research. *Field Methods, 8*(3), 1-5. http://dx.doi.org/10.1177/1525822X960080030101

The Canadian Health Services Research Foundation(CHSRF). (2009). Communication Notes: Reader-Friendly Writing - 1:3:25. Retrieved from: http://www.chsrf.ca/knowledge_transfer/pdf/cn-1325_e.pdf

Claridge, J. A., & Fabian, T. C. (2005). History and development of evidence-based medicine. *World journal of surgery, 29*(5), 547-553. http://dx.doi.org/10.1007/s00268-005-7910-1

Deming, W. (1986). *Out of crisis: Quality, productivity, and competitive position. Cambridge, Mass*.

Dobbins, M., Rosenbaum, P., Plews, N., Law, M., & Fysh, A. (2007). Information transfer: what do decision makers want and need from researchers. *Implementation Science, 2*(20), 12.

Dobrow, M. J., Goel, V., & Upshur, R. (2004). Evidence-based health policy: context and utilisation. *Social science & medicine, 58*(1), 207-217. http://dx.doi.org/10.1016/S0277-9536(03)00166-7

Duan, W., & JIANG, G.-R. (2008). A Review of the Theory of Planned Behavior. *Advances in Psychological Science, 2*, 019.

Eccles, M. P., Hrisos, S., Francis, J., Kaner, E. F., Dickinson, H. O., Beyer, F., & Johnston, M. (2006). Do self-reported intentions predict clinicians' behaviour: a systematic review. *Implement Sci, 1*(1), 28. http://dx.doi.org/10.1186/1748-5908-1-28

El-Jardali, F., Lavis, J., Ataya, N., Jamal, D., Ammar, W., & Raouf, S. (2012). Use of health systems evidence by policymakers in eastern mediterranean countries: views, practices, and contextual influences. *BMC Health Services Research, 12*(1), 200. http://dx.doi.org/10.1186/1472-6963-12-200

Ellen, M. E., Lavis, J. N., Ouimet, M., Grimshaw, J., & Bédard, P.-O. (2011). Determining research knowledge infrastructure for healthcare systems: a qualitative study. *Implement Sci, 6*(1), 60. http://dx.doi.org/10.1186/1748-5908-6-60

Ellen, M. E., Léon, G., Bouchard, G., Lavis, J. N., Ouimet, M., & Grimshaw, J. M. (2013). What supports do health system organizations have in place to facilitate evidence-informed decision-making? a qualitative study. *Implementation Science, 8*(1), 84. http://dx.doi.org/10.1186/1748-5908-8-84

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: time for a map? *Journal of Continuing Education in the Health Professions, 26*(1), 13-24. http://dx.doi.org/10.1002/chp.47

Graham, I. D., & Tetroe, J. (2007). Some theoretical underpinnings of knowledge translation. *Academic Emergency Medicine, 14*(11), 936-941.

Hanney, S. R., Gonzalez-Block, M. A., Buxton, M. J., & Kogan, M. (2003). The utilisation of health research in policy-making: concepts, examples and methods of assessment. *Health Research Policy and Systems, 1*(1), 2. http://dx.doi.org/10.1186/1478-4505-1-2

Hanson, K., Ranson, M. K., Oliveira‐Cruz, V., & Mills, A. (2003). Expanding access to priority health interventions: a framework for understanding the constraints to scaling‐up. *Journal of International Development, 15*(1), 1-14. http://dx.doi.org/10.1002/jid.963

Hennink, M., & Stephenson, R. (2005). Using research to inform health policy: barriers and strategies in developing countries. *Journal of health communication, 10*(2), 163-180.

http://dx.doi.org/10.1080/10810730590915128

Holloway, I. (2005). *Qualitative research in health care*: McGraw-Hill International.

Hyder, A. A., Corluka, A., Winch, P. J., El-Shinnawy, A., Ghassany, H., Malekafzali, H., ... Ghaffar, A. (2011). National policy-makers speak out: are researchers giving them what they need? *Health policy and planning, 26*(1), 73-82. http://dx.doi.org/10.1093/heapol/czq020

Iran's Ministry of Health. (2013). Organizational chart of Iran's Ministry of Health and Medical Education. Retrieved from http://www.behdasht.gov.ir/index.aspx?siteid=1&siteid=1&siteid=1&pageid=1224

Iran's National Institute of Health Research. (2013). Retrieved from: http://nihr.tums.ac.ir/Index.aspx

Innvær, S., Vist, G., Trommald, M., & Oxman, A. (2002). Health policy-makers' perceptions of their use of evidence: a systematic review. *Journal of Health Services Research & Policy, 7*(4), 239-244. http://dx.doi.org/10.1258/135581902320432778

Iran's parliament. (2009a). Law of the fifth Economic, Social and Cultural Development Plan of the Islamic Republic of Iran. Retrieved from http://www.divan-edalat.ir/show.php?page=5country

Iran's parliament. (2009b). Law of formation of the boards of trustees in universities and higher education and research institutions. Retrieved from http://vpb.um.ac.ir/index.php?option=com_content&view=article&id=2437:ghanoon-tashkil&catid=147:ghavanin&Itemid=756

Iran's Supreme Council of Health, and Food Security. (2013). Format of health policy document. Retrieved from http://hamahangi.behdasht.gov.ir/index.aspx?siteid=126&pageid=973

Jewell, C. J., & Bero, L. A. (2008). "Developing Good Taste in Evidence": Facilitators of and Hindrances to Evidence‐Informed Health Policymaking in State Government. *Milbank Quarterly, 86*(2), 177-208. http://dx.doi.org/10.1111/j.1468-0009.2008.00519.x

Jönsson, K., Tomson, G., Jönsson, C., Kounnavong, S., & Wahlström, R. (2007). Health Research Policy and. *Health Research Policy and Systems, 5*, 11. http://dx.doi.org/10.1186/1478-4505-5-11

Koehlmoos, T., Rashid, M., Rahman, Z., Cravioto, A., & Hanney, S. (2009). Understanding the Role of Evidence in Policy Making in Bangladesh Report 1: An Analysis of Interviews with Health Sector Decision Makers.

Larijani, B., Delavari, A., Damari, B., Moghadam, A., & Majdzadeh, R. (2009). Health policy making system in Islamic Republic of Iran: Review an experience. *Iranian Journal of Public Health, 38*(Suppl. 1).

Lavis, J., Davies, H., Oxman, A., Denis, J.-L., Golden-Biddle, K., & Ferlie, E. (2005). Towards systematic reviews that inform health care management and policy-making. *Journal of Health Services Research & Policy, 10*(suppl 1), 35-48. http://dx.doi.org/10.1258/1355819054308549

Lavis, J. N. (2006). Research, public policymaking, and knowledge‐translation processes: Canadian efforts to build bridges. *Journal of Continuing Education in the Health Professions, 26*(1), 37-45. http://dx.doi.org/10.1002/chp.49

Lavis, J. N., Boyko, J. A., Oxman, A. D., Lewin, S., & Fretheim, A. (2009). SUPPORT Tools for evidence-informed health Policymaking (STP) 14: Organising and using policy dialogues to support evidence-informed policymaking. *Health Research Policy and Systems, 7*(Suppl 1), S14. http://dx.doi.org/10.1186/1478-4505-7-S1-S14

Lavis, J. N., & Oxman, A. D. (2009). SUPPORT Tools for evidence-informed health Policymaking (STP).

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, Calif.: Sage Publications.

Majdzadeh, R., Nedjat, S., Fotouhi, A., & Malekafzali, H. (2009). Iran's approach to knowledge translation. *Iranian Journal of Public Health, 38*(Suppl. 1).

Majdzadeh, R., Yazdizadeh, B., Nedjat, S., Gholami, J., & Ahghari, S. (2012). Strengthening evidence-based decision-making: is it possible without improving health system stewardship? *Health policy and planning, 27*(6), 499-504. http://dx.doi.org/10.1093/heapol/czr072

Orem, J. N., Mafigiri, D. K., Marchal, B., Ssengooba, F., Macq, J., & Criel, B. (2012). Research, evidence and policymaking: the perspectives of policy actors on improving uptake of evidence in health policy development and implementation in Uganda. *BMC Public Health, 12*(1), 109. http://dx.doi.org/10.1186/1471-2458-12-109

Oxman, A. D., Lavis, J. N., & Fretheim, A. (2007). Use of evidence in WHO recommendations. *The Lancet,*

369(9576), 1883-1889. http://dx.doi.org/10.1016/S0140-6736(07)60675-8

Packwood, A. (2002). Evidence-based policy: rhetoric and reality. *Social Policy and Society, 1*(3), 267-272. http://dx.doi.org/10.1017/S1474746402003111

Peirson, L., Ciliska, D., Dobbins, M., & Mowat, D. (2012). Building capacity for evidence informed decision making in public health: a case study of organizational change. *BMC Public Health, 12*(1), 137. http://dx.doi.org/10.1186/1471-2458-12-137

Ritchie, J., & Spencer, L. (2002). *Qualitative data analysis for applied policy research*: Sage Publications Inc., Thousand Oaks, CA.

Straus, S. E., Tetroe, J., & Graham, I. D. (2013). *Knowledge translation in health care: moving from evidence to practice*: John Wiley & Sons. http://dx.doi.org/10.1002/9781118413555

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care, 19*(6), 349-357. http://dx.doi.org/10.1093/intqhc/mzm042

Ward, M., & Mowat, D. (2012). *Creating an organizational culture for evidence-informed decision making.* Paper presented at the Healthcare Management Forum. http://dx.doi.org/10.1016/j.hcmf.2012.07.005

World Health Organization. (2004). World report on knowledge for better health. 2004. Retrieved from http://www.who.int/rpc/wr2004

World Health Organization. (2005). World Health Assembly: Resolution on health research. 2005. Retrieved from http://www.who.int/rpc/meetings/58th_WHA_resolution.pdf

World Health Organization. (2008). World Health Organization: The Bamako call to action onresearch for health. 2008. Retrieved from http://www.who.int/gb/ebwha/pdf_files/EB124/B124_12Add2-en.pdf

Appendix

Interview guide: affecting factors on the development of evidence-based health policy briefs

- What do you believe are the *advantages* development of evidence-based health policy documents?
- What do you believe are the *disadvantages* of development of evidence-based health policy documents?
- Is there anything else you associate with your own views about development of evidence-based health policy documents?
- Are there any individual or groups who would *approve* of your development of evidence-based health policy documents?
- Are there any individual or groups who would *disapprove* of your development of evidence-based health policy documents?
- Is there anything else you associate with other people's views development of evidence-based health policy documents?
- What factors or circumstances would enable you to development of evidence-based health policy documents?
- What factors or circumstances would make it difficult or impossible for you to development of evidence-based health policy documents?
- Are there any other issues that come to mind when you think development of evidence-based health policy documents?

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Non-Adherence to Medication in Outpatient Setting in Nigeria: The Effect of Employment Status

Senanu Okuboyejo

[1] Department of Computer and Information Science, Covenant University, Ota, Nigeria

Correspondence: Senanu Okuboyejo, Department of Computer and Information Science, Covenant University, Ota, Nigeria. Tel: 234-806-760-1114. E-mail: sena.okuboyejo@covenantuniversity.edu.ng

Received: October 8, 2013 Accepted: January 14, 2014 Online Published: February 14, 2014

doi:10.5539/gjhs.v6n3p37 URL: http://dx.doi.org/10.5539/gjhs.v6n3p37

Abstract

Background: Non-adherence to prescribed medication and health regimen has been identified as responsible for poor health outcomes. This study investigates the reasons for medication non-adherence in outpatient setting among malaria patients in Nigeria.

Methods: This research adopted quantitative research methods. A well-structured questionnaire was completed by 440 respondents with minimum age of 18 years. The aim of the questionnaire was to get respondents' reasons for non-adherence to medication. The demographic details of the respondents were also captured.

Results: Age, gender, educational level, marital status and medication payment were found not to influence non-adherence while employment was a significant variable. Respondents also indicated fear of death, nauseating smell of drugs, religious beliefs, the side effects of medication, the fear of taking counterfeit drugs or drugs that are past their expiry dates as also responsible for non-adherence.

Conclusion: The results highlighted reasons for poor adherence in southwest Nigeria. Interventions can be targeted towards these reasons.

Keywords: outpatient, non-adherence, interventions, healthcare, Nigeria

1. Introduction

Health challenges present arguably the most significant barrier to sustainable global development. Disease and the lack of adequate preventative care take a significant toll on both developing populations and economies. According to the United Nations Report (2008) and the World Health Statistics (2010), the health related Millennium Development Goals (MDGs) include: reducing child mortality, improving maternal health and combating Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS), Malaria, Tuberculosis and other diseases. In 2008, there were an estimated 243 million cases of malaria causing 863,000 deaths; mostly of children under five (5) years old (World Malaria Report, 2009). Access to treatment (especially artemisinin-based combination therapy) was inadequate in all countries surveyed in 2007 and 2008. By the end of 2012, the UN reported broad and significant progress in the achievement of the MDGs across countries and regions (United Nations, 2012). There was an increase in access to treatment for people living with HIV across the different regions; tuberculosis incidence rates were reduced while global malaria deaths have also declined. The estimated incidence of malaria decreased globally by seventeen per cent (17%) since year 2000. Over the same period, malaria-specific mortality rates have decreased by twenty-five per cent (25%). Reported malaria cases fell by more than fifty per cent (50%) between 2000 and 2010 in 43 of the 99 countries with ongoing malaria transmission. Despite the great progress recorded with the MDGs across regions, the targets have not been reached.

The most common contributors to the disease burden in Nigeria are Malaria, Tuberculosis (TB) and HIV/AIDS (Labiran et al., 2008). These diseases are chronic, infectious/non-infectious, and highly prevalent. The current goals and objectives of the health sector include: reduction of the disease burden from HIV/AIDS and control and eradication of malaria and tuberculosis. Adherence to long-term therapy in outpatient setting is required to reduce prevalence of these diseases (WHO, 2003). Adherence is generally described as the extent to which patients take medications as prescribed by their health care providers (Osterberg & Blaschke, 2005). Rates of adherence for individual patients are usually reported as the percentage of the prescribed doses of the medication

actually taken by the patient over a specified period. Some investigators have further refined the definition of adherence to include data on dose taking (taking the prescribed number of pills each day) and the timing of doses (taking pills within a prescribed period) (Osterberg & Blaschke, 2005).

Non-adherence to prescribed medication and health regimen has been identified as responsible for poor health outcomes. Most researchers agree that at least 50% of patients fail to receive the full benefit of prescribed drugs due to inadequate adherence (Rogers & Bullman, 1995). Non-adherence and poor adherence to long-term therapies severely compromise the effectiveness of treatment, making this a critical issue in population health both from the perspective of quality of life and of health economics. There are studies that have attempted to identify the predictors of adherence and non-adherence. These variables are behavioral and dynamic; and have been classified as provider behaviors, health system factors and patient attributes. In (Brown, 1994; Wright, 1998; Scopp, 2000), provider behaviors were discussed and identified. These research works identified that factors affecting interaction and communication between healthcare providers and patients were the key determinants of adherence. Health system variables include availability and accessibility of services, support for education of patients, data collection and information management, provision of feedback to patients and healthcare providers, and training provided to health service providers (WHO, 2003).

Age, sex, income, marital status, ethnic background, and race are patient characteristics but have not been found to be direct determinants of adherence (Haynes et al., 1980; Kaplan & Simon, 1990). However, a strong relationship exists between medication adherence and perceptions of disease factors and beliefs about treatment. According to Freitas et al. (2010), the predictors of adherence are classified into three categories: (a) demographic, social and economic factors; (b) factors related to the disease and the therapeutic regimen prescribed; and (c) factors related to the patient's relationship with health professionals and services.

Adherence to malaria treatment, that is taking all the doses that are given, is very important for successful malaria treatment outcome. Non-adherence to malaria treatment can lead to re-oocurence of the ailment, the parasites becoming resistant to the drug, so in future the drug will be less effective against the parasites. Critical to patients' adherence is good communication between healthcare providers and their patients (http://labspace.open.ac.uk). Adherence to malaria medication in patients has been linked to knowledge of malaria, access to information on medication for malaria, perceived benefit from the medication, and perceived barriers to treatment. In Brazil, the low compliance with malaria treatment probably explains the large number of Plasmodium vivax malaria relapses observed in the past years. Pereira et al. (2011) studied the proportion of patients adhering to the Plasmodium vivax malaria treatment with chloroquine and primaquine in the dosages recommended by the Brazilian Ministry of Health. Patients who were being treated for Plasmodium vivax malaria with chloroquine plus primaquine were eligible for the study. On the seventh day of taking primaquine, they were visited at their home and were interviewed. The patients were classified as probably adherent, if they reported having taken all the medication as prescribed, in the correct period of time and dosage, and had no medication tablets remaining; probably non-adherent, if they reported not having taken the medication, in the correct period of time and dosage, and did not show any remaining tablets; and certainly non-adherent, if they showed any remaining medication tablets. The study showed that 242 of the 280 patients reported having correctly followed the prescribed instructions and represented a treatment adherence frequency (CI95%) of 86.4% (81.7%-90.1%).

Diala et al. (2013) conducted a cross-sectional study in peri-urban and rural communities of Nasarrawa and Cross-River states in Nigeria to understand the perceptions of intermittent preventive treatment of malaria in pregnancy (IPTp) and barriers to adherence. Study instruments were based on the socio-ecological model and its multiple levels of influences, taking into account individual, community, societal, and environmental contexts of behaviour and social change. The study found that systems-based challenges (stockouts, lack of provider knowledge of IPTp protocols) coupled with individual women's beliefs and lack of understanding of IPT contribute to low uptake and adherence. Many pregnant women are reluctant to seek care for an illness they do not have. Those with malaria often prefer to self-medicate through drug shops or herbs, though those who seek clinic-based treatment trust their provider and willingly accept medicine prescribed.

The aim of this paper is to identify and evaluate some of the reasons for medication non-adherence among malaria patients in outpatient setting in major cities of southwest Nigeria.

2. Method

This research is the first phase of a cross-sectional survey on medication adherence. The study was carried out in some major cities in southwest Nigeria. We investigated socio-demographic characteristics and reasons that have been identified from literature (Nemes et al., 2004; Vik et al., 2004; Jackson et al., 2005; Vlasnik et al., 2005;

Erah & Arute, 2008; Olowookere et al., 2008; Adisa et al., 2009; Uzochukwu et al., 2009; Ekwunife et al., 2010; and Farley et al., 2010) and listed in Tables 1 and 2 for possible correlation with medication adherence. This research adopted quantitative research methods. The survey instrument combined the instruments used in previous research studies on medication adherence and found in (Erah & Arute, 2008; Uzochukwu et al., 2009; Ekwunife et al., 2010). Provision was made for respondents to indicate other reasons not captured by the identified reasons. The questionnaire also captured socio-demographic details such as sex, age range, and level of education, employment status, occupation and health plan of respondents. Copies of the instrument were administered to a convenient and random sample.

The administration of the survey followed an approach which was meant to ensure the validity of the responses to questions on medication adherence behavior. All study participants were informed of their rights by means of an informed consent letter that briefly stated the purpose of the study, its significance, issues of confidentiality, and rights of the respondent. Each participant was also informed before the interview took place that she/he was under no obligation to participate. The informed consent was read aloud to the hearing of prospective participants. Furthermore, participants were informed of their right of confidentiality and that at no time should they disclose any information with which they felt uncomfortable. To maintain confidentiality, there was no identifying information on any questionnaire. The data collected were entered into Statistical Package for Social Sciences (SPSS) version 16.0 software for analysis. The Chi-square test, linear regression and independent *t*-test were used for evaluating factors associated with medication adherence.

2.1 Research Design

A cross sectional survey was used for this study. The study was designed to gather information about the study population at a particular point in time. Data were collected by adopting quantitative methods using a paper-based questionnaire and conducting semi-structured interviews. Before distributing the questionnaire and conducting the interviews, all study participants were informed of their rights, benefits and risks by means of an informed consent letter that briefly stated the purpose of the study, its significance, issues of confidentiality, and rights of the respondent. Each participant was also informed before the interview took place that she/he was under no obligation to participate. The informed consent was read aloud to the hearing of prospective participants. Furthermore, participants were informed of their right of confidentiality and that at no time should they disclose any information with which they felt uncomfortable. To maintain confidentiality, there was no identifying information on any questionnaire. The survey items were also translated to the native language "Yoruba dialect" for the benefit of those who could not read in English. The respondents returned their completed questionnaire to the researcher and research assistants immediately. The study population was adult Nigerians who were on any form of malaria medication in outpatient settings. Our intention is to understand the adherence behaviour of individuals on medications in outpatient setting and design an intervention based on the findings, hence, the study included individuals who were on any form of malaria medication. The inclusion criteria for participants in the study were 1) 18 years of age or older; 2) must be required to take some form of medication for the treatment of malaria; 3) the medication must be over a period of time e.g two days; 4) the medication must be taken in an outpatient setting, the individual must not be on admission in the hospital. The study sample was a combination of random and convenience sample selected from some major cities – Abeokuta, Ado, Akure, Ibadan, Lagos and Oshogbo - in the southwest region of Nigeria based on the above criteria. The sample size was calculated based on the following assumption: since we were using a random sample, our intention was to maximize responses from as many subjects as possible. Hence, confidence level was set at 95%, precision level (margin of error) is also given as +/- 5%; we projected a 90% response rate, 0.9, and calculated our sample to be 427 respondents. This sample size is to estimate the proportion of adherent to non-adherent respondents.

3. Results

3.1 Statistics and Data Analysis

Six hundred (600) questionnaires were distributed; four hundred and sixty (460) returned questionnaires were received. Ten (10) questionnaires were dropped as a result of incomplete responses for each of the measurement items. Ten (10) questionnaires were dropped because the respondents gave invalid response of "not taking any form of medication". This left four hundred and forty (440) questionnaires for the statistical analysis, which represented a 73% valid return rate, this is statistically significant. This was calculated via a ratio of the returned and valid questionnaires and the administered questionnaires.

The sample is made up of two hundred and one (201) males and two hundred and five (205) females while thirty-four respondents did not indicate their gender. One hundred and fifty six (156) respondents are between

28-37 years (35.5%), accounting for a major part of the entire population, one hundred and forty four (144) respondents are between 18-27 years (32.7%), ninety three (93) are between 38-47 years (21.1%), seventeen (17) fall into 48-57 age range (3.9%), 0.9% (4) respondents are in the 58-67 age range while twenty six (26) respondents did not disclose their age range (5.9%). One hundred and ninety four (194) respondents are single; two hundred and twenty (220) are married, one (1) divorced and two (2) widowed while twenty three (23) respondents did not disclose their marital status. Also, a greater portion of the respondents pay for their medication themselves. The socio-demographic characteristics of the respondents are represented in Table 1.

Table 1. Socio-demographic characteristics of respondents

Variable	Frequency	Percent
Age		
18-27	144	32.7
28-37	156	35.5
38-47	93	21.1
48-57	17	3.9
58-67	4	0.9
Missing Value	26	5.9
Total	**440**	**100.0**
Marital Status		
Single	194	44.1
Married	220	50.0
Divorced	1	0.2
Widowed	2	0.5
Missing Value	23	5.2
Total	**440**	**100.0**
Gender		
Male	201	45.7
Female	205	46.6
Missing Value	34	7.7
Total	**440**	**100.0**
Employment Status		
Employed	293	66.6
Self-employed	37	8.4
Unemployed	80	18.2
Missing value	30	6.8
Total	**440**	**100.0**
State/Location		
Lagos	88	20.0
Ogun	117	26.6
Ondo	79	18.0
Osun	12	2.7
Oyo	111	25.2
Ekiti	3	0.7
Others	15	3.4
Missing value	15	3.4
Total	**440**	**100.0**
Educational Level		

Primary school and below	4	0.9
Secondary school	64	14.5
Graduate	227	51.6
Postgraduate	127	28.9
Missing value	18	4.1
Total	**440**	**100.0**
Medical Bill Payment		
Self	261	59.3
NHIS	56	12.7
Family	82	18.6
Welfare/Charity	2	0.5
Employer	31	7.0
Missing value	8	1.8
Total	**440**	**100.0**

Table 2 presents the reasons investigated and estimated as responsible for poor adherence to medication in respondents who have been or currently on prescribed malaria treatment.

Table 2. Factors influencing medication adherence rate

Label	Question	N (Yes)	N (No)	%(Yes)	%(No)
MAB1	I do not understand the need for medication	40	400	9.1	90.9
MAB2	I do not believe the usefulness of medication	42	398	9.5	90.5
MAB3	I do not get support and motivation	71	369	16.1	83.9
MAB4	I do not want to make medications-taking a habit	281	159	63.9	36.1
MAB5	Medication is not readily available	78	362	17.7	82.3
MAB6	I do not have a good relationship with the doctor	56	384	12.7	87.3
MAB7	I do not keep my medications in sight and within reach.	117	323	26.6	73.4
MAB8	I am not satisfied with the treatment	81	359	18.4	81.6
MAB9	I lack confidence in the doctor	48	392	10.9	89.1
MAB10	My medication is expensive	76	364	17.3	82.7
MAB11	I do not like the side effects of the medication	212	228	48.2	51.8
MAB12	I do not want to mix medication with alcohol/any other substance	172	268	39.1	60.9
MAB13	I feel worse when I take my medications	54	386	12.3	87.7
MAB14	The medication/treatment has no effect	53	387	12.0	88.0
MAB15	I feel better before I finish the medication/treatment	292	148	66.4	33.6
MAB16	The duration of the treatment is too long	119	321	27.0	73.0
MAB17	I have to take too many medicines/drugs	88	352	20.0	80.0
MAB18	I am lazy at taking medicines	159	281	36.1	63.9
MAB19	I find it difficult to take my medicines according to prescription e.g during meals, every 8 hours, with a lot of liquid, etc	156	284	35.5	64.5
MAB20	I have no time, always busy	102	338	23.2	76.8
MAB21	I have strong religious or cultural beliefs regarding health and medication	90	350	20.5	79.5
MAB22	I do not like taking medications	167	273	38.0	62.0
MAB23	I forget	146	294	33.2	66.8

From the responses, 281 (63.9%) respondents do not follow their treatment plan because they do not want to make it a habit (MAB4), 117 (26.6%) respondents do not keep their medication in sight and within reach (MAB7), 212 (48.2%) respondents do not like the side effects of medications (MAB11), 172 (39.1%) respondents do not want to mix medication with alcohol or any other substance (MAB12), 292 (66.4%) respondents indicate they feel better before they finish the medication (they experience some level of wellness before completing the required dosage) (MAB15), 119 (27.0%) respondents feel the duration of the medication is too long (MAB16), 159 (36.1%) respondents are lazy at taking medications (medicines) (MAB18), 156 (35.5%) respondents find it difficult to take medicines according to prescription (MAB19), 102 (23.2%) respondents indicate a busy schedule (MAB20), 167 (38.0%) respondents do not like taking medicines (MAB22), while 146 (33.2%) respondents forget to take their drugs (MAB23).

Furthermore, 40 (9.1%) respondents say they do not understand the need for medication (MAB1), 42 (9.5%) respondents do not believe the usefulness of medication (MAB2), 71 (16.1%) respondents would follow their treatment plan if they get support and motivation (MAB3), 78 (17.7%) respondents indicated non-availability of medication (MAB5), 56 (12.7%) respondents do not have a good relationship with their doctors (MAB6), 81 (18.4%) respondents are not satisfied with their treatment, hence do not take their medication (MAB8), 48 (10.9%) respondents lack confidence in their doctor (MAB9), 76 (17.3%) respondents complained of high cost of medication, 54 (12.3%) respondents explained that they feel worse when they take medications (MAB13), 53 (12.0%) respondents believe the medication has no effect, 88 (20.0%) respondents have to take too many drugs/medicines (MAB17), while 90 (20.5%) respondents have strong religious or cultural beliefs regarding health and medication (MAB21).

In the bi-variate analysis carried out, the reason with the highest response rate (MAB15) represented by "I feel better before I finish the medication" (experiencing some level of wellness before completing the required dosage) was used to measure medication adherence. Respondents' age, marital status, educational level, employment status, gender and medication payment were all positively correlated to medication adherence. A chi-square test was performed and no relationship was found between age and medication adherence [X^2 (4, N=440) = 0.858, p= .931]; marital status and medication adherence [X^2 (1, N=440) = 0.533, p= .465]; educational level and medication adherence [X^2 (1, N=440) = 1.529, p= .216]; gender and medication adherence [X^2 (1, N=440) = 0.202, p= .653]. Meanwhile, a positive significant relationship was found between respondents' employment status and medication adherence [X^2 (1, N=440) = 4.875, p= .027]. The results are presented in Table 3.

Table 3. Chi-Square Statistics for "I feel better before I finish the medication"

Demography Attribute	**X^2 Value**	**Df (*Degree of freedom*)**	**Significance *(2-sided)***
Age	0.858	4	0.931
Marital Status	0.533	1	0.465
Educational Level	0.529	1	0.216
Employment status	4.875	1	0.027
Sex	0.202	1	0.653
Medication Payment	1.602	2	0.449

4. Discussion

The study investigated the reasons for non-adherence to malaria medication in outpatient setting. Age, marital status, educational level, gender, medication payment did not cause any variation in medication adherence behavior while employment status caused a significant variation i.e being employed makes me non-adherent.

The factor "I feel better before I finish the medication" had the highest affirmative response and thus established as a prominent factor. This implies many of the respondents stop their anti-malaria medication before completing the prescribed dosage because they experience feelings of wellness after taking some of the medications. This factor has also been established from literature. Other reasons given include the fear of death, nauseating smell and taste of drugs, religious beliefs, the side effects of medication (dizziness, nausea, itching), quantity of drugs to take per time, the fear of taking fake (counterfeit) drugs or drugs that are past their expiry dates. Some respondents also prefer liquid drugs (syrup) to tablets, complained about the distance of health institutions, drug

stores (where original drugs are sold) and healthcare personnel to their homes. Others do not believe nor have confidence in the competence of the healthcare practitioners due to the contrary opinions of such personnel while some feel getting the required support and motivation from people who care and matter to them will make them adhere to their medications.

4.1 Implications for Clinical Practice

The findings from this work can be used in several ways in clinical practice. Employment status was found to have a negative influence on medication adherence rate. This may not make patients initiate or complete prescribed treatment regimen. Being employed (including being self-employed and the nature of job) connotes a busy lifestyle where medication may not fit in. For instance, individuals may find it difficult to take time off work to complete medical treatment such as injections and rehab therapy, fear of stigmatization or public knowledge of one's health may prevent an individual from taking his medication at work, the side effects of some medication (e.g drowsiness) may also influence medication non-adherence. Health care providers should take into consideration the employment status and nature of job of patients before recommending, prescribing or initiating a treatment regimen. Prescriptions should fit into the patient's work style.

4.2 Implications for Employers

Employers should create policies that encourage employees to take matters regarding their health status important. There should not be penalty for missing work based on health grounds. Employers should also take part or full responsibility for the financial implications of medical treatment. This will go a long way in motivating employees to visit health care providers and initiate prescribed treatment regimen.

This study was conducted in southwest Nigeria; medication adherence interventions such as reminding, monitoring, informing and educating interventions could be designed to target these factors for outpatients living in this region. Instances include the use of electronic caps for drugs such that they record each time the patient opens the drug box, the use of mobile phones to send alerts to patients to remind them of their medication, mobile phones can also be used to inform and educate patients of the causes and preventive measures of ailments and diseases. Health care providers, personnel and institutions need to be aware of these factors. Efforts should be made to educate and inform patients on the need to complete their medication irrespective of how they feel. Incentives and rewards can be introduced into treatments. Patients who successfully complete their medication can be rewarded in the most suitable way.

5. Conclusion

This study is a cross-sectional study of factors influencing medication non-adherence among malaria outpatients in southwest Nigeria. These can give the requirements for the design of tailored and targeted interventions to control and influence adherence to medication. Such interventions could be evaluated to measure their effectiveness and efficiency. Adherence to medication will help to curb and reduce the prevalence of malaria, improve population health while reducing health risk factors. This will move Nigeria closer towards achieving the millennium development goal (MDG) on healthcare for all.

References

Adisa, R., Alutundu, M. B., & Fakeye, T. O. (2009). Factors contributing to Nonadherence to Oral Hypoglycemic Medications among Ambulatory Type 2 Diabetes Patients in Southwestern Nigeria. *Pharmacy Practice (Internet), 7*, 163-169. http://dx.doi.org/10.4321/S1886-36552009000300006

Brown, V. J. (1994). The Association of Concordance between Physician and Patient Medical Concepts and Patient Satisfaction, Compliance and Medical outcomes. *Humanities and Social Sciences, 54*, 2632.

Ekwunife, O. I., Udeogaranya, P. O., & Adibe, M. O. (2010). Predictors of self reported adherence to Antihypertensive Medication in a Nigerian population. *Journal of Basic and Clinical Pharmacy, 1*, 133-138.

Erah, P. O., & Arute, J. E. (2008). Adherence of HIV/AIDS patients to antiretroviral therapy in a tertiary health facility in Benin City. *African Journal of Pharmacy and Pharmacology, 2*(7), 145-152.

Farley, J., Miller, E., Zamani, A., Tepper, V., Morris, C., Oyegunle, M., ... Blattner, W. (2010). Screening for hazardous alcohol use and depressive symptomatology among HIV-infected patients in Nigeria: prevalence, predictors, and association with adherence. *Journal of the International Association of Physicians in AIDS Care (JIAPAC), 9*, 218-226. http://dx.doi.org/10.1177/1545109710371133

Freitas, L., Room, B., & Cultural, C. (2010). ADHERENCE TO THERAPY IN PORTUGAL.

Haynes, R. B., Taylor, D. W., Sackett, D. L., Gibson, E. S., Bernholz, C. D., & Mukherjee, J. (1980). Can simple clinical measurements detect patient noncompliance?. *Hypertension, 6*, 757-764. http://dx.doi.org/10.1161/01.HYP.2.6.757

Jackson, L., Leclerc, J., Erskine, Y., & Linden, W. (2005). Getting the most out of cardiac rehabilitation: a review of referral and adherence predictors. *Heart, 1*, 10-14. http://dx.doi.org/10.1136/hrt.2004.045559

Kaplan, R. M., & Simon, H. J. (1990). Compliance in medical care: Reconsideration of self predictions. *Annals of Behavioural Medicine, 12*, 66-71. http://dx.doi.org/10.1207/s15324796abm1202_2

Labiran, A., Mafe, M., Onajole, B., & Lambo, E. (2008). Health Workforce country profile for Nigeria. http://www.hrhobservatory.afro.who.int/images/ Document_Centre/nigeria_country_profile.pdf

Nemes, M. I., Carvalho, H. B., & Souza, M. F. (2004). Antiretroviral therapy adherence in Brazil. *AIDS, 18*, S15-S20. http://dx.doi.org/10.1097/00002030-200406003-00004

Olowookere, S. A., Fatiregun, A. A., Akinyemi, J. O., Bamgboye, A. E., & Osagbemi, G. K. (2008). Prevalence and determinants of nonadherence to highly active antiretroviral therapy among people living with HIV/AIDS in Ibadan, Nigeria. *Journal of Infection in Developing Countries, 2*, 369-372.

Open Learn, Labspace. Communicable Diseases HEAT Module. Retrieved November 18th, 2013 from http://labspace.open.ac.uk/mod/oucontent/view.php?id=439266&section=20.6

Osterberg, L., & Blaschke, T. (2005). Adherence to medication. *New England Journal of Medicine, 353*(5), 487-497. http://dx.doi.org/10.1056/NEJMra050100

Pereira, E. A., Ishikawa, E. A., & Fontes, C. J. (2011). Adherence to Plasmodium vivax malaria treatment in the Brazilian Amazon Region. *Malaria journal*, *10*(1), 355. http://dx.doi.org/10.1186/1475-2875-10-355

Rogers, H., & Bullman, W. (1995). Prescription Medication Adherence: A Review of the Baseline Knowledge. (A report of the National Council of Patient Information and Education), *Journal of Pharmacoepidemiology,* 3(2), 3-36. http://dx.doi.org/10.1300/J055V03N02_02

Scopp, A. (2000). Clear Communication Skills with Headache patients. *Headache Quarterly, 11*, 269-274.

United Nations. (2008). The Millennium Development Goals Report 2008 (New York: United Nations, 2008).

United Nations. (2012). The Millennium Development Goals Report 2012 (New York: United Nations, 2012).

Uzochukwu, B. S. C., Onwujekwe, O. E., Onoka, A. C., Okoli, C., Uguru, N. P., & Chukwuogo, O. I. (2009). Determinants of non-adherence to subsidized anti-retroviral treatment in southeast Nigeria. *Health policy and planning, 24*, 189-196. http://dx.doi.org/10.1093/heapol/czp006

Vik, S. A., Maxwell, C. J., & Hogan, D. B. (2004). Measurement, correlates, and health outcomes of medication adherence among seniors. *The Annals of pharmacotherapy, 2*, 303-312.

Vlasnik, J. J., Aliotta, S. L., & DeLor, B. (2005). Medication adherence: factors influencing compliance with prescribed medication plans. *The Case Manager, 16*, 47-51. http://dx.doi.org/10.1016/j.casemgr.2005.01.009

World Health Organization. (2003). Adherence to long-term therapies: Evidence for action. Geneva: Author. Retrieved from www.who.int/chronic_conditions/adherencereport/en

World Health Organization. (2010). *World Health Statistics 2010*. Switzerland: WHO Press.

Wright, S. (1998). Patient Satisfaction in the Context of Cancer care. *Irish Journal of Psychology, 19*, 274-282. http://dx.doi.org/10.1080/03033910.1998.10558190

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Effects of Social Capital on General Health Status

Ayano Yamaguchi[1]

[1] College of Foreign Studies, Reitaku University, Kashiwa, Chiba, Japan

Correspondence: Ayano Yamaguchi, College of Foreign Studies, Reitaku University, 2-1-1 Hikarigaoka, Kashiwa-shi, Chiba-ken 277-8686, Japan. Tel: 81-4-7173-3605. E-mail: ayamag13@reitaku-u.ac.jp

Received: March 24, 2013 Accepted: January 21, 2014 Online Published: February 14, 2014

doi:10.5539/gjhs.v6n3p45 URL: http://dx.doi.org/10.5539/gjhs.v6n3p45

Abstract

This paper discusses the concept of social capital as a potential factor in understanding the controversial relationship between income inequality and individual health status, arguing a positive, important role for social capital. Most of the health research literature focuses on individual health status and reveals that social capital increases individual health. However, the difficulty in measuring social capital, together with what may be the nearly impossible task of attributing causality, should relegate the concept to a more theoretical role in health research. Nonetheless, social capital receives academic attention as a potentially important factor in health research. This paper finds that the mixed results of empirical research on income inequality and health status remain a problem in the context of defining a stable relationship between socioeconomic status and health status. Clearly, further research is needed to elaborate on the income inequality and health relationship. In addition, focused, rigorous examination of social capital in a health context is needed before health researchers can comfortably introduce it as a concept of influence or significance.

Keywords: social capital, health status, income inequality, social relationships, psychosocial factors, trust, social networks

1. Introduction

Findings from previous studies on income and health have been extensively discussed in health literature (e.g., MacIntyre et al., 1998; Marmot et al., 1984; Adler et al., 1994). A positive relationship between socioeconomic status (SES) and individual health status remains an important factor in maintaining good health. However, previous studies have also discussed the relatively mixed findings on the actual relationship between income inequality and individual health status (e.g., Kawachi et al., 2000; Grossman, 1972; Soonbader et al., 1999).

For better understanding of such varied findings among individual-SES and income-inequality studies, social capital has been introduced as a possibly related concept. Researchers have considered using social capital as a means of understanding how income inequality might be associated with health disparities (Kawachi et al., 1997a). The concept of social capital provides an interesting perspective for integrating existing knowledge about social factors into health issues; additionally, social capital can further our understanding of how social conditions matter for health (Berkman et al., 2000).

Recently, researchers have paid increasing attention to social capital as an explanatory factor of individual environmental characteristics (Kawachi et al., 1999; Rose, 2000). Since a few studies have explored the relationship between social capital and individual health status, in this paper, I discuss issues pertaining to social capital and individual health status and, necessarily, the varied definitions of social capital. Initially, I provide the historical background on the concept of social capital. Contemporary sociological researchers found this concept appealing and hence, conducted research to measure it empirically (Putnam, 2000). Next, I discuss the origins, contemporary conceptualizations, empirical study applications, and critiques of social capital in relation to individual health status. Finally, I explore a theoretical perspective of the impact of social capital on individual health status; based on these findings, I suggest certain theoretical and practical contributions of this paper. Social capital is a controversial issue, and no consensus exists in health research literature on its definition and measurement; thus, social capital is a subject that may reward further investigation. This paper attempts to develop a theoretical perspective on social capital that, while at least partially addressing definition and measurement issues, more clearly addresses individual health status.

1.1 Socioeconomic Status as a Determinant of Health

Socioeconomic status (SES) is defined as the position of individuals within a socially stratified system. SES is a way to measure what people need in order to obtain desired outcomes or goals (House et al., 2000). In particular, the higher one's SES, the greater one's chances for a longer and better life. This positive relationship has been found consistently for populations across location (Robert, 1999) and historical period (Antonovsky, 1967).

Conversely, the lower one's SES, the more negative relationships exist between various SES indicators. For example; income, education, employment status (Sorlie et al., 1995), occupational class or level (MacIntyre et al., 1998); and a wide range of acute, infectious, and chronic health conditions; and actual mortality (Adler et al., 1994; Marmot et al., 1984). Moreover, the relationship between SES and health outcomes exists not only at the "bottom rung" of the social-class "ladder," but also at every individual SES rung. In other words, those at the rung just above the poverty line have a better general health status than those just below it; those at the top rung enjoy a better general health status than those just one rung below them (Adler et al., 1994). Not surprisingly then, many different perspectives and approaches were proposed to explain the relationship between SES and health status, and most of the research has focused on the effects of individual SES and income inequality on general health.

1.2 Income Inequality and Health

Researchers observed the individual to understand how SES may impact health. For instance, Grossman (1972) examined the idea that the individual produces his or her own health and benefits by confounding market goods and his or her own time. Health-production functions are analogues to this argument: health is thus specified as a function of the individual's characteristics (Grossman, 1972), with little or no attention paid to relative social position. Preston (1975) suggested that additional income impacts health as measured by mortality, more positively in those with low income than those with high income.

A number of studies have explored the absolute income hypothesis that posits health increases according to the income of the society in which the individual resides. This contrasts with the relative income hypothesis that posits health increases with an individual's income relative to others in the society. Regarding the relative income hypothesis, Kawachi et al. (2000) explained that

...health depends not just on one's own level of income, but also on the incomes of others in society. At any given level of income, the hypothesis states that an individual's health status depends on the rank within the income distribution that is bestowed upon the individual by his or her level of income, and/or the distance between his or her income and the average income (p. 649).

Directly testing the relative income hypothesis is difficult "because of the lack of agreement about the appropriate reference group for social comparison. An indirect test of the relative income hypothesis is offered by examining the relationship between income distribution and individual health" (Kawachi et al., 2000, p. 649).

Research on income inequality and health outcomes has yielded mixed results. Some studies suggested the effect of income inequality on health behaviors, self-rated general health status, and individual mortality. In addition, further studies replicated such results. However, others revealed a differential effect of income inequality on income groups after controlling for individual income (Kawachi et al., 2000).

Furthermore, some researchers have pointed out that "the practice of adjusting for individual income when finding an effect of income inequality has its own problems" (Kawachi et al., 2000, p. 650). Diez-Roux et al. (2000) mentioned that

...the analytical separation of these two mechanisms (i.e., the effects of absolute and relative differences) may be theoretically interesting but is also artificial, because both are inextricably linked. In reality, adjusting inequality effects for individual-level income necessarily leads to an underestimation of the total inequality effect on health (p. 685).

However, overall, researchers are more likely to address the mechanisms and operations behind the link between income inequality and health outcomes (including general health status). Some research in this direction has emphasized the psychosocial damage inherent to social comparisons and relationships within an unequal society. However, other studies have emphasized the indicators and patterns of social relationships and investments that suggest a growing distance between the rich and the poor (Kawachi et al., 2000, p. 650). Moreover, psychosocial interpretations help to explain mechanisms and operations that potentially link income inequality and health.

Psychosocial interpretation has emphasized relative deprivation, popularized as a social determinant of health by Richard Wilkinson (1997). Wilkinson's work is central to discussions on the value of studying not only income

but also income *inequality*. In other words, health disparities due to SES are related to individuals' SES placement relative to one another. Wilkinson (1997) observed that income inequality impacts health more negatively in locations with wide income disparities. In theory, income inequality impacts health via perceptions of one's place in the hierarchy in two ways (Wilkinson, 1997). Internally, a negative perception of one's place gives rise to negative emotions that impact health via psycho-neuroendocrine mechanisms and unhealthy behaviors. Externally, such negative emotions foster anti-social behavior, for instance, a decrease in social engagement. On the individual level, such a withdrawal may impact health via a variety of social mechanisms, including isolation, mistrust, insecurity, and lowered self-esteem. On a societal level, withdrawal may lead to decreased social cohesion and social capital, both linked to poorer population health outcomes.

Since the findings supporting relative deprivation originate from animal studies (Adler et al., 1994), this theory has been difficult in applying to explanations of income inequality and health status. Nevertheless, Wilkinson (1997) supported the argument through three findings: First, overall mortality in developed countries more closely relates to relative income within countries than to differences in absolute income between countries. Second, national mortality rates tend to be lower in countries with smaller income discrepancies and thus, lower levels of relative deprivation. Third, a rise in life expectancy appears unrelated to economic growth rates. Thus, although material and social influences contribute to health disparities, the significance of *relative SES* seems to confirm psychosocial influences (Wilkinson, 1997).

Particularly, Wilkinson (1997) stated that in a sample of 23 member countries of the Organization of Economic Cooperation and Development (OECD) in 1993, absolute income (measured via the gross domestic product or GDP) was not related to life expectancy. However, Lynch et al. (2000) challenged Wilkinson's psychosocial interpretation by analyzing these same variables for 155 OECD member countries. Interestingly, Wilkinson had not thoroughly described his sample-selection method. Lynch and colleagues' r-correlation for their complete sample was much larger than Wilkinson's and statistically significant. Moreover, unlike the data from the 23 countries Wilkinson sampled (all with a GDP per person greater than $10,000), their data showed a positive linear relationship for all countries above that GDP per person threshold. Therefore, Lynch and colleagues concluded that the relationship between absolute income and life expectancy among wealthier nations is affected by the choice of countries included. Thus, they challenged the validity of a critical finding that Wilkinson used to support his theory. Obviously, we need in-depth research, particularly extending beyond national and cross-national ecologic samples, prior to a truly meaningful discussion for or against relative deprivation.

Consequent to the findings summarized above, the issue of income inequality and its effect on health status is controversial, and therefore, we turn to social capital for answers. I hypothesize that social capital mediates the relationship between income inequality and individual health status.

1.3 Definitions of Social Capital

Social capital has a rather long history in the social sciences. Lyda Hanifan (1920) first used the term in the contemporary sociological sense: she defined social capital as the role of community participation in sharing local educational outcomes. Later in the century, Jane Jacobs (1961), Glenn Loury (1977), and James Coleman (1988) continuously developed social capital as a concept. A French sociologist, Pierre Bourdieu (1983, 1986) has developed a parallel explanation and defined social capital in positive relation to community and governance in Italy in the 1990s. In contrast to his observations of Italy, he asserted that Americans in the late 20th century are "bowling alone" (Woolcock, 1998b).

Throughout its history, social capital has taken various forms. Paxton (1999) defined a physical social capital concept as the ways that implements, such as tools or machines, are used. Thus, social capital facilitates and promotes the production of physical capital. Becker (1964), building on Schultz's work (1961), presented the concept of human capital and argued that individuals, through education or job training, hold within themselves the ability to facilitate production. This later concept of social capital, comprised of implements and individuals, indicates that certain social relations facilitate production (Paxton, 1999).

When defining social capital as the resources that result from social structures, Bourdieu et al. (1992) is often quoted as "Social capital is the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 119). Coleman clarified (1988, 1990) social capital as a function of social structure producing advantage:

Social capital is defined by its function. It is not a single entity but a variety of different entities having two characteristics in common. They all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure (Coleman, 1988, S98).

Grounding his influential work in that of Coleman, although Putnam (1995) preserved the focus on action facilitated by social structure, he added that networks within social capital play an important role in the provision of other aspects of social capital. The most cited in health research, Putnam defined social capital as "features of social organization, such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (p. 67). On the basis of his research on civic traditions and local government in Italy (*Making Democracy Work*) (Putnam, 1993). Putnam (2000) conceptualized social capital by incorporating Alexis de Tocqueville's ideas of associational life being important for nations. Specifically, the amount of social capital in a community—town, state, or nation—is a collective characteristic generated through norms of reciprocity and trustworthiness among residents, and has implications for a multitude of beneficial outcomes for that community.

Lin (1999) defined social capital as access to and use of resources embedded in social networks. Lin's premise of social capital is rather simple and straightforward: "investment in social relations with expected returns" (p. 30). Social capital consists of "individuals engage[d] in interactions and networking in order to produce profits" (p. 31).

Portes et al. (1993) explained that introducing the concept of social capital reinforced sociological perspectives. Although, he clarified social capital as the umbrella concept of social "embeddedness," this raises a question about the "arena" of civic society. As envisioned by Coleman and Bourdieu, Woolcock (1998a; 1998b) most systematically integrated and unified a broad "arena"; in Putnam's footsteps, he included the possibility of studying social capital at different societal levels.

In contrast to the others, however, Woolcock is more likely to apply social capital concepts to analysis of national and community development in Third World countries. In the conceptualization of social capital itself, he suggested four dimensions. The first two dimensions are distinct but complementary, based on the concepts of "embeddedness" and "autonomy." The first concept, embeddedness, supports and follows Granovetter's (1985) contribution that posits all economic action to be inherently enmeshed in social relations of one configuration or another, and development essentially brings about a change in the kind, not degree, of embeddedness. Taking this a step further, however, Woolcock claimed that the senses and tones in which social embeddedness and autonomy are involved at the micro and macro levels are not the same: embeddedness at the micro level refers to intra-community ties; whereas, at the macro level, it relates to state-society relations. Autonomy at the micro level links to extra-community networks; however, at the macro level, it links to institutional capacity and credibility. Thus, Woolcock (1998a) noted that any synthesis of social capital as it has developed at the micro macro levels may have to integrate or unify four distinct dimensions. He referred to embeddedness at the micro level as "integration" and autonomy at the macro level as "organizational integrity." Woolcock stated that combinations of these four dimensions—embeddedness, autonomy, integration, and organizational integrity—can account for a range of development outcomes.

Although researchers provided many definitions of social capital, all the definitions seem to be relational and multidimensional. However, researchers also provided an explicit contrast between the two types of definition. First, social capital is considered an aggregate of the individual (Bourdieu, 1983, 1986; Bourdieu et al., 1992; Coleman, 1988, 1990). Second, it is the notion of resources collectively possessed (Putnam, 1995, 2000).

1.4 Critiques of Social Capital in Empirical Studies

Baron, Field, and Schuller (2000) suggested "over versatility" as a major criticism of social capital. However, over versatility relates more to its various applications than to its intrinsic quality as a concept. In addition, these researchers suggested that societies cannot be sufficiently understood through study of the individual, and they shift analytical focus from behavior of individual agents to social patterns among agents, social units, and institutions.

Arrow (2000) explained the lack of consensus for adding "social capital" to other forms of capital, and Solow (2000) clarified that, so far, social capital is only "seen vague ideas and causal empiricism" (p. 6). There is no value added with this conceptual framework, despite the intentions of those who study social capital to understand the interaction between society's institutions and their shared attitudes about the way the economy works (Arrow, 2000; Solow, 2000).

Labonte (1999) suggested that social capital may be just a fad in the social sciences, wondering if it is a "'Trojan horse' for colonization from any side of the ideological spectrum." The current notions of social capital reveal an element of repackaging in the literature. However, the same can be said of any theoretical construction (Labonte, 1999).

Almedom (2005) pointed out that social capital is a complex, compound construct. It can be both an asset and a

liability to receivers and providers of services and other interventions. In measurement, the most meaningful assessment of social capital may examine individual *access* or *process*, rather than *possession*. After all, social capital is a property belonging to groups and therefore, an economic variable.

Baum (1999) and Labonte (1999) suggested that increasing social capital may negatively affect government support for social services or agencies because social capital supports individuals in the community, thereby reducing the burden on government. Governmental officials, administrators, and researchers need to realize that the purpose of social capital is not to provide the state with an excuse for nonsupport, but to maintain quality of life in the community.

Portes (1998) identified positive and negative aspects of social capital, its function and operation in community and society. First, those with higher levels of social capital are more likely to receive benefits in certain environments, thus increasing social control. A second benefit is that social capital produces the familial and social support that primarily benefits children. Familial social capital is embodied in the parent–child relationship; when parents are an important part of their children's lives, the children's intellectual development and socialization improves (Coleman, 1988). Third, social capital occurs through extra-familial networks, where ties and associations with other individuals and groups can help people gain direct access to economic resources and valued credentials.

For the negative consequences that Portes (1998) identified, the first is exclusion of outsiders. The second is that social group or social community closure may reveal the success of its members' business initiatives. Third, social capital may restrict individual freedom and autonomy. The fourth negative consequence is that social capital tends to be a downward-leveling norm. In some social situations, group solidarity is produced by a common experience of adversity wherein individual success stories of group members may lead to cohesion. As a result of these observations, Portes pointed out that social capital may negatively influence individual lives, because the negative influences may need more material to be convincing.

Recently, Edmondson (2003) suggested that social capital serves as a critique of communities. Currently, social capital is viewed as a source of support for good health even though some argued that the concept should not be used to create neutral policy strategies. Edmondson questioned whether social capital is essential for moral and political debate on health policy.

1.5 Dimensions of Social Capital

Somewhat similar to Woolcock, Putnam (2000) presented certain dimensions of social capital—bonding, bridging, and linking social capital. Bonding social capital denotes the social relations among relatively homogeneous groups (e.g., ethnic, religious, or socioeconomic); it strengthens social bonds within a particular group. Bridging social capital constitutes the social relations among heterogeneous groups, and it strengthens ties across such groups. Linking social capital denotes the social relations between individuals and groups in a stratified hierarchy where different groups access power, social status, and wealth. Putnam (2000, pp. 22–23) noted as follows:

Bonding social capital is good for undergirding specific reciprocity and mobilizing solidarity. Dense networks in ethnic enclaves, for example, provide crucial social and psychological support for less fortunate members of their community, while furnishing start-up financing, markets, and reliable labor for local entrepreneurs. Bridging networks by contrast, are better for linkage to external assets and for information diffusion. Economic sociologist Mark Granovetter has pointed out that when seeking jobs—or political allies—the "weak" ties that link me to distant acquaintances who move in different circles from mine are actually more valuable than the "strong" ties that link me to relatives and intimate friends whose sociological niche is very like my own. …Bonding social capital constitutes a kind of sociological superglue, whereas bridging social capital provides a sociological WD-40.

Although much health research has employed Putnam's conceptualization of social capital, it does not directly address health issues. Therefore, James et al. (2001) offered a conceptual framework for social capital and health status. Although they accepted Putnam's conceptualization of social capital at the community level, they viewed health from a different perspective. They defined social capital as "resources in social relationships" that include "mutual trust, a sense of reciprocal obligation, and civic participation aimed at benefiting the group or community as a whole" (pp. 165–88).

On the basis of Putnam's dimensions of social capital, Woolcock (2001) developed three forms: bonding, bridging, and linking. Bonding social capital denotes social connections among strong ties. It involves a high level of trust in a "network of people individuals turn to when individuals are sick or need an important errand

run" (p. 13). Bridging social capital unifies people "who share broadly similar demographic characteristics." Bridging is characterized by the "building of connections between heterogeneous groups" and the connections that are "likely to be more fragile but foster social inclusion" (p. 13). Linking social capital constitutes social connections with people in positions of power, whether political or financial. Linking relates to connections in the civic community to the political and financial environment, and it relates "to the capacity to level resources, idea[s], and information from formal institutions beyond community" (p. 13).

1.6 Contemporary Development of Social Capital in Health Research

Social capital has been proposed as a leverage point for understanding the literature's collective findings on individual SES and income inequality. Several social epidemiologists (Kawachi et al., 1997a; Berkman et al., 2000; Kawachi et al., 1999; Rose, 2000) have received credit for introducing social capital to public health and have considered its utility for understanding routes through which income inequality is associated with health disparities (Kawachi et al., 1997a).

With a multitude of studies supporting the importance of social adhesion for health, social capital offers an interesting way to gain understanding of how social conditions influence health (Berkman et al., 2000). Therefore, the public health arena has seen a rapid emergence of research on social capital (Kawachiet al., 1999; Rose, 2000). However, the role of social capital in understanding how social conditions impact health means different things to different researchers. In other words, the routes through which social capital is associated with health are hypothesized differently, according to varied psychosocial interpretations. Researchers studying the psychosocial interpretation of income inequality on health have tended to view social capital as a promoting route (Wilkinson, 1997; Kawachi et al., 1997b).

1.7 Measurements of Social Capital

For empirical measurement, the myriad definitions and theories of social capital are problematic. The problem worsens as researchers try to create valid measures of social capital because the theoretical conceptualizations and frameworks actually drive the choice of research measures.

In clarifying the linkage problem from theoretical conceptualizations to measurement, Cattel (2001) explained that empirical studies have not succeeded in fully addressing the construct's complex nature, particularly in contextualizing the place-based issue of social capital within specific localities or areas of analysis. In other words, social capital measured at the state or national level is very different from social capital measured at the neighborhood, community, or even non-place-based social network level. While theoretical arguments can be made for social capital should to be considered at each of these levels, such justification needs to be made explicit.

Health researchers have yet to explore adequately how different forms of social capital (e.g., social support, social leverage, informal social control, and participation in neighborhood organizations) may contribute to different outcomes. Using questions from the U.S. General Social Survey (GSS), Putnam (1995) explored the role of social capital, for instance, in networks, norms, and trust for citizen engagement in community affairs. Moreover, the questions from GSS were used for several epidemiological studies. While studying poverty and social capital in Tanzania, Narayan (1997) developed a Social Capital Index inspired in part by Putnam's work in Italy. In Narayan's survey, the thrust of which was defined as "personal belonging," the householders responded according to three dimensions of social capital: their membership in groups, the characteristics of those groups, and individual values and attitudes. That Narayan's study does not include information on reliability or validity serves, perhaps, to underline the difficulty of such measurement.

Research on children who prosper in unfavorable environments (Runyan et al., 1998) provided an example of social capital measurement without proper construct definition. These researchers presented a broad, brief definition of social capital and directly proceeded to create an index, or measurement, of social capital, using a 0−5 point scale. The items measured were the following, whether: two parents resided in the home; social support was provided for the primary caregiver; more than two children resided in the home; neighborhood support was provided; and the maternal respondent attended church or religious services. Unfortunately, no clear linkage exists between these measures and social capital.

Similarly, the measures that Gooden (1998) used to explore the health of rural African Americans in central Virginia appear questionable. Gooden (1998) chose the following to measure social capital: frequency of church attendance; community organization membership; employment outside of home; marital status; and telephone service in home.

Rose (2000) examined the relationship between social capital and individual health status by using a

special-purpose questionnaire designed to measure social capital in a multiplicity of forms. The New Russia Barometer was employed to conduct a full-scale, multi-stage, randomly stratified sample covering the whole of the Russian Federation, urban and rural. For example, 1904 Russian respondents, aged 18 or over, were interviewed face to face in 191 widely dispersed primary sampling units. Aside from indicators of human capital, social capital measurements included social integration; and an individual's cumulative use of networks and situation specific networks.

Finally, with the aim of providing a brief guide to operationalization and measurement, Lochner et al. (1999) reviewed the concept of social capital and its related constructs. They concluded that despite lacking a single definition of social capital and differing approaches to measurement, there appears to be agreement that community characteristics should be distinguished from individual characteristics and measured at the community level.

2. Conclusion

This paper discussed controversial relationships between income inequality and individual health status. For better understanding of differing study results on income inequality and individual health status, social capital was introduced as a potential mediating factor.

However, the many definitions of social capital currently under discussion make it difficult to determine its role in linking income inequality and health. All the definitions do seem to be relational and multidimensional, and researchers tend to divide the concept into two types. Social capital is first defined as an aggregate of the individual (Bourdieu, 1983, 1986; Bourdieu et al., 1992; Coleman, 1988, 1990) and, second, as resources collectively possessed (Putnam, 1995, 2000).

However, the health-status literature does illuminate an important, positive role for social capital, indicating that it helps to improve individual health status. Nevertheless, growing attention to the many and varied definitions has introduced levels of uncertainty about the use of social capital at the individual level, particularly in relation to health. The difficulty in measuring the concept, together with what may be the nearly impossible task of attributing causality, has relegated social capital to a more theoretical role in health research until such time as measurement and operational definitions attain consensus and more common use. Nonetheless, social capital continues to attract and receive academic attention as a potentially important factor in health research.

The lack of clarity in the relationship between income inequality and health status remains. Till now, credible theoretical and empirical work has been insufficient to offer social capital as a clarifier of these two other correlates. Until such time as a definitive standard exists for social capital and its measurement, the concept remains but a promising theory for health research. To improve our understanding of the mixed results of the income inequality and health status relationship, other, more mature, concepts and variables need to be used.

Clearly, further research is needed to elaborate on the income inequality and health relationship. In addition, focused, rigorous examination of social capital in a health context needed for before researchers can comfortably introduce it as a concept of influence or significance.

3. Implications

This paper suggests that social capital can indeed operate in the health status of various individuals and neighborhoods. It is clear that social capital is important for maintaining people's general health status. In other words, despite gaps in social capital application, a wide range of community associations can improve individuals' health status through outreach efforts that encourage development and maintenance of social integration and ties (Coleman, 1988; Putnam, 1995). For future empirical approaches, research must examine cross-cultural similarities and differences in individual behaviors in order to optimize the concept of social capital toward society's benefit.

Acknowledgements

This research was supported by the Grant-in-Aid for Young Scientists B and the Japan Science Technology (JST) Agency, Japan. This article is based on portions of the first author's doctoral course paper for qualifying review exam, conducted under the supervision of Prof. D. William Wood, Prof. Sun-Ki Chai, and Associate Professor Yean-Ju Lee. I thank them all for their helpful advice and for providing insightful suggestions and comments on an earlier version of this manuscript.

References

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., & Kahn, R. L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist, 49*, 15-24.

http://dx.doi.org/10.1037/0003-066X.49.1.15

Almedom, A. M. (2005). Social capital and mental health: An interdisciplinary review of primary evidence. *Social Science and Medicine, 61*(5), 943-964. http://dx.doi.org/10.1016/j.socscimed.2004.12.025

Antonovsky, A. (1967). Social class, life expectancy and overall mortality: *Milbank Memorial Fund Quarterly, 45*, 31-73. http://dx.doi.org/10.2307/3348839

Arrow, K. J. (2000). Observations on Social Capital, in P. Dasgupta and I. Serageldin (eds.), *Social Capital: A Multifaceted Perspective*. Washington, D.C.: World Bank.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis with special reference to education* (2nd ed.). New York: Columbia University Press.

Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in new millennium. *Social Science & Medicine, 51*, 843-857. http://dx.doi.org/10.1016/S0277-9536(00)00065-4

Bourdieu, P. (1983). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education.* New York: Greenwood Press.

Bourdieu, P. (1986). The Forms of Capital. In J. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241-258). Westport, CT: Greenwood.

Bourdieu, P., & Wacuant, J. D. (1992). *An invitation to reflexive sociology.* Chicago: The University of Chicago Press.

Baron, S., Field, J., & Schuller, T. (Eds.). (2000). *Social Capital: Critical Perspectives*. New York: Oxford University Press.

Baum, F. (1999). Social capital: is it good for your health? Issues for a public health Agenda. *Journal of Epidemiology and Community Health, 53*, 195-196. http://dx.doi.org/10.1136/jech.53.4.195

Cattel, V. (2001). Poor people, poor places, and poor health: The mediating role of social networks and social capital. *Social Forms, 70*, 1077-1100.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95-S120. http://dx.doi.org/10.1086/228943

Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.

Diez-Roux, A. V., Link, B. G., & Northridge, M. (2000). A multilevel analysis of income inequality and cardiovascular disease risk factors. *Social Science and Medicine, 50*, 673-673. http://dx.doi.org/10.1016/S0277-9536(99)00320-2

Edmondson, R. (2003). Social Capital: a strategy for enhancing health? *Social Science and Medicine*, 57, 1723-1733. http://dx.doi.org/10.1016/S0277-9536(03)00011-X

Gooden, B. I. (1998). *Social capital, stress, and the health of rural-African-Americans in central Virginia.* The University of North Carolina at Chapel Hill.

Granovetter, M. S. (1985). Economic actions and social structure: The problem of embeddedness. *American Journal of Sociology, 91*, 481-510. http://dx.doi.org/10.1086/228311

Grossman, M. (1972). On the Concept of Health Capital and the Demand for Health, *Journal of Political Economy, 80*(2), 223-255. http://dx.doi.org/10.1086/259880

Hanifan, L. J. (1920). *The community center*. Boston: Silver, Burdette & Co.

House, J. S., & Willams, D. R. (2000). *Understanding and reducing socioeconomic and racial/ethnic disparities in heath.* Paper presented at the conference "Capitalizing on Social Science and Behavioral Research to Improve the Public Health," sponsored by the Institute of Medicine of the National Academy of Sciences and the Commission on Behavioral and Social Sciences and Education of the National Research Council.

Jacobs, J. (1961). The uses of city neighborhoods. In *The death and life of great American cities.* New York: Vintage Books.

James, S. A., Schulz, A. J., & van Olphen, J. (2001). Social capital, poverty, and community health: An exploration of linkages. In Saegert, S., Thompson, J. P., & Warren M. R. (Eds.), *Social Capital and Poor Communities.* (pp. 165–88). New York: Russel Sage Foundation.

Kawachi, I., Kennedy, B.P., & Grass, R. (1999). Social capital and self-related health: A contextual analysis.

American Journal of Public Health, 89, 1187-1193. http://dx.doi.org/10.2105/AJPH.89.8.1187

Kawachi, I., Kennedy, B. P., & Lochner, K. (1997a). Long live community: Social capital as public health. *The American Prospect, 8*, 56-59.

Kawachi, I., Kennedy, B. P., Lochner, K., & Prothrow-Stith, D. (1997b). Social capital, income inequalities, and mortality. *American Journal of Public Health, 87*, 1491-1498. http://dx.doi.org/10.2105/AJPH.87.9.1491

Kawachi, I., Subramanian, S.V., & Almeida-Filho, N. (2002). A glossary for health inequalities. *Journal of Epidemiology and Community Health, 56*, 647-652. http://dx.doi.org/10.1136/jech.56.9.647

Labonte, R. (1999). Social capital and community redevelopment: Practitioner emptor. *Australian and New Zealand Journal of Public Health, 23*, 430-433. http://dx.doi.org/10.1111/j.1467-842X.1999.tb01289.x

Lin, N. (1999). Theory Paper ABSTRACT 102805 Building a network theory of social capital. *Connections, 22*, 28-51.

Lochner, K., Kawachi, I., & Kennedy, B.P. (1999). Social capital: a guide to its measurement. *Health & Place, 5*, 259-270. http://dx.doi.org/10.1016/S1353-8292(99)00016-7

Loury, G. C. (1977). A dynamic theory of racial income differences. In P. Wallance, & A. LeMund (Eds.), *Women, minorities, and employment discrimination.* Lexington, MA: Lexington, Books.

Lynch, J. W., Davey Smith, G., Kaplan, G. A., & House, J. S. (2000). Income inequality and mortality: Importance to health of individual income, psychosocial environment, or material conditions. *British Medical Journal, 320*, 1200-1204. http://dx.doi.org/10.1136/bmj.320.7243.1200

MacIntyre, S., Ellaway, A., Der, G., Ford, G., & Hunt, K. (1998). Do housing tenure and car access predict health because they are simply markers of income or self esteem? A Scottish study. *Journal of Epidemiology and Community Health, 52*, 657-664. http://dx.doi.org/10.1136/jech.52.10.657

Marmot, M., Shipley, M. J., & Roses, M. (1984). Inequalities in death-specific explanations of a general pattern? *Lancet, 1*(8384), 1003-1006. http://dx.doi.org/10.1016/S0140-6736(84)92337-7

Narayan, D. (1997). *Voices of the poor: Poverty and social capital in Tanzania.* Washington D.C: The World Bank. http://dx.doi.org/10.1596/0-8213-4061-1

Paxton, P. (1999). Is social capital declining in the United States? A multiple indicator assessment. *American Journal of Sociology, 105*, 88-127. http://dx.doi.org/10.1086/210268

Portes, A., & Sensenbrenner, J. (1993). Embeddedness and immigration: Notes on the social determinants of economic action. *American Journal of Sociology, 98*, 1320-1350. http://dx.doi.org/10.1086/230191

Portes, A. (1998). Social Capital: Its origins and applications in modern sociology. *Annual Review of Sociology, 24*, 1-24. http://dx.doi.org/10.1146/annurev.soc.24.1.1

Preston, S. (1975). The Changing Relation between Mortality and Level of Development. *Population Studies, 29*, 231-248.

Putnam, R. D., Robert, L., & Rffaella, Y. N. (1993). *Making Democracy Work*. Princeton: Princeton University Press.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy, 6*, 65-78. http://dx.doi.org/10.1353/jod.1995.0002

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.

Robert, S. A. (1999). Socioeconomic position and health: The independent contribution of socioeconomic context. *Annual Review of Sociology, 25*, 489-516. http://dx.doi.org/10.1146/annurev.soc.25.1.489

Rose, R. (2000). How much does social capital add to individual health? A survey study of Russians. *Social Science & Medicine, 51*, 1421-1435. http://dx.doi.org/10.1016/S0277-9536(00)00106-4

Runyan, D. K., Hunter, W. M., Socolar, R., Amaya-Jackson, L., English, D., Landsverk, J., ... Mathew, R. M. (1998). Children who prosper in unfavorable environments: The relationship to social capital. *Pediatrics, 101*, 12-18. http://dx.doi.org/10.1542/peds.101.1.12

Schuller, T., Baron, S., & Field, J. (2000). Social capital: A review and critique. In S. Baron, J. Field, & T. Schuller (Eds.), *Social capital: Critical perspectives.* Oxford: Oxford University Press.

Schultz, T. W. (1961). Investment in human capital. *American Economic Review, 51*(March 1961), 1-17.

Solow, R. M. (2000). Notes on social capital and economic performance. In P. Dasgupta, & I. Serageldin (Eds.), *Social capital: A multifaceted perspective,* Washington D.C.: The World Bank.

Soonbader, M. J., & LeClere, F. B. (1999). Aggregation and the measurement of income inequality: Effects on morbidity. *Social Science & Medicine, 48*, 733-744. http://dx.doi.org/10.1016/S0277-9536(98)00401-8

Sorlie, P. D., Backlund, E., & Keller, J. B. (1995). US mortality by economic, demographic, and social characteristics: The National Longitudinal Mortality Survey. *American Journal of Public Health, 85*, 949-956. http://dx.doi.org/10.2105/AJPH.85.7.949

Wilkinson, R. G. (1997). Health inequalities: Relative or absolute material standards? *British Medical Journal, 314*, 591-595. http://dx.doi.org/10.1136/bmj.314.7080.591

Woolcock, M. (2001). The place of social capital in understanding social and economic outcomes. *Isuma, 2*, 11-17.

Woolcock, M. (1998a). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society, 27*, 151-208. http://dx.doi.org/10.1023/A:1006884930135

Woolcock, M. (1998b). *Social theory, development policy, and poverty alleviation: A comparative-historical analysis of group-based banking in developing economics.* Doctor of Philosophy Sociology, Brown University.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Association between Awareness of Patient Rights and Patient's Education, Seeing Bill, and Age: A Cross-Sectional Study

Mahbobeh Yaghobian[1], Sima Kaheni[2], Mahmonir Danesh[3] & Farideh Rezayi Abhari[3]

[1] Nursing and Midwifery Management Department, Mazandaran University of Medical Sciences, Sari, Iran

[2] Pediatric Nursing Department, Mazandaran University of Medical Sciences, Sari, Iran

[3] Midwifery Department, Mazandaran University of Medical Sciences, Sari, Iran

Correspondence: Sima Kaheni, Nasibeh Nursing and Midwifery Faculty, Vesal Street, Amir Mazandarani Boulevard, Sari, Mazandaran Province, Iran. E-mail: kaheni2012@yahoo.com

Received: November 24, 2013 Accepted: December 24, 2013 Online Published: February 17, 2014

doi:10.5539/gjhs.v6n3p55 URL: http://dx.doi.org/10.5539/gjhs.v6n3p55

Abstract

Background: Considering the controversial results of previous reports on awareness of bill of patients' rights in different regions, as well as the fact that no report is available on the awareness of patients of their rights in teaching hospitals of Sari, we conducted the present study.

Materials and Methods: This is a cross-sectional Study conducted in teaching hospitals of Sari in 2011. The study population consisted of 336 patients recruited from 4 hospitals affiliated with Mazandaran University of Medical Sciences in Sari, through calculating the selection quota of each hospital. Data were collected through face-to-face interview on discharge, using a two-section questionnaire based on the bill of patient rights and with verified reliability and validity. Data analysis was accomplished on SPSS soft- ware version 10.

Results: 55.4% of patients were women and 44.6% were men. The patients' mean age was 40.93 ± 15.04 years and the mean length of stay was 4.6 ± 3.34 days. Most patients had elementary education (36%) or were illiterate (25%). The majority (63.4%) had not seen the bill of patients' rights. 58.9% had poor knowledge, 12% had intermediate knowledge, and 29.1% had good knowledge. As for the articles of the bill, the poorest awareness correlated to the 9th article (the right to participate or refrain from participating in research). We found a significant relationship between awareness of the bill, and the patient's education, seeing the bill, and age ($p<0.0005$).

Conclusion: The results of the present study indicate that patients are not sufficiently aware of their rights, and this problem requires comprehensive planning to be resolved.

Keywords: awareness, bill of patient rights, teaching hospital, Mazandaran, Sari, Iran

1. Background

Nowadays, healthcare systems in many countries have defined certain rights for patients, and the healthcare providers are obligated to abide by these rights when providing service (Joolaee, 2008). The notion of patient rights has been developed on the basis of concept of the person, and the fundamental dignity and equality of all human beings recognized in the Universal Declaration of Human Rights in 1948. Since, numerous declarations and professional ethical codes have sought to ensure the protection of fundamental human rights and to promote the humanitarian treatment of all patients (Välimäki, 2009).

Despite the efforts to prepare and spread the charter of patient rights, studies from different countries have reported infringement of patients rights, such as not aware of the regulation about patient rights (Ducinskiene, 2006; Zülfikar, 2001), ethical and legal implication (Rowe, 2013) observance of medical ethics is inadequate in hospitals (Humayun, 2008) most psychiatric hospitals in Shanghai have no Medical Ethics Committee (Su, 2012).

In Turkey, only 9% of patients were reported to be aware of their rights (Kuzu, 2006). In China, only 9.5% of medical staff thought that patient treatment would be compromised by refusal to participate (Liang, 2012).

In Poland, patients had the least awareness about the form of giving consent (42.9%) or refusal consent.

To treatment (50.5%), and the doctors' right to refuse the presence of a person close to the patient during treatment (16.4%) while over 80% respondents were aware of their rights such as: choose a treating physician, refusal of the proposed treatment, the choice of the place (Krzych, 2013).

Patient rights constitute an essential component for determining standards of clinical governance. The bill of patient rights was first devised in 2002 in Iran and mandated by the Deputy of Health at Ministry of Health and Medical Education. According to this mandate, all healthcare centers were required to pitch the contents of the bill in a conspicuous spot. In October 2009, the final text of the charter of patient rights was prepared in 5 main axes and 37 articles alongside, insight, value and a final article, and was dispatched to all subsidiaries of the Ministry of Health. The 5 axes consisted of the right to receive appropriate service, the right to receive appropriate and sufficient information, the right of autonomy and free will, and right of privacy and confidentiality, and the right of access to a competent system of complaints, each axis containing 14, 4, 7, 9, and 3 articles, respectively (Parsapour, 2011)

Despite the efforts by the Deputy of Health at Ministry of Health and Medical Education, researcher had not seen bill of patients' rights until two mounts November and December 2011 in 5 main axes and 37 articles in 4 hospitals affiliated with Mazandaran University of Medical Sciences.

Unfourtunatly, I had seen bill of patients' rights in 10 articles (first devised in 2002) were installed in the hallway 4 hospitals.

As patients' awareness varies from one region to another, as well as the facts that no study has been conducted so far to address patients' knowledge of their rights in teaching hospitals of Sari, and the patients' rights are poorly observed in hospitals associated with Mazandaran University of Medical Sciences (only 14.59%) (Kazemnezhad, 2013), and patients' awareness will facilitate the observance of patients' rights (Joolaee 2006), and this is among the research priorities of the Deputy of Treatment, we conducted the present study to measure the rate of patients' awareness of their rights in teaching hospitals of Sari.

1.1 Objectives

The study aims to investigate: (1) to measure the rate of patients awareness of their rights in teaching hospitals of Sari; (2) correlation between background information and patients awareness of their rights.

2. Materials and Methods

2.1 Study Design

This study used a cross-sectional design. Data was collected using structured interview face-to-face.

2.2 Sample and Setting

The sample consisted of 336 patients from 4 teaching hospitals affiliated with Mazandaran University of Medical Sciences. Using the equation (d=0.05, P=0.32 (Mossadeghzadeh, 2006), Z=1.96) the sample size was calculated 336 individuals.

The distribution of samples in each hospital was determined through calculating the selection quota for each hospital (dividing the number of admission per month in the hospital by the overall admissions in the population study): Imam Khomeini hospital was assigned 215 individuals, Fatemeh Zahra hospital was assigned 70 individuals, Zare hospital was assigned 27 individuals, and Bu Ali hospital was assigned 24 individuals.

2.3 Procedure

The study was approved by the research center for Traditional and Alternative Medicine and Study Center for Medical Ethics and History Mazandaran University of Medical Sciences (NO: 90-142), to the mentioned hospitals in two months (November and December 2011) with the introduction letter from the Deputy of Research, and interviewed the discharging patients with permission of the hospital managers.

Stage simple random sampling:

- Researcher referred to the hospital discharged ,with letters of introduction from Mazandaran University of Medical Sciences
- Numbered list of patients being prepared for discharged
- Maximum daily interviews were conducted with 10 patients
- Patients were selected by lottery method
- All of wards 4 hospitals except: the emergency department , oncology, pediatrics and psychiatric wards

If the patient was unable to respond, the patient's next of kin would be interviewed. All patients expressed their consent prior to answering the questions. They were reassured that their anonymity will be preserved.

2.4 Measures

Data was collected using a questionnaire with two parts: the first part dealt with demographic information (sex, age, insurance type ,length of stay, education, and two questions about the bill of patient rights: see the bill of patients' rights, and source of information on the contents of the bill), and the second part contained 10 questions addressing the content of the bill (Right of anonymous treatment, right to know the name of physicians, nurses etc, right to know about the treatment process, right to know about complications of therapy, right of discharge with free will, right of privacy, right of confidentiality by physicians and permission, right of access to physicians etc, right to participate in or refrain from a research, right to learn about insurance coverage.

Questionnaires were completed on discharge through face-to-face interviews. Although the questions were prepared using the text of the bill, we confirmed the content validity of the questionnaire with opinions from the committee of research ethics at Mazandaran University of Medical Sciences. For reliability, in pilot study with 20 patients being discharged were interviewed. Cranach's alpha questions (0/76) were obtained.

The second part of the questionnaire was designed with 10 close-ended questions with yes and no options, the former scored 1 and the latter scored 0. The minimum score was 0 and the maximum was 10. Scores ranging between 0-3 were deemed Poor, 4-6 deemed Intermediate, and more than 7 were deemed good**.**

2.5 Analysis

Collected data were analyzed using descriptive and inferential statistics on SPSS (statistical pakage for the social science, version 10, Inc., Chicago, IL, USA).

Descriptive statistics as mean scores, standard deviations and frequencies were used to describe the demographic characteristics of the patients along with study variables.

Two inferential statistics were used including pearson correlation coefficient (pearson r) to test the correlation between selected factors and scores patients awareness of their rights and dependent T-Test to detect relationship between age, length of stay, and their awareness scores.

3. Results

The results indicate that out of 336 individuals, 55.4% were women and 44.6% were men. Most patients were educated below high school level (36%); 25% were illiterate and only 4.2% had a bachelor's degree. Years of education varied from 0 to 16 years (mean: 6.82 ± 5.29). The mean age of participants was 40.93 ± 15.04 years. The participants were recruited from 4 teaching hospitals of Sari (Mazandaran University of Medical Sciences) based on the number of admissions; thus, the majority of cases (63.7%) pertained to Imam Khomeini Hospital in internal medicine, general surgery, gynecologic surgery, and obstetric wards, 21.1% belonged to the cardiology and post CCU wards of Fatemeh Zahra hospital, 7.1% were selected from the internal medicine and surgery wards of Bu Ali hospital, and 0.8% were recruited from the burns and reconstructive medicine ward of Zare hospital.

As for insurance type, the majority (34.2%) had Medical Services insurance, followed by Social Security insurance (32.7%), Welfare Committee insurance (16.7%), Rural insurance (13.7%) and others (2.7%). The mean length of hospital stay was 4.6 ± 3.34 days.

Most patients (63.4%) answered negatively to the question inquiring whether or not they had seen the charter of patient rights, and only 36.6% had seen the charter. As for the source of information on the contents of the bill, out of 36.6% who had responded positively, most (28.3%) mentioned the hospital as their source and only 1.5% had received any information from public media.

In the second part of the questionnaire, the results indicate that the awareness score ranging from 0 to 10 had a mean value of 3.226 and a standard deviation of 3.68. Most patients (58.9%) had poor knowledge, 12% had intermediate knowledge, and 29.1% had good knowledge (Table 1).

Table 1. Awareness of admitted patients of the bill of patient rights in 2011

Awareness	Count	Percent
Good (7-10)	98	29.1
Intermediate (4-6)	40	12
Poor (0-3)	198	58.9
Total	336	100

Regarding the content of the bill, the mostly ignored article was the right to participate in or abstain from a research activity (84.8%). Moreover, 60.4% were not aware of articles 1 (the right to receive treatment with dignity) and 4 (the right to receive information about the adverse effects of therapy). As table 2 depicts, the most unrecognized articles in decreasing order of unawareness included article 10 (the right to learn about insurance coverage and expenses if transferred to other centers) with 84.2% unawareness, article 8 (the right of access to physicians, etc during admission and after discharge) with 70.5% unawareness, article 7 (the right for privacy by the physician and others and giving permission) with 66.4% unawareness, article 6 (the right of confidentiality of personal information) with 65.2% unawareness, article 2 (the right to know the names of physicians, nurses etc) with 63.4% unawareness, article 5 (the right of discharge at any time with free will) with 61.3% unawareness, and article 3 (the right to learn about the process of therapy and the course of the disease) with 60.7% unawareness.

Table 2. Distribution of frequency of patient awareness of the bill of patient rights in 2011

Patient Rights	Aware	Unaware
1- right of anonymous treatment	133 (39.6)	203 (60.4)
2- right to know the name of physicians, nurses, etc	123 (36.6)	213 (63.4)
3- right to know about the treatment process and course of disease	132 (39.3)	204 (60.7)
4- right to know about complications of therapy and participation in treatment	133 (39.6)	203 (60.4)
5- right of discharge with free will	130 (38.7)	206 (61.3)
6- right of privacy and confidentiality of information	117 (34.8)	219 (65.2)
7- right of confidentiality by physicians and permission	113 (33.6)	223 (66.4)
8- right of access to physicians, etc during admission and after discharge	99 (29.5)	237 (70.5)
9- right to participate in or refrain from a research	51 (15.2)	285 (84.6)
10- right to learn about insurance coverage and expenses when transferred to other healthcare centers	53 (15.8)	283 (84.2)

Numbers in parentheses are expressed as percent.

In addition, we found a significant relationship between awareness scores and the years of education using Pearson's correlation coefficient ($r=0.3$, $p<0.0005$). $r^2=0.09$ indicates that some 10% of changes in the mean awareness scores is related to the patients' years of education. Furthermore, Pearson's correlation coefficient revealed a significant relationship between awareness cores and the answer to the questions, "Have you seen the charter of patient rights?" ($r=0.809$, $p<0.0005$). In other words, about 65% of changes in the awareness scores of patients are related to whether or not the patients have seen the charter in the hospital.

Another finding of our study is the inverse relationship between participants' age and their awareness scores ($r=0.32$, $p<0.0005$). Independent t-test indicated that this relationship is significant, ($t=49.89$, $p=0.0005$) with 95% confidence. Moreover, we found no significant relationship between awareness score and variables of sex, length of stay, and type of insurance.

4. Discussion

Our findings indicate that most patients (63.4%) had not seen the bill of patient rights and only 36.6% mentioned having seen the bill. Kuzu (2006) reported that in Turkey, only 9% of patients were aware of the regulations of

patient rights. In Russia, Fotaki (2006) reported that half of the respondents did not know that there are clear rights and credits for patients. Another study by Deneyer et al in Flemish indicated that only 7.8% of pediatricians were well aware of these regulations (Deneyer, 2012). In Turkey, Ozdemir et al. (2006) concluded that 40% of participating physicians were not aware of legal issues and 63% had never read anything about the legal issues surrounding patient rights. In Iran, Hamadan, 56.2% of patients mentioned that they were not familiar with the bill of patient rights and only 29.3% were aware of it (Hojjatoleslami, 2012). Another study by Hakan Ozdemir et al. (2011) indicated only 34% of participants (midwives and nurses) in university hospitals, state hospitals and village clinics, knew any legal basis for patients' rights. In Lithuania Ducinskiene et al. (2006) indicated 85% medical staff 56% patients had heard or read about the law on patient rights. They suggest a need for awareness-raising among patients.

In Shanghais psychiatric hospitals, 52% medical staff had not education in ethics while almost all (89/1%) thought it was necessary. They reported (87.8%) that their medical institutions had not Ethics Committee. Su et al. (2008) reported (sample 1094), only 11% and 16.6 % respectively knew of the Nuremberg Code and the Declaration of Helsinki.

This factor requires further attention Physicians, nurses, and other members of the healthcare team should attend classes of ethics and law to gain the professional information required for new situations. As for patients, education may be accomplished on admission or any other suitable time, through provision of information both orally and in written (via pamphlets, brochures, booklets, etc). In the teaching hospitals in our study, the bill of patient rights was placed on the walls of all wards; however, many patients fail to read and comprehend it for many reasons. It has even been observed that some senior nursing and midwifery students are not properly aware of patient rights. The problem seems to lie in communications, and hospital staff needs to spend more time communicating with patients. The authorities may also consider compensatory rewards for encouraging their personnel.

Another finding in the present study is that the majority of participants (28.5%) received their information from the hospital and only 1.5% was informed via public media about the bill of patient rights. As patients and their companions regard sufficient information as one factor contributing to the observance of their rights and Patient satisfaction could prove a useful right to health indicator (Mpinga, 2011). The need for information provided by hospitals and other healthcare centers, as well as public media including the radio and television (which play an important role in Iranian common culture) is highlighted.

The findings of the present study indicate that 58.9% of participants had poor knowledge, 12% had intermediate knowledge, and 29.1% had good knowledge. Zeina et al. (2013) in South Egypt, reported the most patients (three quarter) and companions did not know about the list of patients' rights.

Poor knowledge of the charter is not limited to patients, as Ghodsi and Hojjatoleslami (2012) reported students' awareness in a hospital in Hamadan to be poor in 31%, intermediate in 53% and good in 16%. Considering these reports on the awareness of patients, managers and students reveals that despite the fact that the charter of patient rights has been developed in 2002 and revised on 2009, members of the treatment teams in healthcare centers are still not properly educated about patient rights. Resolving this shortcoming requires joint efforts by authority at all managerial levels. It must be noted that some hospitals affiliated with Mazandaran University of Medical Sciences are conducting projects to establish clinical governance, and we hope to observe the results in surveys of coming years.

Another finding of ours is related to the awareness of the contents of the charter. The least awareness pertained to the right of participating in or abstaining from research activities, mentioned in article 9 of the charter (15.2%), while the best awareness pertained to the two domains of treatment with dignity (article 1) and knowledge of complications of therapy (article 4) with 39.6% awareness.

The right to equal treatment, irrespective of age, gender, ethnicity, socio-economic status and place of residence, is an important for several health care system (Askildsen, 2010). In modern medical ethics, great emphasis is placed on the principle of respect for patient autonomy. Patients are now the ultimate decision –makers (Rowe, 2013). In Austria, Stadlbauar et al ,an online survey among 3 groups (ICU nurses n=185;students of health sciences n=1277; students of non- health science related courses n=485) showed that they know (84%) the Austrian organ donation legislation (Stadlbauer, 2013).

On the other hand, Krzych and Ratajczyk (2013) in Poland reported that over 80% of respondents were aware of their right to choose a treating physician, refusal of the proposed treatment, the choice of the place where the patient is treated, the right of access to medical records, free meals, pastoral care, ability to provide to third parties information about the state of health, as well as giving information to particular persons by phone. The

least awareness was shown in relation to the form of giving consent (42.9%) or refusal of consent (50.5%) to treatment and the doctors' right to refuse the presence of a person close to the patient during treatment (16.4%).

The above results indicate that patients do not have appropriate knowledge of article 9 of the charter of patient rights (dealing with the right to participate in or abstain from a research). In Lithuania, information about side-effects to patients is not accordance with the principle of the respect for patients' autonomy and requirements of Lithuanian (Liseckiene, 2008)

Considering the poor knowledge of article 9, those in charge at hospitals and healthcare centers must familiarize patients with this article. In addition, other healthcare personnel must improve their knowledge through training programs for research ethics. It must be noted, however, that mere knowledge will not be sufficient. Mohammad Nejad et al. (2008) reported the knowledge rate of nurses employed in teaching hospitals of Tehran to be good (95.5%). It appears that knowledge alone cannot guarantee the observance of patient rights by the medical team. It is necessary that legislators should clearly define the punishments and other legal issues associated with disregard of each article in the charter to grant a legal and executive guarantee to the charter.

In Turkey, Kuzu reported (2006) that the most common causes of not requesting appropriate service are fearing the anger of healthcare personnel (55.7%), concerns over the negative impact on treatment process (20%), poverty, illiteracy, physical problems, immigration, and timidity (14%), unawareness of the regulations (5.8%), and overworking of personnel and poor communication between patients and personnel (4.3%). It seems that in addition to knowledge of patients and personnel and legal measures, other factors (such as social culture) affect the observance of patient rights.

Regarding other articles of the charter, 60.4% were not aware of the 4th article, dealing with the right to choose the final therapy. In Turkey, Erer (2008) reported that only 43.3% of cancer patients knew that they could reject the therapy proposed by the physician. Arab et al. (2010) reported that the knowledge of hospital managers in the public and private hospitals regarding patient autonomy was 23% and 57%, respectively which falls in the poor category. This indicates that even hospital managers, who are expected to be better aware of the charter than others, have poor knowledge of the matter.

Awareness of the charter of patient rights is vital for patients and finding of our study is the significant relationship between mean score of awareness and years of education, which is consistent with the findings of 10, 27.

Unfortunately, most patients in our study were illiterate or below high school (61%). As Table 3 depicts, most patients with poor knowledge scores were illiterate or educated below high school (approximately 41.9%). This indicates that education influences the patients' awareness.

Table 3. Awareness of contents of bill of patient rights and education

Education	Awareness			Total
	Poor	Intermediate	Good	
Illiterate	67 (19.9)	7 (2.1)	10 (3)	84 (25)
Below High School	74 (22)	16 (4.8)	31 (9.2)	121 (36)
High School	37 (11)	13 (3.9)	38 (11.3)	88 (26.2)
College	9 (2.7)	3 (9)	2 (6)	14 (4.2)
Bachelor	198 (58.9)	40 (11.9)	98 (29.2)	336 (100)

Another finding in the present study (Table 4) is the fact that individuals who had not seen the charter tended to have poor scores (about 56%), whereas those who had seen the charter tended to have good scores (26.2%). This finding indicates that the managers must improve the visibility of the charter of patient rights. Currently, the charters are placed on walls of the wards, which seem to be less than satisfactory. We recommend that more efficient methods, such as pamphlets, brochures, and booklets, should be submitted to patients alongside oral explanations on admission.

Table 4. Awareness of contents of bill of patient rights and seeing the charter

Seeing	Awareness			Total
	Poor	Intermediate	Good	
Seen	188 (56)	15 (4.5)	10 (3)	213 (63.4)
Not Seen	10 (3)	25 (7.4)	88 (26.2)	123 (36.6)
Total	198 (58.9)	40 (11.9)	98 (29.2)	336 (100)

Yaghobian et al. (2009) conducted a quasi-experimental study to conclude that using educational texts alone will not be sufficient for nurses with bachelor's degree, and a combination of texts and lectures will be more efficient. Evidently, illiterate patients and those with lower levels of education require further help for comprehension of the subject, and the material should be presented in a simple and comprehensible fashion.

The source of information about the charter is another finding of our study. As presented in Table 5, most of those who had seen the charter (28.3%) had done so in the hospital, whereas only 1.5% of them had learned about it via public media. Arab et al. (2010) reported that only 13.2% of patients had heard about patient rights, and 8.5% had read about the matter. These findings indicate that authorities need to pay extra attention to public media and the role they may play in improving the awareness of the public.

Table 5. Awareness of contents of bill of patient rights and information source

Source	Awareness			Total
	Poor	Intermediate	Good	
Friends and Acquaintances	1 (3)	6 (1.8)	12 (3.6)	19 (5.7)
Public Media	2 (6)	1 (3)	2 (6)	5 (1.5)
Hospital	6 (1.8)	19 (5.7)	70 (20.8)	95 (28.3)
Not seen	189 (56.3)	14 (4.2)	14 (4.2)	217 (64.6)
Total	198 (58.9)	40 (11.9)	98 (29.2)	336 (100)

Another finding is the inverse relationship between awareness scores and the patients' age. Arab et al. (2010) and Krzych and Ratajczyk (2013) reported significant relationships between age and awareness scores. Considering the mean age of patients in our study (41 years) which is similar to that reported by Arab et al. (2010) (43.6 years) it is crucial to pay attention to the education of middle-aged and senile patients. Moreover, we did not observe a significant relationship between awareness scores and the variables of sex, type of insurance and length of stay. Similarly, Moghaddam et al. (2011) failed to find a significant relationship between length of stay and awareness of the charter whereas Arab et al. (2010) reported a significant relationship between these two variables.

It must be noted that the mean length of stay was 4.6 ± 3.24 days in our study and 7.1 ± 7.4 days in that of Arab et al. It is possible that the longer stay in the latter may have influenced the patients' awareness.

5. Conclusion

The findings of the present study indicate that about 70% of patients did not have good knowledge of the contents of the bill of patient rights, and only 36.6% had seen the charter. Therefore, we have the following recommendations:

1- Placing the bill in public areas of healthcare centers, especially in places where the patients and their companions await admission or other services

2- Preparing brochures, pamphlets, or booklets in a simple language and submitting them to the patient on admission

3- Preparing regulations with executive guarantees

4- Establishing ethics committees in healthcare centers with attorneys and professionals well aware of patient rights

5- As nurses, particularly head nurses, are in direct contact with patients and are among the first people to notice

the observance of patient rights, educating them about the regulations will render them defenders of patient rights in wards. The awareness of head nurses is necessary, but not enough. Ethics committees in hospitals may grant a certain degree of authority to hospital nurses and supervisors.

6- Just in the same way that mothers are routinely educated about breastfeeding in healthcare centers, so must all patients be routinely informed about the contents of the bill of patient rights.

7- Healthcare centers often face the challenge of shortages in educating personnel. Patient education may be accomplished with help of students at all levels of education and with different fields. This is not only cost effective and less time consuming, but also serves as a reminder to students to learn about and propagate the bill of patient rights.

Study Limitations

1- The current study was conducted in teaching hospitals only, and gives no knowledge of the situation in private hospitals.

2- We did not recruit any patient from the emergency department or oncology, pediatrics and psychiatric wards. Thus, we propose the future studies to cover these points, as well.

Ethical Consideration

The study was approved by the research center for Traditional and Alternative Medicine and Study Center for Medical Ethics and History Mazandaran University of Medical Sciences**.**

The researchers contacted the administrator in each of the 4 hospitals in order for data collection to be carried out; the study was explained and permission to enter the hospital for the purpose of gathering data was sought.

Acknowledgement

The present study was conducted under sponsorship of the Research Center for Traditional Medicine and Medical Ethics at Mazandaran University of Medical Sciences (Grant No. 90-42), and we wish to hereby express our gratitude to the personnel of that center. We thank the patients, administrators, nurses for their assistance in the conduct of this study.

Author Contributions

MY did the study conception and design, statistical expertise, analysis and interpretation of data and supervision; SK did manuscript preparation; MD, FRA did data collection and administrative support.

Conflict of Interest

None of the authors have any conflict of interest relevant to this study or the content of this report.

References

Arab, M., Zarei, A., & Hosseini, M. (2010). Awareness and Observation of Patients Rights from the Perspective Of Patients: A Study In University Hospitals In Tehran. *Journal of Public Health, School of Public Health, 8*(2), 7-86.

Askildsen, J. E., Holmås, T. H., & Kaarboe, O. (2010). Prioritization and patients' rights: Analysing the effect of a reform in the Norwegian hospital sector. *Social Science & Medicine, 70*(2), 199-208. http://dx.doi.org/10.1016/j.socscimed.2009.09.022

Bassiri Moghadam, K., Bassiri Moghadam, M., Moslem, A., Ajam Zybd, H., & Gamal, F. (2011). Awareness of Patients And Medical Staff And Patient's Rights In Respect Of Teaching Hospitals Gonabad. *Journal of Knowledge of ogh, 17*(1), 45-54.

Deneyer, M., Marchand, J., Buy, R., Michel, L., Holsters, D., & Vandenplas, Y. (2012). The influence of the law on patient's rights on the practice of the Flemish paediatricians anno 2010. *Acta chirurgica Belgica, 112*(4), 297.

Ducinskiene, D., Vladickiene, J., Kalediene, R., & Haapala, I. (2006). Awareness and practice of patient's rights law in Lithuania. *BMC Int Health Hum Rights, 6*, 10.

Erer, S., Atici, E., & Erdemir, A. (2008). The views of cancer patients on patient rights in the context of Information and Autonomy. *Journal of Medical Ethics, 34*(5), 384-388.

Fehime Zülfikar, M., & Ulusoy, F. (2001). Are Patients Aware of Their Rights? *A Turkish study Nurs Ethics, 8*(6), 487-498. http://dx.doi.org/10.1177/096973300100800603

Fotaki, M. (2006). Users' perceptions of health care reforms: quality of care and patient rights in four regions in

the Russian Federation. *Social Science & Medicine, 63*(6), 1637-1647.

Ghodsi, Z., & Hojjatoleslami, S. (2012). Knowledge of students about Patient Rights and its relationship with some factors in Iran. *Procedia - Social and Behavioral Sciences, 31*(0), 345-348. http://dx.doi.org/10.1016/j.sbspro.2011.12.065

Hojjatoleslami, S., & Ghodsi, Z. (2012). Respect the rights of patient in terms of hospitalized clients: a cross-sectional survey in Iran, 2010. *Procedia - Social and Behavioral Sciences, 31*(0), 464-467. http://dx.doi.org/10.1016/j.sbspro.2011.12.087

Humayun, A., Fatima, N., Naqqash, S., Hussain, S., Rasheed, A., Imtiaz, H., & Imam, S. Z. (2008). Patients' perception and actual practice of informed consent, privacy and confidentiality in general medical outpatient departments of two tertiary care hospitals of Lahore. *BMC Med Ethics, 9*, 14. http://dx.doi.org/10.1186/1472-6939-9-14

Joolaee, S., Nasrabadi, A. N., Yekta, Z. P., Tschudin, V., & Mansouri, I. (2006). An Iranian Perspective on Patients' Rights. *Nurs Ethics, 13*(5), 488-502.

Joolaee, S., Tschudin, V., Nikbakht-Nasrabadi, A., & Parsa-Yekta, Z. (2008). Factors affecting patients' rights practice: the lived experiences of Iranian nurses and physicians. *Int Nurs Rev., 55*(1), 55-61. http://dx.doi.org/10.1111/j.1466-7657.2007.00584.x

Kazemnezhad Mahmood, S., & Hesamzadeh, A. (2013). Implementation of patients' bills of rights by physicians and nurses from their colleagues' points of view in educational hospitals of Mazandaran University of medical sciences. *Journal of Mazandaran University of Medical Sciences, 23*(97), 216-223.

Krzych, Ł. J., & Ratajczyk, D. (2013). Awareness of the patients' rights by subjects on admission to a tertiary university hospital in Poland. *Journal of Forensic and Legal Medicine, 20*(7), 902-905. http://dx.doi.org/10.1016/j.jflm.2013.06.006

Kuzu, N., Ergin, A., & Zencir, M. (2006). Patients' awareness of their rights in a developing country. *Public Health, 120*(4), 290-296.

Liang Sua, B., Huanga, J., Mellorc, D., Yanga, W., McCabec, M., Shena, Y., ... Xu, Y. (2012). The rights of psychiatric patients in China: A survey of medical staff and consumers' attitudes toward patient participation in clinical trials. *Social Science & Medicine, 75*(5), 823-827.

Liseckiene, I., Liubarskiene, Z., Jacobsen, R., Valius, L., & Norup, M. (2008). Do family practitioners in Lithuania inform their patients about adverse effects of common medications? *J Med Ethics, 34*(3), 137-40. http://dx.doi.org/10.1136/jme.2006.019448

Millar, M. (2011). Patient rights and healthcare-associated infection. *J Hosp Infect, 79*(2), 99-102. http://dx.doi.org/10.1016/j.jhin.2011.04.031

Mohammad Nejad, E., Begjani, J., Abotalebi, G., Salari, A., & Ehsani, S. R. (2011). Nurses awareness of patients rights in a teaching hospital. *J Med Ethics Hist Med, 4*, 2.

Mossadeghzadeh Mohammad, A. (2006). The Relationship Between Patients 'Knowledge Of Patients' Rights And Their Satisfaction With Hospital Services. *Teb And Tazkiyeh, 14*(3(Successive70-71)), 65-76.

Mpinga, E. K., & Chastonay, P. (2010). Satisfaction of patients: a right to health indicator? *Health Policy, 100*(2-3), 144-50. http://dx.doi.org/10.1016/j.healthpol.2010.11.001

Ozdemir, M. H., Ergönen, A. T., Sönmez, E., Can, I. O., & Salacin, S. (2006). The approach taken by the physicians working at educational hospitals in Izmir towards patient rights. *Patient Education and Counseling, 61*(1), 87-91.

Parsapour, A., Bagheri, A., & Larijani, M. A. (2010). Bill of Patients' Rights in Iran. *Iranian Journal of Medical Ethics and History of Medicine, 3*(Special Issue), 39-47.

Rowe, K., & Moodley, K. (2013). Patients as consumers of health care in South Africa: the ethical and legal implications. *BMC Med Ethics, 14*, 15. http://dx.doi.org/10.1186/1472-6939-14-15

Stadlbauer, V., Steiner, P., Schweiger, M., Sereinigg, M., Tscheliessnigg, K. H., Freidl, W., & Stiegler, P. (2013). Knowledge and attitude of ICU nurses, students and patients towards the Austrian organ donation law. *BMC Med Ethics, 14*, 32. http://dx.doi.org/10.1186/1472-6939-14-32

Su, L., Huang, J., Yang, W., Li, H., Shen, Y., & Xu, Y. (2012). Ethics, patient rights and staff attitudes in Shanghai's psychiatric hospitals. *BMC Med Ethics, 13*, 8. http://dx.doi.org/10.1186/1472-6939

Välimäki, M., Kuosmanen, L., Kärkkäinend, J., & Kjervike, D. K. (2009). Patients' rights to complain in Finnish psychiatric care: An overview. *International Journal of Law and Psychiatry, 32*(3), 184-188. http://dx.doi.org/10.1016/j.ijlp.2009.02.002

Yaghobian, M., Yaghobi, T., Salmeh, F., Golmohammadi, F., Safari, H., Savasry, R., ... Habibi, Kh. (2009). Comparison with Booklet and Lecture Teaching Methods on Nurses' Knowledge About The Laws And Professional Regulations. *Iranian Journal of Medical Education/Winter, 9*(4), 372-381.

Zeina, H. A., El Nouman, A. A., Zayed, M. A., Hifnawy, T., El Shabrawy, E. M., & El Tahlawy, E. (2013). Patients' rights. *J Empir Res Hum Res Ethics, 8*(3), 46-52. http://dx.doi.org/10.1525/jer.2013.8.3.46

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Factors associated with Posttraumatic Stress Disorder and Its Coping Styles in Parents of Preterm and Full-Term Infants

Maryam Ghorbani[1], Mahrokh Dolatian[2], Jamal Shams[3], Hamid Alavi-Majd[4] & Samira Tavakolian[1]

[1] Shahid Beheshti University of Medical Sciences, Tehran, Iran

[2] Department of Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[3] Department of Psychiatry, Behavioral Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[4] Department of Biostatistics, School of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Correspondence: Mahrokh Dolatian, Shahid Beheshti University School of Nursing and Midwifery, Tehran, Iran. Tel: 98-218-820-2512. Fax: 98-218-820-2512. E-mail: mhdolatian@gmail.com

Received: December 5, 2013 Accepted: January 17, 2014 Online Published: February 20, 2014

doi:10.5539/gjhs.v6n3p65 URL: http://dx.doi.org/10.5539/gjhs.v6n3p65

Abstract

Introduction: Birth of a premature infant and subsequent neonatal intensive care leads to psychological distress and trauma in parents. A large proportion of mothers show signs of trauma long after discharge from hospital. Fathers of premature infants are known to experience more stress than fathers of full-term infants. The sorrow experienced by parents of preterm infants is significantly higher than that experienced by parents of full-term infants because they have not been adequately prepared for the experience of birth, and need to cope with the stress caused by the clinical state and intensive care of the infant.

Method: This was a descriptive-comparative study conducted in medical centers of Qom, Iran in 2012. In this study, 82 couples (164 mothers and fathers), participated in two groups as parents of preterm and full-term infants and completed demographic, midwifery, posttraumatic stress disorder, Spielberg anxiety questionnaires, and the Coping Inventory with Stressful Situation within 2 months after birth of their infant. Data were analyzed using Chi-square, Fisher's exact, Mann-Whitney, independent t tests, logistic regression, and Repeated measures ANOVA in SPSS-18 software.

Results: Posttraumatic stress disorder in preterm group mothers was significantly higher than in term group mothers ($P=0.03$), but no significant difference in this disorder was observed between fathers in these groups. There was a significant difference in coping styles with stress between mothers in the two groups ($P<0.001$) and between fathers in the two groups ($P<0.001$). Logistic model showed a significant correlation between posttraumatic stress and housing and coping strategies with stress in mothers.

Conclusion: Parents of premature infants are more exposed to psychological disorders, and there is a need to adopt educational approaches to improve parents' coping ability with preterm infant's circumstance.

Keywords: prematurity, parents, posttraumatic stress, coping styles with stress

1. Introduction:

With prevalence of 5 to 13%, preterm birth is referred to a birth that occurs between the 20th and 37th gestational week (Subramaniam et al., 2012, Jahromi et al., 2011, Lima de Souza and Pinheiro-Fernandes, 2010). Outcomes of preterm infants are associated with such factors as infant's status, parents' attitude, socio-economic parameters, infant's characteristics, mother-infant relationship, and the family atmosphere (Pierrehumbert et al., 2003). Parents of premature infants are more exposed to stress associated with physical appearance, infant's condition, and parenting problems (Melnyk et al., 2006). Birth of a premature infant and subsequent neonatal intensive care lead to psychological distress and trauma in parents. A large number of mothers show signs of trauma long after infant's discharge from hospital, and express painful memories 6 to 18 months after. These memories are often undesirable and intrusive, and recalling them is usually associated with attempts to avoid remembering prematurity of the infant. Intrusiveness, avoidance, and hyperarousal are the three signs of posttraumatic stress

disorder (Jotzo & Poets, 2005). It seems the degree to which a mother can alleviate feelings of loss and grief associated with premature delivery can affect mother-child relationship (Shah et al., 2011).

It has even been observed that fathers of preterm infants experience more stress than fathers of full-term infants. Stressful factors in the transition to fathering role involve changes in fathers' role and absence of the mothers due to their involvement in the care (Foa & Tolin, 2000). Still, there is little information about fathers' experience, as mothers are normally more attended to (Melnyk et al., 2006). Emotions of fear, anxiety, low self-esteem, failure, and inability to cope with stress have been described in parents' care for the premature infant. The grief experienced by parents of preterm infants is significantly higher than that in parents of full-term infants because they are not prepared for the experience of birth, and there is a need for parents to cope with the stress caused by clinical condition and intensive medical care. Following assessment of a stressful situation, a person begins to adopt different coping strategies for the event (Jotzo & Poets, 2005).

Therefore, given the importance of early diagnosis of prematurity, posttraumatic stress disorder and associated factors, interventions to increase preterm infants' parents' ability to cope, and neglecting fathers in most studies, the researcher decided to compare posttraumatic stress disorder and coping strategies in parents of term and preterm infants.

2. Patients and Methods

This descriptive-comparative study was conducted on all parents of premature and mature infants who had attended health centers in Qom to receive postnatal care from December to March 2012. Inclusion criteria included: no mental illness, no history of any mental disorders, no mental medications such as antidepressants, or psychotropic substances, and no neurological or congenital defects in newborns. Based on statistics, there were 82 couples in each group. Multistage sampling was used in the present study. Qom city was first divided into four economic classes (the first stage of sampling was cluster sampling). Then all health centers of Qom city were listed and the entire sample was distributed based on existing data and in proportion to the volume of patients (the second stage of sampling was quota sampling). In the next step, centers were randomly selected within each region for the sampling. This study was approved in 20 October 2012 in the Deputy for Research of Shahid Beheshti University of Medical Sciences. To comply with principles of ethics, the following was carried out by the researcher: First, the researcher obtained permission letter from officials at Shahid Beheshti University of Medical Sciences and presented the letter to Qom University of Medical Sciences. During sampling, participation in the study was voluntary, and subjects could decline to continue at any stage in the study. The researcher first introduced herself to participants and explained objectives of the study to them. Participants were assured of confidentiality of information. After examination of data, parents in need of counseling, or treatment were referred to a psychologist or a psychiatrist. . Data were analyzed using Chi-square, Fisher's exact, Mann-Whitney, independent t tests, logistic regression, and Repeated measures ANOVA in SPSS-18 software.

The questionnaires for this study include

Section I

Questionnaire regarding father's information contains 2 parts. The first part includes questions about demographic characteristics, history of psychiatric illness in first-degree relatives (6 questions). The second part contains information about the unpleasant events which the father may have experienced during his spouse's pregnancy (27 questions).

Questionnaire regarding mother's information consists of 4 parts.

Part I

The first part includes questions about demographic characteristics, socioeconomic status of the family including housing, family income, and family size (12 items). The second part contains information about the mother's pregnancy including questions about: previous pregnancies, methods of contraception, prenatal care, the rate of satisfaction with midwife's care during childbirth, diseases experienced during pregnancy, insurance type, delivery type, and hospitalization after delivery (38 questions). The third part includes neonatal factors including questions about the baby's gender, type of pregnancy, baby's disease(s) after birth, infant's history of admission to hospital, parent's satisfaction with the baby's gender, baby's gestational age at birth, baby's weight at birth, baby's nutrition, problems in taking care of the newborn, ability to pay baby's hospitalization costs (15 questions). The fourth part includes questions related to unpleasant events in pregnancy (27 questions).

In this study, content validity was used to determine the validity of demographic and obstetric questionnaire. To determine reliability of this questionnaire, test retest was used. The reliability coefficient was calculated as 98

percent.

Part II

Post-traumatic stress disorder symptoms scale: To diagnose post-traumatic stress disorder (PTSD), the severity of symptoms was evaluated based on DSMIV (Diagnostic and Statistical Manual of Mental Disorders); which contains 17 questions with Likert scale. Each question contains a short question and the person's answers are graded from zero (not at all) to 3 (5 or more times a week). In this scale, the frequency and severity of symptoms have been incorporated. The reason is that some PTSD symptoms can be evaluated based on frequency of its occurrences (such as trauma-related nightmares) and others can be described based on their severity (hyper arousal). Four questions related to re-experiencing, 7 questions related to avoidance, and 6 questions related to motivational response. In case of having one or more symptoms related to re-experiencing, 3 or more symptoms of avoidance, 2 or more symptoms related to motivational reactions, PTSD was diagnosed (Foa and Tolin, 2000; Shaban et al., 2013).

In Iran, Mirzamani et al. assessed validity of this scale using concurrent validity method in 2006 ($r = 0.79$, $P<0.001$). Its reliability in test-retest was 74% in various studies and 88% in Cronbach's alpha method (Mirzamani et al., 2006)

Part III

Coping Inventory with Stressful Situation (CISS): This questionnaire is used to assess coping styles of people in stressful situations. This test includes 48 items, with 16 items for each of the coping dimensions of problem-oriented, emotion-oriented, and anxiety. Scoring is based on the 5-point Likert scale, from never (1) to very much (5). Shokri et al. in their 2008 study found internal consistency of this questionnaire 0.55-0.64 and its reliability with Cronbach's alpha 0.7-0.86 (Shokri et al., 2008)

3. Results

Table 1. Demographic data of Parents of Preterm and term infants

Birth type (Demographic data)	Term (N=82)	Preterm (N=82)	Result
Mother's age(mean ±SD)	28.2±4.5	27.6±6.2	P=0.53
Father's age (mean ±SD)	32.8±4.8	31.7±6.2	P=0.23
Mother's education / number / (Percentage)			P=0.88
Primary school	13(15.9)	16(19.5)	
High school	42(51.2)	36(43.9)	
University	27(32.9)	30(36.6)	
Father's education / number / (Percentage)			**P<0.001
Primary school	17(20.7)	28(34.1)	
High school	26(31.7)	54(65.9)	
University	39(47.6)	-	
Mother's job (housewife)/ number (Percentage)	69(84.1)	69(84.1)	P=1
Father's job (self-emPloyed)/ number (Percentage)	57(69.5)	64(78)	P=0.21
Family's income level / Rials/ number / (Percentage)			
0 - 4000000	12(14.5)	9(11)	
4000000 - 8000000	34(41.5)	19(23.2)	P=0.056
8000000 - 10000000	20(24. 4)	38(46.3)	
10000000 - more	16(19.5)	16(19.5)	
Mother's marriage age/(mean ±SD)	20.6±3.4	20.2±3.6	P=0.46

*P<0.05, ** P <0.01

According to table 1, mean age of mothers in the full-term group was 28.2±4.5 years and in the preterm group 27.6±6.2, and mean age of fathers in the full-term group was 32.8±4.8 and in the preterm group 31.7±6.2 years. 51.2% of term group mothers and 43.9% of preterm group mothers had high school education. Majority of fathers in term group (47.6%) had university education, and 65.9% of fathers in preterm group had high school education. Mann-Whitney test results showed that term infants' fathers had significantly higher levels of education compared to preterm fathers (P<0.001). Majority of both term and preterm mothers (84.1%) were housewives, and majority of fathers in term group (69.5%) and in preterm group (78%) were self-employed. 37.7% of subjects owned their home, and others lived in rented accommodations, service houses, or with their families. However, the difference between the two mothers and fathers groups in terms of occupation, income level, and housing was insignificant (Table 1).

In both groups, most subjects were primiparous, and no significant difference was observed between the two groups in terms of type of delivery, number of deliveries, number of living children, number of male children, number of female children, or history of miscarriage, stillbirth, and neonate's gender. According to the results obtained, significant differences were observed between two groups of infants requiring hospitalization (P<0.001) and neonatal intensive care unit (P<0.001) (Table 2).

Table 2. Obstetric characteristics of Parents of Preterm and term infants and characteristics of newborns

Birth type (Pregnancy information)	Term (N=82)	Preterm (N=82)	Result
First Pregnancy/number (Percentage)	37(45.1)	40(48.8)	P=0.71
Number of child /number (Percentage)			
1	39(47.6)	43(52.4)	P=0.87
2-5	43(52.4)	57(47.6)	
Abortion history/number (Percentage)	15(81.7)	22(62.8)	P=0.19
Stillbirth history/number (Percentage)	6(7.3)	11(13.4)	P=0.2
Natural childbirth/number (Percentage)	38(46.3)	47(57.3)	P=0.11
Wanted Pregnancy from the mother's Point of view	64(78)	51(61.2)	**P=0.01
Wanted Pregnancy from the father's Point of view	64(78)	47(57.3)	*P=0.03
Failure of contracePtive methods	10(12.2)	23(28)	**P=0.01
Son (s)/ number (Percentage)	50(61)	45(54.9)	P=0.42
Need for hosPitalization/number (Percentage)	9(11)	48(58.5)	**P<0.001
HosPitalization at ICU/number (Percentage)	3(3.7)	43(52.4)	**P<0.001
Ability to Pay costs/number (Percentage)	80(97.6)	70(85.4)	**P=0.01
Gestational age/weeks/(mean ±SD)	35.4±1.02	39.1±1.04	**P=0.01
Weight/gr/(mean ±SD)	2563.9 ±348	3359.2±373.9	**P=0.01

*P<0.05, ** P <0.01

In terms of incidence of disorders like gestational diabetes, gestational hypertension, urinary tract infection, vaginal infection, bleeding or staining, oligo- and poly-hydroamnios, or incidence of other gestational diseases, the differences were insignificant.

Results indicate a significant difference in posttraumatic stress between mothers in two groups (P=0.03), and incidence of posttraumatic stress disorder in mothers of preterm infants was significantly higher than in mothers of term infants. However, according to Fisher's Exact Test, this difference was insignificant between two groups' fathers (Table 3).

Table 3. Absolute and relative frequency distribution of PTSD in Parents of both groups

Birth type (Mother's PTSD)	Term Number (Percentage)	Preterm Number (Percentage)	χ^2
Yes	1(1.2)	8(9.8)	
N/A	81(98.8)	74(90.2)	*P=0.03
Father's PTSD			
Yes	2(2.4)	1(1.2)	P=1
N/A	80(97.6)	81(98.8)	

*P<0.05, ** P <0.01

Results show that, in terms of coping strategies with stress, there was a significant difference between the two groups of mothers (P<0.001) and the two groups of fathers (P<0.001) (Tables 4 and 5). A mutual effect was observed in mothers' group between strategy adopted and type of birth (term, preterm) (P=0.006). This mutual effect was not found in the fathers' group (P=0.33). Of mothers with posttraumatic stress disorder, 11.1% used anxiety, 44.4% emotion-oriented, and 44.4% used problem-oriented coping styles with stress. In fathers with posttraumatic stress, use of each of the coping styles was 33.3%.

Table 4. Absolute and relative frequency distribution of coping strategies in mothers of both groups

Birth type (Copping strategies)	Problem-oriented	emotion-oriented	anxiety
Term/mean(standard deviation)	42.28 (6.55)	47.4(6.51)	49.72 (8.29)
Preterm/mean(standard deviation)	47.52 (6.89)	50.59(7.93)	50.29(7.1)
Results (RM ANOVA)			**P<0.001
Mutual effect			**P=0.006

*P<0.05, ** P <0.01

Table 5. Absolute and relative frequency distribution of coping strategies in Fathers of both groups

Birth type (Copping strategies)	Problem-oriented	emotion-oriented	anxiety
Term/mean(standard deviation)	46.22 (7.23)	47.4 (6.51)	49 (8.31)
Preterm/mean(standard deviation)	48.35 (7.31)	50.59(7.93)	53.04 (7.69)
Results (RM ANOVA)			**P =0.001
Mutual effect			P=0.33

*P<0.05, ** P <0.01

The logistic regression model showed no significant correlations between posttraumatic stress in mothers and age, occupation, education, economic status, house statue, pregnancy times, history of infant hospitalization, history of infant admitted to neonatal intensive care unit, wanted pregnancy, and wanted infant's gender. However, this model showed a significant correlation between posttraumatic stress and housing and coping strategies with stress in mothers (Table 6).

Table 6. Logistic regression model for PTSD of mothers

	OR	p-value	OR for 95% CI
Mother's age	0.339	0.091	0.097-1.189
Mother's occupation	0.82	0.106	0.004-1.701
Mother's education	1.089	0.849	0.453-2.613
Economic statue	4.899	*0.034	1.124-21.385
House statue	0.121	0.060	0.013-1.097
Pregnancy times	0.724	0.538	0.259-2.024
Ability to Pay costs	0.000	0.998	0.000
Wanted Pregnancy from mother's viewpoint	8.800	0. 84	0.749-103.384
Wanted infant's gender from father's view	1.509	0.781	0.083-27.602
Infant hospitalization	0.827	0.884	0.064-10.685
NICU hospitalization	0.773	0.362	0.064-10.685
Copping style	0.139	**0.006	0.34-0.573

*p<0.05, ** p <0.01.

Logistic regression model showed no correlation in fathers' Posttraumatic stress disorder and age, occupation, education, house statue, history of infant hospitalization, history of infant admitted to sPecial care unit, wanted Pregnancy, wanted infant**'s** gender, or coping styles with stress (Table 7).

Table 7. Logistic regression model for PTSD of fathers

	OR	p-value	OR for 95% CI
Father's age	3.095	0.219	0.511-18.757
Father's occupation	3.711E7	0.997	0.000
Father's education	1.486	0.450	0.531-4.161
House statue	2.294	0.581	0.120-43.785
Wanted Pregnancy from father's viewpoint	11.693	0.116	0.547-250.092
Wanted infant's gender from father's viewpoint	2.847	0.558	0.086-93.909
infant hospitalization	1.754	0.804	0.021-149.318
NICU hospitalization	1.160	0.657	0.602-2.234
Copping style	1.930E7	0.995	0.000

*p<0.05, ** p <0.01.

4. Discussion

Few studies have examined psychological disorders in parents of premature infants in their early infancy, and studies have mostly considered psychological status of the mother and neglected the father. Moreover, coping strategies that can be highly effective in providing more appropriate coping styles for parents of premature infants and increase their efficacy and parenting quality have been overlooked in these studies. In addition, there are various conflicts in the relationship between coping strategies and outcomes of parents of premature infants in these studies.

According to the present study, mothers of preterm infants experience posttraumatic stress significantly more than mothers of term infants do. The results for posttraumatic stress in mothers in the present study are in line with those by Gambia et al. conducted in 2011 with the aim to compare levels of stress, anxiety, and depression in mothers of term and preterm infants. They found posttraumatic stress in mothers of premature infants was significantly higher than in mothers of term infants, but the differences between two studies were for

questionnaire and time of collecting data, Gambina et al used MSP scale (Psychological Stress Measure), 3 days after delivery and before discharge from hospital, but in the present study data were collected 2 months after delivery. Also, Gray et al. conducted a study in Australia in 2012 with the aim to determine parental stress and psychological health in mothers of very immature infants compared to that in mothers of term infants, and concluded there was insignificant difference in the overall stress score between term and preterm groups, which disagrees with the results of present study. The difference between the two studies (Gray's and the present study) was that we used the above questionnaires 2 months after birth to investigate psychological disorders in parents, but Gray et al. collected the questionnaires 4 months after birth. Besides, they used Parenting Stress Index- Short Form (PSI-SF) scale to investigate mothers' stress, which is different from the posttraumatic stress disorder symptoms scale used in present study. Furthermore, Gray et al. only investigated psychological status of mothers, and ignored fathers' mental state. Participants in Gray et al. study were mothers of infants born in their gestational age of 24-30 weeks that were admitted to special care unit. In the present study, mothers of infants born in their gestational age of 32-36 weeks participated as the preterm group, and only 52.4% of them were admitted to special care unit.

According to the results of present study, no difference was observed in posttraumatic stress in fathers in term and preterm groups. These results are in line with results of the study by Pierrehumbert et al. conducted in 2003 aiming to investigate effects of parents posttraumatic reactions on feeding and sleeping of their child, and also with results of the study by Kersting et al. conducted in 2004 aiming to compare posttraumatic stress symptoms in mother of term and preterm infants. According to Pierrehumbert results, parents of premature infants had more posttraumatic stress than parents of term infants. It was also observed that severity of prenatal risks increases the likelihood of incidence of posttraumatic stress in parents. According to results of this study, 67% of mothers showed symptoms of posttraumatic stress, and in the term group, this level was only 6%. Intensity of posttraumatic reactions in parents is a strong predictor of behavioral and sleeps problems of their child. Kersting et al. found that mothers of premature infants showed significantly more symptoms of posttraumatic stress disorder on days 1-3, 14, and months 6 and 14 after birth compared to mothers of term infants, and reduction in severity of these symptoms was observed 14 months after birth. The difference between the present study and Kersting et al study was in the timing of collecting data, and also their follow-up of mothers in terms of posttraumatic stress disorder.

In a study by Shaw et al. in 2009 aiming to investigate prevalence of posttraumatic stress disorder in parents of preterm or sick infants 4 months after birth and to find a relationship between acute stress symptoms immediately after birth and posttraumatic stress disorder, 32.22% of fathers and 9% of mothers were affected by posttraumatic stress disorder. Symptoms of acute stress significantly correlated with posttraumatic stress disorder and depression. Appearance of posttraumatic stress in fathers was more delayed compared to mothers, but on the fourth month, they were more exposed to risks than mothers. 54.4% of mothers showed complete symptoms of acute stress disorder. However, fathers did not show such symptoms. Differences between this study and current study were in methods and aim of study.

In a cross-sectional interventional study in 2005, Jotzo et al. investigated mothers of preterm infants admitted to special care unit (Jotzo & Poets, 2005). Mothers in the intervention group received a structured psychological intervention in the first few days after birth. All mothers could use psychological support if they needed. Control group mothers received no intervention, but could request counseling. When infant was discharged from hospital, mothers in both groups completed a questionnaire containing key outcome parameters (trauma symptoms, feelings when discharged, and sample and control variables. Results of this study showed no difference in demographic variables, family status, pregnancy, and birth in the two groups. At discharge, levels of traumatic response symptoms in intervention group mothers (25 mothers) was significantly lower compared to control group mothers (25 mothers). Thus, conclusion was drawn that intervention program for parents of preterm infants which was a mixture of early crisis intervention, psychological help when infant was admitted, and strong support at times of crisis reduced trauma symptoms associated with prematurity.

According to the present study, fathers of preterm and term infants showed insignificant differences in terms of posttraumatic stress disorder. Thus, in terms of stress, findings of the present study disagree with those in Sloan et al. study in 2008 titled "stress and coping in fathers of preterm infants". This study aimed to investigate experience of fathers of preterm infants during their hospitalization. According to Sloan's results, fathers reported moderate levels of stress, and considered their parents as the main source of social and emotional support and nurses and doctors as the main source of information support. Fathers were also inclined to use adaptive coping strategies with stress, and tried to re-shape the circumstances. The difference between the present study and Sloan's was in the timing of collecting data and in tools used because data were collected when

infants were admitted to special care unit, and Maslach scale was used to investigate stress, and structured interview for social support and coping strategies with stress.

According to results of the present study, significant differences were found in use of each of the 3 approaches: problem-oriented, emotion-oriented, and anxiety as dominant coping styles in parents of both term and preterm groups. A review of similar studies showed that Affleck and Tennen in 1991 investigated coping strategies of parents of preterm infants when their infant had been admitted to special care unit, and found that the most common strategies used by parents were moderate, investigative, and group supports. Greater use of escapist strategies was associated with lesser positive mood at discharge from hospital, while more use of minimalistic strategies was associated with higher positive mood.

Davis et al. in 2003 found no relationship between coping strategies and depression symptoms in mothers of very immature infants a month after birth. Reichman et al. in 2000 found that coping strategies of escape-avoidance had the strongest relationship with psychological distress of parents of very low birth weight infants.

5. Conclusion

Results of present study show that posttraumatic stress disorder in mothers of preterm group was significantly higher than that in mothers of term infants, and there was also a significant difference between parents in two groups in strategies adopted to cope with stress. Yet, it seems that, even after 2 months since birth, parents of preterm infants were more exposed to posttraumatic stress disorder than parents of term infants, and there is a need to adopt educational approaches to improve parents' coping ability with immaturity of their infant. In future studies, fathers should also be considered more.

Acknowledgment

This research is derived from the master thesis in the nursing and midwifery department of Shahid Beheshti Medical University. We appreciate the cooperation by honorable research deputy of university and all participants in this study.

References

Affleck, G., & Tennen, H. (1991). The Effect of Newborn Intensive Care on Parents' Pschological Well-Being. *Children's Health Care, 20*(1), 6-14. http://dx.doi.org/10.1207/s15326888chc2001_2

Davis, L., Edwards, H., Mohay, H., & Wollin, J. (2003). The impact of very premature birth on the psychological health of mothers. *Early human development, 73*(1), 61-70. http://dx.doi.org/10.1016/S0378-3782(03)00073-2

Foa, E. B., & Tolin, D. F. (2000). Comparison of the PTSD Symptom Scale–Interview Version and the clinician-administered PTSD Scale. *Journal of Traumatic Stress, 13*(2), 181-191. http://dx.doi.org/10.1023/A:1007781909213

Gambina, I., Soldera, G., Benevento, B., Trivellato, P., Visentin, S., Cavallin, F., ... Zanardo, V. (2011). Postpartum psychosocial distress and late preterm delivery. *Journal of Reproductive and Infant Psychology, 29*(5), 472-479. http://dx.doi.org/10.1080/02646838.2011.653962

Gray, P. H., Edwards, D. M., O'Callaghan, M. J., & Cuskelly, M. (2012). Parenting stress in mothers of preterm infants during early infancy. *Early human development, 88*(1), 45-49. http://dx.doi.org/10.1016/j.earlhumdev.2011.06.014

Jahromi, B. N., Salarian, L, & Shiravani, Z. (2011). Maternal risk factors and neonatal outcome of the admitted patients for preterm spontaneous uterine contractions. *Iranian Red Crescent Medical Journal, 13*(12), 877.

Jotzo, M., & Poets, C. F. (2005). Helping parents cope with the trauma of premature birth: an evaluation of a trauma-preventive psychological intervention. *Pediatrics, 115*(4), 915-919. http://dx.doi.org/10.1542/peds.2004-0370

Kersting, A., Dorsch, M., Wesselmann, U., Lüdorff, K., Witthaut, J., Ohrmann, P., ... Arolt, V. (2004). Maternal posttraumatic stress response after the birth of a very low-birth-weight infant. *Journal of psychosomatic research, 57*(5), 473-476. http://dx.doi.org/10.1016/j.jpsychores.2004.03.011

Lima de Souza, N., & Pinheiro-Fernandes, A. C. (2010). Domestic maternal experience with preterm newborn children. *Revista de Salud Pública, 12*(3), 356-367. http://dx.doi.org/10.1590/S0124-00642010000300002

Melnyk, B. M., Feinstein, N. F., Alpert-Gillis, L., Fairbanks, E., Crean, H. F., Sinkin, R. A., ... Gross, S. J. (2006). Reducing premature infants' length of stay and improving parents' mental health outcomes with the Creating

Opportunities for Parent Empowerment (COPE) neonatal intensive care unit program: a randomized, controlled trial. *Pediatrics, 118*(5), e1414-e1427. http://dx.doi.org/10.1542/peds.2005-2580

Mirzamani, S. A., Mohammadi, M. R., & Besharat, M. A. (2006). Application of the PTSD symptoms scale (PSS) for Iranian PTSD patients. *Medical Journal of the Islamic Republic of Iran (MJIRI), 19*(4), 345-348.

Pierrehumbert, B., Nicole, A., Muller-Nix, C., Forcada-Guex, M., & Ansermet, F. (2003). Parental post-traumatic reactions after premature birth: implications for sleeping and eating problems in the infant. *Archives of Disease in Childhood-Fetal and Neonatal Edition, 88*(5), F400-F404. http://dx.doi.org/10.1136/fn.88.5.F400

Reichman, S. R., Feldman, M., A Cate, G., Robert, M., & Hendricks-Munoz, K. D. (2000). Stress appraisal and coping in mothers of NICU infants. *Children's Health Care, 29*(4), 279-293. http://dx.doi.org/10.1207/S15326888CHC2904_4

Shaban, Z., Dolatian, M., Shams, J., Alavi-Majd, H., Mahmoodi, Z., & Sajjadi, H. (2013). Post-Traumatic Stress Disorder (PTSD) Following Childbirth: Prevalence and Contributing Factors. *Iran Red Cres Med J, 15*(3), 177-182. http://dx.doi.org/10.5812/ircmj.2312

Shah, P. E., Clements, M., & Poehlmann, J. (2011). Maternal resolution of grief after preterm birth: implications for infant attachment security. *Pediatrics, 127*(2), 284-292. http://dx.doi.org/10.1542/peds.2010-1080

Shaw, R. J., Bernard, R. S., DeBlois, T., Ikuta, L. M., Ginzburg, K., & Koopman, C. (2009). The relationship between acute stress disorder and posttraumatic stress disorder in the neonatal intensive care unit. *Psychosomatics, 50*(2), 131-137. http://dx.doi.org/10.1176/appi.psy.50.2.131

Shokri, O., Taghilou, S., Geravand, F., Paeizi, M., Moulaei, M., Elahpour, M., & Akbari, H. (2008). *Factor structure and psychometricks properties in Farsi version of the Coping Inventory with Stressful Situation* (CISS). Advances in Cognitive Science.

Sloan, K., Rowe, J., & Jones, L. (2008). Stress and coping in fathers following the birth of a preterm infant. *Journal of Neonatal Nursing, 14*(4), 108-115. http://dx.doi.org/10.1016/j.jnn.2007.12.009

Subramaniam, A., Abramovici, A., Andrews, W. W., & Tita, A. T. (2012). Antimicrobials for preterm birth prevention: an overview. *Infectious diseases in obstetrics and gynecology*, 2012. http://dx.doi.org/10.1155/2012/157159

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Which Factors Influence Functional Patients Improvements During Rehabilitation?

Messina Gabriele[1,3], Rasimelli Lorena[2], Bonavita Chiara[3], Ceriale Emma[3], Quercioli Cecilia[1] & Nante Nicola[1,3]

[1] University of Siena, Department of Molecular and Developmental Medicine, Health Services Research Laboratory, Italy

[2] Rehabilitation Hospital Passignano sul Trasimeno, Local Health Unit 2 of Umbria Region, Perugia, Italy

[3] University of Siena, Post Graduate School in Public Health, Italy

Correspondence: Dr. Gabriele Messina, Department of Molecular and Developmental Medicine, University of Siena, Via A. Moro, 53100 Siena, Italy. E-mail: gabriele.messina@unisi.it

Received: January 10, 2014 Accepted: February 13, 2014 Online Published: February 20, 2014

doi:10.5539/gjhs.v6n3p74 URL: http://dx.doi.org/10.5539/gjhs.v6n3p74

Abstract

Background: Rehabilitation in patients with disabilities is an important aspect of tertiary prevention. Severity of disability, evaluated by global measures of autonomy, is essential for functional outcome evaluation.

Aim: To determine the effectiveness of a rehabilitation programme in terms of percentage functional improvement (PFI); to verify the role of gender, age and length of stay (LOS), by motor and cognitive domains, on PFI. **Design:** Longitudinal study. **Setting:** An intensive rehabilitation hospital. **Population:** 305 inpatients.

Methods: The disability has been investigated using the *Functional Independence Measure* (FIM). Percentage differences between discharge and admission were calculated for FIM score. *Wilcoxon matched pair test* for the six areas and the two domains of the FIM score were calculated. The effect of LOS, gender and age on PFI were studied with Robust regression.

Results: Neurological and Orthopaedic patients had improvements on Motor and Cognitive domains. The greatest gains were in the Self Care, Sphintere Control, Transfer and Locomotion Areas ($p=<0.001$). LOS was associated ($p<0.001$) with PFI while age resulted borderline significant ($p=0.049$) in the cognitive domain in Neurological patients.

Conclusion: The rehabilitation improved the overall conditions of neurological and orthopaedic patients. LOS emerged as the most important determinant in PFI.

Keywords: rehabilitation, orthopaedics, neurology, recovery of function

1. Introduction

Rehabilitation to restore autonomy and social activity in patients with disabilities has become an increasingly important aspect of tertiary prevention due to the increase in chronic-degenerative diseases. Increasing health costs and decreasing financial resources call for optimization of rehabilitation and a need to find treatment strategies that improve patient condition. Quantification of the efficacy of rehabilitation programmes can help optimize resource allocation and use (Kehusmaa et al., 2010).

Rehabilitation involves many professions working in synergy; they include physicians, nurses, physiotherapists, occupational therapists, speech therapists, social workers, etc. How disabilities are cared for, with the management effects, especially in relation to the appropriateness, efficacy and equity of care, make it necessary to classify users in functional terms. Indeed, it has been shown that the cost of rehabilitation is determined by initial functional status, length of stay and the need for multidisciplinary care, rather than by diagnosis on admission (Harada, Sofaer, & Kominski, 1993; Rossnagel et al., 2005; Zorowitz, 2009).

Quantification of disabilities is possible with the *Functional Independence Measure* (FIM™), an international standard measurement of disability, whose main element is the FIM™ scale (Linacre et al., 1994; Stineman et al., 1997). Severity of disability, evaluated in the acute phase by global measures of autonomy such as the FIM scale, appear a powerful predictive variable for functional outcome (Adunsky et al., 1998; Linacre et al., 1994; Stineman et al., 1997; Tanaka et al., 2013). Moreover the FIM™ is able to assess both physical and cognitive

functions. The applications of this scale ranges from summarizing information for patients with debility who received rehabilitation services, measuring the appropriateness and efficacy of rehabilitation in a single case, predicting needs and cost of care lending itself to clinical and administrative applications. (Galloway et al., 2013; Granger et al., 2011). Several studies have also investigated its application to the management of human resources in rehabilitation (Mueller et al. 2008; Mueller et al. 2010; Capolongo S. 2012).

Cumulative scores provide a quantitative index of disability making it possible to correlate scores with variables relevant for clinical and epidemiological purposes.

Along these lines, the aims of the present study are: i) to apply the FIM for measuring the functional status and its variation, in terms of mean percentage functional improvement (PFI), in patients which underwent rehabilitation program ii) to verify the role of gender, age and length of stay (LOS), by motor and cognitive domains, on PFI.

2. Materials and Methods

2.1 Setting

The study was conducted between January 2006 and June 2008 in a 20-bed ward of the Intensive Rehabilitation Hospital at Passignano on Trasimeno Lake, Perugia, Italy (Local Health Unit 2 on Umbria Region). The hospital is specialized in motor and neurological rehabilitation. Rehabilitation is aimed at two main categories of patients: neurological (mostly stroke hemiparesis patients) and orthopaedic (mostly hip and knee replacement patients). For the former, the rehabilitation programme consists of cognitive retraining exercises and, if necessary, rehabilitation of swallowing, neuromotor and daily activities, such as washing and dressing (motor activities with cognitive components). The occupational therapist, speech therapist and physiotherapist are involved in these activities, which take up about 3 hours per day, six days out of seven. Orthopaedic patients undergo about 2 hours per day of physiotherapy to recover full ranges of joint movements and proprioceptive exercises to gradually increase loading and force on the limb and reduce use of support for walking and negotiating stairs. All patients under normal admission conditions need 24-hour nursing care because they are not autonomous in any of the activities scored.

2.2 The Functional Independence Measure (FIM)

Disability on admission and at discharge was scored by FIM (Linacre et al. 1994; Stineman et al. 1997), which consists of 18 items assessing 6 areas of function, into two domains: Motor (13 items) and Cognitive (5 items). The Motor domain has 4 areas:

i) Self-care (SC) with 6 items: Eating, Grooming, Bathing, Dressing-upper body, Dressing-lower body, Toileting;

ii) Sphincter control (SPC) with 2 items: Bladder management, Bowel management;

iii) Transfers (T) with 3 items: Bed/chair/wheelchair, Toilet, Tub/shower;

iv) Locomotion (L), with 2 items: Walk/wheelchair, Stairs.

The Cognitive domains has 2 areas:

v) Communication (C) with 2 items: Comprehension, Expression;

vi) Social cognition (SOC) with 3 items: Social interaction, Problem solving, Memory.

Scores for each item range from 1 (complete dependence) to 7 (complete autonomy). The cumulative score of the different areas/items are standard indicators well known in the discipline of rehabilitation. The lowest score is 18 (indicating total dependence) and the highest is 126 (complete independence). If motor and cognitive items are considered separately, the former have a range of scores from 13 to 91 and the latter from 5 to 35. It never occurs that the score is uniform over all items/areas and therefore interpretation of the FIM makes it possible to define personalized care strategies, check objective limits of patients and apply personalized rehabilitation.

2.3 Selection of the Studied Population

The information obtained with the FIM forms by six experienced operators was analyzed in relation to data gathered from the hospital discharge forms in order to obtain insights into LOS, diagnosis and readmissions.

Inclusion criteria were: i) admission for rehabilitation; ii) cases judged to benefit from rehabilitation; iii) cases with neurological or orthopaedic Medical Diagnostic Classification (MDC) in which the main diagnosis had one of the following ICD9-CM codes: 2252, 2396, 33xx, 34xx, 3589, 41xx, 42.xx, 43xx, 4539, 5693, 5722, 71xx, 72xx, 78xx, 8088, 81409, 82xx, 85400, 90xx, 99671, V43xx, V49xx, V537, V549, V57xx.

Discharges of brief duration were regarded as a single admission, summing the days in hospital, in order to avoid

double records. Such discharges occurred towards the end of the hospital period so that the team could assess the impact of the disability on the patient's return home.

Exclusion criteria were: i) emergency transfer to another ward, preventing administration of the questionnaire at discharge; ii) incomplete answers to FIM; iii) patients in intensive care or otherwise unable to sustain 3 hours/day of rehabilitation.

After selection of the inclusion/exclusion criteria, the analysis was conducted on 305 out of a total of 879 cards. The cards were compiled within 3 days (72 hours) of admission and at discharge.

First we considered the total FIM score on admission and compared it with the score at discharge. Since the population was heterogeneous, we then considered the FIM score of each of the six areas (SC, SPC, T, L, C, SOC) and the subscores of the motor and cognitive domains, analyzing them on admission and at discharge in the two MDC categories: neurological (216 cases of stroke, hemiparesis with head injuries, multiple sclerosis, disabilities related to other diseases) and orthopaedic (89 cases of hip or knee replacement, cases of multiple trauma with leg or thigh amputation).

2.4 Statistical Analysis

Descriptive analysis of the data was performed; mean, median and interquartile values were calculated for the studied population using FIM score at the admission and discharge. Wilcoxon matched pair test for the six areas and the two domains was used to identify differences in the FIM score after treatment. Percentage functional improvement (PFI) between discharge and admission was calculated as following: difference between discharge FIM score (DS) and admission FIM score (AS), expressed in percentage:

PFI= (DS-AS)/DS*100. PFI makes possible to measure the improvements independently of the initial and final FIM score of the patients. It was globally calculated and then stratified for the motor and cognitive domains (outcome variables). PFI was adjusted with gender, age and LOS. Scatter plots using PFI and covariates were utilized to verify the possibility to use linear models. Robust regression, which aims to achieve almost the efficiency of ordinary least square regression in less ideal situations, such as when there are non normal errors, was adopted (Hamilton, 2012). Significance level was set $p<0.05$. Stata ® SE, version 12.1, StataCorp, College Station, Texas, USA software was used for the analysis.

3. Results

Our study sample was distributed as shown in Table 1. The largest age class was 70-79 years (42.3%). Women orthopaedic patients were almost two times more frequent than men. Mean ± (SD) LOS was 29.9 ± (23.9) days: 19.9 ± (12.3) days for orthopaedic and 34.0 ± (26.2) days for neurological patients.

Table 1. Distribution of orthopaedic and neurological patients by age class and gender

AGE	Orthopaedic		Neurological		TOTAL
	Men	Women	Men	Women	
20 - 49	6	2	12	12	32 (10.5%)
50 - 59	1	2	13	12	28 (9.2%)
60 - 69	3	8	26	17	54 (17.7%)
70 - 79	12	25	47	45	129 (42.3%)
80 - 89	6	24	13	19	62 (20.3%)
TOTAL	28 (9.2%)	61 (20.0%)	111 (36.4%)	105 (34.4%)	305

Table 2 shows global FIM scores at admission and discharge, divided in the motor and cognitive domains. Mean, median and interquartile range were calculated, for the global FIM score also subdivided by the motor and cognitive domains, both for orthopaedic and neurological patients.

Table 2. FIM scores on admission (entry) and at discharge (exit) for orthopaedic, neurological and all patients, by domain: mean (SD), median (interquartile range) and significance of difference between admission and discharge

Patients	**Neurological**					**Orthopaedic**					**Global**				
DOMAIN	**ENTRY**		**EXIT**			**ENTRY**		**EXIT**			**ENTRY**		**EXIT**		
	Mean (SD)	Median (Range)	Mean (SD)	Median (Range)	P	Mean (SD)	Median (Range)	Mean (SD)	Median (Range)	P	Mean (SD)	Median (Range)	Mean (SD)	Median (Range)	P
Motor	33.3 (18.4)	29 (18.3-43)	51.7 (20.4)	52 (36.3-68)	<0.001	51.2 (15.8)	51 (39-63.5)	67.6 (14.7)	69 (60.5-79)	<0.001	38.5 (19.4)	35 (21-52)	56.4 (20.2)	59 (41-72)	<0.001
Cognitive	25.2 (9.3)	28 (19-34)	27.7 (8.0)	30 (24.3-34)	<0.001	32.4 (4.6)	35 (31-35)	32.7 (4.2)	35 (32-35)	0.049	27.3 (8.8)	30 (23-35)	29.1 (7.4)	32 (26-35)	<0.001
TOTAL	58.5 (25.0)	55 (41-75)	79.4 (26.2)	81 (59.5-101)	<0.001	83.6 (18.5)	84 (70-98.5)	100.4 (17.4)	104 (92-114)	<0.001	65.8 (25.9)	65 (45.5-86)	85.5 (25.8)	90 (67-105)	<0.001

The Wilcoxon matched pair test identified significant improvements comparing the FIM scores at admission and discharge for orthopaedic and Neurological patients both at global and domain levels. The only exception was a borderline significance result in the cognitive domain (p=0.049) of the orthopaedic patients.

ORTHOPEDIC NEUROLOGICAL

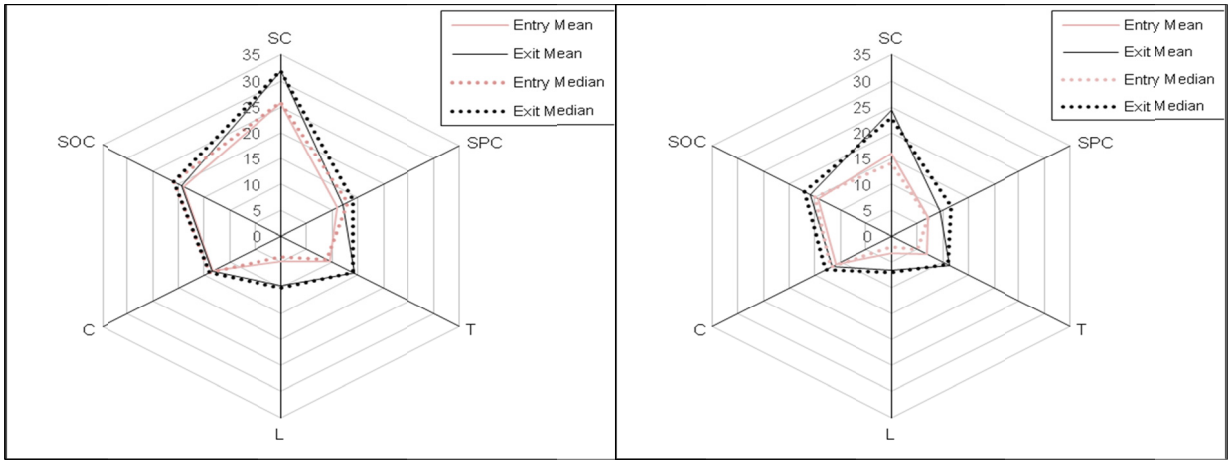


Figure 1. Means and medians at admission and discharge of hospital stay for the six FIM areas, distinguishing between orthopaedic and neurological cases

Figure 1 shows the means and medians at the admission and discharge of hospital stay for the six FIM areas, distinguishing between orthopaedic and neurological cases. Using the Wilcoxon matched pair test all patients areas highlighted statistically significant improvements (p=<0.001) except, in the Orthopaedic patients, the Communication (p=0.070) and Social cognition (p=0.057) areas, which both constitute the cognitive domain (p=0.049).

SC showed the greatest improvements both in Orthopaedic and Neurological areas followed by L and T areas.

Table 3 shows crude and adjusted, by LOS, gender and age, PFI, globally and by domains. Length of stay did improve PFI. Both Orthopaedic and Neurological patients benefit for LOS only on the motor domain. In particular in the adjusted model it increased, per every day of staying, 0.58 % (p<0.001) in orthopaedic patients and 0.32% (p<0.001) in neurological ones .The cognitive domain for Orthopaedic patients showed, an increase of 6.3% PFI in favour to female compared to male although borderline significant (p=0.053). Neurological patients, in the cognitive domain, showed a 0.05% increase (p=0.006) of PFI per every day of staying, while age resulted borderline significant (p=0.049) on PFI increasing 0.07% per every year of age.

Table 3. Crude and adjusted, by LOS, gender and age, PFI, globally and by domains

Crude* Percentage functional improvement in Motor, Cognitive domains, Global scale, Confidence intervals, P value										
Rehabilitation Type	Exposure variables	Motor Domain	95% CI	P	Cognitive Domain	95% CI	P	Global	95% CI	P
Orthopedic	Length stay[1]	0,563	0,374; 0,752	<0,001	-0,49	-0,312; 0,214	0,697	0,349	0,210; 0,490	<0,001
	gender[2]	-5,08	-10,63; 0,481	0,073	-2,59	-8,50; 3,314	0,365	-3,90	-7,68; -0,126	0,043
	age[3]	0,147	-0,046; 0,340	0,134	-0,034	-0,189; 0,121	0,65	0,077	0,057; 0,21	0,259
Neurological	Length stay[1]	0,32	0,218; 0,429	<0,001	0,053	0,024; 0,082	p<0,001	0,30	0,215; 0,380	<0,001
	gender[2]	3,17	-2,84; 9,19	0,300	-0,27	-1,82; 1,28	0,735	1,94	-3,04; 6,92	0,444
	age[3]	0,13	-0,098; 0,35	0,267	0,088	0,0222; 0,153	0,009	0,11	-0,070; 0,30	0,224
Adjusted Percentage functional improvement in Motor, Cognitive domains, Global scale, Confidence intervals, P value**										
Rehabilitation Type	Exposure variables	Motor Domain	95% CI	P	Cognitive Domain	95% CI	P	Global	95% CI	P
Orthopedic	Length stay[1]	0,576	0,39; 076	<0,001	-0,098	-0,336; 0,138	0,383	0,323	0,186; 0,46	<0,001
	gender[2]	-4,14	-9,24;096	0,110	-6,294	-12,67; 0,082	0,053	-3,498	-7,23; 0,240	0,066
	age[3]	0,096	-0,080; 0,27	0,281	0,107	-0,26; 0,047	0,157	0,0328	-0,0964; 0,162	0,615
Neurological	Length stay[1]	0,32	0,212; 0,425	<0,001	0,05	0,014; 0,085	0,006	0,291	0,208; 0,380	<0,001
	gender[2]	2,68	-2,85; 8,21	0,340	-0,077	-1,92; 1,77	0,935	1,04	-3,29; 5,38	0,636
	age[3]	0,048	-0,159; 0,256	0,648	0,070	0,0004; 0,139	0,049	0,039	-0,123; 0,201	0,635

*Percentage variations for every single exposure variable

**Percentage variations adjusted for length of stay, gender and age

[1] measured in days, 1 unit increase per day

[2] male compared to female

[3] measure in years; 1 unit increase per year

4. Discussion

In this study we examined the effectiveness of rehabilitation programme in terms of percentage functional improvement (PFI). We also verified the role of gender, age and LOS, by motor and cognitive domains, on PFI.

Rehabilitation in the hospitalized patients appear leading to an improvement in all subjects examined. The functional status measured with the FIM seems to improve for both orthopaedic and neurological patients. The orthopaedic patients had a better initial condition than neurological ones, this is confirmed by the fact that the former's mean and medians admission scores in the six FIM areas (Figure 1) and domains (Table 2) were always higher.

Therefore, comparing the FIM scores at admission and discharge, we evidenced improvements for all patients and for both domains (motor and cognitive), with the exception of orthopaedic patients in the cognitive domain. This could be due to the fact that most orthopaedic patients did not have cognitive problems on admission, as

neurological patients easily have. In fact cognitive impairment is a frequent complication of stroke in acute phase and is sometimes the severest and most evident symptom. Indeed, it is known, in patients with stroke, the importance of cognitive assessment in early and stabilization phases, in view of the interaction between different neuropsychological deficits and functional recovery (Pustokhanova & Morozova, 2013; Denti, Agosti, & Franceschini, 2008) .

This may be because rehabilitation of stroke patients is intensive and caused this improvement in a brief time. This is also suggested by a meta-analysis (Kwakkel et al., 2004) and other studies (Feys et al., 2004; Sonoda et al., 2004) demonstrating that early intensive intervention produces an increase in FIM score at discharge and decreases the length of hospitalization.

The global PFI, in the adjusted models, is influenced by the independent variables: LOS, both in Orthopaedic and Neurological patients, changed slightly from its crude association; gender, on orthopaedic patients was border line significant (p=0.066) and its effect was not favourable for men respect to women. Length of stay has positive effect on PFI, in the motor domain, both in the orthopaedic and neurological patients, remaining similar at crude analysis. Orthopaedic patients, on the Cognitive domain, highlighted a borderline (p=0.053) reduction of -6.3% in male than in female.

This finding is partially similar to results obtained from another study which, analysing geriatric rehabilitation patients, evidenced that male ones were cognitively depressed; although women suffered more from pain and higher number of them presented with depressed mood (Arinzon et al., 2010).

We found that patients' improvement take time to become evident, as indicated by small mean percentage gain during the rehabilitation process day by day. It also seems likely that hospitalization promotes overall improvement in neurological patients mainly due to the motor domain. The increment in FIM score as indicator of improvement of patient condition has been considered in prior studies. FIM score has also been proposed as a basis for reimbursement of rehabilitation centres (Harada, Sofaer, & Kominski, 1993; Stineman et al., 1998; Bottemiller et al., 2006) or as a factor correlated with LOS (Mahler et al. 2008; Grant, Goldsmith, and Anton 2014) adjusted according to the degree of patient disability (Bates & Stineman, 2000). Moreover, other studies highlighted and association among FIM and LOS (Cowen et al., 1995). We found similar evidence regarding the improvement of the patients' conditions studying PFI, which measures percentage improvements depending the patients condition at admission and discharge, in relation to the effect of LOS, age, gender in the implementation of a rehabilitative care.

The present study is limited by the fact that the rehabilitation centre is specialized in stroke and orthopaedic patients. This means that our population was not fully representative of all categories of patient requiring rehabilitation such as cardiologic and burned ones, and the results therefore cannot be generalized. This problem could be avoided with a multicentre study covering hospitals with different specializations. Furthermore, the fact that we used rigid inclusion/exclusion criteria, enrolling 305 out of 879 subjects, reduced our population but made the data more reliable and less susceptible to variation.

5. Conclusions

In conclusion the results of this study confirm the importance of LOS in the improvements of the functional condition in patients who underwent rehabilitation although some differences emerged, among the Neurological and Orthopaedics groups. Some of these could have important repercussion on management programs also in terms of human and financial resources. This study had the merit to assess not only the FIM, but also its variation between admission and discharge, using mean percentage functional improvement (PFI).

Acknowledgements: Local Health Unit 2, Perugia, Umbria- Italy

Conflicts of Interest: The Authors Declare That There Is No Conflict Of Interest.

Source of Funding: The Authors Declare That They Are Independent From Any Funders And That The Study Was Carried Out In The Framework Of Their Institutional Work Without Support From Any Third Party.

Ethics Committee Approval: The authors declare that ethical approval for conducting the research was not needed. The data was administrative, in aggregate form, anonymous and did not allow patients to be identified.

References

Adunsky, A., Levenkrohn, S., Fleissig, Y., Chetrit, A., & Blumstein, Z. (1998). Evaluation of predictive factors for stroke rehabilitation. *Harefuah, 135*(12), 569-73, 656.

Arinzon, Z., Shabat, S., Peisakh, A., Gepstein, R., & Berner, Y. N. (2010). Gender differences influence the outcome of geriatric rehabilitation following hip fracture. *Arch Gerontol Geriatr, 50*(1), 86-91.

http://dx.doi.org/10.1016/j.archger.2009.02.004

Bates, B. E., & Stineman, M. G. (2000). Outcome indicators for stroke: application of an algorithm treatment across the continuum of postacute rehabilitation services. *Arch Phys Med Rehabil, 81*(11), 1468-78. http://dx.doi.org/10.1053/apmr.2000.17808.

Bottemiller, K. L., Bieber, P. L., Basford, J. R., & Harris, M. (2006). FIM score, FIM efficiency, and discharge disposition following inpatient stroke rehabilitation. *Rehabil Nurs, 31*(1), 22-5.

Capolongo, S., Rossetti, A., Averame, C., Paoletta, M., & Nante, N. (2012). Percorsi riabilitativi verdi. Casa di cura San Michele, Albenga. *Tecnica Ospedaliera, 6*, 42-48.

Cowen, T. D., Meythaler, J. M., DeVivo, M. J., Ivie, C. S. 3rd, Lebow, J., & Novack, T. A. (1995). Influence of early variables in traumatic brain injury on functional independence measure scores and rehabilitation length of stay and charges. *Arch Phys Med Rehabil, 76*(9), 797-803.

Denti, L., Agosti, M., & Franceschini, M. (2008). Outcome predictors of rehabilitation for first stroke in the elderly. *Eur J Phys Rehabil Med, 44*(1), 3-11.

Feys, H., De Weerdt, W., Verbeke, G., Steck, G. C., Capiau, C., Kiekens, C., ... Cras, P. (2004). Early and repetitive stimulation of the arm can substantially improve the long-term outcome after stroke: a 5-year follow-up study of a randomized trial. *Stroke, 35*(4), 924-9. http://dx.doi.org/10.1161/01.STR.0000121645.44752.f7

Galloway, R. V., Granger, C. V., Karmarkar, A. M., Graham, J. E., Deutsch, A., Niewczyk, P., ... Ottenbacher, K. J. (2013). The Uniform Data System for Medical Rehabilitation: report of patients with debility discharged from inpatient rehabilitation programs in 2000-2010. *Am J Phys Med Rehabil, 92*(1), 14-27. http://dx.doi.org/10.1097/PHM.0b013e31827441bc

Granger, C. V., T. A. Reistetter, J. E. Graham, A. Deutsch, S. J. Markello, P. Niewczyk, and K. J. Ottenbacher. (2011). The Uniform Data System for Medical Rehabilitation: report of patients with hip fracture discharged from comprehensive medical programs in 2000-2007. *Am J Phys Med Rehabil, 90*(3), 177-89. http://dx.doi.org/10.1097/PHM.0b013e31820b18d7

Grant, C., Goldsmith, C. H., & Anton, H. A. (2014). Inpatient stroke rehabilitation lengths of stay in Canada derived from the national rehabilitation reporting system, 2008 and 2009. *Arch Phys Med Rehabil, 95*(1), 74-8. http://dx.doi.org/10.1016/j.apmr.2013.08.014

Hamilton, L. C. (2012). *Statistic with Stata: Version 12*. International ed of 8th revised ed ed. United States America: Cengage Learning.

Harada, N., Sofaer, S., & Kominski, G. (1993). Functional status outcomes in rehabilitation. Implications for prospective payment. *Med Care, 31*(4), 345-57.

Kehusmaa, S., Autti-Rämö, I., Valaste, M., Hinkka, K., & Rissanen, P. (2010). Economic evaluation of a geriatric rehabilitation programme: a randomized controlled trial. *J Rehabil Med, 42*(10), 949-55. http://dx.doi.org/10.2340/16501977-0623

Kwakkel, G., van Peppen, R., Wagenaar, R. C., Wood Dauphinee, S., Richards, C., Ashburn, A., ... Langhorne, P. (2004). Effects of augmented exercise therapy time after stroke: a meta-analysis. *Stroke, 35*(11), 2529-39. http://dx.doi.org/10.1161/01.STR.0000143153.76460.7d

Linacre, J. M., Heinemann, A. W., Wright, B. D., Granger, C. V., & Hamilton, B. B. (1994). The structure and stability of the Functional Independence Measure. *Arch Phys Med Rehabil, 75*(2), 127-32. http://dx.doi.org/0003-9993(94)90384-0

Mahler, M. P., Züger, K., Kaspar, K., Haefeli, A., Jenni, W., Leniger, T., & Beer, J. H. (2008). A cost analysis of the first year after stroke - early triage and inpatient rehabilitation may reduce long term costs. *Swiss Med Wkly, 138*(31-32), 459-65. http://dx.doi.org/2008/31/smw-11845

Mueller, M., Boldt, C., Grill, E., Strobl, R., & Stucki, G. (2008). Identification of ICF categories relevant for nursing in the situation of acute and early post-acute rehabilitation. *BMC Nurs, 7*, 3. http://dx.doi.org/10.1186/1472-6955-7-3

Mueller, M., Lohmann, S., Strobl, R., Boldt, C., & Grill, E. (2010). Patients' functioning as predictor of nursing workload in acute hospital units providing rehabilitation care: a multi-centre cohort study. *BMC Health Serv Res, 10*, 295. http://dx.doi.org/10.1186/1472-6963-10-295

Pustokhanova, L., & Morozova, E. (2013). Cognitive impairment and hypothymia in post stroke patients. *J Neurol Sci, 325*(1-2), 43-5. http://dx.doi.org/10.1016/j.jns.2012.11.013

Rossnagel, K., Nolte, C. H., Muller-Nordhorn, J., Jungehulsing, G. J., Selim, D., Bruggenjurgen, B., ... Willich, S. N. (2005). Medical resource use and costs of health care after acute stroke in Germany. *Eur J Neurol, 12*(11), 862-8. http://dx.doi.org/10.1111/j.1468-1331.2005.01091.x

Sonoda, S., Saitoh, E., Nagai, S., Kawakita, M., & Kanada, Y. (2004). Full-time integrated treatment program, a new system for stroke rehabilitation in Japan: comparison with conventional rehabilitation. *Am J Phys Med Rehabil, 83*(2), 88-93. http://dx.doi.org/10.1097/01.PHM.0000107481.69424.E1

Stineman, M. G., Escarce, J. J., Tassoni, C. J., Goin, J. E., Granger, C. V., & Williams, S. V. (1998). Diagnostic coding and medical rehabilitation length of stay: their relationship. *Arch Phys Med Rehabil, 79*(3), 241-8. http://dx.doi.org/S000399939800104X

Stineman, M. G., Tassoni, C. J., Escarce, J. J., Goin, J. E., Granger, C. V., Fiedler, R. C., & Williams, S. V. (1997). Development of function-related groups version 2.0: a classification system for medical rehabilitation. *Health Serv Res, 32*(4), 529-48.

Tanaka, N., Nakatsuka, M., Ishii, H., Nakayama, R., Hosaka, R., & Meguro, K. (2013). Clinical utility of the Functional Independence Measure for assessment of patients with Alzheimer's disease and vascular dementia. *Psychogeriatrics, 13*(4), 199-205. http://dx.doi.org/10.1111/psyg.12012

Zorowitz, R. D. (2009). Inpatient rehabilitation facilities under the prospective payment system: lessons learned. *Eur J Phys Rehabil Med, 45*(2), 259-63.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

The National Health Insurance Scheme (NHIS) in the Dormaa Municipality, Ghana: Why Some Residents Remain Uninsured?

Thompson Amo[1]

[1] Public Health Management, Graduate School of Asia, Pacific Studies, Ritsumeikan Asia Pacific University, Beppu, Japan

Correspondence: Thompson Amo, Public Health Management, Graduate School of Asia, Pacific Studies, Ritsumeikan Asia Pacific University, Beppu, Japan.

Received: December 31, 2013 Accepted: February 4, 2014 Online Published: February 21, 2014

doi:10.5539/gjhs.v6n3p82 URL: http://dx.doi.org/10.5539/gjhs.v6n3p82

Abstract

The paper presents a quantitative investigation on the National Health Insurance Scheme (NHIS) in Dormaa Municipality, Ghana: Why some residents remain uninsured? Since its implementation a little over a decade now. The aim is to identify the obstacles to enrolment by the public which would enable policy direction to ensure that all residents are registered with the scheme. A descriptive and cross-sectional study was conducted between May and July, 2013. Both purposive and simple random sampling techniques were used to select 210 respondents and data obtained through self-administered and face-to-face interviews guided by structured questionnaire. Chi square (χ^2) test of independence was adopted to show the association between socioeconomic and demographic features and membership. Findings from the research suggest that residents' decision to enrol have significant associated with gender, education, number of children, place of residence, employment and income. It was also observed that membership is highly affected by premium level. The discussion of the findings and recommendations offered, if incorporated into the policy guideline of NHIS could maintain and at the same time increase enrolment level which would guarantee quality, accessible and affordable basic health care protection for the good people of Ghana.

Keywords: NHIS, subscription, Dormaa Municipal, Ghana

1. Introduction

Health is very essential to every individual and the nation. Living in a healthy life enables individuals to exhibit his full potential to create more opportunities for himself and his country. The amount of money involved in accessing health care in time of need is always an obstacle to most of the citizenry, especially the poor. Household surveys by world health organization member countries have shown that, about 150 million of people are faced with financial difficulties every year because of direct health care cost. There are a lot of instances where people lose their lives because they cannot make an upfront payment before seeking Medicare. Universal Health Coverage (UHC) has thus become one of the prime targets for health care transformation in several countries and a significant objective of the World Health Organization (WHO). Governments all over the world have great deals on health matters of the people. In May 2005, the fifty-eighth World Health Assembly adopted a resolution urging member states to consider using alternative mechanisms of resource mobilization, including social health insurance in order to bridge the gap between the rich and the poor in accessing health care. Good health is the key to the sustainability of economic and social development, thereby lessening of poverty in society. The access to the required health care needs is essential and vital to maintain and improve health care. Simultaneously, people needed to be protected to avoid being pushed into poverty due to the costs of seeking health care. Evidence from the World Bank (WB) in 2006 estimated that, 28.5% of Ghanaians are living with a dollar per day. Despite this, 27.0% of household income is spent on health care (WHO, 2010).

1.1 Health Insurance in Ghana

Ghana mostly relies on international support for human and capital development, faced with a slow pace of economic advancement and institutional limitations; a common phenomenon facing developing countries explains the need to undertake a robust measure to design a means to finance health care is important. The National Health Insurance act (ACT 650) backed by legislative instrument (LI 1809) was passed in 2004 with the sole responsibility of ensuring that access to quality health care is free for all without any difficulties through

the establishment of mutual health insurance schemes in all the districts in the country (Yevutsey & Aikins, 2010). The Act established the National Health Insurance Authority (NHIA) to regulate, facilitate and coordinate the activities of all the district base health insurance schemes across the country. The NHIS covers primary health care services which constitute about 95% of frequently reported cases in the health care institutions in the country comprising the charge of drugs acknowledged in the NHIS drug list. Outpatient and inpatient services such as eye care services, maternity care, oral health services, surgical and gynaecological operations and emergency care are covered under the scheme.

Premiums are determined according to the poverty indicators in every district and only make it mandatory for people between the ages of 18 and 69 years to pay yearly subscription fees. Persons 70 years and above and also Children below 18 years whose parents are beneficiary is also registered free of charge. The national health insurance regulation also provides that people lacking visible financial source, no permanent residence, not living with someone who is employed with permanent residence or not having a persistent and consistent source of income from others is considered as indigent and relieved from premium payment. Pregnant women also enjoyed the same benefit as they are exempted from all financial obligations of NHIS.

It is expected that, the introduction of NHIS must have a significant impact on health indicators. The life expectancy of the total population is 63.5 years and the chance of dying between the ages of 15 and 60 per 1,000 of population is 234.5 (WHO, 2013). The 2011 estimate of WHO) on out of pocket expenditure as a percentage of private expenditure on health is 66.3%. The 2011 annual report of NHIS indicates a total active membership of 8.2 million, which represent 33% of the population. But the question that still remains unanswered is; why for almost a decade now, a significant number of people are unwilling to register? Could this be attributed to an institutional problem or the general public? This study aims at identifying the specific obstacles that affect residents' decision to enrol in the scheme and offer credible remedies based on available facts to cure this mischief using Dormaa Municipality as a reference point.

2. Methods

A descriptive and cross-sectional study design using a qualitative method was adopted in this paper. Three-stage selection criteria were used to select respondents for the study. In the initial stage, purposive sampling was used to group communities into urban and rural communities and the only two urban cities were selected. In the second stage, a simple random sampling was adopted to select 10 additional rural communities. The last stage involves the selection of respondents using simple random sampling based on the population size of each community on the assumption that information would be obtained from both rural and urban residents in order to draw a fair and balanced conclusion. In all, 210 respondents from the Dormaa Municipality in the Brong Ahafo Region of Ghana were included in the study. Data were obtained through face-to-face interviews with respondents whose educational background could not assist them to complete the questionnaire and self-administered for the educated ones, guided by well-structured questionnaires. The questionnaires were divided into three main fragments. The first part looked at socioeconomic and demographic features such as age, gender, education, number of children, place of residence, employment and income. The second and the last sections respectively focused on the reasons for not joining the scheme and suggestions to ensure total coverage. Data was collected between May and July, 2013.

2.1 Data Analysis Plan

Statistical Package for Social Sciences (SPSS version 18.0) was used in analysing the data for easy understanding of the result. A bivariate analysis such as chi square (χ^2) test of independence was also engaged to show the association between the dependent and the independent variables.

3. Results

Table 1. The impact of socioeconomic and demographic features over enrolment

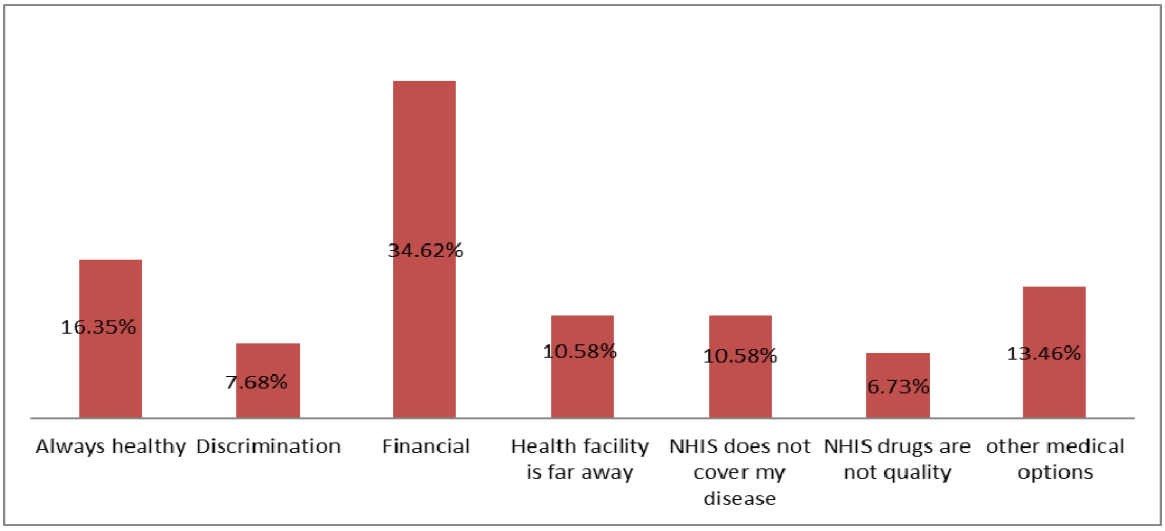
Socioeconomic and Demographic Data	Groupings	Current Subscribers		Total (%)	Pearson Chi Square value	P-Value
		Yes (%) n=126	No (%) n=84			
Age	18-30	37 (56.9)	28 (43.1)	65 (30.9)		
	31-43	46 (67.6)	22 (32.4)	68 (32.4)		
	44-56	19 (46.3)	22 (53.7)	41 (19.5)		
	57-69	24 (66.7)	12 (33.3)	36 (17.2)		
	Total	126	84	210	5.767	0.124
Gender	Male	49 (52.7)	44 (47.3)	93 (44.3)		
	Female	77 (65.8)	40 (34.2)	117 (55.7)		
	Total	126	84	210		
Education Level	No Education	12 (100)	0	12 (6.2)		
	Non Formal	0	8 (100)	8 (4.1)		
	Primary School	17 (60.7)	11 (39.3)	28 (14.4)		
	Middle/JHS	50 (64.1)	28 (35.9)	78 (40.0)		
	Tech/Comm/SHS /'O' Level	19 (52.8)	17 (47.2)	36 (18.5)		
	Tertiary	25 (75.8)	8 (24.4)	33 (16.8)		
	Total	123	72	195	20.387	0.001
Marital Status	Single	40 (62.5)	28 (37.5)	68 (32.4)		
	Married	62 (60.8)	40 (39.2)	102 (48.6)		
	Divorced	4 (50.0)	4 (50.0)	8 (3.8)		
	Widowed	20 (62.5)	12 (37.5)	32 (15.2)		
	Total	126	84	210	0.482	0.923
Number of Children/Dependents	0	37 (56.9)	28 (43.1)	65 (31.0)		
	1	12 (100)	0	12 (5.6)		
	2	33 (76.7)	9 (23.3)	43 (20.5)		
	3	19 (43.3)	27 (58.7)	46 (21.9)		
	≥4	24 (54.5)	20 (45.5)	44 (21.0)		
	Total	125	84	210	22.017	0.000
Place of Residence	Rural	83 (72.8)	31 (27.2)	114 (54.3)		
	Urban	43 (44.8)	53 (55.2)	96(45.7)		
	Total	126	84	210	17.043	0.000
Employment Status	Apprenticeship	20 (100)	0	20 (9.5)		
	Farmer	42 (60.0)	28 (40.0)	70 (33.3)		
	Salary Worker	21 (65.6)	11 (34.4)	32 (15.3)		
	Self Employed	13 (54.2)	11 (45.8)	24 (11.4)		
	Student	6 (37.5)	10 (62.5)	16 (7.6)		
	Trader	24 (60.0)	16 (40.0)	40 (19.1)		
	Unemployed	0	8 (100)	8 (3.8)		
	Total	126	84	210	29.47	0.000
Income level	<100	37 (74.0)	13 (26.0)	50 (27.5)		
	100-200	46 (63.9)	26 (36.1)	72 (39.5)		
	201-300	1 (8.3)	11 (91.7)	12 (6.6)		
	301-400	8 (100)	0	8 (4.4)		
	401-500	10 (83.3)	2 (16.7)	12 (6.6)		
	>500	8 (28.6)	20 (71.4)	28 (15.4)		
	Total	110	72	182	37.59	0.000

Chi-Square test is statistically significant at P< 0.05 level (Asymp. Sig. (2-sided)
Note: 1 USD $ = GH ¢1.90 as of March, 2013 by Bank of Ghana

The table 1 above presents the socioeconomic and demographic characteristics of the sampled population. There is 126 (60%) subscription and 84 (40%) non-subscription. The mean age of the whole respondents is 43.5 with a significance value of 0.124. There are (44.3%) male and 55.7% females respondents which show a significant figure of 0.002. Females have higher membership of 36.7% compared to male subscription of 23.3%. The results also show that the majority of respondents have education up to Middle/Junior High School level (40%). There is a significant association between education and insurance subscription (χ^2 = 20.387, df = 5, P = 0.001). Married persons constitute the higher number of respondents (48.6%) but the single and widowed have higher subscription levels (62.5% each). The analysis shows no significant difference between insurance subscription and marital status (χ^2 = 0.482, df = 3, P = 0.923). There is a significant association between the number of children and the demand of health insurance (χ^2 = 22.017, df = 4, P = 0.000). People who live in the rural communities have a higher subscription (39.5%) level over those in the urban centres (20.5%) with a significant association between place of residence and purchasing of health insurance (χ^2 = 17.043, df = 1, P = 0.000). The results further show that there is a significant difference between insurance and employment. The sample involves more farmers (33.3%) and at the same time higher subscription level (20.0%). The income level of the respondents revealed a significant association between the amount received and the ability to demand for health insurance (χ^2 = 37.59, df = 5, P = 0.000). The income level of the sampled population show that 67.0% of the respondents earn monthly income between 0-200 (GH ¢200 = USD $105.3) which is very low.

3.1 Reasons for Not Joining the NHIS by Respondents

Figure 1 illustrates the respondents' reasons why they remained uninsured at the time of the study. In all, 40.00% of the respondents authenticated their non-subscription of the insurance. The research sought to know their reasons for their action since the main objective of the research is to identify why some residents remains uninsured. This would permit evidence base information for policy transformation and strategies in securing full endorsement by the people.



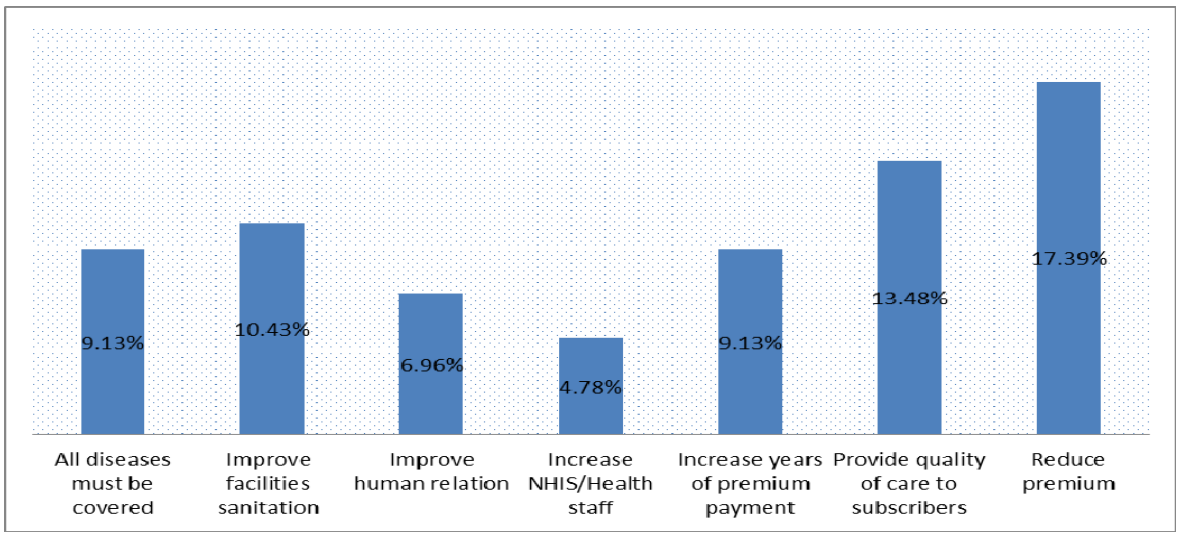
Source: field survey, 2013

Figure 1. Reasons for non-membership of the NHIS by respondents

A lot of reasons were assigned by respondents for their non-participation in the scheme, but the most pressing among them are: financial (34.62%), always healthy (16.35%), other medical options (13.46%), the NHIS benefit package does not cover my health problem and health facility is far away from my community have 10.58% each, discrimination at the point of service (7.69%) and NHIS drugs are substandard (6.73%).

3.2 Suggestions to Ensure Total Coverage by Respondents

The respondents' were asked to suggest what they think in their opinion could be done to ensure total coverage. Several suggestions among others were stated, but the most pressing ones are illustrated in figure 2.



Source: field survey, 2013

Figure 2. The respondents' suggestions to achieve universal coverage

Figure 2 shows that 17.39% of the respondents suggested a reduction of the premiums, 13.48% believed that the quality of health care must be improved, 10.43% suggested an improvement in facility sanitation, 9.13% each represent people who says that all diseases must be covered and an increase in years of premium payment, improve human relation was suggested by 6.96% of the respondents and lastly, increase NHIS/Health staff represents 4.78% of the respondents. Other measures such as refurbishment of modern equipment's of all facilities (2.73%), Speed up card process (2.54%), instant registration at regular interval (2.42%), reimburse of transport fares to patients (2.34%), avoid discrimination at the point of service (1.97%), NHIS card must be accepted by all facilities (1.93), NHIS must ensure quality standards for prescriptions (1.87) among others were mentioned as a key to ensure total coverage.

4. Discussion

The Respondents were selected from different backgrounds to ensure accuracy of results and the actual situation pertaining in the municipality. A total of 210 respondents were selected across the length and breadth of the municipality for the study. The statistics showed that 60.0% are members of NHIS over 40.0% of non-subscribers. The socioeconomic characteristics such as age, gender, education, place of residence, marital status, number of children/dependents, employment and income was analysed and linked to insurance subscription. The findings suggest that the youth (18-43 years) have a higher subscription (39.5%) over those within the ages of 44-69 years (20.4%). It is proven that the age of the people has no significant influence of the individual decision to enrol in the insurance scheme. This contradicts the finding by Gobah et al. (2011), Kirigia et al. (2005) and Grossman (1972) that age has a major effect on health insurance ownership. The high subscription of the youth could be linked to the youthful nature of the population. It is estimated that 0-14 years formed 38.4%, 15-64 years (57.7%) and 65 and above is 3.9% of the population (WB, 2011).

The gender composition of respondents in relation to their subscription was determined to evaluate their involvement. Findings revealed that, 44.3% and 55.7%, representing a male-female respondent which is closely in line with the general population and housing census in 2010 which tag women population to 51.0% as against men (49.0%) of the municipal population. The test shows that, females are more involved in the scheme than men and in general, gender is statistically significant on enrolment. This again contradicts (Gobah et al., 2011) finding that sex has no significant influence on the people's decision to demand health care.

Findings on the education level show a significant influence on the individual quest to buy health insurance. Their results depict that as people moves towards getting a higher education, their demand for health insurance increases. The level of education has been discovered by other researchers such as Kirigia et al. (2005) and Mensah et al. (2010) as a significant factor for the people demand for insurance and medical care.

The marital status in general has no significant impact on membership, but single and widowed have higher subscription levels. It is argued that having children added more responsibilities and as such put parents/guidance extra adverse to the jeopardy of health expenditure as compared to singles. This result

contradicts (Kirigia et al., 2005, Harmon & Nolan, 2001; Liu & Chen, 2002) that married persons have a higher probability to buy health insurance over the single because they deemed it very significant to seek a protection for their children.

The size of the family of the respondents was proved to have a statistically significant bearing with NHIS subscription. This could be attributed to the high subscription by married couples. It is believed that in order not to encounter any catastrophic health cost, people with high family size might demand health insurance more than those with smaller one.

Respondents with high income stand a high chance of subscribing to the scheme. However, as their incomes grow bigger, they tend to look for other options elsewhere. This signifies the need for the scheme to revisit the benefit packages and the service provision to make it more attractive to high income earners. On the contrary, the results identify the problem of affordability as an impediment in the demand for insurance by the residents. This can be related to the general poverty headcount of the population which is 28.5% (WB, 2013). This difficulty relative to the current economic situation of the residents calls for the re-examination of the exemption procedure of the scheme to benefit the poor's and the vulnerable in society in order to realize the scheme slogan of "health insurance for all". An economic intervention to improve the financial standings of the people must be fully endorsed by the authorities to enhance enrolment.

The results show a significant difference between membership and the place of residence. This again contradicts the findings by Gobah et al. (2011) that community description has no substantial impact in membership. The findings further produce enough evidence that the people who live in the rural areas have higher subscription (39.5%) than people in the urban centres (20.5%), a difference of 19%. This could be linked to the fact that people in the rural communities have limited access to health care services and needs to incur some cost to travel to the district capital or go beyond which is more costly to embark as compared to those in the cities.

The type of employment determines the amount one would receive at the end of the month. Findings showed that employment and the income level of the respondents have a significant effect on membership of NHIS subscription. This is in line with Kirigia et al. (2005) which depict that people who have secured jobs high chance to demand health insurance. The main occupation of the people in the municipality is agriculture (62.00%) which is predominantly on the subsistence basis. The income *vis-à-vis* the expenditure patterns suggest that the bulk of their income goes to food (44.80%) followed by education (14.48%) before health (7.60%) (DDA, 2013). This informs policy makers to intensify education campaign on the need to invest more in their health and also support and encourage commercial farming to enrich income levels.

With regards to the reasons for not joining the NHIS, majority of respondents stated about having financial difficulties which is shown in figure 1. The financial problem raised by the majority was consistent with the results of Metiboba, 2011 which says that constrained in demanding health insurance was as a result of several other factors in Nigeria, such as poverty, poor supply of drugs or vaccines, inadequate trained health personnel and dwindling funding of health care, employers/providers' resistance to contribute their quota, general poor state of nation's health care service, cultural belief systems and dilapidated health infrastructures. Also, WHO in 2003 highlighted the fact that membership rates in the health insurance scheme are often influenced by the size of the gap between the household's home to the nearby health facility where covered services are delivered which is in line with accessibility problem mentioned by respondents.

The suggestions made by the respondents most importantly the reduction of the premium level confirm the reason that the people have financial challenges which affect their ability to demand NHIS.

5. Conclusion

Findings from the research suggest that residents' decision to enrol is statistically significant with gender, education, number of children, place of residence, employment and financial constraints. Age and marital status of the respondents have no significant difference with NHIS subscription. It was also revealed that the most significant factor that has been the challenge for the people to join or not to join the NHIS is income. Concerns were raised by the respondents to improve the quality of service offered by health providers. Policy intervention that leads to a reduction in premium payment and ensuring that the enrolment campaign corresponds to the present financial sequences of the municipality and assisting access to credit are all measures which is expected to increase accessibility, thus leading to greater membership rates. It is also significant to improve the quality of care to meet the needs and expectations of the general public. There is the need to provide a furnished medical facility to the doorsteps of the people to serve as a guarantee to easy access to health care services, reduction in time wasting and raised enough income to improve both manpower and infrastructure level of facilities. NHIS must also consider an inclusion of herbal medicines into their drug list to attract those whose belief does not

encourage the use of chemical drugs.

It must be noted that, the enrolment in the sample is higher than the national one which gives good reasons to believe that an obstacle to enrolment goes beyond what was identified which is a limitation of this study. It is recommended that similar research is conducted in a district which has low enrolment figure to find out the challenges affecting the demand of NHIS.

Acknowledgement

I am very grateful to Professor GHOTBI Nader, MD. PhD who doubles as the Director of Ritsumeikan Centre for Asia Pacific Studies (RCAPS) and my masters' research supervisor for his able support in making this work a success.

References

Agyepong, I. A., & Adjei, S. (2008). Public social policy development and implementation: a case study of the Ghana National Health Insurance scheme. *Health policy and planning*, *23*(2), 150-60. http://dx.doi.org/heapol/czn002

Atim, C. (1998). Contribution of Mutual Health Organizations to Financing , Delivery, and Access to Health Care Synthesis of Research in Nine West and Central African Countries. Technical Report No. 18. In Bethesda, MD (ed.), *Partnerships for Health Reform Project, Abt Associates* (pp. 1-81).

Basaza, R., Criel, B., & Van der Stuyft, P. (2008). Community health insurance in Uganda: why does enrolment remain low? A view from beneath. *Health policy (Amsterdam, Netherlands), 87*(2), 172-84. http://dx.doi.org/10.1016/j.healthpol.2007.12.008

Criel, B. (1998). "*District Based Health Insurance in Sub Saharan Africa*". Part 1: Case studies in health services organization and policy 10, Antwerp.

Dixon, J., Tenkorang, E. Y., & Luginaah, I. (2011). Ghana's National Health Insurance Scheme: helping the poor or leaving them behind? *Environment and Planning C: Government and Policy, 29*(6), 1102-1115. http://dx.doi.org/10.1068/c1119r

Dormaa Municipal Assembly (2013). The composite budget. Dormaa Ahenkro, Ghana. Retrieved from http://www.mofep.gov.gh/sites/default/files/budget/2013/BA/Dormaa.pdf

Fusheini, A., Marnoch, G., & Gray, A. M. (2012). *Political Studies Association Annual International Conference In Defence of Politics 3 - 5*. April 2012 Europa Hotel Belfast.

Gobah, F. K., & Zhang, L. (2011). The National Health Insurance Scheme in Ghana: Prospects and Challenges: a cross-sectional evidence. *Global Journal of Health Science*, *3*(2), 90-101. http://dx.doi.org/10.5539/gjhs.v3n2p90

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy, 80*(2), 223-255. http://dx.doi.org/10.1086/259880

Harmon, C., & Nolan, B. (2001). Health insurance and health service utilization in Ireland. *Health Economics, 10*, 135-145. http://dx.doi.org/10.1002/hec.565

Jütting, J. (2001). *The Impact of Health Insurance on the Access to Health Care and Financial Protection in Rural Developing Countries. The Example of Senegal* [HNP Discussion Paper]. Washington: World Bank.

Kirigia, J. M., Sambo, L. G., Nganda, B., Mwabu, G. M., Chatora, R., & Mwase, T. (2005). Determinants of health insurance ownership among South African women. *BMC health services research, 5*(1), 17. http://dx.doi.org/10.1186/1472-6963-5-17

Mensah, J., Oppong, J. R., & Schmidt, C. M. (2010). Ghana's National Health Insurance Scheme in the Context of the Health Mdgs : An Empirical Evaluation Using Propensity Score Matching. *Health Economics, 106*, 95-106. http://dx.doi.org/10.1002/hec

Liu, T., & Chen, C. (2002). An analysis of private health insurance purchasing decisions with national health insurance in Taiwan.*Social Science & Medicine, 55*, 755-774. http://dx.doi.org/10.1016/S0277-9536(01)00201-5

Mershed, M. (2012). Healthcare financing in Syria: satisfaction with the current system and the role of national health insurance—a qualitative study of householders' views. *Journal of health planning,* (March), 167-179. http://dx.doi.org/10.1002/hpm

Metiboba, S. (2011). Nigeria's National Health Insurance Scheme : The Need for Beneficiary Participation. *Research Journal of International Studies, 22*, 51-56.

National Health Insurance Authority. (2011). *Annual Report*. Accra, Ghana

Owusu-Mensah, S. (2010). Assessing The Clientele Satisfaction of The Implementation of the National Health Insurance Policy in Ghana.

Preker, A. S. (2002). Health Care Financing for Rural and Low Income Populations; the Role of Communities in Resource Mobilization and Risk Sharing, Washington DC: IBRD/World Bank.

Shneider, D. F. (2001). *"Impact of Prepayment Pilot on Health Care Utilization and Financing in Rwanda".* Findings from Household's Survey for Health Reform/Plus Technical Paper, Bethesda, Maryland: Abt Associates.

The Republic of Ghana. (2003). *National health insurance act, 2003*. Act 650. Accra, Ghana

Truman, H. (1976). *The Genesis of Medicare*. Columbia: University of Missouri Press.

World Bank. (2013). World development indicators. Available at: http://data.worldbank.org/country/ghana

Asenso-Okyere, W. K., Anum, A., Osei-Akoto, I., & Adukonu, A. (1998). Cost recovery in Ghana: are there any changes in health care seeking behaviour? *Health Policy and Planing, 13*(2), 181-188.

WHO. (2003). *Minimum health spending: feasibility of set of essential health interventions*. WHO/FAR, unpublished.

WHO. (2005). Fifty-Eighth World Health Assembly Geneva, 16-25 May 2005: Resolutions and decisions annex

Yevutsey, S. K., & Aikins, M. (2010). Financial viability of district mutual health insurance schemes of lawra and sissala East districts, upper west region, Ghana. *Ghana medical journal, 44*(4), 130-7.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Responses of Trace Elements to Aerobic Maximal Exercise in Elite Sportsmen

Aynur OTAĞ[1], Muhsin HAZAR[2], İlhan OTAĞ[3], Alper Cenk Gürkan[2] & İlyas Okan[2]

[1] Cumhuriyet Üniversity, School of Physical Education and Sports, Sivas, Turkey

[2] Gazi Üniversity, School of Physical Education and Sports, Ankara, Turkey

[3] Cumhuriyet Üniversity, Vocational School of Health Services, Sivas, Turkey

Correspondence: Aynur OTAĞ, Ph.D., School of Physical Education and Sports, Cumhuriyet Üniversity, Sivas, Turkey. E-mail: otagaynur@gmail.com

Received: January 3, 2014 Accepted: January 31, 2014 Online Published: February 21, 2014

doi:10.5539/gjhs.v6n3p90 URL: http://dx.doi.org/10.5539/gjhs.v6n3p90

Abstract

Trace elements are chemical elements needed in minute quantities for the proper growth, development, and physiology of the organism. In biochemistry, a trace element is also referred to as a micronutrient. Trace elements, such as nickel, cadmium, aluminum, silver, chromium, molybdenum, germanium, tin, titanium, tungsten, scandium, are found naturally in the environment and human exposure derives from a variety of sources, including air, drinking water and food. The Purpose of this study was investigated the effect of aerobic maximal intensity endurance exercise on serum trace elements as well-trained individuals of 28 wrestlers (age (year) 19.64±1.13, weight (Kg) 70.07 ± 15.69, height (cm) 176.97 ± 6.69) during and after a 2000 meter Ergometer test protocol was used to perform aerobic (75 %) maximal endurance exercise. Trace element serum levels were analyzed from blood samples taken before, immediately after and one hour after the exercise. While an increase was detected in Chromium (Cr), Nickel (Ni), Molybdenum (Mo) and Titanium (Ti) serum levels immediately after the exercise, a decrease was detected in Aluminum (Al), Scandium (Sc) and Tungsten (W) serum levels. Except for aluminum, the trace elements we worked on showed statistically meaningful responses ($P<0.05$ and $P<0.001$). According to the responses of trace elements to the exercise showed us the selection and application of the convenient sport is important not only in terms of sportsman performance but also in terms of future healthy life plans and clinically.

Keywords: elite athlete, exercise, aerobic exercise, metabolism, performance

1. Introduction

98% of human body weight is composed of mainly six elements which are oxygen (O), carbon (C), hydrogen (H), nitrogen (N), calcium (CA), phosphorus (P) and additionally sulfur (S), potassium (K), sodium (Na), chlorine (Cl), magnesium (Mg) and silicon (Si). Except for inert gases having less possibility to have physiologic functions, 71 elements are called as trace elements due to their presence in living cells in small amounts (0.01-100tmg/kg). As trace elements perform an enzyme component in biologic systems or as catalyst in chemical reactions occurring within the cells, and as they have toxic effects, it is known that insufficient or excessive intake of these elements causes many diseases (Aras, 2006). Due to important qualities of trace elements, knowledge of the responses given by serum levels to the exercise types will be useful for clinics, selection of exercise type and also for the selection of treatment program to be applied (Haroa, 2011).

Trace elements are found inherently in the environment and people are subject to these elements through various resources such as air, drinking water and foods. World Health Organization defined 19 trace elements which are important for human health (Parkin, 2005). The trace elements in the human body can be classified as those proved to be useful, those whose benefit is still unknown and possibly toxic elements. Chromium, iron, cobalt, copper, zinc, selenium, molybdenum and iodine are useful trace elements and they should be taken in small amounts for continuance of life. Lack of these elements may result in important disorders in the body and even in death. While manganese, silicon, nickel, boron, vanadium and tin are possibly useful trace elements; fluorine, arsenic, cadmium, lead, aluminum and mercury are possibly toxic elements (Aras, 2006).

Measurement capabilities of the methods used to measure trace elements in biology and environmental samples

are depending on specimen (blood, urine, hair, nail) and type of preparing the specimens for analysis (Meyer F, 1987). In order to meet the increasing requirements of today, automatic analysis methods were developed which are used in the detection of trace elements. These methods, providing data numerously and fast with little contribution of the user are: Atomic Absorption Spectrometry (AAS), Electrothermal Absorption Spectrometry (ETAAS), Inductive Coupled Plasma Optical Emission Spectrometry (ICPOES), Inductive Coupled Plasma Mass Spectrometry (ICPMS), Atomic Fluoroscence Spectrometry (AFS), Neutron Activation Analysis (NAA), X-Ray Fluoroscence Spectroscopy (XRF). The most convenient methods for solution samples are AAS, ICP-OES and ICP-MS (Aras, 2006).

Chromium is a trace element which affects insulin activity positively and which is necessary for sucrose and fat metabolisms. It is found throughout the body. However, it is mostly found in liver, kidney, spleen and bone (Mertz, 1998; Vincent, 2003; Jacquamet, 2003). Although 30-60 mg chromium is taken daily, only 4-6 mg can be stored in the body (Kumpulainen, 1992). Molybdenum, one of the useful trace elements, performs at the active centers of some enzymes containing Flavin (Chan, 1998). Furthermore, molybdenum component enzymes are important also ecologically. They help carbon, nitrogen and sulfur circle significantly (Frausta DA Silva, 2001). Nickel is defined as s possibly useful trace element by the World Health Organization (Parkin, 2005). There are proofs showing that nickel is related to intracellular communication mechanism inhibition, fibroblast and epithelial cell eternity, DNA abnormalities and deletion induction, DNA, protein cross link construction, oxidative damage, nucleotide excision repair inhibition, and gene expression inactivation mechanisms in human beings (Miki, 1987; DI Paolo, 1979; Biederman, 1987; Patierno, 1993; Costa, 1996; Sen, 1987; Kosprzak, 1991; Hartwig, 1994; Lee, 1995). Aluminum is one of the most abundant in the world and possibly toxic trace elements (Aras, 2006). Although it wasn't proven that aluminum has an important function in human beings and animals, it was pointed out that it affects some qualities such as growth, reproduction and milk production in some animal trials (Anke, 1990). The basic relation of aluminum element with human health is that it shows important toxic quality when it is found in big amounts (Alfrey, 1986). Scandium, titanium and tungsten are the trace elements of which effects on the organism are still not known (Aras, 2006). Scandium is a very rare element (Clayton, 2003). Titanium is an element which is not toxic, not rejected by the body, and which is used in surgical tools and implants (Emsley, 2001). Tungsten is an element which is widely used for industrial purposes.

In this study, we examined the responses given to aerobic maximal intensity endurance exercise by chromium, molybdenum and nickel among useful trace elements; aluminum among possibly toxic trace elements and scandium, titanium and tungsten among those whose benefit is still not proven in elite sportsmen of the wrestling team. We believe that analysis of the responses of trace elements to exercise will provide useful information in terms of both the health of sportsmen, sedentary with public health and healthy sporting planning.

2. Material and Method

Twenty-eight male subjects who are the elite wrestlers participated in this study. Experimental results on this subject were presented separately as a case report in the result section. The median age of the participating subjects was (year) ranging from 18 to 22. The other physical characteristics of the subjects were as follows table 1.

Table 1. Physical characteristic of the subjects

Age (year)	Weight (kg)	Height (cm)	BMI (kg/cm2)
19.64±1.13	70.07±15.69	176.97±6.69	22.37±1.22

The experimental protocol in this study was approved by the local ethics committee at Gazi University, Ankara, Turkey. All subjects were informed about the purpose and risks of the study before signing a written consent. Studies were performed according to the Declaration of Helsinki.

2.1 Exercise Protocol

A 2000 meter Ergometer test protocol was used to perform aerobic (75 %) maximal endurance exercise. Exercise tests were performed on a Concept IIC rowing Ergometer (Morrisville, USA). Subjects completed a 10 min warm-up before the exercise. All subjects were asked to cover a distance of 2000 m in the least time possible. The test was performed at ambient temperature (21 ± 0.5 ºC).

2.2 Blood Sampling

Blood samples were drawn from the antecubital vein of the subjects right before, immediately after, and one hour after exercise. Blood samples were collected in vacutainer tubes (Becton Dickinson, Franklin Lakes, NJ, USA) and centrifuged at 1500 g for 15 min. Serum samples were aliquoted and stored at -80 ºC until use for analyzing by inductively coupled plasma optical emission spectrometry (ICP-OES). Samples were only thawed once.

2.3 Sample Preparations and Measurements

On the 1 ml blood samples was added 2 ml HNO3 and the samples were digested in Berghof/Microwave Digestion system MWS-3 microwave apparatus. The microwave was kept at 160 °C for 5 min and at 190, 100 and 80 °C for 10 min each. The totally digested samples were diluted to 10 ml with the addition of deionized water 18.3 ohm cm-1. On the 1 ml blood samples was added 2 ml HNO3 and the samples were digested in Berghof/Microwave Digestion system MWS-3 microwave apparatus. The microwave was kept at 160 °C for 5 min and at 190, 100 and 80 °C for 10 min each. The totally digested samples were diluted to 10 ml with the addition of deionized water 18.3 ohm cm-1. Samples were analyzed directly using inductively coupled plasma optical emission spectrometry (ICP-OES, Perkin- Elmer, Optima 5300 DV, USA).

2.4 Statistical Analysis

Statistical analysis was performed with SPSS Ver. 16.0 for Windows. Statistical significance was set at $p<0.05$ (with 95% confidence levels). "Non-parametric Test'' was used in the description of athletes data who included to study taking into the consideration expansiveness of the group. Wilcoxon signed - rank test was used to test the alterations of measured parameters due to time (before exercise, after exercise and one hour after exercise). Significance was defined as a *P* value < 0.05 in all groups.

3. Results

Serum Cr, Ni, Mo, Sc, Ti, W and Al levels as before training (assay1), immediately after training (assay2) and one hour after training (assay3). Have shown in Table 2.

Serum chromium levels have progressively increased. While difference between assay1 and assay2 was significant, difference between assay2 and assay3 was nonsignificant. Difference between assay1 and assay3 was significant.

Serum nickel and titanium levels have significantly increased immediately after training. One hour after training serum nickel and titanium levels have non significantly decreased. For nickel and titanium values of assay3 were higher than values of assay1 and differences between values of assay1 and assay3 were significant.

Serum molybdenum level has significantly increased immediately after training. One hour after training serum molybdenum level has non significantly decreased. Assay1 was higher than assay3 and difference between assay1 and assay3 was nonsignificant.

The levels of serum scandium, tungsten and aluminium were progressively decreased during the experiment. While differences between three assays were significant for scandium, they were nonsignificant for aluminium. For serum tungsten levels while difference between assay2 and assay3 was significant, both difference between assay1 and assay2 and difference between assay1 and assay3 were nonsignificant.

Table 2. Serum Cr, Ni, Mo, Sc, Ti, W and Al levels as before training (assay1), immediately after training (assay2) and one hour after training (assay3)

Elements	Assay1	Assay2	Assay3	P (1,2)	P (2,3)	P (1,3)
Cr (µg/L)	13,42±3,12	15,23±4,12	16,18±4,65	0,010	0,466	0,008
Ni (µg/L)	3,14±0,54	6,29±11,00	4,60±2,46	0,000	0,982	0,000
Mo (µg/L)	17,14±1,12	17,42±4,91	16,89±0,58	0,007	0,008	0,333
Sc (µg/L)	0,93±0,13	0,90±0,65	0,87±0,07	0,000	0,000	0,039
Tİ (µg/L)	12,38±1,88	17,99±11,21	12,71±2,37	0,000	0,001	0,466
W (µg/L)	123,05±34,30	122,98±26,44	112,25±20,21	0,290	0,004	0,524
AI (µg/L)	81,33±117,48	76,91±31,80	72,89±60,57	0,068	0,076	0,425

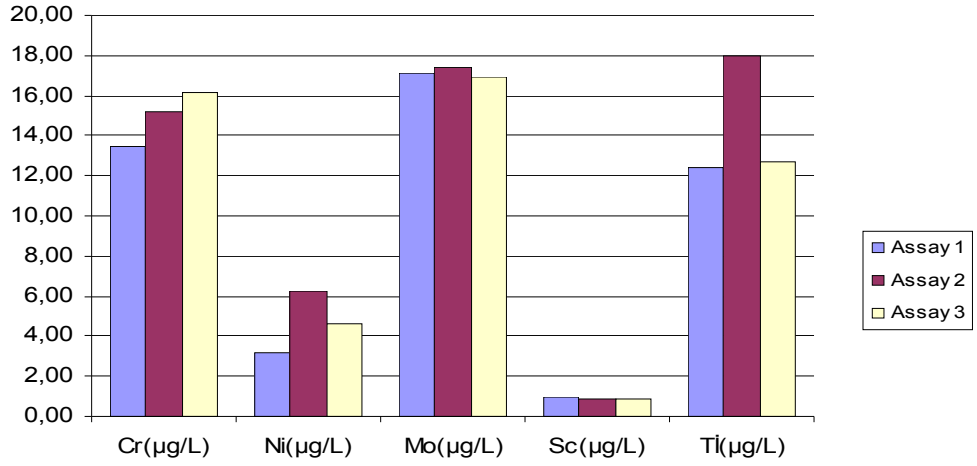


Figure 1. Serum Cr, Ni, Mo, Sc, Ti levels

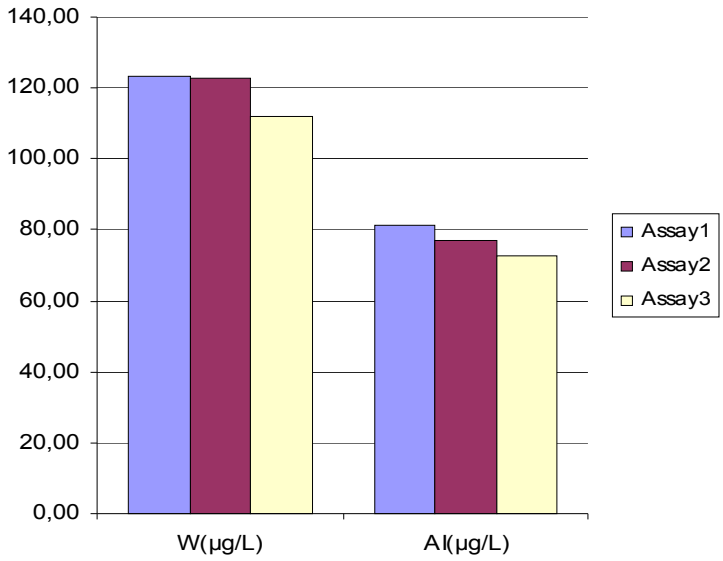


Figure 2. Serum W and Al levels

4. Discussion

Trace elements perform as a catalyst in chemical reactions occurring within the cells in biological systems or as an enzyme component (Aras, 2006). Due to these important functions, they also undertake important physiologic functions. In sportsmen, trace elements affect exercise performance with physiologic roles such as muscle contraction, normal cardiac rhythm, enzyme activation, neural response formation, oxidative phosphorescence, enzyme activation, oxygen transit, immune functions, acid-base balance, antioxidant activity and bone health. For this reason, sportsmen intake all these minerals in sufficient amounts for their diets in order to complete the normal process and increase their performance during the exercise (Speich, 2001; Hazar, 2012).

Knowledge of the responses given by trace elements to the exercise plays an important role in terms of health and performance of the sportsman as well as public health and exercise choice. In order to prevent mineral insufficiency, it should be analyzed which exercise type the trace elements give response and how they respond, and the appropriate diet should be determined under the light of this information (Kara, 2011; Baydil, 2013).

We researched the responses of chromium, nickel, molybdenum, scandium, titanium, tungsten and aluminum elements to aerobic maximal intensity endurance exercise we applied to elite sportsmen of the wrestling team.

Among trace elements, especially chromium affects muscle activity and lipid profiles positively and increases performance of the sportsman (Clarkson, 1997). Chromium may decrease cholesterol level (Efavi, 1993). It

affects insulin activity positively (Vincent, 2003; Jacquament, 2003). While chromium deficiency increases blood glucose level, insulin, cholesterol and triglyceride level, it causes a decrease in body mass (Zafra-Stone, 2007). Furthermore, chromium deficiency contributes to some chronic diseases such as Type 2 diabetes and cardiovascular diseases (Preus, 1998). Immediately after aerobic maximal intensity endurance exercise we applied to elite sportsmen of the wrestling team, the serum level increased meaningfully and this increase continued even one hour later. Chromium increases during exercise will increase glucose and insulin activity and therefore use of glucose. Consequently, the exercise performance was contributed by producing more energy during the aerobic exercise. Moreover, the chromium, which increases during the exercise and then continues to increase later may contribute positively to body fat profile by decreasing cholesterol and triglyceride levels as well as contributing to the protection against Type 2 diabetes and cardiovascular diseases by contributing positively to insulin activity. In our study, while serum levels of nickel element increased meaningfully during the exercise, it decreased one hour after the exercise. In spite of this decrease, the serum level one hour after the exercise is meaningfully higher than the level before the exercise. Although marathon runners show a similar increase in nickel levels, this increase is meaningless (Berger, 2002). The difference between the responses of nickel serum level to exercise among sport branches may be related to the type of exercise. Nickel element affects glucose and insulin metabolism and iron usage positively (Kieffer, 1979). Thus, the meaningful increase of the nickel serum level during exercise ensures the glucose is included within the cell and used as a fuel for energy production. Furthermore, as the positive effect on iron usage will affect oxygen carriage positively, the increase in nickel serum level during the exercise may affect exercise performance positively. While molybdenum level increases during marathon run, it decreases, then (Berger, 2002). The fact that molybdenum serum level increases during the exercise and then decreases in our study shows that there are similar responses between the exercise applied and the marathon in terms of molybdenum. For important enzymes, molybdenum is necessary as a cofactor (Burtis, 2006). Increase of molybdenum during exercise is important for human health. However, being less of a molybdenum serum level after the exercise than the level before the exercise should be paid attention. Aluminum does not have any important physiological function (Anke, 1990). The most important relation of this element with the organism is that it shows toxicity when it is found in excessive amounts. Excessive aluminum affects the skeleton of decreasing bone formation noticeably and results in osteomalasy. Another pathologic result of aluminum toxicity is hypochromic anemia which is not related to iron deficiency (Alfrey, 1989). Moreover, aluminum may cause neurotoxicity in high doses by changing the function of blood-brain barrier (Banks, 1989). In our study, serum aluminum level decreased during the exercise ($P>0.05$) and this decrease continued even after the exercise, and it may have positive effects in terms of clinical and exercise performance. We detected meaningful changes in serum levels of scandium, titanium and tungsten elements during and after the exercise. These elements are those benefits to the organism of which are not determined yet (Aras, 2006). It would be advantageous to perform interdisciplinary studies in order to determine possible physiological roles of these elements and their responses to the exercise.

In our study, we researched the responses given to aerobic maximal intensity endurance exercise by chromium, nickel and molybdenum from useful trace elements; aluminum from possibly toxic elements, and scandium, titanium and tungsten of which possible functions are not found yet. The responses of trace elements to the exercise showed us that the selection and application of the convenient sport are important not only in terms of sportsman performance but also in terms of future healthy life plans and clinically. According to available literature, our study of these elements has not been studied previously in terms of exercise is important.

References

Alfrey, A. C., Orlando, F. Z., & Mertz, W. (1986). *Aluminium in Trace elements in human and animal nutrition*. (5th Ed., Vol. 2, pp. 399-413). Academic Press. http://dx.doi.org/10.1016/B978-0-08-092469-4.50013-3

Anke M., Groppel B., Mueller M., Kraeuter U. (1990). *Aluminium mangler scheinungen beim tier.* Proceedings 10th Arbeitstagung Mengen- und Spurenelemente, Leipzig (pp. 505-515). Publ. University Jena, Germany.

Aras, N. K., & Taman, D. Y. A. (2006). *Trace element analysis of food and diet*. RSC Publishing: Cambridge, UK.

Banks, W. A., & Kastin, A. J. (1989). Aluminum-induced neurotoxicity: alterations in membrane function at the blood-brain barrier. *Neurosci Biobehav Rev., 13*(1), 47-53. http://dx.doi.org/10.1016/S0149-7634(89)80051-X

Baydil, B. (2013). Serum Macro-Micro Element Responses to Acute Maximal Physical Exercise. *World Applied Sciences Journal, 23*(7), 945-949.

Berger, C. E., Kröner, A., Kluger, R., Baron, R., Steffan, I., & Engel, A. (2002). Effects of marathon running on

the trace minerals chromium, cobalt, nickel, and molybdenum *The Journal of Trace Elements in Experimental Medicine, 15*(4), 201-209. http://dx.doi.org/10.1002/jtra.10019

Biedermann, K. A., & Landolph, J. T. (1987). Induction of anchorage independence in human diploid foreskin fibroblasts by carcinogenic metal salts. *Cancer Res., 47*, 3815-3823.

Burtis, C. A., Ashwood, E. R., & Bruns, D. E. (2006). *Tietz Textbook of Clinical Chemistry and Molecular Diagnostic: Vitamins and Trace elements* (64th Ed).

Chan, S., Gerson, B., & Subronaniom, S. (1998). The role of copper, molybdenum, selenium and zinc in nutrition and health. *Toxicology, 18*, 673-685.

Clayton, D. (2003). *Handbook of Isotopes in the cosmos*. Cambridge University Press, 199-201.

Clarkson, P. M. (1991). Minerals: exercise performance and supplementation in athletes. *J Sports Sci, 9*(Spec), 91-116. http://dx.doi.org/10.1080/02640419108729869

Costa, M. (1996). *Mechanisms of nickel genotoxicity and carcinogenicity*. In: Chang LW (Eds) Toxicology of metals. *CRC Press, Boca Raton, FL*, 245-25.

DiPaolo, J. A., & Casto, B. C. (1979). Quantitative studies of in vitro morphological transformation of Syrian hamster cells by inorganic metal salts. *Cancer Res, 39*, 1008-1013.

Emsley, J. (2001). *Nature's Building Blocks: An A-Z guide to the elements*. Oxford, Oxford Üniversity Press, 451-53.

Frausta Do Silva, J. J. R., & Wiliams, R. J. P. T. (2001). The biological chemistry of the elements. *The İnorganic Chemistry of life* (2nd Ed). Oxford: Oxford University Pres.

Haroa, C. G., Soria, M., López-Colónb, J. L., Llorenteb, M. T., & Escaneroa, J. F. (2011). Plasma trace elements levels are not altered by submaximal exercise intensities in well-trained endurance euhydrated athletes. *Journal of Trace Elements in Medicine and Biology, 25*, 54-58. http://dx.doi.org/10.1016/j.jtemb.2010.10.010

Hartwig, A., Mullenders, L. H. F., Schlepegrell, R., Kasten, U., & Beyersmann, D. (1994). Nickel (II) interferes with the incision step in nucleotide excision repair in mammalian cells. *Cancer Res, 54*, 4045-4051.

Hazar, M., Sever, O., & Otag, A. (2012). Physiological responses of macro-elements to maximal aerobic exercise among elite women and men field hockey players. *Health MED, 6*(9), 3084-3090.

Jacquament, L., Sun, Y., Hotfields, S., Gu, W., Croner, S. P., & Crowder, M. W. (2003). Characterization of chomodulin by X-Ray absorption and paramagnetic resonance spectroscopies and magnetic susceptibility measurement. *J AM Chem Soc, 125*, 774-80. http://dx.doi.org/10.1021/ja0202661

Kara, E. (2011). The Effects of Acute Submaximal Exercise on Trace Element Metabolism. *Health MED, 6*(5), 1580-1585.

Kasprzak, K. S. (1991). The role of oxidative damage in metal carcinogenicity. *Chem Res Toxicol, 4*, 604-615. http://dx.doi.org/10.1021/tx00024a002

Kieffer, F. (1979). Spurenelemente. *Sonderdruck aus Sandoz-Bulltein, 16*, 51-53.

Kumpulainen, T. J. (1992). Chromium content of food and diets. *Biol Trace Elem Res, 32*, 9-18. http://dx.doi.org/10.1007/BF02784582

Lee, Y. W., Klein, C. B., Kargacin, B., Salnikow, K., Kitahara, J., Dowjat, K., ... Costa, M. (1995). Carcinogenic nickel silences gene expression by chromatin condensation and DNA methylation: a new model for epigenetic carcinogens. *Mol Cell Biol, 15*, 2547-2557.

Lefavi, R. T., Wilson, G. D., Keith, R. E., Mcmillon, S. L., & Stone, M. A. (1993). Lipid-lowering effect of a dietary chromium (III) nicotinate and complex in male athletes. *Nutr Res, 13*, 239-249. http://dx.doi.org/10.1016/S0271-5317(05)80421-X

Mertz, W (1988). Interaction of chromium with insulin a progress report. *Nutr Rev, 17*, 544-7.

Meyer, F., & Verreault, R. (1987). Erythrocyte selenium and breast cancer risk. *Am J Epidemiol, 125*, 917-919.

Miki, H., Kasprzak, K. S., Kenney, S., & Heine, U. I. (1987). Inhibition of intracellular communication by nickel (II): antagonistic effect of magnesium. *Carcinogensis, 8*, 1757-1760. http://dx.doi.org/10.1093/carcin/8.11.1757

Parkin, D. M., Bray, F., Ferlay, J., & Pisani, P. (2005). Global cancer statistics, 2002 CA. *Cancer J Clin, 55*,

74-108. http://dx.doi.org/10.3322/canjclin.55.2.74

Patierno, S. R., Dirscherl, L., & Xu, J. (1993). Transformation of rat tracheal epithelial cells to immortal growth variants by particulate and soluble nickel compounds. *Mutat Res, 300*, 179-193. http://dx.doi.org/10.1016/0165-1218(93)90049-J

Preuss, H. G., & Anderson, R. A. (1998). Chromium update: examining recent literature 1997-1998. *Curr Opin Clin Nutr Metab Care, 1*(6), 509-12. http://dx.doi.org/10.1097/00075197-199811000-00005

Sen, P., Conway, K., & Costa, M. (1987). Comparison of the localization of chromosome damage induced by calcium chromate and nickel compounds. *Cancer Res, 47*, 2142-2147.

Speich, M., Pineau, A., & Ballereau, F. (2001). Minerals, trace elements and related biological variables in athletes and during physical activity. *Clin Chim Act, 312*(1-2), 1-11. http://dx.doi.org/10.1016/S0009-8981(01)00598-8

Vincet, S. B. (2003). The potential value and toxicity of chromium picolinate as a nutritional supplement, weight loss agent and muscle development agent. *Sport Med, 33*, 213-30. http://dx.doi.org/10.2165/00007256-200333030-00004

Zafra-Stone, S., Yasmin, T., Bagchi, M., Chatterjee, A., Vinson, J. A., & Bagchi, D. (2007). Berry anthocyanins as novel antioxidants in human health and disease prevention. *Mol Nutr Food Res, 51*(6), 675-83. http://dx.doi.org/10.1002/mnfr.200700002

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Quality of Life, Social Desirability and Their Relationship in Opium Addicted Persons in Southeast of Iran

Mansour Arab[1,2], Mehri Kohan[1], Hadi Ranjbar[1], Nanaz Arab[3], Masoud Rayani[4], Salehe Sadat Mirrashidi[1], Hossein Rafiei[5,6] & Masoud Amiri[6]

[1] Department of Medical- Surgical Nursing, Razi School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran

[2] Neuroscience Research Center, Kerman University of Medical Sciences, Kerman, Iran

[3] School of Pharmacy, Kerman University of Medical Science, Kerman, Iran

[4] Department of Health, Razi School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran

[5] Department of Intensive and Critical Care, School of Nursing and Midwifery, Shahrekord University of Medical Sciences, Shahrekord, Iran

[6] Social Health Determinants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

Correspondence: Mehri Kohan, MSc, Department of Medical- Surgical Nursing, Razi School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran. Tel: 98-913-610-0857 or 98-341-320-5220. E-mai: Mkohan@kmu.ac.ir

Received: December 2, 2013 Accepted: Januaray 14, 2013 Online Published: February 22, 2014

doi:10.5539/gjhs.v6n3p97 URL: http://dx.doi.org/10.5539/gjhs.v6n3p97

Abstract

Background and Aim: Addiction leads to many problems which may adversely affect addicted people, their families and impose health care agencies with many challenges. This study aimed to examined quality of life (QoL), social desirability and their relationship among opium addicted persons in southeast of Iran.

Material and Methods: In a cross-sectional study conducted from September 2012 to January 2013, 123 addicted people were studied. Date collection tools were; checklist of demographic data, Iranian version of the 36-item short form QoL (SF-36) and Marlowe-Crowne Social Desirability Scale (MC-SDS).

Results: While mean score of QoL was 60.4±29.5, mean score of social desirability were 14.2±3.7. Low, moderate and high levels of social desirability were observed in 4.9%, 90.2% and 4.9% of participants, respectively. Pearson's correlation were not significant between mean score of social desirability and mean score of QoL (p=0.969, r=0.004).

Conclusion: Addicted participants of present study showed a moderate level of QoL and social desirability, without any significant relationship between QoL and social desirability. Further research is suggested in addicts with social and cultural differences.

Keywords: quality of life, social desirability, opioid addicted, SF-36, MC_SDS, Iran

1. Introduction

Although opium has been used for medical purposes since long time ago (Nakhaee, 2009); nowadays, substance abuse of opium is one of the most complicated health problems worldwide which has been resulted many challenges for health care agencies (Bashardoost & Tirani, 2005; Najafi, 2009; Ziaaddini, 2006; Ziaaddini & Ziaaddini, 2005). Due to a very long border with the world's largest opium producer, Afghanistan (Meysamie, 2009; Parvizy, 2005; Razzaghi, 2006), obtaining opium in Iran is too easy (Meysamie et al., 2009). Opium is the most common type of substance abuse in Iran (Aghaee-Afshar, 2008; Karbakhsh & Salehian Zandi, 2007; Nemati, 2010). Research has shown that the prevalence of opium addiction is approximately between 2 and 14.6 percent in different social groups of Iran (Ahmadi & Hasani, 2003; Mohammad Poorasl, 2007; Rajabizade, 2004; Ziaaddini & Ziaaddini, 2005). There is a very common belief in old Iranians that the use of opium could reduce aches and pains and may even decrease the rate of cardiovascular diseases (Karbakhsh & Salehian Zandi, 2007; Rafiei, 2012).

Quality of life (QoL) could be a key quality indicator in the evaluation of health care systems (De Maeyer, 2010; Hojjati, 2012), and opium addiction may affect on QoL (Hojjati et al., 2012). Due to importance of addiction worldwide, QoL among opiate-dependent individuals has been received considerable attention in recent researches. For example, Bizzari and colleagues (2005) have compared QoL of 57 patients with opioid dependence alone, 41 with opioid dependence and a psychiatric disorder and 45 healthy persons in Italy. They reported that patients with opioid dependence and a psychiatric disorder have had worse QoL compared to patients without psychiatric disorder. They also found that both groups of patients had poorer QOL in the physical, psychological, and social domains in comparison with healthy persons. In another study, Ponizofsky and Grinshpoon (2007) have studied QoL of heroin users who starting a maintenance treatment program using methadone versus buprenorphine. They reported that both methods of maintenance had improved all domains of QoL of heroin users. They also showed that users whom were maintained on methadone have had an earlier onset in improving QoL than patients with buprenorphine maintenance. In 2005, Giacomuzzi and colleagues have examined the effects of gender on QoL of 103 opioid users. They did not find any significant difference in terms of QoL and physical symptoms between addicted men and women. Furthermore, another important issue in improving QoL of opium-addicted patients is social desirability (Hojjati, 2012). Poor social desirability may also adversely affect on QoL of opium-addicted patients.

Since there were a few studies on these topics, in the present study, QoL, social desirability and their relationship in opium-addicted persons who admitted to a maintenance treatment center have been studied in Kerman, southeast of Iran.

2. Materials and Methods

In a cross-sectional study conducted from September 2012 to January 2013 in Kerman, southeast of Iran. Convenience samples of 123 people who addicted to opium and admitted to a maintenance treatment center were studied. The written permission was obtained from deputy of research and also the Ethics' Board of the Kerman University of Medical Sciences. Inclusions criteria were: addiction to opium (more than one year) and ability to answer the provided questionnaire. Exclusion criteria were addiction to other forms of substances and history of mental disorder. Questionnaires were handed out by the second researcher, along with a letter providing information about the aims of the study. Participants answered individually and returned the questionnaire to the researcher. Written consent letters were filled in by all respondents. All participants were promised that all data would remain anonymous, kept confidential and be stored safely.

The various instruments were used for data collection: 1) checklist of demographic data (including age, sex, marital status, job, level of education, type of opium used, age at first use, years of regular use and history of withdrawal), 2) Iranian version of the 36-item short form QoL (SF-36) (This form is a generic multidimensional instrument consisting of eight multi-item components representing physical functioning, role functioning physical, bodily pain, general health perceptions, vitality, social functioning, role functioning emotional and mental health (Juenger, 2002) and 3) Marlowe-Crowne Social Desirability Scale (MC-SDS) (this scale consist of 33 statement to which respondents are asked to answer true (T)-or-false (F). The (T) response was given the value 1 and the (F) response was given a value of zero. The total score on the test was the sum of all scores. Score between 0-8 indicates low social desirability, 9-19 refers to moderate social desirability and 20 – 33 means high level of social desirability (Crowne & Marlowe, 1960; Vu, 2010).

Continuous variables were presented by mean and standard deviation. Pearson's correlation coefficient, independent t-test and ANOVA were applied for correlation and comparison. SPSS software (version 18.0) was used and p-value less than 0.05 were considered as statistically significant.

3. Results

Of 123 addicted persons, 101 (82.1%) persons were men. The mean age of participants was 34.8±9.3 years, 63.6% of them were married, the mean duration of addiction was 11.8±8.1 year, and the mean age of initiating opium use was 21.5±5.8 year. Table 1 shows more information about demographic characteristics.

Table 1. Participants demographic characteristics'

Demographic characteristics'		Number and present
Gender	Male	101(82.1%)
	female	22 (17.9%)
Marital status	Married	78 (63.4%)
	single	38 (30.9%)
	Divorced	3 (2.4%)
	Widow	4 (3.3%)
Education	Primary school	33 (26.8%)
	High school	79 (64.3%)
	2 years of college	7 (5.7%)
	Graduate	3 (2.4%)
	Post graduate	1 (0.8%)
Cause of Addiction	Curiosity	15 (12.2%)
	Friends	51 (41.5%)
	Treatment of disease	11 (8.9%)
	Relief of pain	25 (20.3%)
	Other causes	21 (17.1%)
Mean years of addiction	1- 4 year	20(17.1%)
	4 – 7 year	23(19.7%)
	7- 11 year	21(17.9%)
	11- 15 year	10(8.5%)
	15- 19 year	17(14.5%)
	19- 23 year	17(14.5%)
	More than 23 year	9(7.7%)

Mean score of social desirability were 14.2±3.7. Low, moderate and high levels of social desirability were observed in 4.9%, 90.2% and 4.9% of participants, respectively (Table 1).

Table 2. Mean score of QoL subscale

	Mean Score
Physical Functioning	128.4±18.4
Role-Physical	57.60±28.30
Bodily Pain	52.4±36.59
General Health	49.9±19.85
Vitality	41.50±18.11
Social Functioning	17.64±31.4
Role-Emotional	117.8±113.8
Mental Health	41.4±27.54
Total Score	60.4±29.5

Mean score of QoL was 60.4± 29.5. Higher score was related to sub scale of role functioning physical (128.4± 18.4) and lower score was related to sub scale social functioning (17.64± 31.4) (Table 2).

Table 3. Participants response to questions of social desirability questionnaire

Question Number	Number of (F) responses	Number of (T) responses
1- Before voting I thoroughly investigate the qualifications of all the candidates.	90 (73.2%)	33 (26.8%)
2- I never hesitate to go out of my way to help someone in trouble.	41(33.3%)	82 (66.7%)
3- It is sometimes hard for me to go on with my work if I am not encouraged.	79 (64.2%)	44 (35.8%)
4- I have never intensely disliked anyone.	73 (59.3%)	50 (40.7%)
5- On occasion I have had doubts about my ability to succeed in life.	89 (72.4%)	34 (27.6%)
6- I sometimes feel resentful when I don't get my way.	98 (79.7%)	25 (20.3%)
7- I am always careful about my manner of dress.	100 (81.3%)	23 (18.7%)
8- My table manners at home are as good as when I eat out in a restaurant.	70 (56.9%)	53 (43.1%)
9- If I could get into a movie without paying and be sure I was not seen I would probably do it.	24 (19.5%)	99 (80.5%)
10- On a few occasions, I have given up doing something because I thought too little of my ability.	72 (58.5%)	51 (41.5%)
11- I like to gossip at times.	50 (40.7%)	73 (59.3%)
12- There have been times when I felt like rebelling against people in authority even though I knew they were right.	51 (41.5%)	72 (58.5%)
13- No matter who I'm talking to, I'm always a good listener.	93 (75.6%)	30 (24.4%)
14-I can remember "playing sick" to get out of something.	27 (22%)	94 (78%)
15-There have been occasions when I took advantage of someone.	28 (22.8%)	95 (77.2%)
16- I'm always willing to admit it when I make a mistake.	91 (74%)	32 (26%)
17-I always try to practice what I preach.	96 (78.9%)	26 (21.1%)
18- I don't find it particularly difficult to get along with loud mouthed, obnoxious people.	55 (44.7%)	68 (55.3%)
19- I sometimes try to get even rather than forgive and forget.	44 (35.8%)	79 (64.2%)
20-When I don't know something I don't at all mind admitting it.	48 (39%)	75 (61%)
21-I am always courteous, even to people who are disagreeable.	95 (77.2%)	28 (22.8%)
22-At times I have really insisted on having things my own way.	77 (62.6%)	46 (37.4%)
23- There have been occasions when I felt like smashing things.	47 (38.2%)	76 (61.8%)
24-I would never think of letting someone else be punished for my wrongdoings.	91 (74%)	32 (26%)
25-I never resent being asked to return a favor.	102 (82.9%)	21 (17.1%)
26-I have never been irked when people expressed ideas very different from my own.	99 (89.5%)	24 (19.5%)
27-I never make a long trip without checking the safety of my car.	95 (77.2%)	28 (22.8%)
28-There have been times when I was quite jealous of the good fortune of others.	33 (26.8%)	90 (73.2%)
29-I have almost never felt the urge to tell someone off.	79 (64.2%)	44 (35.8%)
30-I am sometimes irritated by people who ask favors of me.	38 (30.9)	85 (69.1%)
31-I have never felt that I was punished without cause.	77 (62.6%)	46 (37.4%)
32- I sometimes think when people have a misfortune they only got what they deserved.	32 (26%)	91 (74%)

33-I have never deliberately said something that hurt someone's feelings.	91 (74%)	32 (26%)

Pearson's correlation were not significant between mean score of social desirability and mean score of QoL (p=0.969, r=0.004) as well as mean score of social desirability and mean score of each 8 sub scales of QoL (Table 3).

Table 4. Correlation between QoL score and Social desirability score

	Social desirability score		
	Number	**Correlation**	**P value**
Physical Functioning	123	-.035	.701
Role-Physical	123	-.035	.701
Bodily Pain	123	-.035	.701
General Health	123	-.035	.701
Vitality	123	-.035	.701
Social Functioning	123	-.035	.701
Role-Emotional	123	-.035	.701
Mental Health	123	-.035	.701
Total Score	123	-.035	.701

4. Discussion

Nowadays, opium addiction considerably affects on Iranian health care system. This study has considered QoL, social desirability and their relationship in opium-addicted persons who admitted to a maintenance treatment center have been studied in Kerman, southeast of Iran. Findings showed that addicted participants had moderate level of QoL.

Xiao and colleagues (2010) have studied the QoL of outpatients in methadone maintenance treatment in china. Similar to our finding, they also reported that addicted persons have moderate level of QoL which has been improved after methadone maintenance treatment. In another study, Hoseinifar and colleagues (2011) has compared QoL of addicted and non- addicted in Iran. In contrast with our findings, they found that addicted people lived in the worse condition than non-addicted persons. They also reported that addicted people needed more help and support from society. The observed difference between studies might be related to the difference in the place of research with different socioeconomic status. Indeed, Tehran with 12 million citizens as the biggest and more expensive city of Iran, has a good and high quality life than other cities of Iran and therefore more necessity to earn more income. It is obvious that it is very hard for an addicted person to acquire enough income to live in Tehran, which this low income in turn could affect on addicted people's QoL.

Our findings showed that most of addicted people (90.2%) had moderate level of social desirability. Similar to our finding, Hojjati and colleagues (2012) reported that many of Iranian addicted persons (about 70%) had moderate level of social desirability. Furthermore, in Iran, there is a substantial negative attitude towards addiction and addicted persons. Addicted people usually have many problems such as job finding, marriage and obtaining vehicle driving license (Karbakhsh & Salehian Zandi, 2007). That's why a large number of Iranian addicted people tend to re-consumption opium after detoxification programs (Shargh, 2011; Taghva, 2009; Mirzaei, 2010). Shargh and colleagues (2011) reported that one of the most common problems resulting in re-consumption among addicted persons is poor social acceptance of this group. Therefore, to improve the situation of addicted people, Iranian health care agencies should pay more attention to social dimension of addicted's life.

No significant relationship was found between QoL and social desirability in this study. There was only one study in Iran on social acceptance and relationship with QoL of addicted persons referred to addiction centers in Golestan in 2012 (Hojjati, 2012). The mean score of QoL and social desirability of addicted people were 24.0± 1 and 13.0± 3, respectively. Although mean score of QoL and social desirability were less than our study; however, in contrast to our findings, they reported positive relationship between QoL and social desirability.

4.1 Limitation

The respondents were predominantly male, which limits the generalisability of the results for female addicts. As this study was based on a convenient sample and the participation was voluntary, there might have been a selection bias that affected the possibility to generalize the results to all addicted persons. Furthermore, use of the self reported questionnaires may have led to an overestimation of some of the findings because of the variance that is common in different methods.

5. Conclusion

Addiction has many problems which could adversely affect addicted people, their families and may impose health care agencies with many challenges. Addicted participants of present study showed a moderate level of QoL and social desirability, without any significant relationship between QoL and social desirability. Further researches will reveal the potential effects of social and cultural differences.

Acknowledgements

Hereby, the authors would like to thank the Technology Research Center of Kerman University of Medical Sciences for financially supporting the project.

References

Aghaee-Afshar, M., Khazaeli, P., Behnam, B., Zadehkermani, M. R., & Ashraf-Ganjooei, N. (2008). Presence of lead in opium. *Arch Iranian Med, 11*, 553-554.

Ahmadi, J., & Hasani, M. (2003). Prevalence of substance use among Iranian high school students. *Addict Behav, 28*, 375-379. http://dx.doi.org/10.1016/S0306-4603(01)00246-5

Bashardoost, N., & Tirani, M. (2005). Prevalence of addiction in males: Isfahan 2003. *ARYA Journal, 1*(2), 106-108.

Bizzarri, J., Rucci, P., Vallotta, A., Girelli, M., Scandolari, A., Zerbetto, E., ... Dellantonio, E. (2005). Dual diagnosis and quality of life in patients in treatment for opioid dependence. *Subst Use Misuse, 40*, 1765-1776. http://dx.doi.org/10.1080/10826080500260800

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *J Consult Psychol, 24*, 349-354. http://dx.doi.org/10.1037/h0047358

De Maeyer, J., Vanderplasschen, W., & Broekaert, E. (2010). Quality of life among opiate-dependent individuals: A review of the literature. *Int J Drug Policy, 21*, 364-380. http://dx.doi.org/10.1016/j.drugpo.2010.01.010

De Maeyer, J., Vanderplasschen, W., Lammertyn, J., van Nieuwenhuizen, C., Sabbe, B., & Broekaert, E. (2011). Current quality of life and its determinants among opiate-dependent individuals five years after starting methadone treatment. *Qual Life Res, 20*, 139-150. http://dx.doi.org/10.1007/s11136-010-9732-3

Giacomuzzi, S. M., Riemer, Y., Ertl, M., Kemmler, G., Rössler, H., Hinterhuber, H., & Kurz, M. (2005). Gender differences in health-related quality of life on admission to a maintenance treatment program. *Eur Addict Res, 11*, 69-75. http://dx.doi.org/10.1159/000083035

Hojjati, H., Sharif Nia, H., Faghani, M., Hojjati, H., & Salmasi, S. (2012). Study of social acceptance and relationship with quality of addict's life referred to addiction centers in Golestan province in 1388. *Journal of Jondishapoor Medical Science, 3*, 57-64.

Hoseinifar, J., Zirak, S. R., Meamar, E., Moharami, H., & Siedkalan, M. M. (2011). Comparison of quality of life and mental health of addicts and non- addicts. *Procedia - Social and Behavioral Sciences, 30*, 1930-1934. http://dx.doi.org/10.1016/j.sbspro.2011.10.375

Juenger, J., Schellberg, D., Kraemer, S., Haunstetter, A., Zugck, C., Herzog, W., & Haass, M. (2002). Health related quality of life in patients with congestive heart failure: comparison with other chronic diseases and relation to functional variables. *Heart, 87*, 235-241. http://dx.doi.org/10.1136/heart.87.3.235

Karbakhsh, M., & Salehian Zandi, N. (2007). Acute opiate overdose in Tehran: the forgotten role of opium. *Addict Behav, 32*, 1835-1342. http://dx.doi.org/10.1016/j.addbeh.2006.12.014

Maremmani, I., Pani, P. P., Pacini, M., & Perugi, G. (2007). Substance use and quality of life over 12 months among buprenorphine maintenance-treated and methadone maintenance-treated heroin-addicted patients. *J Subst Abuse Treat, 33*, 91-98. http://dx.doi.org/10.1016/j.jsat.2006.11.009

Meysamie, A., Sedaghat, M., Mahmoodi, M., Ghodsi, S. M., & Eftekhar, B. (2009). Opium use in a rural area of the Islamic Republic of Iran. *East Mediterr Health J, 15*(2), 425-432.

Mirzaei, T., Ravary, A., Hanifi, N., Miri, S., Oslouei, F., & Mirzaei Khalili, S. (2010). Addicts' perspectives about

factors associated with substance abuse relapse. *Iran Journal of Nursing, 67*, 1-10.

Mohammad Poorasl, A., Vahidi, R., Fakhari, A., Rostami, F., & Dastghiri, S. (2007). Substance abuse in Iranian high school students. *Addict Behav, 32*, 622-627. http://dx.doi.org/10.1016/j.addbeh.2006.05.008

Mokri, A. (2002). Brief overview of the status of drug abuse in Iran. *Archives of Iranian Medicine, 5*, 184-190.

Najafi, M., Sheikhvatan, M., Montazeri, A., & Sheikhfathollahi, M. (2009). Quality of life in opium-addicted patients with coronary artery disease as measured with WHOQOL-BREF. *Int J Soc Psychiatry, 55*(3), 247-256. http://dx.doi.org/10.1177/0020764008093600

Nakhaee, N., Ziaaddini, H., & Karimzadeh, K. (2009). Epidemiologic study on drug abuse among first and second grade high school students in Kerman. *Addict & Health, 1*, 31-38.

Nemati, M. H., Astaneh, B., & Ardekani, G. S. (2010). Effects of opium addiction on bleeding after coronary artery bypass graft surgery: report from Iran. *Gen Thorac Cardiovasc Surg, 58*(9), 456-460. http://dx.doi.org/10.1007/s11748-010-0613-z

Parvizy, S., Nikbahkt, A., Pournaghash Tehrani, S., & Shahrokhi, S. (2005). Adolescents' perspectives on addiction: qualitative study. *Nurs Health Sci, 7*(3), 192-198. http://dx.doi.org/10.1111/j.1442-2018.2005.00237.x

Ponizovsky, A. M., & Grinshpoon, A. (2007). Quality of life among heroin users on buprenorphine versus methadone maintenance. *Am J Drug Alcohol Abuse, 33*(5), 631-642. http://dx.doi.org/10.1080/00952990701523698

Rajabizade, G. H., Ramezani, A., & Shakiba, M. (2004). Prevalence of opium addiction in Iranian drivers 2001-2003. *J Med Sci, 4*, 210-213. http://dx.doi.org/10.3923/jms.2004.210.213

Rafiei, H., Hossein Rezaei, H., & Moghaddasi, J. (2012). Addicted patients are at higher risk of sternal wound infection after open heart surgeries in the site of surgical incision. *Indian J Thorac Cardiovasc Surg, 28*(3), 207. http://dx.doi.org/10.1007/s12055-012-0151-7

Razzaghi, E. M., Movaghar, A. R., Green, T. C., & Khoshnood, K. (2006). Profiles of risk: a qualitative study of injecting drug users in Tehran, Iran. *Harm Reduct J, 18*, 12. http://dx.doi.org/10.1186/1477-7517-3-12

Shargh, A., Shakibi, A., Neisari, R., & Alilo, L. (2011). Survey of addicts perception of risk factors for relapse who admitted to Azarbayjan maintenance Center in 2009. *Oromieh Medical Journal, 22*, 129-136.

Taghva, A., Kazemi, H. R., Abbasi, R., Ibrahimi, M. R., & Mustafazadeh, B. (2009). Evaluation of relapse six months after detoxification in opioid drug dependents. *Journal of Military Medical Sciences Islamic Republic of Iran, 7*(1), 35-38.

Vu, A., Tran, N., Pham, K., & Ahmed, S. (2011). Reliability of the Marlowe-Crowne social desirability scale in Ethiopia, Kenya, Mozambique, and Uganda. *BMC Med Res Methodol, 11*, 162. http://dx.doi.org/10.1186/1471-2288-11-162

Xiao, L., Wu, Z., Luo, W., & Wei, X. (2010). Quality of life of outpatients in methadone maintenance treatment clinics. *J Acquir Immune Defic Syndr, 53*, 116-120. http://dx.doi.org/10.1097/QAI.0b013e3181c7dfb5

Ziaaddini, H., Zare-zadeh, A., & Heshmati, F. (2006). The prevalence rate of substance abuse and addiction and some relevant factors among junior and senior high school students in kerman city (2000-2001). *Journal of Kerman University of Medical Sciences, 13*, 84-94.

Ziaaddini, H., & Ziaaddini, A. (2005). The household survey of drug abuse in Kerman, Iran. *Journal of Applied Sciences, 5*(2), 380-382. http://dx.doi.org/10.3923/jas.2005.380.382

Zubaran, C., & Foresti, K. (2009). Quality of life and substance use: concepts and recent tendencies. *Curr Opin Psychiatry, 22*, 281-286. http://dx.doi.org/10.1097/YCO.0b013e328328d154

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Evaluating the Scale-Up of Antiretroviral Treatment Sites in Kwazulu-Natal Province of South Africa: Achievements and Challenges from 2005 to 2010

Malangu N[1]

[1] School of Public Health, Medunsa Campus, University of Limpopo, South Africa

Correspondence: Malangu N, School of Public Health, Medunsa Campus, University of Limpopo, South Africa

Received: November 7, 2013 Accepted: December 2, 2013 Online Published: February 22, 2014

doi:10.5539/gjhs.v6n3p104 URL: http://dx.doi.org/10.5539/gjhs.v6n3p104

Abstract

In order to provide care to the increasing number of people infected with HIV, there is a need for scaling up the number of treatment sites. For the public health officials and planners, there is a need for a defined methodology to do this, taking into consideration the national targets as enacted by the National Department of Health (NDOH) of South Africa. This commentary is about an evaluation conducted to review the progress made by the Province of KwaZulu-Natal in scaling up antiretroviral treatment sites (ART). Based on a mathematical modelling combined with a geographical information system by Wilson and Blower, the prediction that 54 ART facilities were required for equitable distribution of antiretroviral treatment in KwaZulu-Natal had been exceeded as 89 ART sites had been established by 2010. Despite this success, two major challenges are still lurking into the ART program, namely, the accessibility of ART by those who need it and the shortage of professional human resources particularly pharmacy staff. Innovative strategies are needed to address the shortage of health professionals and related disparities in order to increase access to ART.

Keywords: antiretroviral treatment, evaluation, scale-up, South Africa

1. Introduction

In August 2005, we set out to use the Wilson-Blower Method to determine the number of antiretroviral treatment sites per district in the province of KwaZulu-Natal Department of Health (KZN-DOH). Our assessment took into account the population served and the number of existing sites. In doing so, we highlighted the gaps (Malangu, 2005). The particular interest in Kwazulu-Natal stemmed from the fact that this province is one of the most affected provinces in South Africa. Although the prevalence is seemingly decreasing, it is still higher in comparison to other provinces (Figure 1). Between 2009 and 2011, overall, the HIV prevalence among pregnant women decreased from 39.5% to 37.4%; while in teenagers, it decreased from 22% to 16.8%; and from 37.2% to 33.3% among young adult women aged 20 to 24 years old (National Department of Health, 2012). Moreover, there is also a huge disparity across districts within the same province; the highest prevalences of HIV in pregnant women were recorded in two districts, Ugu (41.7%) and Mkhanyakude (41.1%) (National Department of Health, 2012).

Wilson and Blower (2005) developed a mathematical model that could inform policymakers' decisions regarding the optimal distribution of treatment sites to ensure equal access by all individuals infected with HIV. Applying this tool to the province of KwaZulu–Natal, Wilson and Blower were able to estimate that 54 ART sites would lead to the greatest fairness in the geographical distribution of ART. Subsequently, Malangu (2005) using the above finding and taking into account the population per district, the estimated 54 ART sites were apportioned to each district.

This commentary is about an evaluation conducted to review the progress made by the Province of KwaZulu-Natal in scaling up antiretroviral treatment sites (ART). Additionally, we explore the challenges of human resources associated with the scaling-up of ART sites. In doing so, it is hoped that other decision-makers could learn from the experiences from KwaZulu-Natal as they expand ART services to their patients.

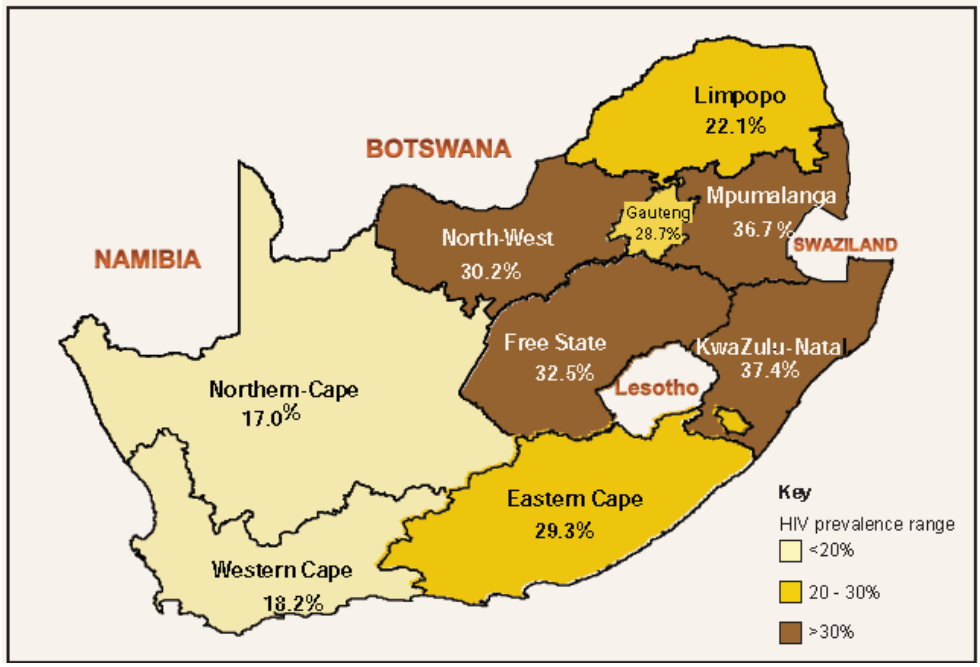


Figure 1. HIV Prevalence in pregnant women per province (Source: 2011 National Surveillance data)

2. Methods

The main document reviewed for this paper was the 2010 Annual Report from the Department of Health of Kwazulu-Natal province. Other relevant literature was also consulted as well as some data from the 2013 Annual Reports of Kwazulu-Natal and Gauteng provinces. Based on data from the 2010 Annual Report of Kwazulu-Natal province, the findings are summarized in Tables 1 to 3.

Table 1. Number of Antiretroviral Treatment Sites and patients by December 2010

District	Actual # sites by 2010	# sites predicted	Status by 2010	# patients registered	AVG # patients per site
DC-21-Ugu	4	4	Achieved	32,005	8001
DC-22-Umgungundlovu	11	5	Exceeded by 2	41,126	3739
DC-23-Uthukela	3	4	Short of 1	26,722	8907
DC-24-Umzinyathi	4	3	Exceeded by 1	15,984	3996
DC-25-Amajuba	4	3	Exceeded by 1	16,557	4139
DC-26-Zululand	9	5	Exceeded by 4	22,910	2546
DC-27-Umkhanyakude	5	3	Exceeded by 2	34,302	6860
DC-28-Uthungulu	10	5	Exceeded by 5	37,437	3744
DC-29-iLembe	8	3	Exceeded by 5	20,576	2572
DC-43-Sisonke	7	2	Exceeded by 5	15,076	2154
Durban-eThekwini	24	17	Exceeded by 7	77,861	3244
Total	**89**	**54**	**Exceeded by 35**	**340,556**	**Average=AVG= 4537**

Legend: # = number

Table 2. Population size per district

District	% Population	# Population	# sites by 2010	% sites	% difference
DC-21-Ugu	7.0	711,117	4	4.5	-2.5
DC-22-Umgungundlovu	9.0	914,294	11	12.4	3.4
DC-23-Uthukela	7.0	711,117	3	3.4	-3.6
DC-24-Umzinyathi	5.0	507,941	4	4.5	-0.5
DC-25-Amajuba	4.0	406,353	4	4.5	0.5
DC-26-Zululand	9.0	914,294	9	10.1	1.1
DC-27-Umkhanyakude	6.0	609,529	5	5.6	-0.4
DC-28-Uthungulu	9.0	914,294	10	11.2	2.2
DC-29-iLembe	5.0	507,941	8	9.0	4.0
DC-43-Sisonke	5.0	507,941	7	7.9	2.9
Durban-eThekwini	34.0	3,453,999	24	27.0	-7.0
Total	**100.0**	**10,158,820**	**89**	**100.0**	

Legend: # = number

Table 3. Number of Professional staff at ART sites

District	Expected # professionals per district			Actual # posted professionals per district			Actual # posted professionals per site		
	Medical Officers	Professional Nurses	Pharmacists	Medical Officers	Professional Nurses	Pharmacists	Medical Officers	Professional Nurses	Pharmacists
DC-21-Ugu	64	128	64	37	95	15	**9**	**24**	4
DC-22-Umgungundlovu	82	165	82	48	122	19	4	11	2
DC-23-Uthukela	53	107	53	31	79	13	**10**	**26**	4
DC-24-Umzinyathi	32	64	32	19	48	8	5	12	2
DC-25-Amajuba	33	66	33	19	49	8	5	12	2
DC-26-Zululand	46	92	46	27	68	11	3	8	1
DC-27-Umkhanyakude	69	137	69	40	102	16	8	**20**	3
DC-28-Uthungulu	75	150	75	44	111	18	4	11	2
DC-29-iLembe	41	82	41	24	61	10	3	8	1
DC-43-Sisonke	30	60	30	18	45	7	3	6	1
Durban-eThekwini	156	311	156	91	231	37	4	10	2

Legend: # = number

3. Results

Overall, the prediction that 54 ART facilities were required for equitable distribution of antiretroviral treatment has been exceeded. Based on the calculations performed in 2005, one district, Ugu, achieved the number predicted; and another, Uthukela was short of one facility as shown in Table 2. The remaining districts exceeded the target by setting up one to seven more ART facilities.

By the end of 2010, the average number of patients was 4,537 per site; however, in three districts, namely, Umkhanyakude, Ugu and Uthukela, there were more than the average number of patients per facility. As shown, in Table 2, these three districts as well as the Ethekwini district had less than the required number of sites based on the populations in their catchments.

These disparities were such that Ugu and Uthukela districts which hold each 7% of the population had respectively 4.5% and 3.4% of ART sites. Similarly, Ethekwini district that has 34% of the population, held 27% of ART sites.

Overall, by 2010, 89 ART sites had been established. Recent data show that the number of facilities providing ART services increased from 89 ART sites in 2008 to 608 by mid-2013. The total number of patients on ART increased from 225,389 patients in 2008 to 726,338 patients by mid-2013, with about 178,927 new patients having been initiated on ART during 2012 (Kwazulu-Natal Department of Health ans Social Welfare, 2013).

Another positive finding was that there was a decrease in the number of patients lost to follow-up. There were 6.3% (21.541.0 out of 340,556.0 registered patients) by 2010, but there are now 4.1% (29,477.0 out of 726,338 registered patients; of this number, 7,386.0 patients or 1% of them being reported dead. This increase is due to

the introduction of a new initiative called "Nurse Initiated and Managed ART (NIMART)"; since 2010, a total of 1,578 nurses have been trained on NIMART and certified to prescribe ART (KZN-DOH, 2013).

4. Discussion

The above findings suggest two things, firstly that the Wilson-Blower model was useful in predicting the initial number of sites required but the effect of the scaling-up of antiretroviral treatment had been missed. Secondly, although the predicted number of sites was exceeded, there is still need for more sites for two reasons.

The first reason is that the provincial department of Health of Kwazulu-Natal has not yet met the national target for ART coverage. It is reported that 60% of people who need ART in this province, actually receive it; this is well below the national target of 80% (KZN-DOH, 2010; NDOH, 2003).

The second reason is the shortage of human resources coupled to its maldistribution in this large province; it seems that an average of 4537 patients per site is still too high when the number of professional staff members is taken into account as explained below. For most remote and rural areas, there is a need for sites that are closer to them. For instance, in comparison to Gauteng Province, ART is available from 90.3% of all public health facilities. There are 5,582 nurses that have been certified to initiate and manage ART in Gauteng, almost three times the corresponding figure for Kwazulu-Natal as stated above (Gauteng-DOH, 2013).

With regard to the targets set for human resources, nationally, the optimal staff complement needed to deliver ART was set as 1 medical officer; 2 professional nurses; 1 pharmacist; 1 dietician/nutritionist; a part-time (50%) social worker, per 500 patients (NDOH, 2003). Hence, based on the average of 4537 patients per site (Table 1), one would have expected 9 medical officers, 9 pharmacists and 18 professional nurses per site. As shown in Table 3, none of the districts met the target for pharmacists; however, Ugu, Uthukela, and Umkhanyakude exceeded the target for professional nurses; Ugu met the target for medical officers, while Uthukela exceeded it (26 instead of 18).

Furthermore, the national targets were still not met based on the number of registered patients and the number of posts filled in; the vacancy rates are high and have been estimatd to be as high as 25.7% for professional nurses, 41.6% for medical doctors, and 76.4% for pharmacist (KZN-DOH, 2010). Hence based on the number of existing staff members, it is can be calculated that, on average, the actual staff complement in 2010 was one professional nurse for 336 patients instead of 250; 1 medical officer for 856 patients instead of 500; and one pharmacist for 2119 patients instead of 500. Thes figures show that the shortage of pharmacists is more severe than that of medical officers and nurses (Table 3). It is clear that filling the posts for pharmacists represents one of the major challenges in the near future. This situation calls for a redefinition of pharmacy staffing norms: should the number of pharmacists continue to be used as a target or rather the number of pharmacist' assistants?

It is my opinion that a revised target should rather be set for five pharmacists' assistants per site with 4500 patients. This is based on 20 working days per month on which ART patients are served, 225 patients per day (4500/20), 10 minutes spent per patient, 48 prescriptions dispensed (eight working hours=480minutes/10) per assistant per day. Since it is faster and even cheaper to train pharmacists'assistants than pharmacists, intensifying the training program for pharmacist'assistants could assist in addressing the shortage of pharmacy personnel required to do the dispensing of antiretroviral and other medicines.

Finally, further research is needed to establish whether the suggested staffing targets correlate with the actual workload and how satisfied, staff members and patients are (MSH and WHO, 2006; van Rensburg et al., 2008; Mayosi et al., 2011).

In conclusion, the predicted number of ART sites by Wilson and Blower method was largely exceeded within 5 years of their prediction. Two major challenges still lurking into the ART program were the accessibility of ART by those who need it and the shortage of professional human resources particularly pharmacy staff. Innovative strategies are needed to address the shortage of health professionals and related disparities in order to increase access to ART.

References

Gauteng Department of Health. (2013). Annual Report 2012/2013. Retrieved December 1st, 2013, from http://www.health.gpg.gov.za/Documents/Annualreport2012-2013GautengDepartmentHealth.pdf

Kwazulu-Natal Department of Health. (2010). Annual Report 2009/2010. Retrieved January 30, 2011, from http://www.kznhealth.gov.za/

Kwazulu-Natal Department of Health. (2013). Annual Report 2012/2013. Retrieved October 30, 2013, from Available at: http://www.kznhealth.gov.za/

Malangu, N. (2005). Estimating the number of antiretroviral treatment facilities based on the Wilson–Blower method. *PLoS Med, 2*(8), e270.

Mayosi, B. M., Mekwa, N. J., Blackburn, J., Coovadia, H., Friedman, I. B., Jeenah, M., & Paruk, F.; National Health Research Committee. (2011). *Strengthening research for health, innovation and development in South Africa: Proceedings and recommendations of the 2011*. National Health Research Summit 26 - 27 July 2011.

Management Sciences for Health (MSH) & World Health Organisation (WHO). (2006). *Tools for planning and developing human resources for HIV/AIDS and other health services*. Cambridge, Massachusetts & Geneva, Switzerland.

National Department of Health. (2003). *Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa*. Pretoria: NDoH.

National Department of Health. (2011). National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa, Epidemiology and Surveillance.

van Rensburg, D., Steyn, F., Schneider, H., & Loffstadt, L. (2008). Human resource development and antiretroviral treatment in Free State province, South Africa. *Human Resources for Health, 6*, 15. http://dx.doi.org/10.1186/1478-4491-6-15

Wilson, D. P., & Blower, S. M. (2005). Designing equitable antiretroviral allocation strategies in resource-constrained countries. *PLoS Med, 2*, e50. http://dx.doi.org/10.1371/journal.pmed.0020050

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Being at Peace as an Important Factor in Acquiring Teaching Competency by Iranian Nurse Teachers: A Qualitative Study

Hormat Sadat Emamzadeh ghasemi[1,2], Forough Rafii[3], Mansoureh A. Farahani[3] & Nooreddin Mohammadi[3]

[1] Schools of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

[2] Department of Nursing Management, Schools of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

[3] Center for Nursing Care Research, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

Correspondence: Mansoureh A. Farahani, Assistant Professor, School of Nursing and Midwifery, Iran University of Medical Sciences, Rashid Yasemi St, Valiasr Ave, Tehran, Iran. Postal code: 193954798, Tel: 98-218-879-4301. E-mail: m_negar110@yahoo.com

Received: November 23, 2013 Accepted: December 23, 2013 Online Published: February 24, 2014

doi:10.5539/gjhs.v6n3p109 URL: http://dx.doi.org/10.5539/gjhs.v6n3p109

Abstract

It is imperative to understand the factor that influence teaching competency. Therefore, it is necessary to study those that have an impact on the process of acquiring teaching competency. Competent nurse teachers have an important role in the achievement of nursing students and improving the quality of nursing education. However, few researches have focused specifically on the process of acquiring teaching competency in nurse teachers and its related factors. This study as a part of more extensive research aims to explore the factors influencing acquisition of teaching competency by Iranian nurse teachers. Grounded theory was chosen as the method. Eleven teachers from three nursing schools in Tehran were recruited. Data was generated by semi structured interviews during May 2011 to March 2013 and was analyzed through using constant comparison. Three main categories were emerged including "individual characteristics" (spirituality, professional interest, ethical conducts, knowledge expansion and reflective practice), "organizational factors" (management of educational systems, solidarity culture, student characteristics) and "socio-cultural factors" (social situations, and public definition of nursing). Nurse teachers who deal peacefully with the nursing profession and colleagues are responsible and committed to acquiring teaching competency. A suitable organization in nursing educational systems that is structured and ordered also encourages a peaceful approach by nurse teachers.

Keywords: teaching competency, nurse teachers, grounded theory, acquisition competency

1. Introduction

Prosperity toward superior nursing care quality within the complex and ever-changing health care and higher education environment requires nurse teachers with adequate knowledge, skills and abilities (Johnson-Farmer & Frenn, 2009; Thornlow & McGuinn, 2010). It is obvious that if the nurse teachers want to be successful in their profession, they need to achieve competency in nursing education. Teaching competency is required to train students who are capable and have a positive perspective to care (Holopainena, Hakulinen-Viitanenb, & Tossavainen, 2007; Johnson-Farmer & Frenn, 2009).

Teaching competency is the ability to meet the needs and requirements of the teaching profession, which manifests in teachers' actions and reactions as they apply an integrated set of knowledge, skills, and attitudes (Nijveldt, Beijaard, Brekelmans, Verloop, & Wubbels, 2005). Competency has been called as "knowing in action", that is an automatic response to the present condition based on internalized knowledge, which increases during a teacher's tenure (Lysaght & Altschuld, 2000).

Acquiring teaching competency by nurse teachers depends on their attitude and their profession's representative way of working, as well as the individual's interpersonal skills and characteristics (Holopainen, Hakulinen-Viitanen, & Tossavainen, 2007; Johnson-Farmer & Frenn, 2009). It requires the establishment of an interpersonal relationship that is influenced by different social conditions and contexts (Holopainen et al., 2007; Holopainen, Tossavainen, & Kärnä-Lin, 2008). Therefore, becoming a competent nursing teacher is a

multidimensional and dynamic process that is influenced by factors such as changing process in the organisation, the culture of health care, nurse teachers' professional self-esteem, the focus of nurse teachers' competence, their relationship with students, the future of their profession, and requirements for staying in the profession (Holopainen et al., 2008).

In the last couple of decades, many researchers have studied the action of nurse teachers and challenges to their competence throughout the world. However, more studies need to be conducted in this area because there are different expectations among societies in relation to professional competency and situations (Holopainen et al., 2007; Johnsen, Aasgaard, Wahl, & Salminen, 2002). In addition, the concept of teaching competency in nursing has cultural complexities that result from changes in societies, scientific and technical advances in nursing, experiences gained in the job, and the culture and working conditions in different countries (Holopainen et al., 2008; JafariGolestan, Vanaki, & Memarian, 2007).

It should be considered that the mission and primary goal of nursing schools is to train competent nursing student and thus to provide quality nursing services to patients (Johnson-Farmer & Frenn, 2009; Little & Milliken, 2007; Thornlow & McGuinn, 2010; Vanaki & Memarian, 2009), which it is not possible unless the nursing schools are equipped with competent nurse teachers. Therefore, deep knowledge of the factors influencing teaching competency by nurse teachers in every cultural and social context can help to overcome obstacles and supports the facilitators to design effective staff development programs for nurse teachers.

1.1 Background on Nurse Teachers in Iran

Most of the Iranian nurse teachers have a Master's degree (MSN) or PhD in nursing and are recruited based on their desire to work in nursing faculties. Most of the recruitments are based on the civil service system in Iran. Some of the nurse teachers, however, work part time who are employed without consideration of any criteria of teaching competency. Nurse teachers in Iran promote and achieve some degrees of professional competency by participation in staff development programs, doing research projects, publishing papers in nursing journals, and attending national or international conferences or workshops.

1.2 Aim

The aim of this study was to explore and describe the factors influencing the acquisition of teaching competency by Iranian nurse teachers

2. Method

This report is part of a doctoral dissertation aimed at shedding light on the process of acquiring teaching competency by nurse teachers. Gaining teaching competency is a dynamic process that occurs in a variety of socio-cultural contexts. Grounded theory is rooted in symbolic interactions (Jeon, 2004), and is sets out by researchers to discover patterns of behaviour among particular groups of people in specific contexts (Backman & Kyngäs, 1999). So grounded theory approach was used for data collection and analysis in this study (Corbin & Strauss, 2008), which is a suitable method to reach a deep and multidimensional understanding about acquiring teaching competency and its influential factors.

2.1 Participants and Data Collection

Data collection was started in May, 2011 and continued until March, 2013. Purposive sampling was used for selecting participants (Patton, 2002), which selecting criteria were that participants should be recognize as competent nurse teacher by peers, students, and heads of department. Theoretical sampling was used to maximize the opportunities to develop concepts and emerging categories (Corbin & Strauss, 2008). Therefore, data was collected by semi-structured interviews with competent nurse teachers in primary interviews and continued with theoretical sampling from others nurse teachers in subsequent interviews (n=11). Some of the interviews were carried out more than once to obtain further explanations or clarifications of certain statements (n=16). Saturation was reached after 10 interviews and analyses from 7 participants, which four additional participants were sampled to ensure the quality of the information. All of the participants were full time nurse teachers from three nursing schools of Tehran who two participants had masters' degree and nine had PhD in nursing education. The PhD nurse teachers consist of: Sex competent nurse teachers, two member of Iranian board of nursing and one was nurse teacher with more than 30 years experience in nursing education. The range of work experiences of them was 5 - 31 years (mean: 25.3 years). The interviews were carried out in the participants' offices and the correspondent author conducted all the interviews, which were guided individually and lasted between 30 minutes and 1.35 hours (mean: 1.0 hour).

Interview guide consisted of grand open ended questions to allow the respondents to explain their experiences as complete as possible. The participants were asked to explain their own experiences and perceptions about

teaching competency in nursing, and the situations which facilitate or hinter their teaching competency acquisition and also their strategies to overcome the barriers. For example: Please tell me about your teaching sessions in the school of nursing, Tell me about the first/ last days of teaching, What is your perception of teaching competency in nursing? Will you please tell me, which activities you usually doing to acquiring competency? How have you acquired teaching competency in nursing? What factors have been effective on teaching competency acquisition?

Probing questions were also used to clarify information and gain additional data. Participant recruitment, data collection, and data analysis continued until theoretical saturation was reached and a rich description of experiences was obtained. All interviews were tape-recorded and, transcribed verbatim and then analyzed with using constant comparative method (Corbin & Strauss, 2008). Data collection and analysis took place concurrently.

2.2 Data Analysis

Data analysis was carried out in four main phases. In the first phase, the data was examined for concepts, deriving codes from the interview data and distinguishing theory categories and their properties. Then, elaborate analysis was conducted by connecting the concepts to each other, crosscutting, comparing incident for similarities and differences, and theoretical sampling. In the next phase, which was done concurrently with the mentioned phases, the data was analyzed for context and identified sets of conditions that influence on acquiring teaching competency of nurse teachers. In the third phase, we identified strategies used by nurse teachers to deal the problems they face in process of acquiring teaching competency. The fourth and final phase focused on detecting core categories. Writing memos and story lines were used to cross-examine the data throughout the analysis. MAXQDA 2010 software was used to manage data.

2.3 Methodological Considerations

This study evaluated in terms of trustworthiness, credibility and dependability (Corbin & Strauss, 2008; Lincoln & Guba, 1985). Trustworthiness was used to make certain integrity and truthfulness from the start of the research process. In order to present a summary of the transcribed interviews with the initial codes were provided to the most of the participants as member checking to confirm that the researchers had real understanding from their world. In addition, a continuous comparison between data, codes and categories was made throughout the analysis. Credibility was established through the participants' confirmation of our understanding by member check, prolonged engagement with the field, peer check, external check and, maximum variation of sampling, also by presenting views from different participants who were purposely and theoretically chosen (Corbin & Strauss, 2008; Streubert & Carpenter, 2010). Dependability was assured by the fact that the same researcher, the correspondent author, performed all the interviews, analysis and transcriptions. The use of a tape-recorder and verbatim transcripts, as well as referring back to, and re-reading the transcripts during the analysis process, allowed the researcher to stay near to the text. The citations make it possible to assure conformability. Objectivity of the data was enhanced by ensuring theoretical sensitivity whereby the researcher put aside any preconceived ideas about the topic during the data analysis. Then, expert supervisors and faculty members checked the data and its objectivity.

2.4 Ethical Consideration

The Ethics Committee of Tehran University of Medical Sciences approved this research. All participants provided informed consent. We assured the participants of their anonymity and informed them that they could stop the interview at any time they wished. The researcher also obtained the participants' permission to audiotape the interviews to study and audit trail.

3. Findings

The findings showed that three main categories of "individual characteristics", "organizational factors and "socio-cultural factors" have influenced teaching competency in nurse teachers. Figure 1 depicts the emerged categories and their sub-categories.

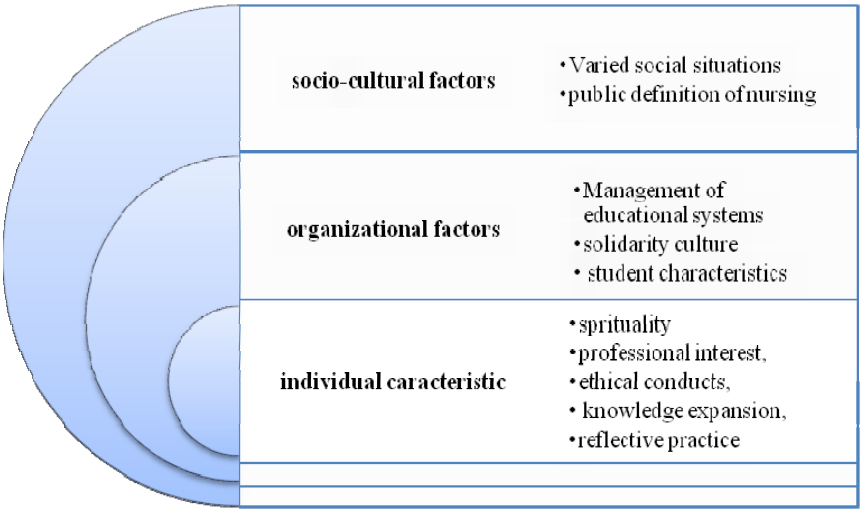


Figure 1. The factors influencing on teaching competency in the participants

3.1 Individual Characteristics

Individual characteristic as an intrinsic factor influenced teaching competency process in nurse teachers. This category consisted of five subcategories: "spirituality", "professional interest", "ethical conducts", "knowledge expansion" and "reflective practice".

3.1.1 Spirituality

For participants in this study, spirituality provided a sense of satisfaction and efficacy throughout the process of acquiring teaching competency. They tried to achieve spiritual goals and along with that came a sense of commitment and job accountability that encouraged them to improve their teaching competency. One of the competent nurse teachers stated (P_3): "*I always ask God to help me to develop my teaching and learning skills during the teaching process; this consideration has been very helpful, but whenever I neglect God or relay just on myself the learning results have been very poor"*.

Also, a sense of accountable to God led nurse teachers to be at peace with living and people that augmented the nurse teachers' capability and professional competency. One of the competent nurse teachers stated (P_2): *"We have to be accountable somewhere, the first is God, and God tells us help my people"*.

3.1.2 Professional Interest

For participants in this study, teaching competency depended on the level of interest in nursing and caring. They believed that different attitudes toward nursing education not only influence teachers' competency and ability, but also affected students' competency. One of the competent nurse teachers, stated (P_4): *"Thence, I accept nursing profession and adapt with nursing…so, my standpoint was always that our outcome must be for the patient"*. On the contrary, performance of the teachers with negative views about caring and nursing, effect as a barrier on the teaching competency process. In this regard, the other competent nurse teachers (P_5) quoted from some incompetent of her colleagues: *"Caring for patients and helping them is regarded as a degrading action for nursing students and nurse teachers",* also she stated: "*These teachers tell me that you lower their prestige"*. Hence, the different and opposing perspectives of nurse teachers and different levels of interest in nursing and caring influenced their teaching competency.

3.1.3 Ethical Conduct

The participants believed that their professional ethics resulted in the development of students, the progress of their profession, and their own competency. The ethical behavior of the teachers establishes good communication with their group manager and colleagues. For instance, the teachers' commitment to performing the duties perfectly and solving the existing problems resulted in their greater efforts for the acquisition of teaching competency. One of the competent nurse teachers stated (P_1): *"I can work properly with head nurses in clinical settings; also, I can get along well with the group manager. For example, very often, the group manager asks me to not take this or that lesson because teacher X is taking it. I simply get along with her"*. In this regard another competent nurse teacher stated (P_7): "*When we become seniors (in nursing education) as some*

competencies, we should help juniors' promotion and this very thing conveys more energy to us to move forward and become more competent". So being at peace with others and loving them will result in improving teaching competency in nurse teachers.

3.1.4 Knowledge Expansion

For the participants, knowledge expansion was one of the effective teacher's characteristics in the process of achieving teaching competency. The participants declared that in order to develop their knowledge, they did self-study, participated in scientific conferences, attended in clinical settings, and also in other teachers' classes. In this regard, one of the nurse teachers stated (P_3): "*I try to study before going to class and review the content which I want to teach, because I believe that my pervious knowledge is not enough".* Another teacher stated (P_6): *"I had just finished my Master's degree and I had to be a nurse teacher for students in critical care unit. So, I myself went to the unit in the afternoons to learn more".*

3.1.5 Reflective Practice

By working more and studying harder, learning from previous experiences, and reflection on what they had learned, the participants consistently took measures to improve their teaching quality. In this regard one of the competent nurse teachers stated (P_1): "*I thought a lot on a series of teaching principles which I had learnt in the teaching courses".* Another participant stated (P_7): *"We should recall our previous experiences and try to learn from the events that happened to us".*

3.2 Organizational Factors

This category consisted of three subcategories including "management of educational systems", "solidarity culture", and "student characteristics".

3.2.1 Management of Educational Systems

From the teachers' views, management of educational systems in terms of decision making, implementation of rules and regulations, staff development and evaluation programs should be in such a way to provide the teachers with a sense of security and peace in the job environment or a sense of disappointment. One of the competent nurse teachers stated (P_4):*"When you see that the system is not the one you can exercise your thoughts and ideals, you'd rather give up and stop"*. Also, the promotion of teachers and evaluation of their performance based on quantitative rather than qualitative criteria played an inhibitive role in the process of acquisition competency in nurse teachers. In this regards, one of the competent nurse teachers stated (P_1): "*New rules limit us more each day. They say you have to have two papers indexed in ISI. It preoccupies the teachers or makes them put force on students to write these papers or they do it themselves, because this is what brings promotion, not a good class".*

3.2.2. Solidarity Culture

Existence or lack of solidarity among colleagues was a subcategory of organizational factors which affected on acquiring teaching competency. As a result, encouragement and persuasion of peers and providing sincere and respectful feedback to each other facilitated the process of teaching competency acquisition. As an example, a competent nurse teacher said (P_1): "*In the first session of my class, Dr. X came with me and after the class said that I taught very well, he encouraged me very much and I taught the next session more comfortably and more easily because of his encouragement. … My colleague was an important factor in my improvement".*

3.2.3 Students' Characteristics

Since effective teaching was associated with the students' motivation and their tendency to learn, teachers had different educational conducts and motivations. They performed different activities to achieve competency which were proportionate to different behaviors and feelings of their students (P1): *"I feel a severe decline…I think with myself that students are no longer interested in science, they don't like to learn".* And another participate stated (P_3): "*My satisfaction and success is different at different periods, because students themselves are different".*

3.3 Socio-Cultural Factors

This category consisted of two subcategories including "various social situations" and "public definition of nursing".

3.3.1 Various Social Situations

The teachers who encountered various situations in their work and society could attain teaching competency easier than others: "*I dealt with different fields. I learnt some things from the pharmacist, some things from the*

psychiatrist, etc. Each one somehow influenced me". Different situations and opportunities that nurse teachers encountered in their profession made them more competent than their counterparts.

3.3.2 Public definition of nursing

Public definition of nursing profession and the social stand of nurses provided various levels of motivations for the teachers to acquire competency: "*Professional anonymity in the society is a barrier…in addition, lack of a specific definition of nursing and its power in health systems are other barriers. These barriers are challenging for us and inhibit us to accept the profession of nursing and get competency".*

4. Discussion

The findings of this study indicated that teaching competency for nurse teachers was influenced by individual characteristics of the nurse teachers, organizational factors in nursing educational systems, and socio-cultural factors in their living and background. In addition, the findings indicated that the participants' characteristics and their interest about nursing profession and colleagues had an important role in acquiring teaching competency and confronting the existing challenges in the way of acquiring teaching competency. In a qualitative study by Holopainen et al., teaching in nursing profession was introduced as a multidimensional and dynamic process, which was influenced by factors such as the process of organizational changes, the culture of governing health care and social systems, the teachers' professional self-confidence, their interaction with students, their image of their future occupation, and their personal needs and characteristics (Holopainen et al., 2008; Holopainen, Tossavainen, & Kärnä-Lin, 2009). The findings of our study also showed that most of these factors such as professional characteristic of nurse teachers, peaceful interactions of teachers (as a cultural value), and the culture of their organizations and managerial systems had the greatest effect on their teaching competency. Consequently, the nurse teachers, based on their individual characteristics and their attitudes towards nursing and teaching, tried to respect the cultural values and acquire teaching competency.

The nurse teachers, according to their views and acceptance of nursing profession, performed different activities in the teaching career. Some of them who had positive views about the concept of nursing and nursing teaching dealt with peacefully and always tried to develop nursing capabilities in their students and their selves. Also, they tried to solve problems in clinical nursing and nursing education. Likewise, Holopainen et al. (2009) indicated that the commitment of nurse teachers was as a main factor of nurse teacherhood and played a pivotal role in their teaching activities. Therefore, it can develop different capabilities for these teachers based on the levels of commitment to the teaching profession (Holopainen et al., 2009). In our study, the teachers who had interest in and commitment to nursing profession tried to have a complete understanding of the educational contents, to transfer knowledge to others better, and to facilitate the process of education. In this process, the nurse teachers, had a feeling of commitment to the nursing profession, tried to develop competency and empowerment in their students, and solve the existing problems in the system. Moreover, such endeavors resulted in an increased professional competency of the teachers.

Johnson et al. (2009) described that the process of becoming an excellent nurse teacher was changing from 'instiller' to 'facilitator' and laid the foundation for continued development of our teaching in nursing (Johnson-Farmer & Frenn, 2009). Therefore, it can be argued that by fostering the facilitative role of the nurse teachers, it will be possible not only to achieve success in effective teaching to nursing students, but also to further foster the teachers' capabilities and competency. According to the findings of the present study, by facilitating the students' learning and increasing their capabilities, the competent teachers themselves acquired more capabilities and competency based on the principle of "reciprocal effect of functions": *"This world is the mountain and our action the shout: the echo of the shouts comes (back) to us" (Maulana Rumi, 1925).*

In addition, the findings of the present study showed that nurse teachers with lower degrees of commitment and interest in nursing profession not only place in lower levels of nursing teaching competency, but also do not possess the necessary job satisfaction from performing nursing activities and teaching its specific skills and features. Such teachers, as stated by the participants, were regarded as barriers to the acquisition of teaching competency for other teachers. In general, teaching and nursing education are dependent on a representative way of professional working, interpersonal skills, and the teacher's personal characteristics (Holopainen et al., 2007). If the interpersonal skills and relationships of nurse teachers in the work environment are not for the actualization of supreme organizational goals, they can be considered as a barrier to the acquisition of job competency and empowerment for nurse teachers.

It is obvious that, since teachers need to establish interpersonal relationships, they are influenced by different social situations and contexts (Holopainen et al., 2007). The findings of our study showed that the existence or absence of solidarity among colleagues, as a subcategory of organizational factors, influenced teaching

competency acquisition. Peers' encouragement and persuasion long with providing sincere and respectful feedbacks facilitated the process of teaching competency acquisition. In this regard, is believed that the interface between practice and theory of ethics should be unifying by the harmony created by being at peace with one's cultural values (Mpeli & Monnapula-Mapesela, 2009). In our study, the teachers were at peace with their colleagues and their cultural organization values; they tried to develop unity, create a spirit of cooperation in the work environment, and receive more help and cooperation from their colleagues. These teachers possessed ethical values and professional ethics, made provisions for acquiring teaching competency.

It has been argued that the individual characteristics of teachers are as influential factors in nursing education (Najafi Kalyani, Sharif, Nahid, & Shahnaz, 2011). Price (2010) also regarded the personal factors in teachers as a determinant of their reactions to their work load in colleges and their abilities in reaction to work environment stresses. The findings of our study also indicated that the individual factors of teachers were one of the three major categories of influential factors in teaching competency acquisition. According to other studies, this factor is necessary for a nurse teacher to enter the field of education and to promote these competencies in clinical setting (Johnson-Farmer & Frenn, 2009; McAllister & McKinnon, 2009).

The participants had different behaviors based on their own commitment and perspectives towards the nursing profession and nursing education. Therefore, they experienced different levels of empowerment and satisfaction which finally resulted in different educational outcomes. The findings of the present study showed that the nurse teachers' views about the nursing profession and their relationships with colleagues were important elements of individual characteristic. Nurse teachers with dealing peacefully toward nursing profession and colleagues are responsible and committed to acquiring teaching competency and overcoming the obstacles in process of teaching competency.

5. Conclusion

Teachers' activities in the acquisition of competency were according to their attitudes towards nursing profession, colleagues, and all other people. Therefore, the process of acquiring competency by nurse teachers is situated on a spectrum with complete teaching competency in nursing on one end, and incompetency on the other end. However, it is difficult to place nurse teachers in one of the extremes because of the dynamic nature of human beings, education, and nursing profession. In addition, different levels of "being at peace" with profession, colleagues and people would result in different levels of teaching competency for the nurse teachers. They are always in the process of development and dynamism, based on their views about and definition of nursing, humanity, and commitment. Hence, they reveal different behaviors and reactions to the existing challenges in the process of competency acquisition. In other words, despite various intrinsic and extrinsic factors that could act as barriers or facilitators in the way of competency acquisition, if nurse teachers possess individual characteristics with positive attitudes and dealing with peacefully could easily pass the process of teaching competency acquisition with success and move towards supremacy.

Acknowledgements

The authors would like to thank the participants for their sincere cooperation during the different stages of this study. The budget for conducting this study was provided by the Faculty of Nursing and Midwifery, Iran University of Medical Sciences.

References

Backman, K., & Kyngäs, Helvi A. (1999). Challenges of the grounded theory approach to a novice researcher. *Nursing & Health Sciences, 1*(3), 147-153. http://dx.doi.org/10.1046/j.1442-2018.1999.00019.x

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, California: SAGE.

Holopainen, A., Hakulinen-Viitanen, T., & Tossavainen, K. (2007). Nurse teacherhood: systematic descriptive review and content analysis. *International Journal of Nursing Studies, 44*(4), 611. http://dx.doi.org/10.1016/j.ijnurstu.2006.04.004

Holopainen, A., Tossavainen, K., & Kärnä-Lin, E. (2008). Substantive theory on commitment to nurse teacherhood. *Nurse Education Today, 28*(4), 485. http://dx.doi.org/10.1016/j.nedt.2007.07.011.

Holopainen, A., Tossavainen, K., & Kärnä-Lin, E. (2009). Nurse teacherhood and the categories influencing it. *Journal of Research in Nursing, 14*(3), 243-259. http://dx.doi.org/ 10.1177/1744987108098140

JafariGolestan, N., Vanaki, Z., & Memarian, R. (2008). Organizing "Nursing Mentors Committee": an Effective Strategy for Improving Novice Nurses' Clinical Competency. *Iranian Journal of Medical Education, 7*(2),

237-246.

Jeon, Y. H. (2004). The application of grounded theory and symbolic interactionism. *Scandinavian Journal of Caring Sciences, 18*(3), 249-256. http://dx.doi.org/10.1111/j.1471-6712.2004.00287.x

Johnsen, K. O., Aasgaard, H. S., Wahl, A. K., & Salminen, L. (2002). Nurse educator competence: a study of Norwegian nurse educators' opinions of the importance and application of different nurse educator competence domains. *The Journal of nursing education, 41*(7), 295.

Johnson-Farmer, B., & Frenn, M. (2009). Teaching excellence: What great teachers teach us. *Journal of Professional Nursing, 25*(5), 267-272. http://dx.doi.org/10.1016/j.profnurs.2009.01.020

Lincoln, Yvonna S, & Guba, eG. (1985). Naturalistic inquiry: Sage Publications, Beverly Hills, California.

Little, M. A., & Milliken, P. J. (2007). Practicing what we preach: Balancing teaching and clinical practice competencies. *International Journal of Nursing Education Scholarship, 4*(1). http://dx.doi.org/10.2202/1548-923X.1305.

Lysaght, R. M., & Altschuld, J. W. (2000). Beyond initial certification: the assessment and maintenance of competency in professions. *Evaluation and Program Planning, 23*(1), 95-104. http://dx.doi.org/10.1016/S0149-7189(99)00043-9

Maulana Rumi, J. M. (1925). *The Mathnawi of Jalaluddin Rumi* (R. Nicholson, A Ed.). Cambridge: Soham Hamsah. Retrieved from http://www.scribd.com/doc/18791792/THE-MATHNAWI-Book-1-2-RUMI

McAllister, M., & McKinnon, J. (2009). The importance of teaching and learning resilience in the health disciplines: a critical review of the literature. *Nurse education today, 29*(4), 371-379. http://dx.doi.org/10.1016/j.nedt.2008.10.011

Mpeli, MR, & Monnapula-Mapesela, MLE. (2009). *Scraping the surface: what is the bottom line regarding ethics.* Paper presented at the 31st Annual EAIR Forum in Vilnius, Lithuania.

Najafi kolyaee, M., Sharif, F., Jamshidi, N., & Karimi, S. (2011). Student's perceptions of effective teaching in nursing education: A qualitative study. *Iranian Journal of Nursing Research, 5*(19), 6-15.

Nijveldt, M., Beijaard, D., Brekelmans, M., Verloop, N., & Wubbels, T. (2005). Assessing the interpersonal competence of beginning teachers: The quality of the judgement process. *International Journal of Educational Research, 43*(1), 89-102. http://dx.doi.org/10.1016/j.ijer.2006.03.008

Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*. Thousand Oaks, CA: Sage.

Price, M. J. (2010). *The Lamp of Sacrifice: Professional Identity and Work Culture.* University of Exeter (E-Library). Retrieved from http://hdl.handle.net/10036/3070

Streubert, H. J., & Carpenter, D. R. (2010). *Qualitative research in nursing: Advancing the humanistic imperative* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.

Thornlow, D. K., & McGuinn, K. (2010). A necessary sea change for nurse faculty development: spotlight on quality and safety. *Journal of Professional Nursing, 26*(2), 71-81. http://dx.doi.org/10.1016/j.profnurs.2009.10.009

Vanaki, Z., & Memarian, R. (2009). Professional ethics: beyond the clinical competency. *Journal of Professional Nursing, 25*(5), 285-291. http://dx.doi.org/10.1016/j.profnurs.2009.01.009

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Violence against Women by Their Intimate Partners in Shahroud in Northeastern Region of Iran

Sepideh Hajian[1], Katayon Vakilian[2], Khadijeh Mirzaii Najm-abadi[3], Parastoo Hajian[4] & Mehrdad Jalalian[5]

[1] Department of Midwifery and Reproductive Health, Faculty of Nursing & Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[2] Department of Midwifery, Nursing and midwifery school, Arak University of Medical Sciences, Arak, Iran

[3] Department of Midwifery and Reproductive Health, Faculty of Nursing & Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

[4] Shohada-e-Tajrish Hospital, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[5] Electronic Physician, Mashhad, Iran

Correspondence: Sepideh Hajian, Ph.D. in Reproductive Health, Assistant Professor, Department of Midwifery and Reproductive Health, Faculty of Nursing & Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran. E-mail: Hajian74@yahoo.com

Received: January 13, 2014 Accepted: February 7, 2014 Online Published: February 27, 2014

doi:10.5539/gjhs.v6n3p117 URL: http://dx.doi.org/10.5539/gjhs.v6n3p117

The authors declare that they have no competing interests

Abstract:

Background: Violence against women is one of the worst consequences of cultural, political, and socio-economic inequalities between men and women. Intimate Partner Violence (IPV) has been identified as an important cause of morbidity from multiple mental, physical, sexual, and reproductive health outcomes. Nonetheless, the prevalence and related factors of this international problem have not been investigated extensively in some parts of the world.

The aims of this research were to determine the prevalence of physical and mental violence perpetrated by men against their intimate partners and to assess the associated factors of partner violence among women in Shahroud in northeastern region of Iran in 2010.

Methods: This Cross-Sectional study was conducted in Shahroud, in northeast of Iran in 2010. Cluster sampling was done from primary health service institutions, universities, public schools and governmental organizations throughout the city and six hundred married women completed the study. A structured questionnaire with 34 items was designed in three parts to assess the physically (10 items) and mentally (15 items) violent acts by a current intimate male partner and identify collative behaviors (9 items) of victims. The Logistic regression analysis was applied to determine the net effect of background variables on the IPV occurrence within the past year.

Results: About 20% of the participants experienced at least one type of physical violence. Increased risk of physical violence was positively associated with the younger age of the couple (OR=3.08, P< 0.05), lower education (OR=2.28, P<0.01) and having a semi-manual skilled occupation of husband (OR=3.62, P<0.05), husband's heavy cigarette smoking (OR=2.62, P<0.01), and his drug abuse (OR=2.1, P<0.05). About 85% of the women had experienced mental harassment within the past twelve months. Logistic Regression Analysis found that lower education (OR=3.06, P<0.01) and having semi-manual skilled occupation (OR=3.8, P<0.05) of husband, increasing years of marriage (OR=2.8, P<0.01), husband's heavy cigarette smoking (OR=2.3, P<0.01) and his abusing the use of drugs (OR=3.4, P<0.01) had significant associations with women's experience of mental violence.

Conclusions: Some socioeconomic characteristics such as educational level, occupational status of men, heavy smoking and drug abusing are associated with the occurrence of violence against one's intimate partner. Since

IPV is usually unreported, healthcare providers should be aware of the risk factors associated with domestic violence to be able to design preventive measures against its negative health outcomes in women.

Keywords: domestic violence, spouse abuse, battered women, Iran

1. Introduction

The term "intimate partner violence" (IPV) is used to describe the brawling bawling manner that happens between family members and close relatives. This situation has been identified as an important cause of morbidity from multiple mental, physical, sexual, and reproductive health outcomes. In addition, it is associated with a range of adverse consequences that have adverse effects on the health of the victims' children (Abramsky et al., 2011; Sadock et al., 2009). This problem is described as a shameful human rights violation, and it has short- and long-term impacts on women's health, including unsafe abortions, fetal distress during pregnancy, pre-term labor, low weights of newborns, venereal diseases, physical disorders, tendencies toward addictions, intention to commit suicide, depression and anxiety (Ngoc Do, 2013; Rahman et al., 2012; Rodrigues et al., 2008). International Conference on Population and Development (ICPD) has emphasized to reduce violence against women as one of the priorities for the health of communities, and elimination of violence against women is a central strategy for the achievement of women's empowerment and gender equality, which are the two main objectives of Millennium Development Goals (Elsberg, 2006).

According to WHO the global prevalence of physical and/or sexual intimate partner violence women was 30 % and the highest rates were reported from the African, Eastern Mediterranean and South-East Asia Regions (Peltzer & Pengpid, 2014). Population-based research has increased on this subject during recent years, and the prevalence of this health problem and associated factors differ globally across various populations. According to a large population-based, household survey on IPV against women conducted in 15 countries, the reported lifetime prevalence of physical or violence by a sexual partner, or both, varied from 15% to 71% (Garcia-Moreno et al., 2006). Nonetheless, the data are still limited from some regions, such as Asia - especially the Middle East - and a few studies have suggested different prevalence rates of IPV, i.e., 54% in Pakistan (Naeem et al., 2008), 23.1% in Syria (Maziak & Asfar, 2003), and 13.4% in Turkey (Toprak et al., 2009). Considering the negative consequences of this problem on the family's health, understanding the associated factors of IPV in different populations with different cultural norms, political circumstances, and laws requires more studies in this area.

There are some reports from a few studies about IPV in Iran, which is located in the Middle East. Iran has a population of 75 million people. It is relatively culturally diverse with several ethnicities in some rural, developed, and metropolitan regions. A few studies have indicated a wide range of IPV prevalence rates in Iran. Results from research in Urmia, a northeastern province in Iran, indicated that the most prevalent form of violence was physical violence (50%), followed by mental/emotional (25.7%) and financial (23.2%). These problems were more prevalent among illiterate and young women (Arefi, 2003). However, findings from two studies from Isfahan, a large central province (Malek Afazali et al., 2004), and Khuzestan, a southwestern province (Nuh Jah et al., 2011) showed that the most common form of violence against women was the verbal-mental form (up to 64% in Isfahan and 41% in Khuzestan), while the physical, sexual, and financial forms were next in that order. Hence, these statistics cannot be applied as being representative of the overall prevalence rate in Iran, because each region of the country has its own set of cultural norms and socioeconomic status. Nonetheless, the majority of studies in this area includes the capitals of provinces in Iran and do not encompass the other sites. Hence, further population-based studies are necessary, as Iranian studies on this topic in general are still limited.

The present study was undertaken in an attempt to deal with the above-mentioned issues, i.e., the lack of clear statistics, the difficulty in reaching people in some areas of the country, the paucity of documents about IPV in various parts of Iran, and the importance of IPV to the health of women. In addition, this research was accomplished in one of the northeastern cities in Iran, Shahroud, situated in Semnan Province for two main reasons. First, there was not any population-based survey to estimate the prevalence of partner violence rate in Shahroud and any document related to IPV was gathered and referred to the forensic medicine organization of Semnan Province and final statistics used to be reported for the whole province and data was not specific for Shahroud. Second, the authors as reproductive health researchers confronted battered women attending the health centers to receive reproductive health services in several situations while there was not routine case finding program for this issue in the health facilities, so such cases are usually ignored and remained as silent victims. Indeed, prior to preventing programs and social interventions, performing preliminary study to estimate the prevalence and identify the related factors of IPV can provide clear data for this purpose. Specific objectives

of the study were: a) To estimate the prevalence and intensity of two common forms of IPV, i.e., physical and mental violence by an intimate partner, and b) To determine the factors associated with the risk of first-time IPV among women in Shahroud, in north east of Iran.

2. Materials and Methods

2.1 Research design and Setting

The present cross-sectional study was accomplished for the first time in Shahroud among married women who had ever lived with an intimate partner in the past 12 months. Shahroud is a northeastern city in and capital of Shahroud County, Semnan Province, Iran. It is the largest and the most populous city of Semnan Province and its county has same position in the province. At the 2011 census, its population was 238,830, in 70,700 households (Statistical Center of Iran, 2012).

2.2 Sampling

2.2.1 Sample Size

According to the related Iranian literature and wide range of the IPV the sample size was estimated at 645 women, considering 15% attrition (using a single cross-sectional study formula):

$n= Z^2.p. (1-p). (DEFF) / d^2$

Where: Z=1.96, p=0.7, DEFF (Estimated design effect)=2, d=0.05

As the sample size required for a cluster study is larger than simple random sampling and our study's clusters may vary for some particular background variables, the DEFF considered around two, which means the variability is not the same as simple random sampling methods. We assumed that the greater DEFF increases the sample size and increase a desired level of precision. Although the present study was based on a relatively small sample size, 645 women, data were collected from four different directions in several and diverse sites across the city, so it seems that sample size was large enough to produce sufficient power for a number of effects to be statistically significant.

2.2.2 Sampling Methods

Using the multi-stage sampling method first, the list of primary health services, universities, public schools, center of women group meetings, and governmental organizations were listed throughout the city. The reason for selecting those localities was to increase the possible access to employed and unemployed women. In addition, "out-of-home sampling" was chosen for clients and patients at hospitals and primary healthcare clinics, because the security and/or privacy of women could not be guaranteed at their homes due to the probable presence of their family members. Second, in order to do a randomized cluster sampling, the city was divided into the four portions as, north, south, west and east areas. Then, from all governmental organizations, at least one organization was selected randomly. However, according to the sensitivity of the IPV issue, two organizations did not allow the researchers for sampling. Consequently, two public schools, two public hospitals, two universities, town council, the office of public health insurance and a private center of women group meetings in the city were randomly selected. On the other part, all 10 primary health services through the city were included into the clusters and the number of sampling units chosen from each center was based on its population.

2.3 Measurement Tool

We designed a structured questionnaire based on WHO's Study on Women's Health and Domestic Violence Against Women to assess the physically and mentally violent acts by a current or former intimate male partner (Garcia-Moreno et al., 2006). Although the questionnaire was validated and used formerly in other Iranian studies (Agha Khani et al., 2002; Farrokh, Eslamloo, & Booshehri, 2007; Kazemi & Navvabi, 2004), we modified and validated our instrument using the content validity index (CVI) for each item based on literature experts and representatives of the target population (Grant & Davis, 2006; Polit & Beck, 2006). At first, the questionnaire was developed with 39 items based on the related literature in this domain. Then, researchers asked eight experts from the Departments of Reproductive Health, Midwifery, Psychiatry, Psychology, Sociology, and Epidemiology at the medical university to rate items based on their relevancy to the study's objectives, simplicity, and clarity on a four-point scale. Then, items that had CVI values greater than 0.8 were retained, those with values in the range of 0.71 - 0.79 were returned to the researchers for reconsideration, and those that had values less of 0.70 or less were deleted. In addition, the experts were asked to suggest additional abusive items. Following this step, 20 eligible women from 10 separate households were asked to evaluate the scale for clarity, simplicity, and relevancy from the population's perspectives. The total CVI value of the questionnaire was estimated to be 0.74, and the final instrument consisted of 34 items that were designed to

assess physical and mental violence. Furthermore, we tested internal consistency ("reliability") using Cronbach's alpha. It is most commonly used when researchers have multiple, Likert-type questions in a questionnaire that form a scale (Gliem & Gliem, 2003). Cronbach's alpha coefficient reached 0.92 (excellent), 0.89 (good), and 0.88 (good) for physical abuse, mental abuse, and collative behavior items, respectively.

Finally, the instrument prepared for the study consisted of the following parts: 1) general and specific demographic questions possibly associated with domestic violence, such as a history of any kind of childhood violence, the duration of the marriage, the grade given the marriage by both people involved, the number of children and their genders, the presence of children from previous marriages, and living with relatives. We used housing tenure status instead of household income, because, in some internal pilot studies, most respondents had refused to provide income information, and owning a home was strongly associated with higher income. 2) Measurements for assessing two kinds of IPV within past 12 months - physical (10 items) and mental violence (15 items) and 3) adaptive or collative behaviors of victims (9 items) to identify how women collate or cope with the problem. A five-point Likert-type response format was used to assess women's experiences of violence in each part. Women were asked a group of questions about whether they had ever experienced any kind of physically and/or mentally violent act in the 12 months preceding the study. Women who did not report any violence on the part of their partners were categorized as 'never abused;' if they reported at least one violent act, they were categorized to 'mild violence,' and three to five violent acts were categorized as 'moderate violence,' and more than five violent acts were categorized as 'severe violence.' Every question was graded from the score of **0** for "never" to the score of **3** for "more than 5 times" for violent behavior. Hence, women who reported having experienced any act of physical and/or mental violence in the past year were categorized to 'current violence.'

2.4 Data Collection

Two separate trained researchers collected data from the centers among married women with several socio-economical statuses who had ever lived with an intimate partner in the past 12 months conducted sampling. After defining the study's objectives to the participants and obtaining their informed consent, they were assured that their verbal and written responses to the questions would be remained completely confidential. The questionnaires were anonymous and completed by participants. In case of illiteracy, trained female researchers asked the participants to answer the questions orally, and the researcher completed the questionnaire based on their responses. All interviews were conducted in a private room without the presence of a third party. During the study, women who needed counseling or treatment services were referred to the relevant sources of assistance if they asked for help. Data gathering was started on May 2010 and lasted for two months and six hundred women completed the study.

2.5 Ethical Considerations

Ethical approval for the study was obtained from the ethical review group and the Deputy of Research at the Shahroud University of Medical Sciences under code 8740. In addition, Informed consent was obtained from all study participants.

2.6 Statistical Analyses

Data were analyzed using SPSS software, version 17. Between-group differences were measured using the t- test and the one-way ANOVA test if the data had a continuous spread, and the chi-square test was used for categorical variables to test the association between the variables. We applied logistic regression to identify the factors associated with the likelihood of experiencing physical and mental violence by a spouse and by other significant partners. In case of missing data, that case was excluded from the analysis for the specific variable.

Estimation of odds ratio (OR) greater than 1 indicated as a risk factor for domestic violence, while an OR less than 1 indicated the presence of protective factors against domestic violence. However, our study had a cross-sectional design, and we analyzed the association between possible risk factors and domestic violence rather than a causality relationship. Statistical significance was considered at the 5% level.

3. Results

3.1 Participants' Socio-Demographic Characteristics

Among the 645 participants, 600 women completed the study. The mean age of the women was 36 (±11), and about half of them had husbands who were more than five years older than they were. The mean of the years of marriage was 15 (±11), and more than half of respondents were housewives. About 20% of participants did not have any children, more than half of them had two children, and one third had a daughter and a son. Less than 5% of the respondents and their spouses had experienced second marriages and less than 3% of them lived with their

children from previous marriages. Around 94% of participants lived in a nuclear family, including couple and children. Participants' characteristics are shown in Table 1.

Table 1. Characteristics of participants

Characteristics	n=600	percent
Woman's age		
15-25	107	17.8
26-35	178	29.7
36-45	163	27.2
≥ 46	152	25.3
Husbands' age		
15-25	109	18.1
26-35	186	31.0
36-45	132	22.0
≥ 46	173	28.9
Woman's education (years)		
0 t0 5	95	15.8
6-12	270	45
> 12(college)	235	38.2
Husbands' education (years)		
0 to 5	88	14.7
6-12	298	49.7
> 12(college)	214	35.6
Woman's occupation		
housewife	311	51.7
semi-manual skilled(laborer)	17	2.8
Official employed	206	34.5
Self-employed	66	11
Husbands' occupation		
Official employed	275	45.8
Self-employed	234	39.0
Manual skilled	49	8.2
semi-manual skilled(laborer)	42	7.0
Housing tenure		
Owner occupied	330	55.0
Rented	192	32.0
others	78	13.0
Duration of marriage (years)		
Up to 5	153	25.5
6-10	142	23.7
11 and more	305	50.8
Husband's smoking (≥25 cigarettes/day)*	127	22
Husband's drug abusing*	44	7.3
Consanguinity marriage	64	19.6
History of any kind of reported child violence(yes)*	43	5.7

*Some data was missing.

3.2 Physical Violence

The study's findings showed that 19.6% of participants had experienced at least one kind of physical violence within the past 12 months, categorized as mild (11.4%), moderate (6.1%) and severe (2.1%) forms of physical abuse. Physically violent acts included pushing, jostling, slapping, fisting, kicking, or throwing objects at the women; however, we categorized whipping, purposeful burning, choking, and threatening with a knife to be severe abuse, even if they only occurred once.

A history of any kind of reported childhood violence in couples, gender of the children, age gap with the spouse, living with relatives (extended family versus nuclear form), housing tenure status, consanguinity marriage, duration of marriage, grade of marriage, and living with children from a previous marriage did not show any significant association with physical violence. Alternatively, the younger age of couples, primary education, being a housewife or engaging in semi-manual skilled work, heavy smoking, and drug abuse by the spouse were associated with increased risk of physical abuse in the past year compared to no reports using the Chi-square test (Table 2). All of the factors that were significant at the 5% level were included in the logistic regression analysis. We used the Enter method for these analyses. After adjusting for background variables in the model, variables, such as the age of woman, educational level of the spouse, the husband's occupation, heavy cigarette smoking, and drug abusage of the spouse, remained significant factors in the final model associated with having experienced physical violence by the spouse. The younger age of women was strongly associated with increased risk of having experienced physical violence, since women aged 15 to 25 about three times more likely (P=0.013) to have experienced physical violence than women older than 35, and those in the age range of 26 to 35 were about 2.4 times (P=0.035) more likely to have this experience than older women. Moreover, women whose husbands' educational levels were 0 to 6 years and 6 to 12 years were about 2.3 times (P=0.001) and 2 times (P=0.007), respectively, more likely to experience physical violence compared to those women whose husbands had higher levels of education. Also, women whose spouses were working as manual laborers and semi-manual skilled workers were 2.9 (P=0.016) and 3.6 times (P=0.03), respectively, more likely to report physical violence than women whose spouses were official employees. Women whose spouses smoked 25 or more cigarettes per day (heavy smokers) had about 2.6 times (P=0.001) the chance of experiencing physical abuse compared to women whose husbands were non-smokers. Likewise, women whose husbands were drug abusers were 2.1 times (P=0.02) more likely to report physical violence compared to those whose husbands were not drug abusers (Table 3).

Table 2. Descriptive data for demographic characteristics and OR and 95% CI for associations with physical and mental violence among study population (n = 600)

Variable	Physical violence OR (95% CI)	Mental violence OR (95% CI)
Woman's Age		
15-25	3.14** (1.48-6.63)	1.3 (0.6-2.7)
26-35	2.23* (1.08-4.61)	2.6* (1.9-3.6)
36-45	1.98 (0.94-4.18)	2.8* (1.82-3.15)
≥ 46	Reference	Reference
Husband's age		
15-25	1.80 (0.74-4.37)	1.22(0.99-3.34)
26-35	2.15** (1.25-3.70)	2.10* (1.12-4.45)
36-45	1.50 (0.82-2.73)	1.1 (0.2-2.5)
≥ 46	Reference	Reference
Woman's education (years)		
0 to 5	2.46** (1.32-4.59)	1.73* (1.02-3.1)
6-12	1.97** (1.20-3.24)	1.90* (1.11-2.50)
>12 (college)	Reference	Reference
Husband's education		
0 to 5	3.21** (1.55-6.64)	3.10** (1.72-5.66)
6-12	3.69*** (2.13-6.40)	3.44*** (1.98-6.60)
>12 (college)	Reference	0.6 (-0.78- 1.82)
Woman's occupation		
Housewife	1.66*(1.08-2.55)	2.2* (1.09-3.6)
Semi- manual skilled (laborer)	1.80* (1.1-3.4)	1.8* (1.1-2.4)
Official employed	Reference	Reference
Self- employed	1.04(0.98-1.34)	1.6* (0.81-2.8)
Husbands' occupation		
Official employed	Reference	0.7((-0.29- 2.02)
Self-employed	2.03** (1.24-3.31)	1.14 (0.50-3.11)
Manual skilled	5.83*** (2.92-11.60)	4.88*** (2.30-6.22)
semi-manual skilled(laborer)	7.15*** (2.81-18.21)	5.42*** (3.78-7.90)
Housing tenure		
Owner occupied	Reference	Reference
Rented	2.00* (1.27-3.17)	1.6* (0.89-5.28)
others	2.00* (1.06-3.76)	1.9*(0. 2-4.49)
Husband's smoking (≥25 cigarettes/day)		
Yes	3.27*** (2.06-5.20)	3.1*** (1.23-5.60)
No	Reference	Reference
Husband's drug abusing		
Yes	2.26** (1.15-4.44)	4.8*** (2.12-6.89)
No	Reference	Reference
Duration of marriage (years)		
Up to 5	-	1.2 (0.90-2.43)
6-10		2.8** (1.83-5.60)
11 and more		4.6*** (2.56-10.47)

OR= odds ratio, CI= confidence interval, Chi-square statistic significant at P<0.001* **, P< 0.01* *, P<0.05*.

Table 3. Factors related to physical violence using logistic regression

Variable	OR (95% CI)	P-value
Woman's age		
15-25	3.08* (1.26-5.35)	0.013
26-35	2.41* (1.06-5.50)	0.035
36-45	1.05 (0.86-4.73)	0.105
≥ 46	Reference	
Husband's education(years)		
0 to 5	2.28** (1.79-5.06)	0.001
6-12	2.0** (1.29-4.33)	0.007
>12 (college)	Reference	
Husbands' occupation		
Official employed	Reference	
Self-employed	1.35 (0.74-2.46)	0.316
Manual skilled	2.93* (1.21-5.10)	0.016
semi-manual skilled(laborer)	3.62* (1.13-4.88)	0.030
Husband's smoking (≥25 cigarettes/day)		
Yes	2.62** (1.51-4.52)	0.001
No	Reference	
Husband's drug abusing		
Yes	2.1* (1.51-2.82)	0.02
No	Reference	

*Adjusting variables were composed of the woman's age, the husbands' age, the woman's education, the husband's education, the woman's occupation, the husband's occupation, housing tenure, duration of the marriage, and the husband's cigarette smoking and drug abuse.

*** P<0.001, ** P<0.01, * P<0.05.

3.3 Mental Violence

We also determined that 85.5% of the participants reported at least one or more events of any kind of mental violence. Participants were more likely to suffer from mild (46.5%) and moderate (35.6%) degrees of mental harassment, but 3.4% of them had experienced severe mental violence within the 12 months. Mental violence was described as any form of offensive words, shouting and wrath, derision and humiliation, preventing one's wife from contact or visiting her parents or friends, physically locking up one's wife at home, unplugging the phone at home, patriarchal control over the family earnings and household income, preventing the wife from working or getting an education, skepticism about one's wife's faithfulness, and threatening to divorce or re-marry by the husband.

Table 2 shows the association between having experienced mental violence by one's husband and other background variables, such as age, educational level, occupation, housing tenure status, living in primary years after marriage, being a heavy smoker, and drug abuse by the spouse. For instance, housewives (P<0.05) and middle-aged women were found to have faced a significantly higher (P<0.01) proportion of mental violence by their husbands than employed and older women. Similarly, a significantly lower proportion of women who had higher education had experienced mental harassment compared to the situation in which both the woman and her husband had not completed their secondary education. In addition, a significantly lower percentage of women (P<0.001) whose husbands were official employees had experienced mental harassment compared to those whose husbands engaged in manual or semi-manual skilled work. As the years of marriage increased, women had a significantly higher (P<0.001) chance of being subjected to mental violence compared to those in the early years of marriage, and the highest prevalence rate was reported within the first 11-15 years of marriage, after which it decreased dramatically (P<0.001).

After adjusting for these variables, age and woman's occupation were excluded from the model due to their strong correlation with the husband's occupation and the duration of the marriage. However, low education level, heavy cigarette smoking, and drug abusage of spouse were significant factors associated with having

experienced mental violence by the spouse. Logistic regression analysis indicated a risk reduction in mental violence risk among women whose spouse had completed their secondary education; in other words, achieving a higher educational level by the husband was associated significantly with decreased mental harassment when compared to situations in which the husband had not completed his primary education. Furthermore, the most consistent protective effect against mental violence against woman was observed among women whose spouses were official employees than when husbands were engaged in a semi-skilled or non-manual skilled work ($P < 0.001$). Conversely, increasing the years of marriage was associated significantly with 2.8 times increased risk of mental harassment compared to the living within the primary years of marriage. Moreover, heavy smoking and drug abusage of the spouse remained significant as risk factors for mental violence against women. In the final model, those activities increased the risk to 2.3 and 3.4 times, respectively, compared to those did not report such activities (Table 4).

Table 4. Factors related to mental violence using logistic regression

Variable	OR (95% CI)	P-value
Husbands' education		
0 to 5	3.06** (1.14 -4.32)	0.001
6 to 12	2.7* (1.30-5.91)	0.03
> 12(college)	0.2** (-0.78-2.16)	0.008
Husband's occupation		
Official employee	0.4*** (-0.14- 2.99)	0.001
Self-employee	1.2 (0.8-3.06)	0.82
Manual skilled	3.5*** (1.35-3.45)	0.001
Semi-manual skilled	3.8. *** (1.68-4.90)	0.001
Duration of marriage(years)		
Up to 5	Reference	
6-10	1.6* (1.2- 3.22)	0.03
11 and more	2.8 ** (1.36- 4.20)	0.001
Husband's smoking(≥25 cigarette/day)		0.001
Yes	2.3** (1.76-3.96)	
No	Reference	
Husband's drug abuse		0.001
Yes	3.4*** (1.8-5.06)	
No	Reference	

Adjusting variables were composed of the woman's age, the husband's age, the woman's education, the husband's education, the woman's occupation, the husband's occupation, housing tenure, duration of the marriage, and the husband's cigarette smoking and drug abuse.

*** P<0.001, ** P<0.01, *P<0.05

We did not find any association between a history of any kind of reported childhood violence in couples, gender of the children, age gap with spouse, living with relatives (extended family), consanguinity marriage, grade of marriage, and living with children from a previous marriage with mental violence.

3.4 Collative Behaviors

At the end of the questionnaire, we assessed collative or adaptive behaviors of the victims who experienced any kind of IPV within the past 12 months. The findings indicated that more than half of the women (54.7%) had tried to negotiate with their spouses to resolve problems. Others preferred to give up and abandon the arguments (39.5%), to consult with family members (16.5%) or friends (11.8%), to engage in mutual fighting (15.4%), to leave home (1%), and to file a complaint in court (1%). Higher-educated couples and employed and older women (>35 years) tended to show more mutual negotiation compared to housewives, lower-educated women, and younger women (P<0.001). However, housewives tended to abandon the arguments with their spouses significantly more than employed women (P<0.05). Furthermore, mutual fighting and consultation with family or friends were reported significantly more often by younger and lower-educated women than others (P<0.001).

4. Discussion

Our findings showed that, although the reported IPV prevalence rate was lower than some internal and foreign studies (Agha Khani, Aghabiglooie, & Chehresaz, 2002; Bhuiya, Sharmin, & Hanifi, 2003; Diop-Sidibe, Campbell, & Becker, 2006; Farrokh, Eslamloo, & Booshehri, 2007; Koenig et al., 2003; Clark et al., 2009), domestic violence, especially mental violence, was widespread in Shahroud. In spite of the wide range of partner abuse (15% in Ethiopia to 71% in Japan) based on WHO's Multi-country Study at 14 sites (Abramsky, et al., 2011), methods and types of physical violence are different at different sites. For instance, in Bangladesh, it was described as beating with the hands or wood or kicking (Bhuiya, Sharmin, & Hanifi, 2003), while 98% of the women in our study and in similar research in Iran described it as pushing, shaking, having objects thrown at them, or being slapped (Malek et al., 2004; Farrokh, Eslamloo, & Booshehri, 2007; Hashemi, 2011). Although the prevalence and types of IPV vary in different regions, there may be under-reported data that are affected by the methods of data collection, privacy, and the context of the interviews (as was done in our case when the participants were illiterate) and cultural norms that influence the estimation of the precise prevalence rates and types of IPV across the world. In communities, such as our Iranian society in which physical violence is considered a social crime and has legal fines, the prevalence of physical abuse may decline; conversely, the possibility of mental harassment may increase. Studies has shown that long-term mental violence by a partner is associated with negative health outcomes, such as depressive symptoms, chronic disease, and chronic mental illness (Naeem et al., 2008), and when both kinds of IPV are included in the logistic models, higher mental abuse rates were more strongly associated with these health outcomes than were physical abuse rates (Do et al., 2013).

The results of our study showed that educated and older women were less likely to experience physical violence by their spouses, and this was in agreement with the conclusions in similar studies conducted in Urmia (Arefi, 2003) and Ardabil (Narimani & Aghamohammadian Sherbaaf, 2005), two northwestern provinces in Iran. In addition, the protective effect of education against physical and mental violence appeared better when both the woman and her spouse had completed secondary education. Results from studies confirm such findings and explain the necessity of both females and males having access to educational attainment according to the Millennium Development Goals, especially in developing areas (Ahmad et al., 2007; DaFonseca et al., 2010; Diop-Sidibe et al., 2006). Presumably, young women who are usually less mature to handle marital relationships may also be economically vulnerable and at risk of submitting to man abuse (Shamu et al., 2011). It is believed that the more educational experience that girls attain, the better they are prepared for coping with the challenges of life. In addition, low-educated young women often lack enough experience in marital life and are more emotionally and financially dependent to their husbands in most of situations, which makes them more likely prone to experience IPV (Naeem et al., 2008).

Low socioeconomic status was associated with greater risk of physical and mental violence in our study as it has been at other sites across the world (Abramsky et al., 2011). Sociology literature indicate that the more resources are accessible for people, the more people's capabilities are getting stronger by using power. Consequently, people who lack resources in the life, such as the financial or occupational resources, perceive no other source of power and are more likely to resort to violence; in other words, violence is considered as an ultimate resource, because it is used when other resources are not enough to achieve goals (Guruge, 2012). Another probable reason could be that the stress of handling the family expenses and the perception of occupational instability in most of manual and semi-manual skilled works may increase the risk of violence being perpetrated against wives. It has been stated that men living in poverty are unable to fulfill social expectations and the traditional role as a "successful man," so violent acts towards women are the result (Jewkes, 2002).

In families in which higher-educated women are involved in some form of occupation in which they earn money, the women often have more power in financial decision making and have greater autonomy in family affairs compared to housewives, and they are less likely to be prone to IPV by their spouses (Nojomi, Agaee, & Eslami, 2007). In the present study, the occupational status of women was associated with risk of IPV before making adjustments for other variables (Table 2), which may confound or mediate the effect of this variable on IPV risk. However, our findings did not prove that such a difference exists in this domain. Alternatively, it seems that, in societies in which women's status is in transition from low to high, as is the case in Iran, the risk of IPV tends to increase, because women have become aware of their own rights and seek enough power to challenge the authority of men (Naeem et al., 2008).

There also was an association between mental violence and the duration of marriage, as increasing the years of marrige increased the risk of mental violence against women, and this effect remained consistent after adjustment for other variables. However, there were some indications that women in newer relationships (less than five years) were at increased risk of IPV, compared to longer relationships (Abramsky et al., 2011). This

result was unlike findings observed for physical violence, as increased risk of physical violence in the past year was associated with the younger age of women in the primary years after marrige. An alternate interpretation for our finding may be that the burden of financial problems and elder children's needs increase along with their growing up, and the expectaion that these burdens should be met by the parents can lead to challenges between couples. Another reason that may account for the reduced inclination of husbands to commit physically violent acts toward their wives could be the presence of older children, which is not the case for younger couples.

Our study illustrates that women whose spouses were heavy smokers (≥25 cigarettes per day) and/or drug abusers were more likely to experience physiscal and/or mental violence than those whose spouse were not smokers or drug abusers. This finding is similar to those of other studies, which have found drug abuse to be a major cause of IPV (Hashemi et al., 2011; Taillieu & Brownridge, 2010; Ellsberg et al., 2008; Nojomi et al., 2007). Drugs often reduce inhibitions and lead to irresponsible behaviour such as violence and drug abusers are more likely to smoke many more cigarettes per day than those who do not use drugs. However, after controlling for drug abuse, the effect of heavy cigarette smoking on IPV was consistently significant.

Compared to the results from a few studies, there was no significat association between other background variables and the risk of IPV. For instance, in related studies, a history of childhood violence, the number and gender of children (especially having a daughter instead of a son), and living in a nuclear family have been shown to be risk factors of violence toward women (Malek Afzali et al., 2004; Arefi, 2003; Naeem et al., 2008). However, our findigs did not confirm these findings. The most likely explanation for these findings is that more than half of the respondents and their husbands had secondary and college educations and more than one-third of women were involved in an occupation in which they earned money (except for workers). It seemed that, when women had greater influence in the family and outside the home, they gained self confidence and increased their more capabilty to deal with community activities. For women, power can be aquired from several sources, such as education, making money, and having a role in community activities; an appropriate social situation and the attainment of wealth often are associated with low levels of violence for both women and men. Since low socio-economic status is strongly related to being abused, it is necessary to empower women by improving their educational level and raising their income to access and control the financial resources and consequently declining the chances of being abused (Shamu et al., 2011). In contrast, in families in which men dominate in economic issues and decisionmaking, the men are more likely to resort to violence to resolve disagreements with their wives, so a greater risk of partner violence exists in these situations (Naeem et al., 2008). Nonetheless, pre-disposing agents and risk factors of intimate partner violence vary even in similar settings in a country. Some of the differences may be explained by various factors, such as the design of the study, cultural differences between races, inclination of respondents to disclose violent experience, and women's acceptance of interpersonal violence. On the othe hand, perception of violence and agreement to what behaviours are considered as partner violence are different among couples. So if a behavior is not seen as violent, it will be more acceptable by perpetrator and/or victim (Waltermaurer et al., 2013).

The most common adaptive behavior reported by more than half of respondents, particualrly highly-educated couples and older women, was mutual negotiation between spouses; giving up the argument was the next strategy to resolve the problems, and recourse to the legal system was hardly ever reported (1% of all participants). Results from other studies are similar to our findings that more than half of women who experienced physical or mental violence did not ask for assistance neither from family members nor legal athorities(Elsberg, 2006; Rabbani & Javadian, 2007; Garg & Singh, 2013). It often returns to the cultural norms and the extent of social and legal support in the community. Adequate social support was shown to be protective against IPV, and, in societies in which women are valued in their own right and are respected in the family and outside the home, they are less likely to be abused. Conversely, in settings in which male control is widely accepted , men use violence as a learned social behavior, and women learn to tolerate aggressive behavior (Bell et al., 2013). The most likely explanation for the concillatory behaviors among lower-educated women and housewives is that having a higher education and having access to finanicial resources empower women to challenge gender inequality through a rational path, such as mutual negotiation. In situations in which women do not have adequate social and economic support, they are more likely to return to their families, seek help from friends, or tolerate the living conditions; depending on the social traditions, they often have to be the first to concede to avoid continuing the argument in order to fulfill their role of ensuring 'a good womanhood.'

This study has several limitations. First, respondents were recruited from accessible sites, and women who were considered to be out of reach were not included in the invesigation. Since abusive men are often restrict their wife's movements and contacts with others, abused women are more likely to be isolated. Second, the measures of IPV relied on self-reporting by participants, and the prevalence rate and/or some of the background variables

could have affected by the respondents' lack of inclination to disclose the violence. Third, the reported previous history of childhood violence may be influenced by biased recall by women who have experienced partner violence (current violence) compared to never abused women. Finally, since the study had a cross-sectional design, causality between the variables cannot be concluded.

5. Conclusions

The findings of the present study indicate that a group of individual, household, and socioeconomic factors has a significant role in the occurrence of intimate partner violence. However, the importance and magnitude of some factors may vary across regions and for different races even in the same country. The salient effects of various factors, such as high educational levels and appropriate employment, which reduce poverty in society, highlight the need for access to higher education, especiaqlly for girls, and the need to change people's attitudes towards gender norms. Due to the lack of a significant association of IPV with a number of variables, additional research is needed using different methods, such as qualitative or mixed-method studies . In addition, the study shuld be repeated in a less-developed area, such as a rural region, or with marginalized peole who are at greater risk of partner violence, such as refugees, divorced women, and homeless people. Finally, there needs to be routine screening and referral for IPV by care providers and more coordination between health sectors and criminal justice settings. In addition, Healthcare providers should understand more specifically about IPV and be aware of the community resources available to victims of the violence. They also should be skilled in detecting the risk factors of IPV, recognizing women who are at risk for partner violence, and providing appropriate healt services and guidance for women who are experiencing domestic violence.

Acknowledgments

The authors thank all women who were participated in the study. Our thanks are due to Shahroud University of Medical Sciences for technical support of this research. The views expressed in this article are those of the authors and not necessarily the organizations who allowed the data to be gathered.

Reference

Abramsky, T., Watts, C. H., Garcia-Moreno, C., Devries, K., Kiss, L., Ellsberg, M., & Heise, L. (2011). What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on women's health and domestic violence. *BMC Public Health, 11*, 109. http://dx.doi.org/10.1186/1471-2458-11-109

Agha khani, K., Agha Biglooie, A., & Chehreh saz, A. (2002). Investigation of men physical aggression against women attending at Forensic Medicine Center of Tehran. *Journal of Iran Medical Science University, 9*(31), 485-490. [article in Persian]

Ahmad, F., Hogg-Johnson, S., Stewart, D., & Levinson, W. (2007). Violence involving intimate partners: prevalence in Canadian family practice. *Can Fam Physician, 53*, 461-8460.

Arefi, M. (2003). A descriptive study of violence against women in Urmia, Iran. *Psycho-social Studies of Women, 1*(2), 101-120. [article in Persian].

Bell, M. E., Larsen, S. E., Goodman, L. A., & Dutton, M. A. (2013). Comparison of victims' reports and court records of intimate partner violence perpetrators' criminal case outcomes. *J Interpers Violence, 28*(14), 2966-77. http://dx.doi.org/10.1177/0886260513488693

Bhuiya, A., Sharmin, T., & Hanifi, S. M. (2003). Nature of domestic violence against women in a rural area of Bangladesh: implication for preventive interventions. *J Health Popul Nutr, 21*(1), 48-54.

Clark, C. J., Bloom, D. E., Hill, A. G., & Silverman, J. G. (2009). *Eastern Mediterranean Health Journal, 15*(4), 880-89.

Coker, A., Davis, A., Arias, I., Desai, S., Sanderson, M., Brandt, H. M., & Smith, P. H. (2002). Physical and Mental Health Effects of Intimate Partner Violence for Men and Women. *Am J Prev Med, 23*(4), 260-8. http://dx.doi.org/10.1016/S0749-3797(02)00514-7

Country's population urban and rural area. Publication database, Statistical Center of Iran. 2012 http://www.amar.org.ir

DaFonseca, R. M., Egry, Y., Guedes, R. N., Gutierres, A. R., & Tezzei, F. (2011). Violence against women: a study of the reports to police in the city of Itapevi Sao paolo, Brazil. *Midwifery, 27*(4), 469-73. http://dx.doi.org/10.1016/j.midw.2010.03.004

Diop-Sidibe, N., Campbell, J. C., & Becker, S. (2006). Domestic violence against women in Egypt—wife beating and health outcomes. *Social Science & Medicine, 62*, 1260-1277. http://dx.doi.org/10.1016/j.socscimed.2005.07.022

Do, K. N., Weiss, B., & Pollack, A. (2013). Cultural Beliefs, Intimate Partner Violence and Mental Health Functioning among Vietnamese Women. *Int Perspect Psychol, 2*(3).

Ellsberg, M., Jansen, H., Heise, L., Watts, C., & Garcia-Moreno, C. (2008). Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *The Lancet, 371*(9619), 1165-72. http://dx.doi.org/10.1016/S0140-6736(08)60522-X

Ellsberg, M. (2006). Violence against women and the Millennium Development Goals: Facilitating women's access to support. *International Journal of Gynecology & Obstetrics, 94*(3), 325-334. http://dx.doi.org/10.1016/j.ijgo.2006.04.021

Farrokh Eslamloo, H. R., & Booshehri, B. (2007). Investigation of intimate partner violence and some effective factors in women attending at Forensic Medicine Center of Urmia in 2005. *Journal of Medical Science University of Urmia, 18*(3), 554-561. [article in Persian]

Garcia-Moreno, C., Jansen, H. A. F. M., Ellsberg, M., Heise, L., & Watts, C. H. (2006). Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *The Lancet,* 368(9543), 1260-1269. http://dx.doi.org/10.1016/S0140-6736(06)69523-8

Garg, S., & Singh, R. (2013). Gender-violence and health care: How health system can step in. *Indian J Public Health, 57*, 4-7. http://dx.doi.org/10.4103/0019-557X.111355

Gliem, J., & Gliem, R. (2003). *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales*. Midwest Research to Practice Conference in Adult, Continuing, and Community Education.

Grant, J. C., & Davis, L. L. (1997). Selection and use of content experts for instrument development. *Research in Nursing and Health, 20*(3), 269-274. http://dx.doi.org/10.1002/(SICI)1098-240X(199706)20:3<269::AID-NUR9>3.0.CO;2-G

Guruge, S. (2012). Intimate partner violence: a global health perspective. *Can J Nurs Res, 44*(4), 36-54.

Hashemi, H. M., & Beshkar, M. (2011). The prevalence of maxillofacial fractures due to domestic violence--a retrospective study in a hospital in Tehran, Iran. *Dent Traumatol, 27*(5), 385-8. http://dx.doi.org/10.1111/j.1600-9657.2011.01016.x

Jewkes, R. (2002). Intimate partner violence: causes and prevention. *The Lancet, 359*, 1423-29. http://dx.doi.org/10.1016/S0140-6736(02)08357-5

Kazemi Navvabi, F. (2004). *Investigation of causes, prevalence and outcomes of domestic violence against women in pregnant women referring to birth centers in Tehran*. Dissertation of master's degree in midwifery. Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Koenig, M. A., Ahmed, S., Hussein, M. B., & Khorshed Alam Mozumder, A. B. (2003). Women's status and domestic violence in rural Bangladesh: individual- and community-level effects. *Demography, 40*(2), 269-288. http://dx.doi.org/10.1353/dem.2003.0014

Malek Afazali, H., Mehdizadeh, M., Zamani, A., & Faraj Zadegan, Z. (2004). Investigation of various types of domestic violence against women in Isfahan, Iran. *J Azad Med Sci University, 14*(2), 63-65. [Persian]

Maziak, W., & Asfar, T. (2003). Physical abuse in low-income women in Aleppo, Syria. *Health care women international, 24*(4), 313-26. http://dx.doi.org/10.1080/07399330390191689

Narimani, M., & Aghamohammadian Sherbaaf, H. R. (2005). Investigation male to female violence and related variables in households of Ardebil, Iran. *The Quarterly Journal of Fundamentals of Mental Health, 7*(28), 107-113. [article in Persian].

Naeem, F., Irfan, M., Zaidi, Q. A., Kingdon, D., & Ayub, M. (2008). Angry wives, abusive husbands: relationship between domestic violence and psychological variables. *Women's Health Issues, 18*(6), 453-462. http://dx.doi.org/10.1016/j.whi.2008.08.002

Nojomi, M., Agaee, S., & Eslami, S. (2007). Domestic violence against women attending gynecologic outpatient clinics. *Arch Iran Med, 10*(3), 309-315.

Peltzer, K., & Pengpid, S. (2014). Female genital mutilation and intimate partner violence in the Ivory Coast. *BMC Womens Health, 14*(1), 13. http://dx.doi.org/10.1186/1472-6874-14-13

Polit, D. F., & Beck, C. T. (2006). The content Validity Index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health, 29*, 489-97. http://dx.doi.org/10.1002/nur.20147

Rabbani, R., & Javadian, S. R. (2007). Investigation of women's behaviors against husband's violence. *Daneshvar, 14*(25), 19-30. [article in Persian]

Rahman, M., Nakamura, K., Seino, K., & Kizuki, M. (2012). Intimate partner violence and use of reproductive health services among married women: evidence from a national Bangladeshi sample. *BMC Public Health, 12*, 913. http://dx.doi.org/10.1186/1471-2458-12-913

Rodriques, T., Rocha, L., & Barros, H. (2008). Physical abuse during pregnancy and preterm delivery. *Am J Obstet Gynecol, 198*(2), 171. e1-6.

Sadock, B., Sadock, A., & Ruiz, P. (2009). *Kaplan and Sadock's Comprehensive Textbook of Psychiatry*. Lippincott Williams press.

Shamu, S., Abrahams, N., Temmerman, M., Musekiwa, A., & Zarowsky, C. (2011). A systematic review of African studies on intimate partner violence against pregnant women: prevalence and risk factors. *PLoS One, 6*(3), e1759. http://dx.doi.org/10.1371/journal.pone.0017591

Taillieu, T. L., & Brownridge, D. A. (2010). Violence against pregnant women: Prevalence, patterns, risk factors, theories, and directions for future research. *Aggression and Violent Behavior, 15*, 14-35. http://dx.doi.org/10.1016/j.avb.2009.07.013

Ergönen, A. T., Ozdemir, M. H., Can, I. O., Sönmez, E., Salaçin, S., Berberoğlu, E., & Demir, N. (2009). Domestic violence on pregnant women in Turkey. *Journal of Forensic and Legal Medicine, 16*(3), 125-129. http://dx.doi.org/10.1016/j.jflm.2008.08.009

Nuh Jah, S., Latifi, S. M., Haghighi, M., Etesam, H., Fatollahifar, A., & Zaman, N. (2011). Prevalence against women and some related factors in Khuzestan Province, Iran. *Journal of Kermanshah University of Medical Sciences (Behboud), 15*(4), 278-286.

Waltermaurer, E., Butsashvili, M., Avaliani, N., Samuels, S., & McNutt, L. A. (2013). An examination of domestic partner violence and its justification in the Republic of Georgia. *BMC Womens Health, 13*, 44. http://dx.doi.org/10.1186/1472-6874-13-44

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Relationship between Revised Graduated Index (R-GINDEX) of Prenatal Care Utilization & Preterm Labor and Low Birth Weight

Tahereh Tayebi[1], Zeinab Hamzehgardeshi[2,3], Marjan Ahmad Shirvani[1], Marjaneh Dayhimi[4] & Mahmonir Danesh[1]

[1] Department of Midwifery, Mazandaran University of Medical Sciences, Sari, Islamic Republic of Iran

[2] Traditional and Complementary Medicine Research Centre, Mazandaran University of Medical Sciences, Sari, Islamic Republic of Iran

[3] Department of Midwifery and Reproductive Health, Mazandaran University of Medical Sciences, Sari, Islamic Republic of Iran

[4] Department of Midwifery, International Branch of Shahid Beheshti Medical University, Tehran, Iran

Correspondence: Zeinab Hamzehgardeshi, Department of Midwifery and Reproductive Health, Mazandaran University of Medical Sciences, Nasibeh Nursing and Midwifery faculty, Vesal Street, Amir Mazandarani Boulevard, Sari, Mazandaran Province, Iran. Po Box: 4816715793. E-mail: Hamzeh@razi.tums.ac.ir

Received: November 20, 2013 Accepted: January 20, 2014 Online Published: February 27, 2014

doi:10.5539/gjhs.v6n3p131 URL: http://dx.doi.org/10.5539/gjhs.v6n3p131

Abstract

Prenatal care refers to accurate and consistent performance of the principles important to maintain healthy pregnancy outcomes and also for mother and child health. One of the new indices to assess the adequacy of care is Revised Graduated Index of Prenatal Care Utilization (R-GINDEX).The study aims to assess the relationship between quantitative prenatal care factors and preterm labor and low birth weight using R-GINDEX. This historical cohort study has been conducted on 420 mothers during the first two years after delivery in 2010. The adequacy of care was calculated by R-GINDEX. Based on this index, participants have been divided into three care groups including inadequate, adequate and intensive care groups. A significant relationship has been found between R-GINDEX and preterm birth and low birth weight ($P<0.05$). Thus the probability of premature labor in inadequate care group (RR=3.93) and low birth weight (RR= 2.53) was higher than that of the adequate and intensive care group. The results showed that the quantity of prenatal care is effective in reducing preterm birth and low birth weight.

Keywords: prenatal care, revised G Index, premature labor, low birth weight, neonate

1. Introduction

According to the most recent estimates, 343,000 mothers died in 2008 due to complications related to pregnancy and childbirth (Hogan et al., 2010). Many cases of maternal and fetal mortalities and morbidities as well as stillbirth, preterm birth and low birth weight are because of inadequate and inappropriate prenatal care. Appropriate prenatal care can greatly reduce most of the maternal and child complications and problems in future. The overall rate of fetal death was 2.7 per 1000 births in women who received prenatal care versus 14.1 per 1000 in women not receiving any prenatal care. Researchers reported that lack of prenatal care is associated with 3.3 times increase in the relative risk of stillbirth and two times rise in the risk of preterm labor (Cunningham, Gant, Leveno, & Larry, 2010).

More recently, a research reviewed a 10 year retrospective study where the risk of preterm birth among the adolescents who received inadequate prenatal care has been assessed. They found that the women with no prenatal care had nearly 8-fold higher risk of preterm birth (odds ratio [OR], 7.9; 95% confidence interval [CI], 6.1 - 10.3) compared with those who attended 75% - 100% of the recommended visits (Debiec, Paul, Mitchell, & Hitti, 2010).

Adequate prenatal care provides an opportunity for consultation and reduces complications related to pregnancy and delivery (Miranda et al., 2010). In a study with the aim to determine the factors associated with inadequate prenatal care in Ecuadorian women, it has been discovered that the inadequate care was in 75.5% of cases (by Kessner index) while an adverse outcome of the prior pregnancy (abortion, intrauterine fetal demise, or ectopic

pregnancy) increased this risk (Paredes, Hidalgo, Chedraui, Palma, & Eugenio, 2005). Researchers have demonstrated that adequate prenatal care was an effective intervention to improve pregnancy outcomes (Stringer, 1998). On the other hand, a group of researchers demonstrated that reducing the number of visits had no harmful effects on maternal and neonatal outcomes in low-risk pregnant women (Walker, McCully, & Vest, 2001). In another study performed by the Michigan College of Nursing to assess satisfaction and adequacy of prenatal care among low-income rural women, 50% of women with less adequate care were satisfied with the care and optimal outcomes of pregnancy. There was no difference between this group and the group of women who received adequate care (Omar & Schiffman, 2000).

A new index used to provide more accurate and comprehensive measurements of prenatal care utilization is the revised G Index. This index can identify the adequacy of prenatal care by the use of care starting time and care relevance number. It is worth to mention that this index does not consider the quality of service, and only measures the usefulness or adequacy of care (VanderWeele, Lantos, Siddique, & Lauderdale, 2009).

According to the previous studies derived results, there is a controversy about the effect of quantitative care factors that improve pregnancy outcomes. So that this study aims to analyze the relationship between quantitative prenatal care factors and preterm labor and low birth weight by using R-GINDEX.

2. Method

The samples were selected randomly out of the individuals who referred to the public health center to receive maternal-child care during the first two years after childbirth in 2010 based on inclusion and exclusion criteria. The sample size was determined according to the previous studies like the ones by Alexander and colleagues (2001), the Department of Kansas (2008) and the other researches and by statistical formulas with 95% confidence (420 women).

The review board of Shahid Beheshti University of Medical Science approved the study protocol. Inclusion criteria were 18-35 year-old mothers with singleton fetus in their last pregnancy, lack of physical and psychological illness and available family medical files. The mothers with previous history of preterm birth, low birth weight, smoking, alcohol & drug abuse and mellitus diabetes and fetal abnormalities were excluded in order to reduce confounding variables. We applied random sampling method. After receiving the information form, in case the women agreed to participate in the study, they signed the consent form.

The researcher-built questionnaire was provided including 27 questions about demographic characteristics, obstetric history, delivery data and infant features. Validity of the questionnaire was assessed by validity qualitative content method and reliability was higher than 90 by test, re- test and correlation analysis. The questionnaires were completed through daily visit and interviews with the mothers. Other information was completed from the mothers' health file and other sources based on existing data at the health centers.

Adequacy of care was calculated by R-GINDEX. This index is one of the five indicators used to measure the adequacy of prenatal care proposed by Alexander and Kotelchuck in 1994 (newer than Kessner's index). Three parameters associated with birth are required to calculate R-GINDEX as the following:

1-The start of cares (Trimester 1-3); 2-Gestational Age; and 3-The total number of prenatal cares.

Based on this index, participants were divided into three care groups including: inadequate, adequate and intensive care groups. Adequate care refers to the minimum recommended level of cares. Intensive care is the care much higher than the number of the recommended level and is calculated as one standard deviation more than moderate standard of cares in each period in R-GINDEX. Inadequate care includes women with both lower than the average and no prenatal care. For accurate measurement of indices, the expected number of visits was calculated according to the standardized protocol. In this protocol ,eight visits have been usually done based on the gestational week for low-risk pregnancies, two visits in the first half of pregnancy(6-20weeks), and six visits in the second half (21-40weeks) . Preterm birth was considered as delivery occurring before 37 weeks of gestation and low birth weight was viewed as the weight less than 2500 g at birth (Lowdermilk, Perry, & Bobak, 2004).Statistical analysis was performed using descriptive statistics, chi-square test, variance analysis, t-test, Spearman correlation coefficient and relative risk.

3. Results

Totally 420 women were assessed. At the first visit, most of the mothers (44.5%) were within 9-16 weeks of gestation. The majority of mothers (51.9%) received 5-8 times of care. Adequate care was the most common category of maternal care (Figure 1).

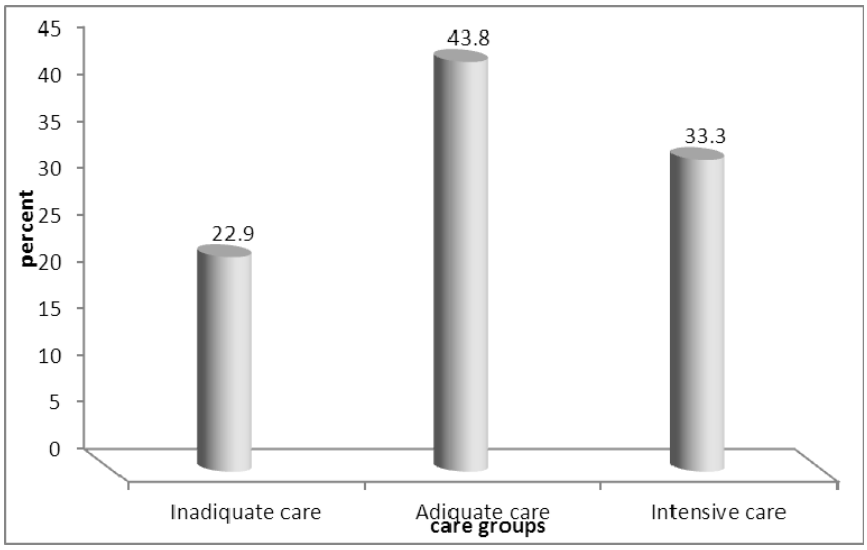


Figure 1. Frequency of care groups based on the R-G Index

There was significant difference in the level of education, the type of delivery, the first visit, the total number of cares, gestational age, birth weight, complete prenatal tests, participation in child birth preparation classes and the number of ultrasonography among the care groups (Tables 1 and 2).

Table 1. The demographic characteristics and frequency of care groups based on them

Demographic characteristics	Total sample	Adequacy of care (M±SD)			P value
		Inadequate	Adequate	Intensive	
Age	25.5±4.3	26.12± 4.77	26.47± 4.27	26.82± 4.24	NS†
BMI‡ (M±SD)	24.82±3.58	25.40± 4.09	24.65± 3.44	24.66± 3.37	NS
Job	N(%)	N(%)	N(%)	N(%)	
House wife	363(86.4)	82(22.6)	155(42.7)	126(34.7)	NS
Employer	57(13.6)	14(24.6)	29(50.9)	14(24.6)	
Education					
Primary	12(2.9)	1(1.0)	5(2.7)	6(4.3)	
High school	63(15.0)	8(8.3)	29(15.8)	26(18.6)	0.04
Diploma	229(54.5)	49(51.0)	105(57.1)	75(53.6)	
University	116(27.6)	38(39.6)	45(24.5)	33(23.6)	

† Non significant, ‡ Body Mass Index.

Table 2. The obstetrics characteristics and frequency of care groups based on them

Obstetrics characteristics	Total sample	Adequacy of care (M±SD)			P value
		Inadequate	Adequate	Intensive	
First visit (week)	14.48±6.84	21.40± 6.96	14.20± 5.64	10.10± 3.71	0.000
Frequency of cares	4.80±1.91	2.34± 0.75	4.48± 0.50	6.89± 1.27	0.000
Gestational age(Week)	38.40±1.39	37.78± 1.40	38.25± 1.23	39.03± 1.33	0.000
Neonatal weight(Gr)	3203.31±469.56	3117.6± 505.95	3174.08± 450.65	3300.5± 454.52	0.007
Ultrasonography	2.84±1.28	2.60±1.34	2.82±1.24	3.01±1.28	0.05
Complete tests N(%)					0.000
Yes	409(97.4)	87(21.3)	182(44.5)	140(34.2)	
No	11(2.6)	9(81.8)	2(18.2)	0	
Participation in childbirth classes					0.000
Yes	135(32.1)	17(12.6)	59(43.7)	59(43.7)	
No	285(67.9)	79(27.7)	125(43.9)	81(28.4)	
Delivery type					0.003
Vaginal	109(26)	13(13.5)	50(27.2)	46(32.9)	
Cesarean	311(74)	83(86.5)	134(72.8)	94(67.1)	

Overall, 26 mothers (6.2%) had preterm delivery. The maximum rate of preterm birth was seen in the inadequate care and the minimum in intensive care group. There was a significant correlation between R-G Index and preterm delivery (Table 3), as the relative risk (RR) of preterm delivery in the inadequate care group was 3.93 times more than that of the adequate and intensive care groups.

Table 3. The relation of preterm labor with R-G Index and its components

R-G Index and its components	Preterm	labor	P value
Index category	Yes N(%)	No N(%)	0.000
Inadequate	14(14.6)	82(85.4)	
Adequate	8(4.3)	176(95.7)	
Intensive	4(2.9)	136(97.1)	
	M±SD	M±SD	
Onset of care (week)	17.19 ±8.57	14.30 ± 6.69	NS
Frequency of cares	3.62 ± 2.65	4.88± 1.83	0.001

Also, 35 women (8.3%) had low birth weight that was the highest in inadequate care and the lowest in intensive care group. A significant correlation was observed between low birth weight and care-given groups (Table 4). Thus low birth weight among the mothers with inadequate maternal care was higher than that in women who received adequate care or intensive care (RR= 2.53).

Table 4. The relation of low birth weight with R-G Index and its components

R-G Index and its components	Low birth	weight	P value
Index category	Yes N(%)	No N(%)	0.000
Inadequate	15(15.6)	81(84.4)	
Adequate	14 (7.6)	170(92.4)	
Intensive	6(4.3)	134(95.7)	
	M±SD	M±SD	
Onset of care (week)	8.17 ±17.17	6.67 ±14.23	0.04
Frequency of cares	2.5±4.0	1.83 ±4.87	0.01

The mean number of cares was lower in preterm birth and low birth weight (Table 3 and 4).Most of the mothers (93.8%) were taking ferrous pills daily, but no significant correlation was found between ferrous intake and preterm birth (P=0.47) and also low birth weight (P= 0.53). While there was a significant correlation between multivitamin- folic acid intake & preterm birth (p=0.02 & 0.004, respectively) and low birth weight (p=0.03 & P=0.004, respectively).

4. Discussion

The results of this study showed that the highest percent of the mothers were in the adequate care group. In the similar studies based on the recommended index by America Academy of Obstetrics and Gynecology (ACOG), most of the women were in the intensive and adequate care groups (Alexander & Kotelchuck, 2001; Heaman, Newburn-Cook, Green, Elliott, & Helewa, 2008). The main finding in this study was an increased risk of preterm birth with inadequate care in low-risk pregnant women so that the relative risk of preterm birth in inadequate care group was 3.93 times higher than that of the mothers in the other groups. Similarly, another study (Paredes et al., 2005) suggested that the rate of preterm birth was 7.2% in inadequate care that was approximately twice than the rate of the adequate care group (3.5%). Using R-GINDEX, insufficient care was significantly correlated with preterm labor (OR=1.2). In other words, the rate of preterm birth increased by 20% via inadequate care. Another research showed that the risk of preterm birth in the women with inadequate care was 2 times than that of the women receiving adequate or average care (OR= 2.1) (Krueger & Scholl, 2000). The study results also revealed that the group prenatal care results in higher birth weight, especially "in the children who had been born preterm (Ickovics et al., 2007). American's Department of Health and Human Services study demonstrated that in the mothers who had no prenatal care, the risk of low birth weight and infant mortality risk increased 3 times and 5-times, respectively.

Another result of this study was a meaningful relationship found between mothers' education level and providing care to the mothers. So, the higher educated mothers (high school or college level) received more adequate care than the other groups. There was a significant relationship between the participation of the mothers in childbirth preparation classes and performing adequate care (P<0.05). Also, using R-GIndex, the probabilities of low birth weight are higher in low-risk women with inadequate prenatal care, thus the risk is 2.53 times more than that of the other groups. These results suggest that through mass media, the development of maternal caring programs, mothers referring to health centers and participation in childbirth preparation classes can reduce the role of low level of education on the rate of adverse outcomes such as low birth weight and preterm birth. A similar study showed that there is a correlation between inadequate care and low birth weight based on R-GINDEX (OR=1.1). According to the survey results and comparison with similar studies, again the effect of prenatal care quantity on pregnancy outcome, especially preterm birth and low birth weight can be emphasized.

In our study, the existence of the specific criteria such as the previous history of preterm delivery and low birth weight or chronic disease as the factors influencing pregnancy outcome were excluded. Thus according to the previous study in Iran and considering the effect of the mentioned variables on pregnancy outcomes, it can be expected that the rate of premature birth and low birth weight in high-risk pregnant women is much more than that of the results of present study (Vahdaninia, Tavafian, & Montazeri, 2008).

The limitations of this study were the existence of some important maternal factors such as socioeconomic condition, race, ethnicity and health behaviors that were not controlled and can affect the care patterns and pregnancy outcomes. Further studies are suggested to survey the relationship between the quantity of prenatal care and the other adverse pregnancy outcomes. In the recent years, some countries such as Iran reduced the total

number of prenatal cares with the aim to increase the quality of cares, while this research concluded that many services need to be provided in a timely manner, so increasing the interval of cares may result in losing many opportunities for the management of gradual or sudden complications in pregnancy.

5. Conclusion

The results showed that the quantity of prenatal care is effective in reducing preterm birth and low birth weight.

Acknowledgement

The authors are grateful to the health centers personnel and the mothers for their patience and cooperation in answering the questions.

None of the authors has a conflict of interest.

Authors' Contributions

TT, ZH, MASH, MD, and MMD designed the study, TT and MASH collected and analyzed data. TT wrote the first draft of the manuscript, which has been critically reviewed by ZH. The final version of the manuscript has been commented on by some other authors. Both authors contributed to and approved the final version of the manuscript.

References

Alexander, G. R., & Kotelchuck, M. (2001). Assessing the role and effectiveness of prenatal care: history, challenges, and directions for future research. *Public Health Reports, 116*(4), 306. http://dx.doi.org/10.1016/S0033-3549(04)50052-3

Cunningham, F. G., Gant, N. F., Leveno, K. J., & Larry, C. (2010). *Williams obstetrics* (23 ed. Vol. 1). McGrawHill.

Debiec, K. E., Paul, K. J., Mitchell, C. M., & Hitti, J. E. (2010). Inadequate prenatal care and risk of preterm delivery among adolescents: a retrospective study over 10 years. *American journal of obstetrics and gynecology, 203*(2), 122. e121-122. e126. http://dx.doi.org/10.1016/j.ajog.2010.03.001

Heaman, M. I., Newburn-Cook, C. V., Green, C. G., Elliott, L. J., & Helewa, M. E. (2008). Inadequate prenatal care and its association with adverse pregnancy outcomes: a comparison of indices. *BMC Pregnancy and Childbirth, 8*(1), 15. http://dx.doi.org/10.1186/1471-2393-8-15

Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., ... Murray, C. J. (2010). Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5. *The Lancet, 375*(9726), 1609-1623. http://dx.doi.org/10.1016/S0140-6736(10)60518-1

Ickovics, J. R., Kershaw, T. S., Westdahl, C., Magriples, U., Massey, Z., Reynolds, H., ... Rising, S. S. (2007). Group prenatal care and perinatal outcomes: a randomized controlled trial. *Obstetrics and gynecology, 110*(2 Pt 1), 330. http://dx.doi.org/10.1097/01.AOG.0000275284.24298.23

Krueger, P. M., & Scholl, T. O. (2000). Adequacy of prenatal care and pregnancy outcome. *JAOA: Journal of the American Osteopathic Association, 100*(8), 485-492.

Lowdermilk, D. L., Perry, S. E., & Bobak, I. M. (2004). *Maternity & women's health care*. Mosby.

Miranda, A. E., Trindade, C. R., Nunes, R. H., Marba, E. F., Fernandes, M. C., Quarto, G. H. A., & França, L. C. (2010). Factors associated with prenatal care and seeking assistance in public hospitals in Vitoria, Espirito Santo, Brazil. *Women & Health, 50*(3), 229-240. http://dx.doi.org/10.1080/03630242.2010.480904

Omar, M., & Schiffman, R. (2000). Satisfaction and adequacy of prenatal care utilization among rural low-income women. *Outcomes management for nursing practice, 4*(2), 91.

Paredes, I., Hidalgo, L., Chedraui, P., Palma, J., & Eugenio, J. (2005). Factors associated with inadequate prenatal care in Ecuadorian women. *International Journal of Gynecology & Obstetrics, 88*(2), 168-172. http://dx.doi.org/10.1016/j.ijgo.2004.09.024

Stringer, M. (1998). Issues in determining and measuring adequacy of prenatal care. *Journal of perinatology: official journal of the California Perinatal Association, 18*(1), 68.

Vahdaninia, M., Tavafian, S. S., & Montazeri, A. (2008). Correlates of low birth weight in term pregnancies: a retrospective study from Iran. *BMC Pregnancy and Childbirth, 8*(1), 12. http://dx.doi.org/10.1186/1471-2393-8-12

VanderWeele, T. J., Lantos, J. D., Siddique, J., & Lauderdale, D. S. (2009). A comparison of four prenatal care indices in birth outcome models: comparable results for predicting small-for-gestational-age outcome but different results for preterm birth or infant mortality. *Journal of clinical epidemiology, 62*(4), 438-445. http://dx.doi.org/10.1016/j.jclinepi.2008.08.001

Walker, D. S., McCully, L., & Vest, V. (2001). Evidence-Based Prenatal Care Visits: When Less Is More. *Journal of Midwifery & Women's Health, 46*(3), 146-151. http://dx.doi.org/10.1016/S1526-9523(01)00120-9

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Relationship between Addiction Relapse and Self-Efficacy Rates in Injection Drug Users Referred to Maintenance Therapy Center of Sari, 1391

Zahra Abdollahi[1], Fatemeh Taghizadeh[2], Zeinab Hamzehgardeshi[3,4] & Olia Bahramzad[5]

[1] Department of Midwifery Education, Nasibeh Nursing and Midwifery Faculty, Mazandaran University of Medical sciences, Sari, Iran

[2] Department of Mental Health, Public Health Center, Mazandaran University of Medical sciences, Sari, Iran

[3] Traditional and Complementary Medicine Research Centre, Mazandaran University of Medical Sciences, Sari, Iran

[4] Department of Midwifery, Mazandaran University of Medical Sciences, Sari, Iran

[5] Department of Midwifery, Public Health Center, Mazandaran University of Medical Sciences, Sari, Iran

Correspondence: Fatemeh Taghizadeh, Department of Mental Health, Public Health Center, Mazandaran University of Medical scences, Roudaki Avenue, Mazandaran Province, Sari, Iran. Tel: 98-015-1225-5661. Po Box: 4816711447. E-mail: tag.faty@ yahoo.com

Received: December 22, 2013 Accepted: Januray 18, 2014 Online Published: February 28, 2014

doi:10.5539/gjhs.v6n3p138 URL: http://dx.doi.org/10.5539/gjhs.v6n3p138

Abstract

Background and Purpose: Self-efficacy is the belief that one has the ability to implement the behaviors needed to produce a desired effect. There has been growing interest in the role of self-efficacy as a predictor and/or mediator of treatment outcome in number of domains. In numerous studies of substance abuse treatment, self-efficacy has emerged as an important predictor of outcome, or as a mediator of treatment effects. In the event of a slip, highly self-efficacious persons are inclined to regard the slip as a temporary setback and to reinstate control, whereas those who have low self-efficacy are more likely to proceed to a full-blown relapse. This study was carried out to determine relationship between relapse and self-efficacy and other factors in injected drug users.

Materials and Methods: We conducted this study in 200 addicts in the center of counseling behavioral disease in health center of sari city (methadone maintenance therapy center or MMTC). A cross-sectional study was carried out on all of these addicts.

Results: The average age in addictions was38 and its range was 20-60.72%of them were married and the first drug used was opium. All of them had relapse at least one time .we found a relationship between relapse and self-efficacy as well as the relationship between self-efficacy with the age of the first of drug use, dose, and procrastination for treatment, marriage, employment and job was significant.

Conclusion: This study found that there was a significant difference between relapse and self-efficacy as well as other related factors. It is important to include drug users and common society organizations representing them in every stage of the governmental policy and program development process to make them responsive to the needs of the community.

Keywords: self-efficacy, relapse, addiction, methadone maintenance therapy center (MMTC)

1. Introduction

Drug abuse and addiction is a major global problem that destroys economy health, relationships and career and has several complications including relapse that often remain untreated (Nessa, Latif, Siddiqui, Hussain, & Hossain, 2008). Substance use has chronic relapsing period (Gaily & Bashir, 2004). The literature review showed that the self-efficacy related to addiction relapse (Ibrahim, Kumar, & Samah, 2011). In addition to the treatment addict person who have high self-efficacy would be low risk to be substance user again (alsop2000). The past studies showed that there is strong relationship between self-efficacy with addiction relapse (Dolan,

Martin, & Rohsenow, 2008; Ibrahim, et al., 2011). One of the most important factors that influence the rate of relapse is not enough self-efficacy in drug addicts. Self-efficacy is derived from social cognitive theory of famous psychologist that refers to beliefs or judgments of individual about his capabilities to perform the duties and responsibilities. Social cognitive theory is based on a tripartite model of the environment and the individual. Social cognitive theory is based on a tripartite model of the behavior, environment and the individual. This model emphasized the relationship between behavior, environmental effects and personal factors (cognitive, emotional and biological factors) which refers to perception of psychological functions. According to this theory, people in a tripartite causal system affect their behavior and motivation (Bandura, 1999). Bandura has rejected environmental effects on individual behavior that is one of behavioral psychologists' assumptions. Humans have a system of self-regulation and self-control and by this control his thought, feelings and behavior and also have decisive role on your own destiny. Thus, human behavior is not only control by environment but also cognitive processes have an important role in human behavior. Human learning and performance affected by cognitive approaches, emotional, expectations, beliefs and values. Human being is an active creature and affects his life events. Human is influenced by psychological factors and actively affect his motivation and behavior. According to "Bandura" People are not driven by internal forces, nor do environmental stimuli lead them to action, thus psychological functions determine function, behavior, environment and their stimulations. Bandura argues that self-efficacy, which thereby can be constructive, cognitive skills, social, emotional and behavior for different goals, such regulation is effective. In his idea having knowledge, skills and previous achievements are not good predictor of future performance, but people believe about their abilities to perform their functions are effective. There are significant differences between varieties of skills with their combination power in appropriate methods and in different conditions. "People know what to do and have skills needed to perform their functions, but often fail to implement appropriate skills" self- recognition enabled through cognitive, motivational and emotional process which are responsible for transfer of knowledge and abilities to conduct. In summary, self-efficacy is not related to a skill or skills, but also refers to belief in ability to work in different job situations. Self-efficacy theory predicts that treatment will be effective when increase the client's reasonable expectations of what can be achieved and continue (Bandura, 1999). Sense of self-efficacy is an individual's judgment about their ability to perform an action that can enable people to adopt healthy behaviors and leave harmful ones (Bandura, 1999). A study from Iran investigated the relationship between confidence and self-efficacy with health behaviors of Yazd students with higher self-efficacy in medical university students their health scores increased. Significant positive correlation between health behavior and self-confident students were observed (Mazloumi Mahmoudabad, Mehri, & Morovati Sharifabad, 2006). Self-efficacy of a treatment increases the need to a business and health promotion behaviors; behavior change is the most important factor (Bandura, 1999). Since addiction is an extremely stressful behavior and their role in its effectiveness is obvious; independent research so far in relation to addiction relapse rate of drug efficacy have not looked in Mazandaran province so we decided to do the study. This study was a cross - sectional study in which the researcher examines the relationship between addiction relapse and self-efficacy and its relationship with some factors in injection drug users referred to the health center of Sari city. The study population consists of all drug users of treatment center in Sari. Samples consist of all drug users in Sari Health Maintenance Treatment Center. Samples were selected through census sampling, in this study 200 drug users in were examined in Sari health maintenance treatment center. This is a cross - sectional study that is done on all injection drug users referred to the state health department at Sari-Iran (about 200 people by census). First, interviewers were trained. Then the purpose of self-administered and self-efficacy questionnaire design and methods has been described for drug addicts and the questionnaire was completed by interview and questionnaire was completed by addicts.

2. Methods

In this study, three types of questionnaires were used as follows: firstly, Epidemiology of subjects; secondly, The questionnaire related to drug abuse type, history of addiction, Addiction Withdrawal decision, withdrawal action and relapse; and thirdly; Standard questionnaire for measuring efficacy.

For checking reliability of questionnaire internal consistency was used and reduced Cronbach's alpha was measured 0/88.

General Self-Efficacy Scale consists of ten questions that have been used in several investigations in Iran in this study score above 35 indicate high efficacy and below 30 low efficacies and the rest are average. Grading scores is done by Likert method (1-4). The findings based on the type of data, quantitative continuous (age) discrete quantitative, such as frequency of use, qualitative data such as the level of education and occupation. Following data, descriptive and inferential statistics were used to analyze the data.

Descriptive statistics are used as frequency distribution tables, mean and standard deviation. In inferential

statistics SPSS version 16 software was used. Descriptive and analytical indicators such as Pearson coefficient were determined. The chi-square test was employed for the bivariate analysis. The level of significance was set at 0.05.

3. Results

In this study, mean age is 38 years old and its domain is between 20-60 years. 28% of participants were single and 72% are married and 74 percent of them have self-employment, 21% of them are unemployed and 5% are retired. In terms of education, 43% were illiterate or have primary education, 57 percent junior school, 71 percent have diploma, 20 percent associate degree and 9 percent have bachelor degree or higher. According to Table 2-4 their father education level in 67 percent is illiterate and primary level education, and also 66 percent of their mothers are illiterate and primitive. The first intake 63 percent were opium, in 32 percent were Hashish and in 5 percent were alcohol; the way of using drugs in 76 percent was smoke, in 19 percent oral and in 5 percent inhalation. The reason of relapse after withdrawal in 53% of subjects was temptation, in 15% friends and in 17% emotional and family problems. The mean age of first drug use was 19 years, and the frequency of 2 times per day. Decision to quit the drug takes average 4 years after the first intake, after decision to stop it takes 32 months to start treatment with methadone. After first withdrawal averagely takes 7 months that people reuse the drug. Addicts averagely have had 8 withdrawals and interval between their withdrawals was 6 months. 58% of them used all materials, and the majority of them 56 percent used. In 58 percent one of the family members use drugs, in 18% father, in 21 percent brother, in 8% wife, in 5% son and in 7% all family members. 40% of people at least once have been admitted to a hospital or treatment center. 67% have been tested for HIV and 26 percent had sex, at least once, with a strange person. According to Table 4.10, the mean of self-efficacy in this study is 5/32 and its domain is between 24-40 that from this amount 45 percent have low self-efficacy <30, 25 % have moderate self-efficacy (30-35) and 30% have low self-efficacy (scores above 35). Other findings are as follows: there is a significant relationship between withdrawal times and self-efficacy ($p<0.05$). However, there is no relationship between frequency of use and the age of first use, but there is a direct relationship between withdrawal and self-efficacy ($p<0.05$). Between withdrawal and first relapse (clean time) self-efficacy according to this point that the amount of p-value is less than 0/05, this result is obtained that there is a direct and significant relationship between two variables. There is a significant and inverse relationship between the visit times from hospital due to drug overdose and self-efficacy. Also, self-efficacy in married is more than singles and this relationship is significant and direct ($p<0.05$). Self-efficacy in people that their father has higher education is more ($p<0.05$). Efficacy in people which their mother have higher education is more ($p<0.05$). Individuals that their father is unemployed have lowest self-efficacy score and those who their fathers are self-employed have highest self-efficacy.

Table 1. Distribution of respondents according to the first drug, and how to use and re-use after withdrawal

Drug	**Frequency**	**Percent**
Hashish	64	32 **%**
opium	126	63**%**
Alcohol	10	5**%**
Total	200	100**%**
Way of use	Frequency	Percent
Smoking	152	76**%**
Inhalation	10	5**%**
Edible	38	19**%**
Total	200	100**%**
The reason for re-use	Frequency	Percent
Temptation	107	53**%**
Emotional problems	14	7**%**
Family problems	23	10%
Friends	30	15**%**
Without answer	30	15**%**
Total	200	100**%**

Table 2. Table of variables in terms of the mean

Variables	**Mean**
How old were you the first time you use?	19
How many times did you use?	3
The first time after how many years you've decided to leave?	7
After deciding to leave it took how many months to begin methadone treatment?	32
After first withdrawal it took how many months to use again?	7
How many times have you leaved?	8
How many months gap are there between your withdrawals?	6

Table 3. Table of some variables related to self-efficacy

Row	Variables	Pearson coefficient	Error rate α	p.va	Significance
1	Age of the first consumption with self-efficacy	-0/058	0/05	0/4	Not significant
2	The number of daily consumption with self-efficacy	-0/01	0/05	0/9	Not significant
3	Distance between withdrawal and first relapse (clean time) with self-efficacy	0/2	0/05	0/005	Significant and positive
4	Delay in treatment with self-efficacy	-0/28	0/05	0/001	Significant and reversed
5	Frequency of withdrawal with self-efficacy	0/19	0/05	0/02	Significant and positive

4. Discussion and Conclusions

In this research samples include 27% singles and 72% married. Also 74% of them have free job and 21% are unemployed and 5% are pensioners. Also in an Iranian research 12% of mans are unemployed (Seraji, Momeni, & Salehi, 2010). Base on the table of sample in term of education, 43% illiterate and primary school, 57% junior,

71% diploma, 20% associate degree and 9% bachelor degree and higher. Fathers education 67% on illiterate and primary school level and also 66% of mothers are on illiterate and primary school level. Age average of this research is 38 and its amplitude is between 20 and 60.

First used drugs is opium for 63% of mans, Marijuana for 32% of mans and alcohol for 5% of them. Also using method was smoking for 76% of addicts, meal for 19% and inhalation for 5% (Table 1). Opium was the most common used drug in Ahari and associates research (Narimani & Sadeghieh, 2008).

Table 3-4 show that Cause of relapse after quitting was temptation for 53% of samples, 15% friends and 17% sentimentally and domestically problems. Most important environmental cause of addiction relapse discussed respectively, sleepless and temptation, psychological distress, Deficiency of confidence and feelings of futility and ramble in the Iranian associates research (Mirzaei et al., 2011). In a study psychological parameter such as Anxiety, stress, depression, feelings of losing something, availability of drug's, socializing with addict friends, belief that they will not addict by once drug use and self-examination were the most common factors of addiction relapse in turkey (Narimani & Sadeghieh, 2008). Age average of first drugs usage is 19 years old and the number of iterations per day was 2 uses per day. Deciding to quit the drug mean lasted 4 years after first use. Samples also after decide for quitting lasted on mean 32 month until starting treatment by methadone. After first drug quitting lasted on mean 7 month to relapse addiction. Based on past study, 53% of addicts relapse addict less than 3 month and just 12% of them could be stay without drugs more than 1 year and average of quitting was 6.3 month (Mirzaei et al., 2011). In another study 72% of mans had relapse (Narimani & Sadeghieh, 2008).

Addicts on mean have 8 times quitting and average time between their addict quitting was 6 month and 58% of them used all of drugs and majority namely 56% used crystal. A study reported that 35% of relapses occur in the negative emotions, 16% in conflicts with others, and 20% for social pressures (Marlatt & Donovan, 2005). Another study concluded that 62 –73% of relapse episodes coded under negative emotions and social pressures (Lowman, Allen, & Stout, 1996).

Previous study found that social pressures determinants were not the only important factors in relapse, but craving, temptation, and substance cues can also do so (Bradley, Phillips, Green, & Gossop, 1989). Some research showed that heroin addicts relapse primarily because of NE and lack of social supports. Mood state, along with social isolation and family factors, was more likely to be repeated as high-risk situations of the coming relapse incidences (Heather, Stallard, & Tebbutt, 1991).

In a Persian study, 33% of addicts once, 38% 2-3 time, and 28.5% of them more than tree time have unsuccessful treatment (Mirzaei et al., 2011). In addition, another study reported 48.9% of mans have addiction relapse within first 4 month after quitting (Seraji et al., 2010). Also there isn't relation between use frequency and so first use age with self-efficacy. But between drug quitting time and self-efficacy there is direct and significant relation ($p<0.05$) depend on p value amount less than 0.05 between quitting and firs relapse (clear time) that concluded between two variant there is significant relation and it's direct. This point show that mans with higher self-efficacy has more time strength against relapse than addicts with low rate self-efficacy. There is significant and reverse relation between counts of refers to the hospital because of drugs over dosage and self-efficacy. Also married have more self-efficacy than single mans and this is a direct and significant relation ($p<0.05$). A number of relatively recent studies assessing the role of self-efficacy among abusers of various substances are cited, but the list is not meant to be exhaustive (Kadden & Litt, 2011).

Many studies have shown that self-efficacy is a predictor of treatment outcome. In some cases, self-efficacy has been found to predict the quantity of alcohol or drugs consumed. These studies found that self-efficacy significantly predicted alcohol consumption for periods of up to twelve months also argued that negative life events and the exposure to the high-risk situation had not been related to relapses probability (Maisto, Connors, & Zywiak, 2000). However, another study found that higher self-efficacy predicted less drug use only after 3 months but not after 6 months (Dolan et al., 2008). In a study of the Effectiveness of step-down continuing care following residential or intensive outpatient care found little evidence to support step-down continuing care itself (McKay et al., 2004). Other study have shown that self-efficacy was a relatively strong predictor of post-treatment abstinence and the frequency of marijuana use (Kadden & Litt, 2011) also reported a significant relationship between self-efficacy expectancies during inpatient alcohol dependence treatment and several frequency-related outcome variables:The likelihood of drinking; time to first drink; and time to relapse during the year following treatment similarly for outpatient treatment. Alcoholics' post-treatment self-efficacy was a predictor of time to relapse and high confidence in their ability to resist drinking were more likely to maintain abstinence for 6 months (Borrelli & Mermelstein, 1994). A study observed that individuals whose increased confidence in high-risk situations persisted during follow-up had both fewer days of use and reduced

alcohol/drug severity (Brown, Seraganian, Tremblay, & Annis, 2002).

The past study reported a negative relationship between self-efficacy and relapse to alcohol use, but not for relapse to drug use (Walton, Blow, Bingham, & Chermack, 2003). In a study comparing four treatment approaches for marijuana dependence (Romo et al., 2009), while replicating the common finding that high self-efficacy was correlated with longer periods of abstinence.

Given the low level of self-efficacy in this study and its relationship with relapse, specifies the need for interventions to increase these variables in addicts.

Consistent with other studies, the results suggest that self-efficacy factor is an important factor towards relapsed addiction amongst addicts (Ibrahim et al., 2011). With efforts to enhance the preparation of total human development strategy amongst relapsed drug addicts, it could increase addicts' self-efficacy to live without drugs. It means that serious efforts should be done to restructure weak self-efficacy to enable the addicts to be stronger when facing life challenges after their release. Although the findings of this study are important for the stakeholders in public health, it is also essential to conduct future studies with larger sample sizes.

Acknowledgment

This article is derived from MPH thesis, Trends in the management and prevention of addiction, written by Fatemeh Taghizadeh. Hereby, I sincerely appreciate my Advisor Dr. Eftekhar and Supervisor Dr. Garmaroudi and colleagues in Behavioral Disorders Counseling Center, Ladies: Mosaffa, Taghavi and Babaee and management of this center Dr. Rouhani.

References

Bandura, A. (1999). Self-efficacy: Toward a unifying theory of behavioral change.

Borrelli, B., & Mermelstein, R. (1994). Goal setting and behavior change in a smoking cessation program. *Cognitive Therapy and Research, 18*(1), 69-83. http://dx.doi.org/10.1007/BF02359396

Bradley, B. P., Phillips, G., Green, L., & Gossop, M. (1989). Circumstances surrounding the initial lapse to opiate use following detoxification. *The British Journal of Psychiatry, 154*(3), 354-359. http://dx.doi.org/10.1192/bjp.154.3.354

Brown, T. G., Seraganian, P., Tremblay, J., & Annis, H. (2002). Process and outcome changes with relapse prevention versus 12-Step aftercare programs for substance abusers. *Addiction, 97*(6), 677-689. http://dx.doi.org/10.1046/j.1360-0443.2002.00101.x

Dolan, S. L., Martin, R. A., & Rohsenow, D. J. (2008). Self-efficacy for cocaine abstinence: Pretreatment correlates and relationship to outcomes. *Addictive Behaviors, 33*(5), 675-688. http://dx.doi.org/10.1016/j.addbeh.2007.12.001

Gaily, E. S. S. E., & Bashir, T. Z. (2004). High-risk relapse situations and self-efficacy: Comparison between alcoholics and heroin addicts. *Addictive Behaviors, 29*(4), 753-758. http://dx.doi.org/10.1016/j.addbeh.2004.02.003

Heather, N., Stallard, A., & Tebbutt, J. (1991). Importance of substance cues in relapse among heroin users: comparison of two methods of investigation. *Addictive Behaviors, 16*(1), 41-49. http://dx.doi.org/10.1016/0306-4603(91)90038-J

Ibrahim, F., Kumar, N., & Samah, B. A. (2011). Self efficacy and relapsed addiction tendency: An empirical study. *The Social Sciences, 6*(4), 277-282. http://dx.doi.org/10.3923/sscience.2011.277.282

Kadden, R. M., & Litt, M. D. (2011). The role of self-efficacy in the treatment of substance use disorders. *Addictive Behaviors, 36*(12), 1120-1126. http://dx.doi.org/10.1016/j.addbeh.2011.07.032

Lowman, C., Allen, J., & Stout, R. L. (1996). Replication and extension of Marlatt's taxonomy of relapse precipitants: Overview of procedures and results. *Addiction, 91*(12s1), 51-72. http://dx.doi.org/10.1080/09652149638809

Maisto, S. A., Connors, G. J., & Zywiak, W. H. (2000). Alcohol treatment changes in coping skills, self-efficacy, and levels of alcohol use and related problems 1 year following treatment initiation. *Psychology of Addictive Behaviors, 14*(3), 257. http://dx.doi.org/10.1037/0893-164X.14.3.257

Marlatt, G. A., & Donovan, D. D. M. (2005). *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors*: Guilford Press.

Mazloumi Mahmoudabad, S., Mehri, A., & Morovati Sharifabad, M. (2006). The Relationship of Health

Behavior with Self-esteem and Self-efficacy in Students of Yazd Shahid Sadooghi University of Medical Sciences (2005). Strides in Development of Medical Education.

McKay, J. R., Foltz, C., Leahy, P., Stephens, R., Orwin, R. G., & Crowley, E. M. (2004). Step down continuing care in the treatment of substance abuse: Correlates of participation and outcome effects. *Evaluation and Program Planning, 27*(3), 321-331. http://dx.doi.org/10.1016/j.evalprogplan.2004.04.005

Mirzaei, T., Ravary, A., Hanifi, N., Miri, S., Oskouie, F., & Mirzaei, k. a. S. (2011). Addicts' Perspectives about Factors Associated With Substance Abuse Relapse. *Iran Journal Of Nursing (IJN), 23*(67), 49-58.

Narimani, M., & Sadeghieh, S. (2008). A Study of the Rate and Causes of Addiction Relapse Among Volunteer Addicts Seeking Help at the Center for the Prevention of Addiction Affiliated to the Welfare Organization, Ardabil Province, Iran. *Iran Research Journal of Biological Sciences, 3*(2), 258-264.

Nessa, A., Latif, S., Siddiqui, N., Hussain, M., & Hossain, M. A. (2008). Drug abuse and addiction. *Mymensingh medical journal: MMJ, 17*(2), 227-235.

Romo, L., Strat, Y. L., Aubry, C., Marquez, S., Houdeyer, K., Batel, P., et al. (2009). The role of brief motivational intervention on self-efficacy and abstinence in a cohort of patients with alcohol dependence. *The International Journal of Psychiatry in Medicine, 39*(3), 313-323. http://dx.doi.org/10.2190/PM.39.3.g

Seraji, A., Momeni, H., & Salehi, A. (2010). The investigation of factors affecting dependence on narcotics and appearance of drug usage in narcotics anonymous population in Khom (2009). *Arak Medical University Journal, 13*(3).

Walton, M. A., Blow, F. C., Bingham, C. R., & Chermack, S. T. (2003). Individual and social/environmental predictors of alcohol and drug use 2 years following substance abuse treatment. *Addictive Behaviors, 28*(4), 627-642. http://dx.doi.org/10.1016/S0306-4603(01)00284-2

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Cultural and Socio-Economic Factors on Changes in Aging among Iranian Women

Masoumeh Bagheri-Nesami[1] & Seyed Afshin Shorofi[1]

[1] Department of Medical - Surgical Nursing, School of Nursing & Midwifery, Mazandaran University of Medical Sciences, Sari, Iran

Correspondence: Department of Medical-Surgical Nursing, School of Nursing & Midwifery, Mazandaran University of Medical Sciences, Sari, Iran. Tel: 98-151-226-7551. E-mail: ashorofi@yahoo.com

Received: December 17, 2013 Accepted: Januray 24, 2014 Online Published: February 28, 2014

doi:10.5539/gjhs.v6n3p145 URL: http://dx.doi.org/10.5539/gjhs.v6n3p145

Abstract

The aim of the study is to determine the cultural and socio-economic factors that influence changes in aging among Iranian women. This qualitative study was part of a more extensive study designed according to grounded theory method. A purposeful, snowball and theoretical sampling technique was used. Data collection instruments were interviews and field notes. Duration of interviews differed and ranged from 38 to 110 minutes. Data collection process, coding and analysis were performed simultaneously. Collected data were analyzed using the recommended method by Corbin and Straus (1998 and 2008). The factors were formed from 6 subcategories: cultural and socio-economic status in the past, urban/rural life, companionship status, beliefs and attitudes, higher responsibilities of women and women's financial capability. This study explained the various aspects of cultural and socio-economic changes in the elderly participants based on their real experiences.

Keywords: women, community dwelling elderly, cultural context, socioeconomic factors

1. Introduction

It has been stated that by 2030, the elderly will constitute 21% of the total world population (Strydom, 2005). According to biostatistics estimations, by the year 1410 AP (2030 AD), Iran will experience an explosion in aging, placing 20 to 25 percent of the population over the age of sixty (Foroughan, 2001).

The increasing elderly population around the world is one of the most challenging issues in the health and welfare fields and aging is discussed as a universal phenomenon (Gates, 2000). Aging and the aging process are often associated with increased chronic diseases. It also seems that inactivity and general disability are part of the aging process. Most of these problems lead to other issues such as social isolation, functional loss, economic loss and depression (Easley & Schaller, 2003). In addition, older age is associated with higher risk of disease, physical and emotional damage, decrease of functional capacity, multiplicity and abundance of problems related to aging, all of which are natural phenomenon (Strydom, 2005). The results of studies confirm that aging puts older people at risk of further damage. On the other hand, elder women have low income and low socio-economic status that makes them vulnerable to be placed in this category (Cyr, 2007). Clearly the changes in the framework of aging are influenced by internal and external factors (Balcombe & Sinclair 2001). These include a wide range of factors influencing physical, mental, emotional, cultural and social-economic aspects. Several studies have reported the effects of various factors including culture, occupation, education and low income on physical disabilities (Chiu, Hsieh, Mau & Lee, 2005; Day, 2008; Jacelon, Connelly, Brown, Proulx & Vo, 2004), mental health (Grundy & Sloggett, 2003; Kawachi & Berkman, 2001), depression (Black, White & Hannum, 2007), life satisfaction (Nagalingam, 2007), health status, having healthy aging (Bryant, Corbett & Kutner, 2001; Hinck, 2004; Jamjan, Maliwan, Pasunant, Sirapo-Ngam & Porthiban, 2002; Shin, Kang, Park, Cho & Heitkemper, 2008; Strydom, 2005; van Manen, 2006) and successful aging (Matsubayashi, Ishine, Wada & Okumiya, 2006). Moreover, some researchers showed that attitudes, expectations and behavior are formed and influenced by culture and affect aging via adopted behavior (Bryant et al., 2001; Ramamurti, 1997; Reichstadt, Depp, Palinkas, Folsom, & Jeste, 2007; Sarkisian, Hays & Mangione, 2002). For instance, the dominant lifestyle in rural areas is being active and working hard. Also, several studies have demonstrated the effect of rural lifestyle on the health of the elderly (Dorfman, Murty, Evans, Ingram & Power, 2004; Smith, 2007).

As is the case in many developing countries, the senior population in Iran is significantly growing. The baby

boom occurred in war-time Iran (1980s), and it is predicted that more than 26 million seniors (over 60 years old) will live in Iran by 2050. The aged people (65 years and older) represent more than 7% of the population, and it is projected to be more than 10% and 21% by 2025 and 2050, respectively. The cohort of Iranians, 0-14 years old, has been significantly declining since the 1990s. Based on various estimates, the proportion of the seniors will increase considerably in the next four decades. For instance, the number of seniors is estimated to reach 8.5 and 10.5 million by 2020 and 2025, respectively. The aging of the population will be somewhat more rapid in Iran than in other developing countries (Amini, Ingman & Sahaf, 2013).

Therefore, it is important to study the aging phenomenon on Iranian elderly and to understand it based on chronological age, taking into consideration the contexts, including cultural, historical, socio - economic and regional variables (Orimo et al., 2006).

A review of literature showed limited published study exploring cultural and socio-economic factors influencing changes in aging amongst women. Most reported studies have quantitatively investigated this topic. Additionally, most studies are confined to Western and European societies and have been carried out in social and cultural contexts that are very different from Eastern countries. Few quantitative studies have been undertaken in Iran and the qualitative aspects of this issue have not been studied to deeply understand the experiences of Iranian elderly women. Considering the fact that aging is a circuit process and is especially influenced by cultural and social contexts, and several confounding factors are involved in the interactions of the mentioned process, this study sought to provide a foundation for developing our knowledge about elderly women via the exploration of their experience.

2. Materials and Methods

This qualitative study was part of a more extensive study designed according to grounded theory method. Grounded theory is a method of qualitative research in the field of research and describes the phenomena experienced in natural environments such as hospitals, outpatient clinics and nursing homes. The purpose of this study was to find out whether the detail of practices, behaviors, beliefs and attitudes of individuals or groups is similar to their real life (Polit & Beck, 2006). A qualitative research aims to understand the social reality lies in the experiences of individuals, groups and cultures and seeks to discover the behavior, ideas, feelings and experiences of people and what are located at the center of their lives. This kind of research suggests that human's experiences are dependent on the background of the experiences and cannot be detached from the time and situation (Corbin & Strauss, 2008). As a result, in this study we used a qualitative approach to explain the cultural and socio-economic factors which affect changes in elderly women.

Participants of the study were elder women living in private homes in Sari, Mazandaran province and Tehran, Tehran province in Iran. After obtaining informed written consent to participate in the study based on a purposeful, theoretical and snowball sampling technique, the eligible participants were recruited into the study (Polit & Beck, 2006).

Primary inclusion criteria were being female, aged 65 years and older, living in the home and no history of cognitive and mental disorders, cancer or physical illness that required hospitalization. The first sample was a 70-year-old woman with a high school diploma, widowed and housewife who lived alone in her private home in town. The next participant was a woman aged 67 years old introduced by the first participant and selected through snowball method based on the inclusion criteria. The remaining samples were recruited considering the inclusion criteria and were selected from elderly women with different characteristics in terms of age, educational level, occupation, marital status, residence location (city vs. rural areas) and socio-economic and cultural status. Elderly women living in the city and rural areas, older women who were married, single, widowed single, widowed while living with unmarried children, elderly widows living with another widow, or living independently at home with their children and widows with children living in their children's home were enrolled. Following interview with the concepts generated by the interviews, it seemed interviews with people who came to live with the elderly could provide more information. Therefore, following gradual data gathering and analyzing information from research, for development of the data, the researcher did an interview with the daughter of an elderly woman who lived with her family at her mother's home. Theoretical saturation of conceptual categories was accomplished after 20 interviews with 19 participants and the review of field notes taken by the researcher during the interviews.

Data collection instruments were semi-structured interviews and field notes. After each interview session, the recorded data was transcribed and field notes were rewritten by the researcher. In this study, information such as the participant's appearance, non-verbal behaviors, interactions with other household members, roles, use of a cane, and the photos in home decorations all were recorded.

Several main questions that were repeated in almost all interviews were as follows: 'Please describe your daily living activities from awaking in the morning to sleeping time at night'; 'What are the issues and problems you are facing with?'; 'If possible, can you explain more about your experiences of life in aging?'. The duration of interviews ranged from 38 to 110 minutes. Most of interviews ended at first session, and only in one case, the second interview was scheduled.

Data collection process, coding and analysis were performed concurrently and data analysis was performed using the recommended method by Corbin and Strauss (1998 and 2008).

In this method, three types of open coding, axial, and selective central was performed to discover the main categories, subcategories and core variable of the aging process. Open coding or substantive coding is conceptualizing on the first level of abstraction. Written data from field notes or transcripts were conceptualized line by line. The coding was often done in the margin of the field notes. The researchers goes back and forth while comparing data, constantly modifying, and sharpening the growing theory at the same time as she follows the build-up schedule of grounded theory's different steps. By axial coding data were put back together in new ways after open coding, by making connections between categories. Selective coding was done after having found the core variable or what is thought to be the core, the tentative core. The core explains the behavior of the participants in resolving their main concern (Corbin & Strauss, 2008; Strauss & Corbin, 1998).

In this study, validation of data was established with prolonged engagement, member check, peer debriefing, triangulation, disconfirming evidence, and researcher credibility (Polit, Beck & Hungler, 2002). Moreover, elsewhere in the report as evidence of data dependency, the same words of the participants were used (Streubert & Carpenter, 2007). The researcher was trying to correctly interpret the findings with the idea of journalism (through the use of memos) and checking participates. In addition to leaving a footprint, utilized the new creative ideas to provide appropriate practical services in daily life of elderly people.

3. Results

Cultural and socio-economic factors were formed from 6 subcategories including previous cultural and socio-economic status, urban/rural life, companion status, beliefs and attitudes, higher responsibilities of women and women's financial capability. According to the results, it seems that these factors were affecting all dimensions of physical, psychological, cultural and socio-economic of the elderly women. Other minor subcategories are shown in Table 1.

Table 1. Categories and subcategories of cultural and socio-economic factors on changes in aging among Iranian women

Cultural and socio-economic factors	
Previous cultural and socio-economic status	- Previous economic status
	- Previous companion status
	- Previous employment
Urban/rural life	Rural activity style
	Rural nutritional style
	More physical power of rural women
	More facilities in rural than past
Companion status	- Presences of companion
	- Type of companion
Beliefs and attitudes	- Beliefs about gender
	- Therapeutic and health care beliefs
Higher responsibilities of women	
Financial capability	- Healthcare costs - Children financial aids - A decrease in the cost of children's education and marriage

3.1 Pervious Cultural and Socio-Economic Status

This subcategory emerged from minor subcategories including economic status, companion status and employment status. The data showed that the past lifestyle was as a predictive value as current lifestyle among the older women. About the effect of previous cultural and socio-economic status on current lifestyle, one participant said: 'Well, my father was one of the great landlords in a good financial situation. I have the same inheritance income now. But it is not so good. However, I could handle my life by renting a house and so on. I have spent my life by traveling alone or with my family members and sometimes I go to entertainment events / parties'.

Also a retired participant expressed the importance of previous economic status: '... if I can find a job in my youthful days, I can take advantage of it during aging. Since I had a job during my youth, I do not need to ask my husband to give me some money to buy something every day. Now I am at old age. I have 6 grandchildren, one bride, two girls and their husbands. I have to buy birthdays gifts for all of them. Now, my husband and I pay our salaries one by one to provide the gifts. When we were young, we were away from each other. Now we are together and use each other's incomes'.

Another participant also expressed about previous companion status**:** 'It was just me and my husband. Our children lived separately in their own house. My husband was an employee of department of education. He was also poet and religious singer. We have always visited others at home and our house was a center for interaction with others. Come and go in our house is continued up to now. If only 5 people come to our house a day, we ask from ourselves: "what's happened? Why others have left us alone"'.

Another elderly housewife woman expressed about previous employment**:** 'If I was a man, I could work out, it was very good. Since I am a woman, I'm always at home and suffering from to be at home. Well, I'd like to have a job and worked out into the community. I'd like to work at home and outside too. People, who work out, could use their art and thoughts to do better work and could be successful in his/her life.'

Another elderly woman who was a retired nurse, said**:** 'Well, my career really helped me know what I eat at this age. When I'm sick, I know what I should do. I know what is good for me or not. Using my knowledge, I could help myself and my friends. I do my daily work and I take my blood pressure pills by myself. I will seek the doctor if my attempts are failed. I provided all of my husband's needs by myself. Having a job really causes someone to be mature. Working is really prefect.'

Another participant believed that: 'Because I was a housewife from a younger age, I was not socialized, I did not know people. I taught all people around the world are perfect. Why should a person battle me when I am a widow woman who lives with her young children'.

3.2 Urban and Rural Life

This subcategory was formed from several minor subcategories including rural style activities, rural nutritional style, more physical power of rural women and more facilities in rural area compared to previous times. Most participants believed that changes in physical, mental and social status were influenced by their lifestyle. A participant said about the style of rural activities: 'Because I have a garden, I personally do gardening and also participate with workers employed to do this job. After getting up in the morning, we prepare food for the workers. We also have livestock and farming. Summary, we have some cattle that make us busy. The day that we have workers on farm, I have to work hard. Activities in village are too much and so difficult, while the income are too low. We wake up early morning, say prayer and then go at work until sunset. We work, work…work even we feel pain, we still work. We can't stop the work.'

The same participants said about the rural nutritional style: 'But I eat too much rice. It is just my only mistake in regimen. The quantity of my diet is not less than before, because doing hard work in the village needs lots of energy and eating more consequently.'

Another 72 years old woman expressed about the more physical power in rural women: 'I prepare all facilities for my guests alone. I prepare all of my needs by myself. I don't need anyone helping me for my routine daily living. For example, when I invite my children in fasting month, I make food. Then they wash and dry the dishes; either my bride or my girls.'

This elderly lady, about the development of life in village compared to the past expressed**:** 'At that time we did not have these facilities, there was many problems. Now we live easier than the past we did. I thank God. Already the work was very hurt and the life was very difficult. All family members lived with together. There were no facilities in the past. Our young people should not declare life isn't easy today.' She continued: 'Feeling sad is now less prominent than in the past. Now everything is ready. When the guests arrive, we are happy.

Everything is ready. The furniture, freezer and food are accessible'.

3.3 Companion Status

Companion status, is one of the other factors affecting the aging changes, was assessed in this study. This minor subcategory was formed by presence and type of companions. About necessity of companion, a participant said: 'What does an elderly expect? An elderly needs to go outdoors, prefers to be with family members, to be with a partner and friends, not to leave alone, to be stable for living. If not, frequent thinking will lead to mental illness. Personally, if I don't walk outside and stay home for a week, and have no meeting with others, I will be depressed'.

About the type of companions, an elderly woman stated: 'In fact, I am very annoyed with someone who has stress. Someone who is suffering from stress and anxiety for anything, such as fear of crossing the road, or always suffering from conflict to do or not to do something, make me stressful. I try to have less contact with anxious people. Sometimes it is impossible to detach yourself from others and it bothers me. Conversely, I feel comfort with a number of people'.

Another elderly woman said: 'I travel with my previous co-workers and classmates; I interact with people who have similar moral values'.

3.4 Beliefs and Attitudes

This subcategory includes codes of gender, attitudes, ideas and therapeutic and health care beliefs and attitudes. About the effect of gender on attitudes and beliefs a participant believed: 'A man is free to select a partner, to go outdoors whenever he wants. Could I go outdoors at 12 midnight? I have to stay home. These differences cause emotional stress. Men are free. We are limited. Being free makes men to be health more than women. Certainly it affects physically and internal stress could be effective on everything'.

Another elderly woman said: 'Women are more resilient than men. If a single woman survives to 85-90 years, she could live alone without thinking about getting married, but a man cannot do so. If I had died, my husband would have married. The men need partners to live. Well, women ignore mistakes too much, and can tolerate living alone'.

What we concluded from the data is that, having right and positive ideas can influence the application of proper strategies which lead to reduction of negative changes.

An elderly woman stated about the beliefs and attitudes of health care and therapeutics: 'But we are always careless. Because we always have so much work to do, that causes that we ignore ourselves. Doctors are available, however we are careless to go to their office. A part of this ignorance is related to negligence and it is dangerous'.

Another participant said: 'Since white bread causes obesity, I prefer to eat bran bread which does not cause obesity and is useful too. I often eat non-baked dinner. I have a glass of milk. Some foods like butter and jam are forbidden for us. Of course, I am not diabetic. I follow the diet because I don't like to be fat'.

3.5 Higher responsibilities of Women

Employed elderly women who are retired now complained of this issue that they had many responsibilities in the past. They mentioned it as an etiological factor for aging-related injuries and diseases. One of the participants said about the great responsibilities of women: 'We hope all men be healthy. Well, when a woman delivers a baby, lots of calcium and other elements transfers to the baby's body and mother starts to become weak. Maybe just difficult baby deliveries cause low back pain in mother. About 90 percent of carriage, housework and shopping are done by women in households. Well, heavy burden of housekeeping is on the shoulders of women. So they have dubbed works and the hard work of household are not without adverse effects for the women'.

Another retired elderly said 'Men do not take responsibility and do not have trouble! Certainly they are much better than us. Responsibility of a woman as a mother or housewife is very different. With someone like me who worked all day long; I had responsibility of home and kids. I had responsibility for supervising their educational classes and their lessons. I think men had no problems like we have. Their responsibility seems not to be much featured at home. Their job is just their responsibility and it is all they do'.

3.6 Financial Capability

In accordance to the findings observed, financial independence in the elderly not only provides them happiness, but also results in ability to change strategy to be effective in terms of their physical, mental-emotional, cultural and social-economic status. Financing power can be included dimensions of treatment costs, children financial

support, and handling costs of children's education and their marriage. Most participants were complaining of rising healthcare costs in this age. One of the elders said: 'I told to my doctor that the cost of the tablets I take is too high for us at this age. I am a widow and have no extra income. We must live with employee salary. But within days we should pay for the pills which controls the pain and avoids bone deformities and builds bone materials. The doctor said "You could buy the Iranian pills, because each imported tablet is about 16,000 Rials"'. Another participant stated: 'I always have a mobile pharmacy in my bag. I have no financial problems now. But I spend more for visiting the doctor, medicine and checkups than in the past'. About the financial support of children, an elderly expressed: 'I have no income. My boys and girls are supporting me financially. They give financial aid to me monthly. They constructed the house I am living there now'.

Other participants stated about decreasing their children's' education and marriage expenses: 'I'm satisfied with my life; I have enough income to spend. God bless my husband. I am benefited from what he prepared for me in the young age. I have already paid money for my children to get married. Now they are independent and there is no need for my support. Today, my life is better. I have no debit. I am living now'.

4. Discussion

In the present study, participants' experiences showed that cultural and socio-economic status in the past, living in urban and rural area, companion status, beliefs and attitudes, more responsibilities of women and financial capacity were the cultural and socio-economic factors influencing changes in aging amongst Iranian women.

Categories organizing the cultural and socio-economic status of the elderly in the past in this study were: previous economic status, previous companion status and employment. In order to enrich the findings of this study, various participants to achieve a better view point of cultural and socio-economic conditions were enrolled.

Participants expressed being employed in the past in their life was a factor for success of various affairs of life, and believed that the current economic situation is the outcome of their previous social and economic status. It seems the theory of continuity confirms these findings. This theory expresses that the elderly continue the habits, adherence and values, especially in a way that they have chosen according to their social position to maintain sustainability. Therefore, knowing these factors, it can be predicted how they are old and what changes they experience (Eliopoulos, 2010; Mauk, 2006). Culture of an elderly person originates from social environment surrounding him/her and affects his/her attitude (Bryant et al., 2001). The aging process varies according to cultural change (Shin, Kim, & Kim, 2003). According to this analogy, all changes in elder life are caused by his/her culture. It is clear that separate assessments of various mental and biological aspects of life are meaningless. Each of these aspects is affected by another aspect, and this interaction is quite clear and obvious, especially in the elderly. So what we call mental and social life is only understood under human existential life situation. This situation and manner of life affects physical function. Because as before was mentioned, the analytical aspects of old age alone is not enough because each aspect had an impact on other aspects and other aspects are also affected. Therefore, study of the elderly should be comprehensive and complete. Aging can be understood only as a whole and is not only a biological fact but a true cultural, social and economic fact as well. Nevertheless, living conditions affect all aspects of life in the elderly (Bagheri-Nesami, 2012). Some similar studies have reported the effect of previous cultural and socio-economic status including culture, occupation, education and low income on physical disabilities (Chiu et al., 2005; Day, 2008; Jacelon, 2007), mental health (Grundy & Sloggett, 2003; Kawachi & Berkman, 2001), depression (Black et al., 2007), satisfaction of life (Nagalingam, 2007), health status, having a healthy old age (Bryant et al., 2001; Hinck, 2004; Matsubayashi et al., 2006; Shin et al., 2003; Strydom, 2005; van Manen, 2006) and successful aging (Matsubayashi et al., 2006).

In this study, the urban/rural life subclass was another factor influencing the cultural and socio- economic changes in the elderly. It included subcategories of rural activities, rural nutrition style, more physical power among rural women, and more access to more facilities in the village nowadays compared to the past. Rural participants in this study expressed that due to heavy work in the village, they have to do much more physical activity. Thus, compared to urban-living elderly, they need to consume more food in order to receive sufficient energy. Also, in comparison with the urban elderly, they believed that they are physically more powerful. Researches also show that the dominant culture of life in the village is hard work along with high activity (Dorfman et al., 2004; Smith, 2007). The rural elderly know working as a part of their life, even in the aging; especially work for agriculture, because it brings them the sense of well-being, physical activity and enjoyment. Desire for independence and unwillingness to change their previous lifestyle has also been dominant feature of rural culture. Thus, according to the continuum theory (Eliopoulos, 2010; Mauk, 2006) it can be said that rural-living people like to keep their previous lifestyle and remain active in the aging period. Other feature of

rural culture is jointing the two categories of working and the families in rural areas (Dorfman et al., 2004; Goins, Williams, Carter, Spencer & Solovieva, 2006). The elderly in rural areas compared with urban elderly also benefit from more resources and social support, and this issue will contribute more to their mental health. This study showed that self-reporting about health status is similar between elderly in both urban and rural areas and the amount of high quality and useful food intake strategy, there was no differences between the two elderly groups. Another similar result with the present study was accessibility to facilities like freezer that prepare opportunities for rural elderly to choose and having the necessary foods. It seems rural elderly are overcome on their nutritional requirement (Smith, 2007). It is notable that this study reported a difference of more than five years of life for elderly in rural areas compared to urban elderly.

In the present study, participants expressed the companion status as another factor influencing cultural and social-economic aspects. The participants believed that communication is a source of support by others and improve physical, mental and social status. According to experiences of key informants in this study, elderly chose their communicators based on their mental and psychological characteristics. So, most participants preferred to cut their relationship with someone who is anxious. Social capital has positive and negative effects on the elderly. If the resources or the people are appropriate, the elderly will be successful; otherwise the individual may be suffering from loneliness or social separation (Cannuscio, Block & Kawachi, 2003). The findings of other studies also indicate the fact that communication with people benefit mental and physical health (Gilhooly et al., 2007; Kawachi & Berkman, 2001; Kunzmann, Little, & Smith, 2000; Walker & Hiller, 2007), prevent loss of cognitive impairment such as Alzheimer's and dementia (Fratiglioni, Paillard-Borg & Winblad, 2004; Walker & Hiller, 2007), increase perfect sense, being independent and productive (Cannuscio et al., 2003) and increase longevity (Giles, Glonek, Luszcz & Andrews, 2005; Walker & Hiller, 2007) in the elderly.

Other contributing factors influencing changes in aging amongst Iranian elderly women were beliefs and attitudes. The results showed the shape of health behaviors, medical follow-ups, adherence to health advice, the prevention of changes in aging and enjoyment of health beliefs amongst Iranian elderly women. It is believed that attitudes, subjective norms and perceived ability to control the behavior of the elderly are mixed together to create a goal to perform a behavior. Therefore, beliefs and attitudes, expectations and behavior formed and influenced by the changes in aging can affect adopted behavior (Ramamurti, 1997; Reichstadt et al., 2007; Sarkisian et al., 2002). Also, the attitude among the elderly is a predictive important factor for the understanding of health, feeling close to death and problems of end of life was reported (Torsch & Ma, 2000). The data analysis related to a study showed that there was no significantly a difference between successful and unsuccessful elderly as viewpoints of numbers rate of life events experienced. But unsuccessful older people were more negative in their experience and feel the experience has had a negative impact on their lives. Based on the results of this study, attitudes and beliefs of the elderly are the main issues affecting changes in the period of life (Reichstadt et al., 2007).

Another category in the present study, as factors contributing to the cultural and socio-economic changes of aging, was the more responsibilities of women than men. Two groups of participants had complained about responsibilities more than others. The two groups were; rural elderly women and women who work outdoors. The contributors stated working together outdoors and inside the home caused the physical and psychological erosion among them. Feminist theorists believed that most of the activities women do, influenced by the culture and norms of society. Today, with the rise of modernity, the lives of women must be changed, while today women are under past man-dominated culture and therefore they have not equal rights. Theorists believe that what these elderly women do, it is not what others expect of her, or should do, and this is a reason of there are being under pressure, suffering and hardship and increase in women's responsibility. According to the feminist theory in comparison with men's duties, taking care of families with having a mother relationship with children is a moral concept like justice and dignity that is far off human rights law (Utz & Nordmeyer, 2007). It seems women have a sense of responsibility to their families and children. Women's work is a kind of sacrifice and opposite of the perspectives of the feminist theory; this is not a default from woman who involves her in trouble. Although it is difficult, it is possible by family support and government protection. Current laws to help women, such as labor rights, breast feeding, retirement with 25 years' service, etc. in Iran expresses itself in honoring the women.

Participants' experiences showed that financial power is one of the categories influencing cultural and socio-economic changes in the elderly. Elderly women expressed factors such as medical expenses, financial aids of children, decreasing children's' education and married expenses' costs as important factors affecting financial power. Because through supporting roles for family and children, older women while enjoying financial assistance to the relatives and next-generation, will be able to achieve capacity, respect and dignity of old age

(Fiksenbaum, Greenglass & Eaton, 2006; Nagalingam, 2007; Ravanipour, Salehi, Taleghani, Abedi & Schuurmans, 2008; Strydom, 2005). Also, according to the participants' experiences and findings of other studies, older women, when faced with financial problems, may experience the consequences of social separation, depression and fear of future (Fiksenbaum et al., 2006; Ravanipour et al., 2008; Strydom, 2005). So, based on what mentioned above, changes in aging are affected by cultural and socio-economic contexts of life.

The results of our study can help health care providers to be attuned to the needs of Iranian elderly women, delivering them more suitable health care services.

Acknowledgements

Researchers are grateful to all the elderly women who kindly participated in this study.

References

Amini, R., Ingman, S. R., & Sahaf, R. (2013). Aging in iran: past, present and future. *The Journal of Aging in Emerging Economies*, *4*(1), 17-34.

Bagheri-Nesami, M. (2012). Exploration of elderly women lived experiences about psychological-emotional changes: a qualitative study. *Journal of Mazandaran University of Medical Sciences, 21*(1), 204-215.

Balcombe, N. R., & Sinclair , A. (2001). Ageing: defnitions, mechanisms and the magnitude of the problem. *Best Practice & Research Clinical Gastroenterology, 15*(6), 835-849. http://dx.doi.org/10.1053/bega.2001.0244

Black, H. K., White, T., & Hannum, S. M. (2007). The lived experience of depression in elderly African American women. *The Journals of Gerontology, 62*(6), S392-398. http://dx.doi.org/10.1093/geronb/62.6.S392

Bryant, L. L., Corbett, K. K., & Kutner, J. S. (2001). In their own words: a model of healthy aging. *Social Science & Medicine, 53*(7), 927-941. http://dx.doi.org/10.1016/S0277-9536(00)00392-0

Cannuscio, C., Block, J., & Kawachi, I. (2003). Social capital and successful aging: the role of senior housing. *Annals of Internal Medicine, 139*(5 Part 2), 395-399. http://dx.doi.org/10.7326/0003-4819-139-5_Part_2-200309021-00003

Chiu, H. C., Hsieh, Y. H., Mau, L. W., & Lee, M. L. (2005). Associations between socio-economic status measures and functional change among older people in Taiwan. *Ageing and Society, 25*(3), 377-395. http://dx.doi.org/10.1017/S0144686X05003478

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory*. Thousand Oak London New Delhi: Sage Publications Inc.

Cyr, N. R. (2007). Depression and older adults. *Association of Operating Room Nurses journal, 85*(2), 397-401. http://dx.doi.org/10.1016/S0001-2092(07)60050-7

Day, R. (2008). Local environments and older people's health: dimensions from a comparative qualitative study in Scotland. *Health Place, 14*(2), 299-312. http://dx.doi.org/10.1016/j.healthplace.2007.07.001

Dorfman, L. T., Murty, S. A., Evans, R. J., Ingram, J. G., & Power, J. R. (2004). History and identity in the narratives of rural elders. *Journal of Aging Studies, 18*(2), 187-203. http://dx.doi.org/10.1016/j.jaging.2004.01.004

Easley, C., & Schaller, J. (2003). The experience of being old-old: life after 85. *Geriateric Nursing, 24*(5), 273-277. http://dx.doi.org/10.1016/S0197-4572(03)00246-5

Eliopoulos, C. (2010). *Gerontological nursing*. Philadelphia: Lippincott Williams & Wilkins.

Fiksenbaum, L. M., Greenglass, E. R., & Eaton, J. (2006). Perceived social support, hassles, and coping among the elderly. *Journal of Applied Gerontology, 25*(1), 17-30. http://dx.doi.org/10.1177/0733464805281908

Foroughan, M. (2001). *Iran and the world's first congress on aging issues*. Tehran: ketab Ashena.

Fratiglioni, L., Paillard-Borg, S., & Winblad, B. (2004). An active and socially integrated lifestyle in late life might protect against dementia. *The Lancet Neurology, 3*(6), 343-353. http://dx.doi.org/10.1016/S1474-4422(04)00767-7

Gates, K. M. (2000). The experience of caring for a loved one: a phenomenological study. *Nursing Science Quarterly, 13*(1), 54-59. http://dx.doi.org/10.1177/08943180022107285

Giles, L. C., Glonek, G. F. V., Luszcz, M. A., & Andrews, G. R. (2005). Effect of social networks on 10 year survival in very old Australians: the Australian longitudinal study of aging. *British Medical Journal, 59*(7),

574-579.

Gilhooly, M., Hanlon, P., Mowat, H., Cullen, B., Macdonald, S., & Whyte, B. (2007). Successful ageing in an area of deprivation: part 1--a qualitative exploration of the role of life experiences in good health in old age. *Public Health, 121*(11), 807-813. http://dx.doi.org/10.1016/j.puhe.2007.03.005

Goins, R. T., Williams, K. A., Carter, M. W., Spencer, S. M., & Solovieva, T. (2006). Perceived barriers to health care access among rural older adults: a qualitative study. *The Journal of Rural Health, 21*(3), 206-213. http://dx.doi.org/10.1111/j.1748-0361.2005.tb00084.x

Grundy, E., & Sloggett, A. (2003). Health inequalities in the older population: the role of personal capital, social resources and socio-economic circumstances. *Social science & medicine, 56*(5), 935-947. http://dx.doi.org/10.1016/S0277-9536(02)00093-X

Hinck, S. (2004). The lived experience of oldest-old rural adults. *Qualalitative Health Research, 14*(6), 779-791. http://dx.doi.org/10.1177/1049732304265774

Jacelon, C. S. (2007). Theoretical perspectives of perceived control in older adults: a selective review of the literature. *Journal of Advanced Nursing, 59*(1), 1-10. http://dx.doi.org/10.1111/j.1365-2648.2007.04320.x

Jacelon, C. S., Connelly, T. W., Brown, R., Proulx, K., & Vo, T. (2004). A concept analysis of dignity for older adults. *Journal of Advanced Nursing, 48*(1), 76-83. http://dx.doi.org/10.1111/j.1365-2648.2004.03170.x

Jamjan, L., Maliwan, V., Pasunant, N., Sirapo-Ngam, Y., & Porthiban, L. (2002). Self-image of aging: a method for health promotion. *Nursing Health Sciences, 4*(3 Suppl), A6. http://dx.doi.org/10.1046/j.1442-2018.2002.01140_14.x

Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health, 78*(3), 458-467. http://dx.doi.org/10.1093/jurban/78.3.458

Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin Aging Study. *Psychology Aging, 15*(3), 511-526. http://dx.doi.org/10.1037/0882-7974.15.3.511

Matsubayashi, K., Ishine, M., Wada, T., & Okumiya, K. (2006). Older adults' views of" successful aging": Comparison of older Japanese and Americans. *Journal of the American Geriaterics Society, 54*(1), 184-187. http://dx.doi.org/10.1111/j.1532-5415.2005.00575_15.x

Mauk, K. L. (2006). *Gerontological nursing: competencies for care.* Boston Toronto London Singapore: Jones & Bartlett Publishers.

Nagalingam, J. (2007). Understanding successful aging: a study of older Indian adults in Singapore. *Care Management Journal, 8*(1), 18-25. http://dx.doi.org/10.1891/152109807780494131

Orimo, H., Ito, H., Suzuki, T., Araki, A., Hosoi, T., & Sawabe, M. (2006). Reviewing the definition of elderly. Geriatrics & Gerontology International, 149-158. http://dx.doi.org/10.1111/j.1447-0594.2006.00341.x

Polit, D., & Beck, C. (2006). Nursing Research: Generating and Assessing Evidence for Nursing Practice. Philadelphia: Lippincott Williams & Wilkins.

Polit, D., Beck, C., & Hungler, B. (2002). *Essential of nursing research.* Philadelphia: Lippincot.

Ramamurti, P. V. (1997). Coping with ageing. *The Indian Journal of Medical Research, 106*, 376-380.

Ravanipour, M., Salehi, S., Taleghani, F., Abedi, H. A., & Schuurmans, M. J. (2008). Power in Iranian Elders: Barriers and Facilitators. *Psychogeriatria polska, 5*(3), 114-121.

Reichstadt, J., Depp, C. A., Palinkas, L. A., Folsom, D. P., & Jeste, D. V. (2007). Building blocks of successful aging: a focus group study of older adults' perceived contributors to successful aging. *The American Journal of Geriatric Psychiatry, 15*(3), 194-201. http://dx.doi.org/10.1097/JGP.0b013e318030255f

Sarkisian, C. A., Hays, R. D., & Mangione, C. M. (2002). Do Older Adults Expect to Age Successfully? The Association Between Expectations Regarding Aging and Beliefs Regarding Healthcare Seeking Among Older Adults. *Journal of the American Geriatrics Society, 50*(11), 1837-1843. http://dx.doi.org/10.1046/j.1532-5415.2002.50513.x

Shin, K. R., Kang, Y., Park, H. J., Cho, M. O., & Heitkemper, M. (2008). Testing and developing the health promotion model in low-income, Korean elderly women. *Nursing Sciences Quaterly, 21*(2), 173-178. http://dx.doi.org/10.1177/0894318408314698

Shin, K. R., Kim, M. Y., & Kim, Y. H. (2003). Study on the lived experience of aging. *Nursing Health Sciences, 5*(4), 245-252. http://dx.doi.org/10.1046/j.1442-2018.2003.00161.x

Smith, J. (2007). *Food customs of rural and urban Inupiaq elders and their relationships to select nutrition parameters, food insecurity, health, and physical and mental functioning*. (Ph.D dissertation), Florida International University, Miami.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: techniques and procedures for developing grounded theory*. Thousand Oak London New Delhi: Sage Publications Inc.

Streubert, H., & Carpenter, D. (2007). *Qualitative research in nursing* . Philadelphia: Lippincot.

Strydom, H. (2005). Perceptions and attitudes towards aging in two culturally diverse groups of aged males: a South African experience. *Aging Male, 8*(2), 81-89. http://dx.doi.org/10.1080/13685530500088456

Teymoori, F., Dadkhah, A., & Shirazikhah, M. (2006). Social Welfare and Health (Mental, Social, Physical) Status of Aged People in Iran. *Middle East Journal of Age and Ageing, 3*(1), 39-45.

Torsch, V. L., & Ma, G. X. (2000). Cross-cultural comparison of health perceptions, concerns, and coping strategies among Asian and Pacific Islander American elders. *Qualitative Health Research, 10*(4), 471. http://dx.doi.org/10.1177/104973200129118589

Utz, R. L., & Nordmeyer, K. (2007). Feminism, aging, and the life course perspective. *The Gerontologist, 47*(5), 705-709. http://dx.doi.org/10.1093/geront/47.5.705

van Manen, H. M. T. (2006). Being old does not always mean being sick: perspectives on conditions of health as perceived by British and American elderly. *Journal of Advanced Nursing, 53*(1), 54-64. http://dx.doi.org/10.1111/j.1365-2648.2006.03670.x

Walker, R. B., & Hiller, J. E. (2007). Places and health: a qualitative study to explore how older women living alone perceive the social and physical dimensions of their neighbourhoods. *Social Science & Medicine, 65*(6), 1154-1165. http://dx.doi.org/10.1016/j.socscimed.2007.04.031

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Assessing the Association between the Degree of Pain and Socioeconomic Status among Older Persons in Ghana

Kwame Annin[1], Bahiru I. I. Saeed[1], Alfred Yawson[2], A. A. I. Musah[6], Emmanuel Nakua[3], Peter Agyei-Baffour[3] & N. N. N. Nsowah-Nuamah[5]

[1] Mathematics and Statistics Department, Kumasi Polytechnic, Kumasi, Ghana

[2] Department of Community Health, University of Ghana Medical School, College of Health Sciences, Korle-Bu, Accra, Ghana

[3] Department of Community Health, Kwame Nkrumah University of Science and Technology Medical School, College of Health Sciences, Ghana

[4] Paediatric Department, Komfo Anokye Teaching Hospital, Kumasi, Ghana

[5] Rector, Kumasi Polytechnic, Kumasi, Ghana

[6] Mathematics and Statistics Department, Tamale Polytechnic, Tamale, Ghana

Correspondence: Kumasi Polytechnic, Department of Mathematics and Statistics, P O Box 854, Kumasi, Ghana.

Received: December 2, 2013 Accepted: December 24, 2013 Online Published: March 6, 2014

doi:10.5539/gjhs.v6n3p155 URL: http://dx.doi.org/10.5539/gjhs.v6n3p155

Abstract

Objectives: The current study sought to examine the association between the degree of pain and socioeconomic status among older male and female Ghanaians.

Method: Data were drawn from the 2007–08 World Health Organization Global Ageing and Adult Health (SAGE) survey conducted in Ghana (Young adults=803, Adults=1689 and Older adults=2616). This includes bodily aches Ghanaians experienced in the last 30 days. Analyses of the association of pain with predisposing and enabling factors were carried out by means of ordinal logistic regression analysis.

Results: In the age-adjusted model, pain was statistically significantly associated with the cohabitating group as its marginal effect suggests that respondents in that category were less likely to experience pain as related to the others in women.

Conclusion: This study established that Ghanaian men go through more pain than their women counterparts. This article is premier to our knowledge to apply ordered logistic for the degree of pain.

Keywords: degree of pain, predisposing factors, enabling factors, prevalence, ageing Ghanaians

1. Introduction

Pain is a major public health problem. For individual pain causes decreased quality of life, activity limitations, and reduced functional capacity (Mantyselka, Turunen, Ahonen, & Kumpusalo, 2003; Mantyselka et al., 2001; Smith et al., 2001). For society, pain is a considerable financial burden causing an increased use of health services and medical, sickness absence and early retirement (Elliott et al., 2003; Mantyselka et al., 2001, 2002). Workability is strongly affected by pain (Blyth et al., 2003), regardless of its cause or site. Loss of productivity is a substantial consequence of pain in the work life. According to Mantyselka et al. (2003) 35% of the Finnish population reported chronic pain. Much research has examined meaning in the form of appraisals of the threat value of pain, or individuals' perceived ability to cope with the threat of pain (Sullivan et al., 2001). Discourses of justice and injustice appear inherent in the chronic pain experience (McParland, Hezseltine, Serpell, Eccleston, & Stenner, 2011). Individuals with chronic pain may ascribe external blame for those suffering (McParland & Whyte, 2008), which may increase the likelihood that pain is experienced with an elevated sense of injustice (Miller, 2001).

Meanwhile, perceived injustice in the chronic pain context has been operationally defined as an appraisal reflecting the severity and irreparability of pain-related loss, blame, and unfairness (Sullivan et al., 2008). Mounting evidence indicates that perceived injustice contributes to problematic outcomes associated with

persistent musculoskeletal pain. This has led to greater pain severity, pain behavior, and mental health difficulties, reduced physical function, and prolonged work disability (Scott & Sullivan 2012; Scott, Trost, Milioto & Sullivan, 2013; Sullivan et al., 2008; Sullivan, Davidson, Garfinkel & Siriapaipant, 2009; Sullivan et al., 2009). Moreover, due to the social inequality in the society, perceived injustice highly predicts adverse pain outcomes even when controlling for other pain-related psychosocial constructs, such as pain catastrophizing and fear of movement (Rodero et al., 2012; Scott & Sullivan, 2012; Sullivan, Davidson, Garfinkel, Siriapaipant & Scott, 2009; Sullivan et al., 2009). There are indications that perceived injustice might be more resistant to change than other psychosocial pain-related variables (Sullivan et al., 2008).

However, other recent studies argued that peripheral and central sensitization in knee osteoarthritis (OA) could be important for the poor pain outcome for some patients after total knee arthroplasty (TKA) and pharmacological interventions (Arendt-Nielsen & Graven-Nielsen, 2011; Skou et al., 2012). Quantitative sensory testing (QST) has frequently been applied to investigate sensitization in OA and increased pain sensitivity both locally and distantly from the affected joint has been reported (Arendt-Nielsen et al., 2010; Graven-Nielsen, Wodehouse, Langford, Arendt-Nielsen & Kidd, 2012; Imamura et al., 2008; Lee et al., 2011; Skou et al., 2013; Suokas et al., 2012). In patients with chronic painful knee OA, higher clinical pain intensities and longer pain durations caused relatively more temporal summation of pain compared with patients with shorter duration and less pain (Arendt-Nielsen et al., 2010).

Moreover, chronic pain and co-morbid insomnia are worldwide recognized as serious health problems that severely impact patients' quality of life and productivity. Sleep disturbances are acknowledged among patients with nociceptive pain (Abad, Sarinas & Guilleminault, 2008; Irwin et al., 2012; Smith, Quartana, Okonkwo & Nasir, 2009; Taylor-Gjevre, Gjevre, Nair, Skomro & Lim, 2011), neuropathic pain (Langley, Van Litsenburg, Cappelleri, Carroll, 2013; Zelman, Brandenburg & Gore, 2006) and mixed pain conditions such as cancer (Buffum et al., 2011; Cheng & Yeung, 2013; Dhruva et al., 2012; Garrett et al., 2011) or low back pain (Alsaadi, McAuley, Hush & Maher, 2011; Bahouq, Allali, Rkain, Hmamouchi & Hajjaj-Hassouni, 2012; Marty et al., 2008; van de Water, Eadie & Hurley, 2011). Nevertheless, it is imperative if treatments of chronic pain are to be successful that chronic pain is understood. Failure to do so causes many to suffer and modeling this could prove vital for research in this area. To date, however, socioeconomic and socio-demographic predictors have not been empirically researched into in Ghana. Against this backdrop, the study seeks to examine the association between socioeconomic status and the degree of pain among older male and female Ghanaians.

2. Material and Methods

2.1 Sampling Procedures

The data employed in this study were drawn from the World Health Organization Global Ageing and Adult Health (SAGE). This aims to evaluate the association of the degree of pain and predisposing and enabling factors of adults and ageing Ghanaians. It also aims at addressing the gap in reliable data and scientific knowledge on ageing and health in low – and middle –income countries. SAGE is a longitudinal study with nationally representative samples of persons aged 50+ years in Ghana with a smaller sample of adults aged 18-49 years. Instruments are compatible with other large high-income country longitudinal ageing studies. Wave 1 was conducted during 2007-2008 and included a total of 4305 respondents aged 50+ and 803 aged 18-49. In this article, Sample sizes of young adults=803, adults=1689 and older adults=2616 respectively had been considered.

Multistage cluster sampling strategies were used where households were classified into one of two mutually exclusive categories:

(1) All persons aged 50 years and older were selected from households classified as '50+ households'; and

(2) One person aged 18–49 years were selected from a household classified as an '18–49 household'.

Household enumerations were carried out in the final sampling units. One household questionnaire was completed per household where a household informant and individual respondent need not be the same individual. One individual was selected from 18–49 households, whereas for 50+ households all individuals aged 50+ were invited to complete the individual interview. Proxy respondents were identified for selected individuals who were unable to complete the interview. Household-level analysis weights and person-level analysis weights were calculated for each country, which included sample selection and a post-stratification factor. Post stratification correction techniques used the most recent population estimates provided by the Ghana Statistical Service (Biritwum et al., 2013).

2.2 Measures of Pain

Information about pain status was elicited in one question. Respondents were asked the degree of bodily aches or

pains they experienced in the last thirty days. The question captures the degree of pain. Body aches or pains refer to any form of physical pain or discomfort in the body that interferes with a person's usual activities, either for a short or long period of time.

2.3 Predisposing and Enabling Measures

Predisposing and enabling measures were selected on the basis of previous studies on the prevalence of acute, chronic and disabling pain (Saastamoinen et al., 2005).

Predisposing measures were age (age 18-49 (young adults), 50-59 (adults) and 60yrs and above (older adults)), gender and marital status (currently married, never married, cohabitating, separated/divorced and widowed).

Enabling measures were assessed in terms of education, job employment, well-being and income. Education was recorded as *college/university completed, high school completed, secondary school completed, primary school completed, less than primary school completed and no formal education*. Job employment was categorized into four groups: public, private, self-employed and informal employment. Public sector includes employees of state, or municipal governments and their agencies, parastatal enterprises, and semi-autonomous institutions such as social security institutions that are owned by the government or institutions like religious schools if the staff are paid by the government. Private sector includes any employees not working for the government and not self-employed. Self-employed includes those who earn their livelihood directly from their own trade or business rather than as an employee of another. Informal employment could mean employment in the informal economy or informal employment. Informal economy refers to the general market income category wherein certain types of income and the means of their generation are "unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated". Jobs in the informal economy are characteristically without benefits such as health insurance, sick leave, paid vacations or pensions. Well-being status was recorded as *completely, mostly, moderately, a little and not at all*. Income level was divided into five categories: Income Quintile; *Q1 (lowest) through Q5 (highest)*. Wealth or income Quintiles were derived from the household ownership of durable goods, dwelling characteristics (type of floors, wells and cooking stove), and access to services (improved water, sanitation and cooking fuel) for a total of 21 assets. A two-step random effects probit model was used to generate the Quintiles (Kowal et al., 2012).

2.4 Statistical Methods

Descriptive characteristics of all respondents were first calculated. Analyses of the association of pain with predisposing and enabling factors were carried out separately for women and men by means of ordinal logistic regression analysis. Odds ratios (OR) and their respective 95% confidence intervals were also computed. Firstly, no variable was adjusted for age (age-unadjusted model). Secondly, each variable in the analysis was adjusted for age (age-adjusted model).

For a response with five options (extreme, severe, moderate, mild and none), the ordinal logistic regression suggests that the effect of any predisposing and enabling factors would induce a change in the odds of responding to option extreme instead of the rest, or extreme or severe or moderate or mild instead of none by a factor of the exponent of the regression estimates. Stata SE (version 12.1) was used for analysis.

3. Results

3.1 Ratio of Pain by Predisposing Factors

Age gradient was found in the degree of pain: the older the respondent, the higher the prevalence of pain (Table 1). By marital status, degree of pain varied only modestly in men and widely in women (Table 2).

Table 1. Descriptive characteristics of pain by age

Age Category	Male	Female	Sample size(n)
	Pain %	Pain %	
18 - 49	16.1	14.8	803
50 - 59	35.6	31.0	1689
60 +	48.3	54.2	2616

Table 2. Descriptive characteristics of pain by socio-demographic and socio- economic indicators

	Male	Female	Both Sexes
	Pain %	Pain %	Pain %
MARITAL STATUS			
Currently Married	83.1	31.5	58.9
Never married	2.4	2.5	2.5
cohabitating	1.2	1.4	1.3
Separated / divorced	7.5	19.9	13.3
Widowed	5.9	44.6	24.1
HIGHEST EDUCATIONAL LEVEL			
No formal education	38.7	59.3	48.4
Less than primary school	10.6	13.3	11.9
Primary school completed	14.2	9.9	12.2
Secondary school (O&A levels) completed	8.5	3.6	6.2
High school (or equivalent) completed	23.2	11.9	17.9
College / university completed	4.8	2.0	3.5
JOB EMPLOYMENT			
Public	13.3	5.0	9.4
Private	6.0	2.1	4.2
Self-employed	73.8	86.3	79.7
Informal employment	6.9	6.6	6.8
INCOME			
Q1	18.1	20.2	19.1
Q2	18.8	20.3	19.5
Q3	19.7	20.4	20.0
Q4	20.9	20.6	20.8
Q5	22.5	18.5	20.6
WELL-BEING			
Completely	1.7	1.1	1.4
Mostly	5.6	5.4	5.5
Moderately	25.6	21.6	23.7
A Little	43.0	43.7	43.4
Not at all	24.1	28.2	26.0

3.2 Ratio of Pain by Enabling Factors

In women, the degree of pain varied widely with educational levels (Table 2). Generally, there is decline of the pain ratio with education when estimating the ratios for both sexes. An educational gradient was found for pain (except high school completed) with lower level of education, having a greater percentage.

Self-employed Ghanaians tended to experience the greatest degree of pain in men and women respectively (Table 2). There was no income gradient found in the degree of pain in both men and women respectively. However, the well-being gradient was found for pain: the lower the well-being, the sharp intensity of pain.

Table 3. Age-adjusted and age unadjusted odds ratio (OR) from ordinal logistic regression analysis and their 95% confidence intervals (CI) for the degree of pain by socio-demographic and socioeconomic indicators among males, females and altogether

	MALE				**FEMALE**				**BOTH**			
	Age Unadjusted		**Age Adjusted**		**Age Unadjusted**		**Age Adjusted**		**Age Unadjusted**		**Age Adjusted**	
	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
AGE												
18-49	ref		ref		ref		ref					
50- 59			2.27 (1.80, 2.85)				2.79 (2.13, 3.65)				2.51(2.11, 2.98)	
60 +			4.56 (3.62, 5.75)				4.52 (3.40, 6.01)				4.58(3.83, 5.47)	
MARITAL STATUS												
Currently married	ref		ref		ref		ref					
Never married	0.85 (0.52, 1.37)		1.38 (0.85, 2.23)		1.19 (0.71, 1.98)		1.49 (0.87, 2.53)		0.96 (0.67, 1.35)		1.40 (0.98, 2.00)	
cohabitating	1.03 (0.53, 1.98)		1.12 (0.57, 2.15)		0.23 (0.10, 0.50)		0.30 (0.13, 0.65)		0.51 (0.31, 0.83)		0.60 (0.36, 0.99)	
Separated / divorced	0.94 (0.72, 1.23)		0.78 (0.59, 1.02)		1.42 (1.14, 1.77)		1.08(0.86, 1.35)		1.20 (1.02, 1.42)		0.95 (0.81, 1.13)	
Widowed	1.40 (1.04, 1.89)		1.07 (0.79, 1.45)		1.64 (1.37, 1.96)		1.10 (0.91, 1.34)		1.53 (1.32, 1.77)		1.05 (0.90, 1.22)	
HIGHEST EDUCATION												
No formal education	ref		ref		ref		ref					
Less than primary school	0.87 (0.68, 1.10)		1.01 (0.79, 1.29)		0.65 (0.51, 0.82)		0.80 (0.63, 1.01)		0.74 (0.63, 0.88)		0.90 (0.76, 1.07)	
Primary school completed	0.59 (0.47, 0.74)		0.80 (0.63, 1.01)		0.49 (0.38, 0.65)		0.66 (0.50, 0.87)		0.54 (0.45, 0.64)		0.73 (0.61, 0.87)	
Secondary school completed	0.74 (0.56, 0.99)		1.11 (0.83, 1.50)		0.53 (0.34, 0.83)		0.95 (0.60, 1.51)		0.66 (0.52, 0.83)		1.03 (0.81, 1.32)	
High school(or equivalent) completed	0.63 (0.51, 0.77)		0.8 (0.65, 0.98)		0.48 (0.37, 0.62)		0.67 (0.51, 0.88)		0.56 (0.48, 0.66)		0.75 (0.63, 0.88)	
College/university completed	0.77 (0.53, 1.12)		0.99 (0.67, 1.45)		0.48 (0.26, 0.86)		0.60 (0.33, 1.09)		0.64 (0.47, 0.88)		0.83 (0.60, 1.14)	
JOB EMPLOYMENT												
Public	ref		ref		ref		ref					
Private	0.75 (0.52, 1.07)		0.84 (0.58, 1.20)		0.50 (0.27, 0.94)		0.60 (0.32, 1.14)		0.68 (0.50, 0.92)		0.77 (0.56, 1.05)	
Self-employed	1.05 (0.84, 1.32)		1.20 (0.95, 1.51)		0.86 (0.59, 1.24)		0.95 (0.65, 1.38)		0.98 (0.81, 1.19)		1.12 (0.92, 1.36)	
Informal employment	0.63 (0.45, 0.89)		0.72 (0.50, 1.01)		0.77 (0.49, 1.23)		0.84 (0.52, 1.34)		0.72 (0.55, 0.94)		0.82 (0.62, 1.07)	
WELL-BEING												
Completely												
Mostly	1.06 (0.56, 2.04)		1.04 (0.54, 2.04)		0.53 (0.23, 1.19)		0.60 (0.27, 1.35)		0.84 (0.51, 1.39)		0.87 (0.52, 1.45)	
Moderately	1.98 (1.11, 3.61)		1.96 (1.08, 3.61)		0.97 (0.45, 2.09)		1.01 (0.48, 2.18)		1.54 (0.98, 2.46)		1.53 (0.96, 2.46)	
A little	2.54 (1.43, 4.60)		2.45 (1.36, 4.50)		1.17 (0.55, 2.50)		1.20 (0.57, 2.57)		1.90 (1.20, 3.01)		1.85 (1.17, 2.96)	
Not at all	2.82 (1.57, 5.17)		2.52 (1.38, 4.70)		1.66 (0.78, 3.58)		1.64 (0.77, 3.53)		2.37 (1.49, 3.79)		2.19(1.37, 3.52)	
INCOME												
Q1	ref		ref		ref		ref					
Q2	1.24 (0.99, 1.57)		1.27 (1.00, 1.60)		1.03 (0.81, 1.30)		0.98 (0.78, 1.24)		1.12 (0.95, 1.32)		1.10 (0.94, 1.30)	
Q3	1.24 (0.98, 1.56)		1.12 (0.89, 1.42)		1.29 (1.02, 1.63)		1.26 (0.99, 1.59)		1.26 (1.07, 1.48)		1.18 (1.00, 1.40)	
Q4	1.09 (0.86, 1.39)		1.00 (0.78, 1.27)		0.97 (0.76, 1.24)		0.89 (0.69, 1.14)		1.04 (0.87, 1.23)		0.94 (0.79, 1.12)	
Q5	0.93 (0.72, 1.20)		0.79 (0.61, 1.03)		1.19 (0.91, 1.56)		1.07 (0.81, 1.40)		1.02 (0.85, 1.23)		0.89 (0.74, 1.08)	

3.3 Associations between Levels of Pain Outcomes and Predisposing and Enabling Factors among Men

Among men, pain showed age-unadjusted association with marital status. The marginal effect of being widowed suggests that respondents in that group were slightly more likely to experience pain than the rest. In contrast, the same cannot be said after adjusting for age. In age-unadjusted model, pain was associated with level of education.

The marginal effects of having primary, secondary or high school education clearly suggests that respondents in those groups were less likely to experience various degrees of pain as compared to the others. After adjustment for age, the only remaining statistically significant association as the marginal effect of high school education suggest that respondents in that class were slightly less likely to experience pain as compared to the other groups. Pain showed age-unadjusted association with lower employment class among men as the marginal effect of being in the informal sector suggest Ghanaians in that class decreased the likelihood to experience pain as their other counterparts. There was no association at all after age-adjustment. Among men, the degree of pain was statistically significantly associated with the well-being in both the age-unadjusted and age-adjusted models (Table 3). In the age-unadjusted model, the various marginal effects on the well-being clearly suggest that, Ghanaians in those classes were more likely to have various degrees of pain than their counterparts with the complete well-being. These statistically significant associations remained unchanged after adjusting for age.

Interestingly, in the age-adjusted model, age remained statistically significantly associated with pain and the magnitude of the associations were higher than that of the well-being. The marginal effect of age suggests that adults and older adults were more likely to experience degrees of pain than young adult in the age-adjusted model.

Among men, the degree of pain showed both age-unadjusted and age-adjusted associations with lower income. The marginal effect of being in the second income quintile, suggests that Ghanaians in that class were slightly more likely to experience pain than the other groups.

3.4 Associations between Pain Outcomes and Predisposing and Enabling Factors among Women

In comparison to men, age showed statistically significantly associated with pain. The marginal effect of age suggests that, adults and older adults were more likely to experience pain than young adult in the age-adjusted model.

In contrast to men, pain among women was also associated with marital status, as the various marginal effects of separated/divorced or widowed suggest respondents in those groups were slightly more likely to experience pain as those currently married.

After adjustment for age, the only remaining statistically significant association as the marginal effect of cohabitating suggests Ghanaians in that category were far less likely to experience pain as compared to the rest. Again, in contrast to men, the pain was associated with many more levels of education in the age-unadjusted model. The marginal effects of those levels of education, suggest that Ghanaians in these levels of education were fairly less likely to experience various degrees of pain as to their counterparts with no formal education. However, after adjustment for age, the only remaining statistically significant association as the marginal effect of primary and high school education suggest that respondents in those categories were fairly less likely to experience pain as compared to the others. In contrast to men, pain showed age-unadjusted association with rather higher employment class as the marginal effect of being in the private sector suggest respondents in that class decreased the likelihood to experience pain as the other groups.. After adjusting for age, the association did not exist.

Finally, in contrast to men, pain showed age-unadjusted association with income as the marginal effect of being in the third income quintile slightly increased the likelihood to experience pain as compared to the other Quintiles. There was absolutely no association after age-adjustment.

4. Discussion

This study established that Ghanaian men go through more pain than their women counterparts. The prevalence of pain in men were higher in both young adults and adults respectively, whereas in the older adults, the sex gradient was the opposite. The separated/divorced percentage was almost thrice in women as compared to men due to pain. More than twice Ghanaian men were currently married than their women counterparts. According to previous results (McParland et al., 2011), discourses of justice and injustice appear inherent in the chronic pain experience. Interestingly, individuals with chronic pain may ascribe external blame for (McParland, & Whyte, 2008), which may increase the likelihood that pain is experienced with an elevated sense of injustice. The degree of pain poses serious threat to the general population

In this study, the prevalence of pain was fairly the same among women and men. This is in sharp contrast to Saastamoinen et al. (2005). In educational levels, the degree of pain varied a bit wider in women than men. There was no employment gradient found in the degree of pain. However self-employed Ghanaians tended to experience the greatest degree of pain. This was supported by Blyth et al. (2003) as they claimed that work ability was strongly affected by pain regardless of its cause. There was an inverse relationship between the

well-being and the intensity of pain. This was corroborated by Mantyselka et al. (2003 & 2001) and Elliott et al. (2001) as they established that individual pain causes decreased quality of life, activity limitations and reduced functional capacity. Loss of productivity is a substantial consequence of pain in the work life. In further disagreement with our results (Elliott et al., 2003; Mantyselka et al., 2001, 2002) maintained that pain has a considerable financial burden due to an increased use of health services and medical. Perceived injustice has been associated with greater pain severity, pain behavior, and mental health difficulties, reduced physical function, and prolonged work disability (Scott & Sullivan, 2012; Scott et al., 2013; Sullivan et al., 2008; Sullivan et al., 2009) similarly the marginal effect of widowed Ghanaians suggests they were slightly more likely to experience pain than the rest (age-adjusted model). Studies with other indicators also suggest adverse pain outcomes even when controlling for other pain related psychosocial constructs, such as pain catastrophizing and fear of movement (Rodero et al., 2012; Scott & Sullivan, 2012; Sullivan et al., 2009). The low pain association was consistent with education among men and women in the age-unadjusted model. However, in the age-adjusted model, it was associated fairly among women and weakly among men. The underlying assumption of the low prevalence of pain among those with various levels of education may lie in the small gap in resources provided by education. Weak resources only aid exposures, lack of care and chronic symptoms. However, previous studies (Saastamoinen et al., 2005) suggested pain association being most consistent with education among women. Sleep disturbances are acknowledged among patients with nociceptive pain (Abad et al., 2008; Irwin et al., 2012; Smith et al., 2009; Taylor-Gjevre et al., 2011), neuropathic pain (Langley, Van Litsenburg, Cappelleri, Carroll, 2013; Zelman, Brandenburg & Gore, 2006) and mixed pain conditions such as cancer (Buffum et al., 2011; Cheng & Yeung, 2013; Dhruva et al., 2012; Garrett et al., 2011) or low back pain (Alsaadi et al., 2011; Bahouq et al., 2012; Marty et al., 2008; van de Water et al., 2011). In our study, pain was highly associated with Ghanaian men in middle and lower classes. This could be attributed to the overburden of relations outside the nuclear families and also low incomes earned. Social (well-being) class has rarely been used in researches of pain. However, some researches have established that chronic pain and co-morbid insomnia are worldwide recognized as serious health problems that severely impact a patient's quality of life and productivity. In this article, pain associated with employment was low in both sexes for the age-unadjusted and non-existent in the age-adjusted model. Nevertheless, exposures at work are likely to vary between social classes. Pain, among those in informal employment might be more pronounced than among those in public employment. Arguably, one would have expected stronger correlations between pain and job employment than pain and education since the data used consist of ageing Ghanaians who often have long-lasting work-related exposures. Income correlation with pain was found in the relatively low income bracket (Q2) in the age-adjusted model for men. However, the relationship was found in the middle income bracket (Q3) in the age-unadjusted model for women. According to literature, housing tenure has been associated with pain (Smith et al., 2001). Nevertheless in a longitudinal research, similar disparities could not be established (Elliot et al., 2002).

This research investigated the degree of pain as a problem. The data used, was cross-sectional and therefore relied heavily on self-reports. Pain is a subjective phenomenon and thus self-reports provided reliable data for the assessment of pain in ageing Ghanaians. The response rate of the survey (81%) conforms with past surveys on pain (response rate 67%) (Saastamoinen et al., 2005).

In conclusion, this article is premier to our knowledge and has thus found predisposing and enabling factor disparities in the degree of pain. Older adults were at the greatest risk for the degree of pain. Those with no formal education and self-employed were at the greatest risk for the degree of pain. Furthermore, Ghanaians in lower social (well-being) class were at greater risk of pain. Enabling factor disparities were at variance as pain result was severer. For this article, older adults with no formal education and self-employed are at risk of higher degree of pain. Further research is required to improve the enabling factor disparities in pain.

Acknowledgments

Financial support was provided by the US National Institute on Aging through an interagency agreement with the World Health Organization. WHO contributed financial and human resources to SAGE. The Department of Health in Ghana is supportive of SAGE. The University of Ghana's Department of Community Health contributed. The Ghana Statistical Office provided the sampling information for the sampling frame and updates.

We also acknowledge The WHO SAGE Study Team consisted of: Vitaly Belov, Richard Biritwum, Ties Boerma, Somnath Chatterji, Wu Fan, Kathy Kahn, Paul Kowal, Ruy Lopez-Ridaura, Tamara Maximova, Nadia Minicuci, Nirmala Naidoo, Nawi Ng, Sulabha Parasuraman, Karl Peltzer, Arokiasamy Perianayagam, Nancy Refilwe Phaswana-Mafuya, Rosabla Rojas, Steve Tollman, Emese Verdes, Guo Yanfei, Zheng Yang, Alfred Edwin Yawson, Jiang Yong.

References

Abad, V. C., Sarinas, P. S., & Guilleminault, C. (2008). Sleep and rheumatologic disorders. *Sleep Med Rev, 12*, 211-228. http://dx.doi.org/10.1016/j.smrv.2007.09.001

Alsaadi, S. M., McAuley, J. H., Hush, J. M., & Maher, C. G. (2011). Prevalence of sleep disturbance in patients with low back pain. *Eur Spine J, 20*, 737-743. http://dx.doi.org/10.1007/s00586-010-1661-x

Arendt-Nielsen, L., & Graven-Nielsen, T. (2011). Translational musculoskeletal pain research. *Best Pract Res Clin Rheumatol, 25*, 209-226. http://dx.doi.org/10.1016/j.berh.2010.01.013

Arendt-Nielsen, L., Nie, H., Laursen, M. B., Laursen, B. S., Madeleine, P., Simonsen, O. H., & Graven-Nielsen, T. (2010). Sensitization in patients with painful knee osteoarthritis. *Pain, 149*, 573-581. http://dx.doi.org/10.1016/j.pain.2010.04.003

Bahouq, H., Allali, F., Rkain, H., Hmamouchi, I., & Hajjaj-Hassouni, N. (2013). Prevalence and severity of insomnia in chronic low back pain patients. *Rheumatol Int, 33*(5), 1277-81. http://dx.doi.org/10.1007/s00296-012-2550-x

Biritwum, R. B., Mensah, G., Minicuci, N., Yawson, A. E., Naidoo, N., Chatterji, S., & Kowal, P. (2013). Study on global AGEing and adult health in Ghana: Methodology and household characteristics in Wave 1. *Glob Health Action, 6*, 20096. http://dx.doi.org/10.3402/gha.v6i0.20096

Blyth, F. M., March, L. M., Nicholas, M. K., & Cousins, M. J. (2003). Chronic pain, work performance and litigation. *Pain, 103*, 41-7. http://dx.doi.org/10.1016/S0304-3959(02)00380-9

Buffum, D., Koetters, T., Cho, M., Macera, L., Paul, S. M., West, C., … Miaskowski, C. (2011). The Effects of Pain, Gender, and Age on Sleep/Wake and Circadian Rhythm Parameters in Oncology Patients at the Initiation of Radiation Therapy. *J Pain, 12*, 390-400. http://dx.doi.org/10.1016/j.jpain.2010.09.008

Cheng, K. K., & Yeung, R. M. (2013). Impact of mood disturbance, sleep disturbance, fatigue and pain among patients receiving cancer therapy. *Eur J Cancer Care, 22*, 70-78. http://dx.doi.org/10.1111/j.1365-2354.2012.01372.x

Dhruva, A., Paul, S. M., Cooper, B. A., Lee, K., West, C., Aouizerat, B. E., ... Miaskowski, C. (2012). A longitudinal study of measures of objective and subjective sleep disturbance in patients with breast cancer before, during, and after radiation therapy. *J Pain Symptom Manage, 44*, 215-228. http://dx.doi.org/10.1016/j.jpainsymman.2011.08.010

Elliott, T. E., Renier, C. M., & Palcher, J. A. (2003). Chronic pain, depression, and quality of life: correlations and predictive value of the SF-36. *Pain Med, 4*, 331-9. http://dx.doi.org/10.1111/j.1526-4637.2003.03040.x

Garrett, K., Dhruva, A., Koetters, T., West, C., Paul, S. M., Dunn, L. B., … Miaskowski, C. (2011). Differences in sleep disturbance and fatigue among patients with breast and prostate cancer at the initiation of radiation therapy. *J Pain Symptom Manage, 42*, 239-250. http://dx.doi.org/10.1016/j.jpainsymman.2010.11.010

Graven-Nielsen, T., Wodehouse, T., Langford, R. M., Arendt-Nielsen, L., & Kidd, B. L. (2012). Normalization of widespread hyperesthesia and facilitated spatial summation of deep-tissue pain in knee osteoarthritis patients after knee replacement. *Arthritis Rheum, 64*(9), 2907-16. http://dx.doi.org/10.1002/art.34466

Imamura, M., Imamura, S. T., Kaziyama, H. H., Targino, R. A., Hsing, W. T., de Souza, L. P., … Camanho, G. L. (2008). Impact of the nervous system hyperalgesia on pain, disability, and quality of life in patients with knee osteoarthritis: a controlled analysis. *Arthritis Rheum, 59*, 1424-1431. http://dx.doi.org/10.1002/art.24120

Irwin, M. R., Olmstead, R., Carrillo, C., Sadeghi, N., Fitzgerald, J. D., Ranganath, V. K., & Nicassio, P. M. (2012). Sleep loss exacerbates fatigue, depression, and pain in rheumatoid arthritis. *Sleep, 35*, 537-543.

Kowal, P., Chatterji, S., Naidoo, N., Biritwum, R., Wu, F., Lopez Ridaura, R., ... Boerma, J. T., and the SAGE Collaborators. (2012). Data Resource Profile: The World Health Organization Study on global AGEing and adult health (SAGE). *Int J Epidemiol, 41*(6), 1639-49. http://dx.doi.org/10.1093/ije/dys210

Langley, P. C., Van Litsenburg, C., Cappelleri, J. C., & Carroll, D. (2013). The burden associated with neuropathic pain in Western Europe. *J Med Econ, 16*, 85-95. http://dx.doi.org/10.3111/13696998.2012.729548

Lee, Y. C., Lu, B., Bathon, J. M., Haythornthwaite, J. A., Smith, M. T., Page, G. G., & Edwards, R. R. (2011). Pain sensitivity and pain reactivity in osteoarthritis. *Arthritis Care Res (Hoboken), 63*, 320-327.

Mantyselka, P. T., Kumpusalo, E. A., Ahonen, R. S., & Takala, J. K. (2002). Direct and indirect costs of managing patients with musculoskeletal pain—challenge for health care. *Eur J Pain, 6*, 141-8. http://dx.doi.org/10.1053/eujp.2001.0311

Mantyselka, P. T., Turunen, J. H. O., Ahonen, R. S., & Kumpusalo, E. A. (2003). Chronic pain and poor self-rated health. *J Am Med Assoc, 290*, 2435-42. http://dx.doi.org/10.1001/jama.290.18.2435

Mantyselka, P., Kumpusalo, E., Ahonen, R., Kumpusalo, A., Kauhanen, J., Viinamaki, H., ... Takala, J. (2001). Pain, as a reason to visit the doctor: a study in Finnish primary health care. *Pain, 89*, 175-80. http://dx.doi.org/10.1016/S0304-3959(00)00361-4

Marty, M., Rozenberg, S., Duplan, B., Thomas, P., Duquesnoy, B., & Allaert, F.; Section Rachis de la Société Française de Rhumatologie. (2008). Quality of sleep in patients with chronic low back pain: a case-control study. *Eur Spine J, 17*, 839-844. http://dx.doi.org/10.1007/s00586-008-0660-7

McParland, J. L., & Whyte, A. (2008). A thematic analysis of attributions to others of the origins and ongoing nature of pain in community pain sufferers. *Psychol Health Med, 13*, 610-20. http://dx.doi.org/10.1080/13548500701842966

McParland, J., Hezseltine, L., Serpell, M., Eccleston, C., & Stenner, P. (2011). An investigation of constructions of justice and injustice in chronic pain: A q-methodology approach. *J Health Psychol, 16*, 873-83. http://dx.doi.org/10.1177/1359105310392417

Miller, D. T. (2001). Disrespect and the experience of injustice. *Annu Rev Psychol, 52*, 527-53. http://dx.doi.org/10.1146/annurev.psych.52.1.527

Nielsen, T. (2010). Sensitization in patients with painful knee osteoarthritis. *Pain, 149*, 573-581. http://dx.doi.org/10.1016/j.pain.2010.04.003

Saastamoinen, P., Leino-Arjas, P., Laaksonen, M., & Lahelma, E. (2005). Socio-economic differences in the prevalence of acute, chronic and disabling chronic pain among ageing employees. *Pain, 114*(3), 364-71. http://dx.doi.org/10.1016/j.pain.2004.12.033

Scott, W., & Sullivan, M. (2012). Perceived injustice moderates the relationship between pain and depressive symptoms among individuals with persistent musculoskeletal pain. *Pain Res Manag, 17*, 335-40.

Scott, W., Trost, Z., Milioto, M., & Sullivan, M. (2013). Further validation of a measure of injury-related injustice perceptions to identify risk for occupational disability: A prospective study of individuals with whiplash injury. *J Occup Rehabil, 23*(4), 557-65. http://dx.doi.org/10.1007/s10926-013-9417-1

Skou, S. T., Graven-Nielsen, T., Lengsoe, L., Simonsen, O., Laursen, M. B., & Arendt-Nielsen, L. (2013). Relating clinical measures of pain with experimentally assessed pain mechanisms in patients with knee osteoarthritis. *Scand J Pain, 4*(2), 111-117. http://dx.doi.org/10.1016/j.sjpain.2012.07.001

Smith, B. H., Elliott, A. M., Chambers, A. W., Smith, C. W., Hannafold, P. C., & Penny, K. (2001). The impact of chronic pain in the community. *Fam Pract, 18*(3), 292-9. http://dx.doi.org/10.1093/fampra/18.3.292

Smith, M. T., Quartana, P. J., Okonkwo, R. M., & Nasir, A. (2009). Mechanisms by which sleep disturbance contributes to osteoarthritis pain: a conceptual model. *Curr Pain Headache Rep, 13*, 447-454. http://dx.doi.org/10.1007/s11916-009-0073-2

Sullivan, M. J. L., Adams, H., Horan, S., Maher, D., Boland, D., & Gross, R. (2008). The role of perceived injustice in the experience of chronic pain and disability: Scale development and validation. *J Occup Rehabil, 18,* 249-61. http://dx.doi.org/10.1007/s10926-008-9140-5

Sullivan, M. J. L., Davidson, N., Garfinkel, B., Siriapaipant, N., & Scott, W. (2009). Perceived injustice is associated with heightened pain behavior and disability in individuals with whiplash injuries. *Psychol Inj Law, 2*, 238-47. http://dx.doi.org/10.1007/s12207-009-9055-2

Sullivan, M. J. L., Thibault, P., Simmonds, M. J., Milioto, M., Cantin, A. P., & Velly, A. M. (2009). Pain, perceived injustice and the persistence of post-traumatic stress symptoms during the course of rehabilitation for whiplash injuries. *Pain, 145*, 325-31. http://dx.doi.org/10.1016/j.pain.2009.06.031

Sullivan, M. J. L., Thorn, B., Haythornthwaite, J. A., Keefe, F., Martin, M., Bradley, L. A., & Lefebvre, J. C. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *Clin J Pain, 17*, 52-64. http://dx.doi.org/10.1097/00002508-200103000-00008

Suokas, A. K., Walsh, D. A., McWilliams, D. F., Condon, L., Moreton, B., Wylde, V., ... Zhang, W. (2012).

Quantitative sensory testing in painful osteoarthritis: a systematic review and meta-analysis. *Osteoarthritis Cartilage, 20*, 1075-1085. http://dx.doi.org/10.1016/j.joca.2012.06.009

Taylor-Gjevre, R. M., Gjevre, J. A., Nair, B., Skomro, R., & Lim, H. J. (2011). Components of Sleep Quality and Sleep Fragmentation in Rheumatoid Arthritis and Osteoarthritis. *Musculoskeletal care, 9*, 152-159.

Van de Water, A. T., Eadie, J., & Hurley, D. A. (2011). Investigation of sleep disturbance in chronic low back pain: an age- and gender-matched case-control study over a 7-night period. *Man Ther, 16*, 550-556. http://dx.doi.org/10.1016/j.math.2011.05.004

Vangronsveld, K. L., & Linton, S. J. (2011). The effect of validating and invalidating communication on satisfaction, pain and affect in nurses suffering from low back pain during a semi-structured interview. *Eur J Pain, 16*, 239-46. http://dx.doi.org/10.1016/j.ejpain.2011.07.009

Zelman, D. C., Brandenburg, N. A., & Gore, M. (2006). Sleep impairment in patients with painful diabetic peripheral neuropathy. *Clin J Pain, 22*, 681-685. http://dx.doi.org/10.1097/01.ajp.0000210910.49923.09

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Risky Sexual Behavior among Rural Female Adolescents in Malaysia: A Limited Role of Protective Factors

Maryam Ahmadian[1], Hanina H. Hamsan[1], Haslinda Abdullah[1,2], Asnarulkhadi Abu Samah[1] & Amna Md Noor[1]

[1] Department of Social and Development Sciences, Faculty of Human Ecology, Universiti Putra Malaysia, Selangor, Malaysia

[2] Institute for Social Science Studies, Universiti Putra Malaysia, Selangor, Malaysia

Correspondence: Maryam Ahmadian & Hanina H. Hamsan, Department of Social and Development Sciences, Faculty of Human Ecology, Universiti Putra Malaysia (UPM), Serdang 43400, Selangor, Malaysia. E-mail: marydian50@gmail.com & hanina3282@gmail.com

Received: November 25, 2013 Accepted: January 7, 2014 Online Published: March 23, 2014

doi:10.5539/gjhs.v6n3p165 URL: http://dx.doi.org/10.5539/gjhs.v6n3p165

Abstract

Purpose: This paper presents the findings of a cross-sectional survey on the risk and protective factors of premarital sexual behavior among rural female adolescents in Peninsular Malaysia.

Methods: We investigated data on 770 female respondents aged 13-17 years in rural areas to identify predictive factors for premarital sexual intercourse. Data were analyzed using bivariate and multivariate regression. Specific socio-demographic factors, psychological and family domains, peer delinquency, and knowledge and attitudes about sexuality were considered in risky sexual behaviors in rural Malay girls. The effects of other covariates for premarital sexual intercourse were controlled by logistic regression model.

Results: Of the 770 rural female students, about 3.2% of respondents reported experience of sexual intercourse in the past three months. Out of those sexually active girls, 36% were 17 years old and 20% stated having sexual intercourse with more than one partner, and 72% did not use contraception during the most recent sexual intercourse. Midnight activities, peer-sexual disorder, self-evaluation, and attitude toward sexual health were significant predictors of sexual intercourse in rural girls in Malaysia.

Conclusion: The finding highlights the impact of psychological factors and peer group influences on the challenges of premarital sexual behavior among rural girls and the notion of school-based sexual health education for adolescents. This study triggers other researchers take into account a comprehensive view of protective factors operating in adolescents' risky sexual behaviors in Asian culture seeing that family domain variables, unexpectedly, exerted no predicting influence on sexually active female teens in rural areas in Malaysia.

Keywords: adolescent, risky sexual behavior, risk and protective factors, Asian

1. Introduction

Sexual relations outside of marriage, particularly before 15 years of age raise the prevalence of negative health outcomes. Previous research on adolescents' sexuality has directed towards identifying risk factors such as peer influence, parental involvement, abuse history, and drug use, which are associated to risky sexual behaviors. Nevertheless, culture as a possible risk or protective factor was almost neglected (Gardner & Wilcox, 1993; Lacky & Moberg, 1998). In addition, research pertaining to Asian culture and adolescents' risky sexual behavior is inadequate. Yet, the finding of previous studies has indicated that race or ethnicity is one of critical factor associated with sexual behaviors (Schuster et al., 1998).

Studies have also shown that risky sexual behaviors among adolescents can lead to sombre health consequences such as sexually transmitted diseases (STDs), teenage pregnancy, and Human Immunodeficiency Virus (HIV) infection. Previous researchers found that unprotected sexual behavior can cause a series of harmful physical, emotional, and social outcomes, especially for girls (Jejeebhoy et al., 2005). Even the proportion of girls having sexual intercourse before marriage was higher in number in contrast to boys (Liu et al., 2006; Shtarkshall et al., 2009).

Involvement in premarital sexual activities in Malaysia verified in a small number among adolescents. However, in the past two decade, sexual activity among Malaysian adolescents has initiated to get higher as a result of significant societal changes. A total of 18,652 pregnancies among teenagers aged between 10-19 years old were reported by the Ministry of Health Malaysia in 2011 (Annual Report, 2011). A review of the literature shows boys are more likely to be sexually experienced than girls in Malaysia (Brown, 1997; Herold et al., 1992). However, the percentage of unmarried adolescents who have had sexual intercourse was increased (Zulkifli et al., 1995).

The risky sexual incidents among the adolescent reported by the National Study on Reproductive Health of Adolescents in the year 1994-95 were only 1% of the respondents (13 cases from 1379 adolescents aged 15-17 years) who had sexual intercourse (National Population and Family Development Board, 1998). From the 1996 National Health and Morbidity Survey, 1.8% of 30 000 school-going respondents admitted that they had had sexual intercourse. Male teens were twice as likely to be sexually involved as female students (2.5% vs. 1.2%). Of those who had sexual intercourse, 19.9% were homosexual and 9.4% had sex with prostitutes (World Health Organization Regional Office for the Western Pacific, 2005). It is difficult to compare prevalence rates of sexual intercourse among adolescents with the findings of previous studies at the local level due to bias against certain groups such as certain ethnicity, gender or ages.

Previous research focusing on risky sexual behavior has found that variables such as gender, employment, and sexual attitudes were associated with sexual intercourse among adolescents. For example, a less conservative attitudes score was linked with five times greater likelihood of being sexually experienced than a conservative score (Zulkifli & Low, 2000). Whereas few national and international research papers exists documenting the adolescents' sexual practices in Malaysia, there is no research report on adolescents' risky sexual behavior among rural female students. Thus, the overarching goal of this research is to systematically examine the determinants of risky sexual behaviors among rural female teens without considering ethnicity.

The theoretical framework guiding the research on the development of risk and protective factors was based on Social Developmental Model (SDM) proposed by Catalano and Hawkins (1996). Reviewed literature has shown that this model had been used in several discrete studies (Catalano et al., 1996; Lonczak et al., 2001; Yi et al., 2010; Harliza et al., 2012). In this study, an integrated approach to the assessment of risk and protective factors was viewed as causes of sexual risky behaviour, particularly sexual intercourse among adolescents. The buffer model was already applied in determining the new paradigm of risk/protection which reduces the impact of risk factors (Armstrong et al., 2005). Based on the Social Developmental Model (SDM), sexual attitudes and behaviours among adolescents are learned through all these socialization agents namely, parents, friends, school, and community.

This paper specifically intends to scrutinize risk and protective factors influencing risky sexual behaviours in rural female adolescents at the individual, peer, family, school, community, and social realms. This study employed a survey design to explore predictive factors that concern sexual intercourse among school-attending female adolescents. Socio-psychological theory was used as a guiding ground to adjust behavioral facets of health among individuals and communities (Ahmadian et al., 2012). The results will contribute to health education to reduce sexual risk behaviour among unmarried adolescents in Asian countries. The term of rural teen/rural student/rural girl/ female teen/female adolescent in this paper refers to rural female adolescent aged13-17 years.

2. Methodology

The cross-sectional survey was conducted from January to March 2012 at 41 schools located in ten states of Peninsular Malaysia. The study used a multistage cluster random sampling method to acquire 770 rural female adolescents aged 13 to 17 years which were drawn from a total of population of 993,220 students according to the latest 2010 census of Malaysia. A list of all schools was obtained from the Ministry of Education (MOE) in Malaysia. The ratio of students' number in rural and urban areas was 30:70 percent. 41schools out of 72 schools were selected for data collection. Students within the schools were randomly selected and all of them agreed to join in the study. The Bahasa Malaysia version of the instrument was given to the participants. The response rate was 100% with no refusals. Students completed the online survey by logging on the selected website via internet or ad-hoc server for school with limited internet accessibility. Questionnaires were administered online and students filled out questionnaires at computer labs. The instrument also had the offline versions of the equal test.

The female adolescents were assured of confidentiality and enumerators left the labs during completion of the survey. Approximately 3% of all female adolescents in rural areas were selected reflecting a representative sample of rural female adolescents in Malaysia. Inclusion criteria for subject selection were: (1) students who

live in rural areas and communities; (2) rural female adolescents aged 13 to 17 years; (3) capable of completing questionnaires on and off-line.

Approval to perform the survey was provided by the Research Management Centre (RMC) at University of Putra Malaysia. Letters authorizing data collections at the participating schools were obtained prior to the survey. Trained data collectors were executed to collect the data in the selected schools. Data collectors clarified the aim of the study to the adolescents before data collection process.

Statistical Package for Social Science version 19 (IBM, Chicago, IL, USA) software was used to analyze the data. Bivariate regression and multiple logistic regression were done by using the enter method in order to determine the risk and protective factors influencing risky sexual behavior along with premarital sexual intercourse. Multivariate analysis examined several predictors of sexual intercourse among rural female teens, particularly controlled the effects of other covariates by logistic regression model for premarital sexual intercourse.

These analyses estimate whether the beta coefficient of variables influencing early and risky sexual behaviours connects any higher odds for adolescents having premarital sexual intercourse. A two tailed p-value of 0.05 was used to determine the statistical significance for all examinations. Standardized Cronbach's for the scales and sub-scales in the instrument ranged from .60 to .70. Since none of the independent variables had standard error larger than 2.0, there was no proof of multicollinearity.

2.1 Questionnaire

The questionnaire consists of sections which include socio-demographic characteristics, sexually risky behaviors, knowledge and attitudes towards sexuality, psychological domain, family domain, peer delinquency, and sexual activity.

2.1.1 Socio-Demographic Characteristics

The aspect covered age, marital status of parents, head of household, head of household's education level, and living arrangement.

2.1.2 Sexually Risky Behaviors

This section used previous inventory which is related to youth involvement in risky sexual behavior during the past three months. It comprises sexual intercourse, numbers of sex partners, age at first sex experience, and having unprotected sex. This part was already developed by Blum and Mmari (2005) amd Yi et al. (2010). In addition, we asked survey respondents: have you ever experienced pregnancy?

2.1.3 Knowledge and Attitudes towards Sexuality

It was evaluated based on the validated instrument developed by researchers. There are 9 items for measuring adolescent's knowledge about sexual reproductive health as well as 6 items for measuring their attitude concerning sexual reproductive health.

2.1.4 Psychological Domain

The Asian Adolescent Depression Scale (AADS) (Woo et al., 2004) was used to measure psychological constructs, such as negative self-evaluation and lack of motivation. We also used an adapted scale of self-control from the scale developed by Sutherland et al. (1947) to complete the psychological domain.

2.1.5 Family Domain

This realm comprised family communication and attachment, family positive involvement, and family management practice from the scale developed by Ungemack et al. (2000). Additionally, we measured school attachment using items adapted from a previous study by Yi et al. (2010).

2.1.6 Peer Delinquency

It was evaluated based upon the scale developed by Khaidzir and Hanina (2007). There are 18 items which includes five dimensions namely: peer sexual disorder, drug abuse, discipline, integrity misconduct, and criminal abuse. The constructs and scales were drawn and modified from the previous literature regarding peer delinquency.

2.1.7 Sexual Activity

It was defined as having sexual intercourse outside of marriage in the last three months and respondents were asked, ‘‘Have you ever had sexual intercourse in the last three months?”. However, sexual activity involves behaviors from kissing to sexual intercourse (O'Sullivan & Allgeier, 1998). The term of sexual activity in this

study refers to having "sexual intercourse" outside of marriage.

3. Results

Of the 770 rural female school students, 3.2% had sexual intercourse (Table 1). The mean age of the respondents was 15. 16 years (SD=1.4; range 13-17) and a majority of them were living with married parents, the father, as head-of-household. Of respondents who report ever having sex, 36% were 17 years old and their parents' educational level was also relatively low and 68% percent had primary and secondary education. Out of these sexually active adolescents, 68% were living with two parents and their father supported the family as head. It would appear that parental marital status in a rural setting with conservative culture is not protective in terms of reproductive health for adolescents, particularly as far as rural females are concerned. In addition, other factors such as age, socio-economic status, and low educational status of parents may play crucial roles in sexual misconduct matters involving female students in rural areas.

Table 1. Socio-demographic characteristics of the rural female adolescents (n=770)

	Number of adolescents	**having sexual intercourse**	
		Have never had (%) (n=745)	Ever had (%) (n=25)
Age			
13	114	15.2	4.0
14	168	21.7	24.0
15	111	14.5	12.0
16	237	31.0	24.0
17	140	17.6	36.0
	770	96.8	3.2
Parental marital status			
Married	680	89.1	68.0
Divorced/separated	54	6.3	24.0
Father/mother/both parents died	36	4.6	8.0
Head of household			
Father	662	86.6	68.0
Mother	65	8.2	16.0
Grandfather	26	3.2	8.0
Grandmother	3	0.4	-
Elder brother	5	0.7	-
Elder sister	1	0.1	-
Other relatives	8	0.8	8.0
Head of household' s education			
Ever received formal education	20	2.7	-
Primary	80	9.5	36.0
Secondary	359	47.1	32.0
Tertiary	174	22.9	16.0
Religious school	10	1.3	-
Don't know	127	16.5	16.0

Table 2 shows risky sexual behaviours among the 25 sexually active female adolescent. Of the 25 rural female adolescents, 52% had sex for the first time at the age of 14 years old. Findings indicate that over half of female respondents (52% vs 48%) had forced sex or were raped. Regarding numbers of sex partners, 80% of respondents reported that they had sex with one person and 20% of them had sexual intercourse with more than one. Table 2 presents 72% of respondents who reported ever having sex, had not used contraception during the most recent sexual intercourse. Among the 25 sexually active adolescents, 12% have ever experienced pregnancy. The Chi-square (χ^2) test proved that there is a significant relationship between marital status of parents and having sexual intercourse among respondents ($P<0.01$).

Table 2. Risky Sexual behaviors among sexually active female adolescents (n=25)

	N	%
Sexual intercourse for the first time		
14	13	52.0
15	3	12.0
16	8	32.0
≥17	1	4.0
Type of first time sex experience		
Voluntary (fun/ money)	12	48.00
Involuntary (being forced/raped)	13	52.00
Numbers of sex partners		
One	20	80.0
Two or more	5	20.0
Contraceptive use at last sexual intercourse		
Yes	7	28.0
No	18	72.0
Ever experienced pregnancy		
Yes	3	12.0
No	22	88.0

3.1 Results of Bivariate Analyses

Among rural female adolescents, significant factors influencing risky sexual behavior comprised higher level of midnight activities (β=.921, SE=.184, p<0.0001), clubbing (β=.892, SE=.415, p<0.05) and drug abuse (β=-1.788, SE=.828, p<0.05). Similarly, higher level of sexual disorder among peer group members (β=.442, SE=.147, p<0.05), lack of school attachment (β=-.407, SE=.131, p<0.05), incomplete family structure (β=-.403, SE=.155, p<0.01), lower level of family communication (β=.-.382, SE=.125, p<0.05) and negative attitude toward sexual health (β=-.064, SE=.019, p<0.01) affect risky sexual behavior. Table 3 shows that higher level of midnight activities and clubbing was significantly associated with the highest likelihood of hazardous sexual behaviour.

Table 3. Results of bivariate regression analyses of risk and protective factors influencing risky sexual behaviour

Expected risk and protective factors	β	SE	*p*- value
Lifestyle-involve in midnight activities	.921	.184	.000
Lifestyle-clubbing	.892	.415	.032
Lifestyle-drug abuse*	-1.788	.828	.031
Peer-sexual disorder	.442	.147	.003
School attachment	-.407	.131	.002
Family structure (0=incomplete; 1=complete)	-.403	.155	.010
Family communication	-.382	.125	.002
Attitude towards sexual health and reproductive	-.064	.019	.001
Lifestyle-tobacco	.248	.260	.340
Lifestyle-alcohol	-.185	.367	.613
Lifestyle-coupling/dating	.125	.116	.282
Lifestyle-illegal motorcycle race	.247	.325	.448
Negative self-evaluation	.137	.103	.185
Self-control	.066	.131	.616
Family management	.052	.030	.087
Knowledge on Sexual health and reproductive	.008	.027	.768

Expected risk and protective factors	β	SE	*p*- value
Living arrangement (0=without family; 1=with family)	.009	.138	.948
Family involvement	.070	.124	.577
Peer-discipline	.114	.146	.433
Peer-drug abuse	.001	.169	.995
Peer-criminal	.082	.172	.632
Peer-integrity disorder	.084	.125	.506

Note. SE=Standard error.

*Only 3 respondents have a friend who involved with drugs abuse and all of them are in a group who have ever had sexual intercourse.

3.2 Results of Multivariate Logistic Regression

The multiple logistic regression analysis used the full model which deemed all independent variables together. As shown in Table 4, the odds for having premarital sexual intercourse among rural students were controlled by variables namely peer-sexual disorder, attitude towards sexual health and reproductive, midnight activities, and negative self-evaluation. The model explained between 10% (Cox & Snell R Squared) and 41% (Nagelkerke R Squared) of the variance in sexual intercourse.

The odds ratios (OR) for having sexual intercourse among rural female adolescents were significant for peer-sexual disorder (OR= 5.85, 95% CI: 2.06-16.58, P≤ 0.001), attitude towards sexual health (OR= 4.03, 95% CI: 1.35-12.03, P≤ 0.05), midnight activities (OR= 8.75, 95% CI: 3.11-24.62, P≤ 0.001), negative self-evaluation (OR= 6.49, 95% CI: 1.45-28.99, P ≤ 0.05). Although higher level of sexual disorder among peer group members, higher level of midnight activities, and negative self-evaluation and attitude toward sexual health were significant at bivariate analysis, no statistically significant correlation was observed between demographic factors considered in the study and sexual intercourse among rural female teens using multivariate logistic regression.

Table 4. Results of multivariate logistic regression for predicting premarital sexual intercourse

Variable	OR	95% CI	
		Lower	Upper
Peer-sexual disorder	5.85**	2.06	16.58
Attitude towards sexual health and reproductive	4.03*	1.35	12.03
Midnight activities	8.75**	3.11	24.62
Negative self evaluation	6.49*	1.45	28.99

* p≤ 0.05; **p≤ 0.001; χ^2=84.328 (11)**; Cox & Snell R^2=.104; Nagelkerke R^2=.416

4. Discussion

This research presents the prevalence of the premarital sexual intercourse among rural female adolescents was low (3.2%) compared to sexual intercourse among adolescents from a study conducted by Zulkifli & Low (2000) which was 13% (60 out of 486 and 44 male teens vs. 16 female teen). It was lower than the prevalence of sexual intercourse among local adolescents in previous study done in 1986 which showed 9% (Zulkifli et al., 1995), as well as to the adolescents at Negeri Sembilan, which was 5.4% (Lee et al., 2006). Never the less, all of these percentages are low compared with their western counterparts.

The study displays more than 50% of respondents who admitted ever having sex (13 out of 25), had been raped or forced into sex acts. In Malaysia, females are generally supposed (in media and popular discourse) to be at higher risk of sexual victimization compared with males (Choo et al., 2011). There are protective factors with regard to sexual behavior associated with family domain variables such as family discipline and structure or family communication which can impact on sexual behaviors and victimization. However, the effects of these protective factors on sexual intercourse in rural female teens were null by other factors such as peer delinquency and adolescents' attitude and self-evaluation along with their midnight activities. It is worth noting that

socio-cultural taboos concerning sexual activity in rural areas also limit awareness raising about sexual behaviours in Malaysia.

Bivariate analysis shows that midnight activities and clubbing are the most salient risk factors of sexual behavior among female rural students. Despite the conservative attitude of Malaysian on premarital sexual behavior, major changes have taken place in female adolescents due to the impact of modernization and/or westernization. Consequently, some of the individual risk factors such as smoking, drinking alcoholic beverages, and taking drugs can increase the number of risky sexual behaviours among female teens during midnight activities. This finding is in line with previous Asian reports (Liu et al., 2006; Lee et al., 2006; Wong et al., 2009).

Another explanation could be critical for sexual activity in teens, is their desire for casual sex. It is possible that socio-cultural background and physiological characteristics change sexual desires among older adults (Palacios-Cena et al., 2012).

The results also associate with the effects of potential protective factors such as family structure and family communication. Bivariate linear regression proposes that for rural female adolescents, a better family communication and stable family structure may operate the same as positive attitude towards sexual and reproductive health against risky sexual behaviour. In other words, successful parent discipline and control plays a significant role in the value orientation of the adolescent (Rose, 1999).

Besides, sexual disorder among peer group has significant association with risky sexual behavior among rural girls. This study is in line with previous findings which propose that peer influence appears to be crucial in adolescents' sexual behaviour (Whitbeck et al., 1992; Brown et al., 1997; Mumari & Blum, 2009; Yi et al., 2010).

In contrast, drug abuse among friends does not play an important role in involving risky sexual behavior. However, substance use is one of the most relevant predictor of risky sexual behavior among teens (Tapert et al., 2001; Yi et al., 2010). Besides, substance use may have a confusing effect on cognitive functions leading to deprived decision-making among adolescents and increases their connection with risky sexual behavior (Bell et al., 2003; Yi et al., 2010). Another possible reason concerns the significance of life style drug abuse in bivariate analyses in this study, is few number of adolescents (n=3) who have friends involving drug.

The results from this countrywide representative sample point out that the higher level of midnight activities negatively affect rural female adolescents and play an important role in predicting sexual intercourse among them. Findings of this study shows that female teens have late-night activities are almost nine times more likely to have sexual intercourse (Table 4).

The odds ratio (OR) for having sexual intercourse in rural girls was not significant for most of protective factors such as family communication and involvement, and family management (Table 4). Despite the family value in Asian culture, it is expected that low parental educational attainment and modernization affect family communication and, simultaneously, the risk factors exaggerate sexual risky behaviours in rural female adolescents in the study.

After controlling for other covariates in the multiple regression model, negative self-evaluation and adolescents' attitude towards sexual health remained significantly associated with premarital sexual intercourse in rural girls. Results of this study show that sexually active girls are almost seven times more likely to have negative self-evaluation. Likewise, adolescents' negative attitude regarding sexual health increases the sexual intercourse rate about five times (Table 4). However, the results of the bivariate linear regression shows that adolescents' attitude towards sexual health was also associated with adolescents' risky sexual behaviours. Similarly, previous studies showed that troubled adolescents may engage in risky health activities such as substance use to relieve negative psychological states (McKirnan et al., 1996).

These findings suggest training both family members and adolescents in community health programs for youth. These results also recommend researchers continue to search for various risk and protective factors related to risky sexual behaviour and a large community sample of sexually active adolescents.

Peer-sexual disorder is one of the most influential predictors of sexual intercourse among sexually active teenagers in this study. Having experienced sexual disorder among peer group increases six times to have sexual intercourse in female teens in this study (Table 4). Peer delinquency can operate as a source of pressure for adolescents and provide adolescents the opportunity to contribute to poor decision making and becoming involved in the range of sexual behaviour (Keliwer & Murrelle, 2007; Yi et al., 2010).

It is worthy to say that family structure, discipline, and communication are associated with risky sexual behaviors among girls only using bivariate analysis. However, multivariate analysis shows relative risk ratios from adjusted logistic regression and confirms the family domain, as defined here; do not stand a significant

predictor of sexual intercourse in rural female adolescents. Although the non-significant association do not prove previous literature which proposes that protective factors are also crucial in adolescent health outcomes (Ostaszewski & Zimmerman, 2006; Yi et al., 2010).

Despite these interesting results, several limitations merit discussion in the current study. First, the number of respondents for logistic regression was small and therefore lacks a robust statistical analysis. Second, the study was a web-based survey and thus technical issues can cause inconsistent responses. Third, our measures related to risky sexual behavior are challenging in the study since sexual activity refers to having sexual intercourse outside of marriage.

Besides, the studied items concerning risky behaviors among sexually active female teens are quite limited. Additionally, the same as all cross- sectional surveys disallow us to investigate causal relationships between the predictors and risky sexual behaviors. Another limitation that should be acknowledged is the representative sample has not met a wide range of social status group and therefore the results may not be generalized to other adolescents with diverse life style in Malaysia.

Finally, the most important limitation that may provide a consideration for future studies is that although this research carried out among a nationally representative sample of rural female adolescents, only 25 students had premarital sexual intercourse. The number may not be accurate which could be argued that shyness is a stereotype among rural Malay girls. Our results propose the importance of considering cultural taboos and tolerance for pre-marital sex among Asian female adolescents when planning and implementing multifaceted intervention and prevention programs.

5. Conclusion

The project is designed to deliver more knowledge sharing in relation to risks and protective factors associated with risky sexual behaviors among rural female adolescents in Malaysia. Our findings do mean that the relative risk factors of sexual behaviors (e.g. midnight activities, peer-sexual disorder) are more effective than other protective factors (e.g. family communication, family attachment) among rural female adolescents which may refer the matter to the modernization and transformation. Cost-effective essential health care package in schools may have pivotal role in maintaining youth sexual health behavior and help to prevent teen pregnancy, HIV/AIDS, and other sexual transmitted diseases among adolescents at risk of sexual misconduct.This research supports the voice of rural female students beyond the conservative culture they were raised in which would be the best source of information for awareness-raising for scaling up HIV (Human Immunodeficiency Virus) and STDs (Sexually Transmitted Diseases) prevention in rural districts in Malaysia.

Acknowledgment

This study was supported by the Fundamental Research Grant Scheme (Project Code: FRGS/1/11/SS/UPM/02/19). We would like to thank the Ministry of Higher Education (MOHE) for providing us the grant to conduct this research.

References

Ahmadian, M., Samah, A. A., Redzuan, M. R., & Emby, Z. (2012). The Influence of Psycho-social Factors on Participation Levels in Community-based Breast Cancer Prevention Programs in Tehran, Iran. *Global Journal of Health Science, 4*(1), 42. http://dx.doi.org/10.5539/gjhs.v4n1p42

Annual Report. Ministry of Health Malaysia (2011). Retrieved November 2013, from http://www.moh.gov.my/images/gallery/publications/md/ar/2011_en.pdf

Armstrong, D., Hine, J., Hacking, S., Armaos, R., Jones, R., Klessinger, N., & France, A. (2005). *Children, risk and crime: the On Track Youth Lifestyles Survey*.

Bell, D. C., Trevino, R. A., Atkinson, J. S., & Carlson, J. W. (2003). Motivations for condom use and non use. J*ournal of the American Society for Medical Technology, 16*(1), 20.

Blum, R. W., Mmari, K. N. (2005). *Risk and Protective Factors Affecting Adolescent Reproductive Health in Developing Countries*. World Health Organization (WHO) and John Hopkins Bloomberg School of Public Health.

Brown, B. B., Dolcini, M. M., & Leventhal, A. (1997). Transformations in peer relationships at adolescence: Implications for health-related behavior. In J. Schulenburg, J. Maggs, K. Hurrelmann (Eds.), *Health Risks and Developmental Transactions during Adolescence*. New York: Cambridge University Press.

Brown, B. D. (1997). Are young people in the Philippines taking chances with HIV/AIDS? *Asia Pacific*

Population and Policy, 1997(40), 1-4.

Catalano, R. F., & Hawkins, J. D. (1996). The social development model: A theory of antisocial behavior. In J. D. Hawkins (Ed.), *Delinquency and Crime: Current Theories* (pp. 149-197). New York: Cambridge University Press.

Catalano, R. F., & Hawkins, J. D. (1996). The Social Developmental Model: a theory of anti-social behavior. In Hawkins, J. D. (Ed.), *Delinquency and Crime Current Theories*. Cambridge: Cambridge University Press.

Catalano, R. F., Kosterman, R., Hawkins, J. D., Newcomb, M. D., & Abbott, R. D. (1996). Modeling the etiology of adolescents substance use: A test of the social development model. *J Drug Issues, 26*, 429-455.

Choo, W. Y., Dunne, M. P., Marret, M. J., Fleming, M., & Wong, Y. L. (2011). Victimization experiences of adolescents in Malaysia. *Journal of Adolescent Health, 49*(6), 627-634. http://dx.doi.org/10.1016/j.jadohealth.2011.04.020

Gardner, W., & Wilcox, B. L. (1993). Political intervention in scientific peer review: Research on adolescent sexual behavior. *American Psychologist, 48*(9), 972. http://dx.doi.org/10.1037/0003-066X.48.9.972

Hanina, H.H. (2009). *Perkembangan Resiliensi Kanak-kanak Peringkat Pertengahan* [Doctoral research]. Universiti Kebangsaan Malaysia (UKM).

Harliza, H. S., Khaidzir, I., Mohamad Zaki, I., & Hanina, H. H. (2012). *Kajian Kesihatan Seksualdan Reproduktif Remaja di Semenanjung Malaysia*. UKM: Bangi.

Herold, J. M., Valenzuela, M. S., & Morris, I. (1992). Premarital sexual activity and contraceptive use in Santiago, Chile. *Stud Fam Plann, 23*(2), 128-36. http://dx.doi.org/10.2307/1966542

Jejeebhoy, S. J., & Bott, S. (2005). Nonconsensual sexual experiences of young people in developing countries: An overview. In S. J. Jejeebhoy, I. H. Shah, Shyam Thapa (Eds.), *Sex without consent: young people in developing countries* (pp. 3-45). London: Zed Books.

Khaidzir, I., & Hanina, H. (2007). *Kajian Belia Berisiko Negeri Selangor.* UKM: Bangi.

Kliewer, W., & Murrelle, L. (2007). Risk and protective factors for adolescent substance use: Findings from a study in selected Central American countries. *Journal Adolescent Health, 40*, 448-455. http://dx.doi.org/10.1016/j.jadohealth.2006.11.148

Lackey, J. F., & Moberg, D. P. (1998). Understanding the onset of intercourse among urban American adolescents: A cultural process framework using qualitative and quantitative data. *Human Organization, 57*(4), 491-501.

Lee, L. K., Chen, P. C., Lee, K. K., & Kaur, J. (2006). Premarital sexual intercourse among adolescents in Malaysia: a cross-sectional Malaysian school survey. *Singapore medical journal, 47*(6), 476-481.

Liu, A., Kilmarx, P., Jenkins, R. A., Manopaiboon, C., Mock, P. A., Jeeyapunt, S., ... van Griensven, F. (2006). Sexual initiation, substance use, and sexual behavior and knowledge among vocational students in northern Thailand. *International family planning perspectives, 32*(3), 126-135. http://dx.doi.org/10.1363/3212606

Lonczak, H. S., Huang, B., Catalano, R. F., Hawkins, J. D., Hill, K. G., Abbott, R. D., ... & Kosterman, R. (2001). The social predictors of adolescent alcohol misuse: A test of the social development model. *Journal of Studies on Alcohol, 62*(2), 179.

Losel, F., & Bender, D. (2003). Protective Factors and Resilience. In D. Farrington & J. Coid (Eds.), *Early prevention of adult antisocial behavior*. Cambridge: Cambridge University Press.

McKirnan, D. J., Ostrow, D. G., & Hope, B. (1996). Sex, drugs, and escape: a psychological model of HIV-risk sexual behaviors. *AIDS Care, 8*, 655-669. http://dx.doi.org/10.1080/09540129650125371

Mmari, K., & Blum, R. W. (2009). Risk and protective factors that affect adolescent reproductive health in developing countries: a structured literature review. *Global public health, 4*(4), 350-366. http://dx.doi.org/10.1080/17441690701664418

National Population and Family Development Board. (1998). *Report of the National Study on Reproductive Health and Sexuality 1994/1995*. Kuala Lumpur: National Population and Family Development Board.

NPFDB. (2007). *Sexual and reproductive health of adolescents and youths in Malaysia: A review literature project 2005*. World Health Organization.

Okazaki, S. (2002). Influences of culture on Asian Americans' sexuality. *Journal of Sex Research, 39*(1), 34-41. http://dx.doi.org/10.1080/00224490209552117

Ostaszewski, K., & Zimmerman, M. A. (2006). The effects of cumulative risks and promotive factors on urban adolescent alcohol and other drug use: A longitudinal study of resiliency. *American Journal of Community Psychology, 38*(3-4), 237-249. http://dx.doi.org/10.1007/s10464-006-9076-x

O'Sullivan, L. F., & Allgeier, E. R. (1998). Feigning sexual desire: Consenting to unwanted sexual activity in heterosexual dating relationships. *Journal of Sex Research, 35*(3), 234-243. http://dx.doi.org/10.1080/00224499809551938

Palacios‐Ceña, D., Carrasco‐Garrido, P., Hernández‐Barrera, V., Alonso‐Blanco, C., Jiménez-García, R., & Fernández‐de‐las‐Peñas, C. (2012). Sexual Behaviors among Older Adults in Spain: Results from a Population‐Based National Sexual Health Survey. *The journal of Sexual Medicine, 9*(1), 121-129. http://dx.doi.org/10.1111/j.1743-6109.2011.02511.x

Rose, S. R. (1999). Towards the development of an internalized conscience: Theoretical perspectives on socialization. *Journal of human behavior in the social environment, 2*(3), 15-28. http://dx.doi.org/10.1300/J137v02n03_02

Schuster, M. A., Bell, R. M., Nakajima, G. A., & Kanouse, D. E. (1998). The sexual practices of Asian and Pacific Islander high school students. *Journal of Adolescent Health, 23*(4), 221-231. http://dx.doi.org/10.1016/S1054-139X(97)00210-3

Sexual and Reproductive Health of Adolescents and Youths in Malaysia. (2005). A Review of Literature and Projects. Manila, Philippines, World Health Organization Regional Office for the Western Pacific.

Shtarkshall, R. A., Carmel, S., Jaffe-Hirschfield, D., & Woloski-Wruble, A. (2009). Sexual milestones and factors associated with coitus initiation among Israeli high school students. *Archives of Sexual Behavior, 38*(4), 591-604. http://dx.doi.org/10.1007/s10508-008-9418-x

Sutherland, E. D. (1947). Principles of Criminology (4th Edition). Philadelphia, PA: J.B. Lippincott.

Tapert, S. F., Aarons, G. A., Sedlar, G. R., & Brown, S. A. (2001). Adolescent substance use and sexual risk-taking behavior. *Journal of Adolescent Health, 28*(3), 181-189. http://dx.doi.org/10.1016/S1054-139X(00)00169-5

Ungemack, J. A., Delaronde, S., & Cook, J. (2000). Connecticut 1997 Substance Abuse Prevention Needs Assessment Student Survey Report.

Whitbeck, L. B., Hoyt, D. R., Miller, M., & Kao, M. Y. (1992). *Parental support, depressed affect, and sexual experience among adolescents*. Youth & Society. http://dx.doi.org/10.1177/0044118X92024002003

Wong, M. L., Chan, R. K. W., Koh, D., Tan, H. H., Lim, F. S., Emmanuel, S., & Bishop, G. (2009). Premarital sexual intercourse among adolescents in an Asian country: multilevel ecological factors. *Pediatrics, 124*(1), e44-e52. http://dx.doi.org/10.1542/peds.2008-2954

Woo, B. S., Chang, W. C., Fung, D. S., Koh, J. B., Leong, J. S., Kee, C. H., & Seah, C. K. (2004). Development and validation of a depression scale for Asian adolescents. *Journal of adolescence, 27*(6), 677-689. http://dx.doi.org/10.1016/j.adolescence.2003.12.004

World Health Organization. (2009). Adolescent pregnancy: a culturally complex issue. *Bull World Health Organ, 87*(6), 410-411. http://dx.doi.org/10.2471/BLT.09.020609

Yi, S., Poudel, K. C., Yasuoka, J., Palmer, P. H., Yi, S., & Jimba, M. (2010). Role of risk and protective factors in risky sexual behavior among high school students in Cambodia. *BMC public health, 10*(1), 477. http://dx.doi.org/10.1186/1471-2458-10-477

Zulkifli, S. N., & Low, W. Y. (2000). Sexual practices in Malaysia: determinants of sexual intercourse among unmarried youths. *Journal of adolescent health, 27*(4), 276-280. http://dx.doi.org/10.1016/S1054-139X(00)00099-9

Zulkifli, S. N., Low, W. Y., & Yusof, K. (1995). Sexual activities of Malaysian adolescents. *The Medical journal of Malaysia, 50*(1), 4-10.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Environmental Factors in an Ontario Community with Disparities in Colorectal Cancer Incidence

Jeavana Sritharan[1], Rishikesan Kamaleswaran[2], Ken McFarlan[3], Manon Lemonde[1], Clemon George[1] & Otto Sanchez[1]

[1] Faculty of Health Sciences, University of Ontario Institute of Technology, Oshawa, Ontario, Canada

[2] Faculty of Business and Information Technology, University of Ontario Institute of Technology, Oshawa, Ontario, Canada

[3] Lakeridge Health, Oshawa, Ontario, Canada

Correspondence: Jeavana Sritharan, PhD Student at the University of Toronto, Cancer Care Ontario, 1768-505 University Avenue, Toronto M5G 2P3, Ontario, Canada. Tel: 289-404-9121. E-mail: jeavana.sritharan@mail.utoronto.ca

Received: December 19, 2013 Accepted: January 16, 2014 Online Published: March 24, 2014

doi:10.5539/gjhs.v6n3p175 URL: http://dx.doi.org/10.5539/gjhs.v6n3p175

Abstract

Objective: In Ontario, there are significant geographical disparities in colorectal cancer incidence. In particular, the northern region of Timiskaming has the highest incidence of colorectal cancer in Ontario while the southern region of Peel displays the lowest. We aimed to identify non-nutritional modifiable environmental factors in Timiskaming that may be associated with its diverging colorectal cancer incidence rates when compared to Peel.

Methods: We performed a systematic review to identify established and proposed environmental factors associated with colorectal cancer incidence, created an assessment questionnaire tool regarding these environmental exposures, and applied this questionnaire among 114 participants from the communities of Timiskaming and Peel.

Results: We found that tobacco smoking, alcohol consumption, residential use of organochlorine pesticides, and potential exposure to toxic metals were dominant factors among Timiskaming respondents. We found significant differences regarding active smoking, chronic alcohol use, reported indoor and outdoor household pesticide use, and gold and silver mining in the Timiskaming region.

Conclusions: This study, the first to assess environmental factors in the Timiskaming community, identified higher reported exposures to tobacco, alcohol, pesticides, and mining in Timiskaming when compared with Peel. These significant findings highlight the need for specific public health assessments and interventions regarding community environmental exposures.

Keywords: colorectal cancer, cancer disparities, community based research, environmental health, tobacco smoking, alcohol drinking

1. Introduction

Colorectal cancer rates follow an unequal population distribution and burden around the world (Henry, Niu, & Boscoe, 2009). The worldwide geographical differences are so great that colorectal cancer incidence rates range by 20 fold, with the lowest incidence in India and the highest incidence in Japan (Adami, Hunter, & Trichopoulos, 2008). Colorectal cancer is the third most diagnosed cancer in males and second in females worldwide, similar to that in Canada where it is the third most common cancer diagnosis and the second leading cause of cancer related deaths (Adami et al., 2008; Canadian Cancer Society, 2011; Centres for Disease Control and Prevention [CDC], 2011). In Ontario, colorectal cancer incidence rates vary prominently from the highest incidence in the North East region of Timiskaming in 2003 (70.4 cases per 100, 000) to the lowest incidence in the Southern region of Peel in 2003 (41.3 cases per 100, 000) (Public Health Agency of Canada [PHAC], 2011). To date, no studies have been conducted in Timiskaming pertaining to cancer incidence. Identification of the factors that contribute to colorectal cancer disparities will help to facilitate preventive interventions, making it possible to reduce its magnitude (Jemal et al., 2011).

Risk factors that are often related to the risk for colorectal cancer incidence are generally classified as non-modifiable or modifiable factors. Non-modifiable factors that are often related to colorectal cancer incidence rates are age, gender, family history, and genetic predisposition (Canadian Cancer Society, 2011). The risk tends to be higher in males than females and increases after the age of 40 years and more so after the age of 50 years (Haggar & Boushey, 2009; Robb, Miles, & Wardle, 2004). With regards to family history and genetic predisposition, only about 20% of cases are recognized to be associated to family history and 5-10% associated to genetic risk (Haggar & Boushey, 2009). Modifiable risk factors that are often discussed with colorectal cancer are diet and body weight. There are evident inconsistencies concerning the relationship between diet and colorectal cancer (Alexander, Cushing, Lowe, Sceurman, & Roberts, 2009; Cho et al., 2004; Park et al., 2005; Sanjoaquin, Allen, Couto, Roddam, & Key, 2004). When examining body weight, obesity has been found to have a strong link to colorectal cancer (Moghaddam, Woodward, & Huxley, 2007). These studies ultimately reveal gaps in the research concerning the remaining portion of colorectal cancer incidence rates. Colorectal cancer may also be linked to modifiable risk factors that are classified as environmental. These environmental risk factors are not nutritional and can be altered or changed as they relate to personal behaviours, lifestyles and occupations. Environmental factors are a missing component of the present knowledge as there is a lack of evidence in the current available literature.

To explore environmental risk factors that may be linked to the high incidence colorectal cancer rate among Timiskaming inhabitants, we first performed a systematic review of non-nutritional modifiable environmental risk factors associated with colorectal cancer incidence. We then developed a questionnaire assessment tool of the factors identified through the systematic review and applied the tool to the community of Timiskaming and the reference community of Peel.

2. Methods

2.1 Environmental Risk Factor Categories

A systematic review of the published literature regarding non-nutritional modifiable environmental risk factors and colorectal cancer was completed in collaboration with an information specialist (K.M). Our search strategy selected original studies in humans that addressed environmental risk factors with colorectal cancer as the measurable outcome. A comprehensive search of the National Library of Medicine (PubMed) database up until April 12, 2011 was performed using the key words “colorectal neoplasms”, “ethanol”, “alcoholism”, “alcoholic beverages”, “alcoholic drinking”, “smoking”, “tobacco”, “air pollution”, “adverse effects ionizing radiation”, “metals”, “heavy/adverse effects”, “light/adverse effects”, “occupational exposure”, “pesticides” and “organochlorine products”. The initial search yielded 534 citations which were reviewed by the primary investigator utilizing a created inclusion criteria tool. The articles included were then transferred to a data extraction spreadsheet where they were further categorized based on risk factor. These categories were tobacco smoking, alcohol, pesticides, metal toxins and occupational exposures as risk factors for colorectal cancer.

2.2 Development and Application of the Environmental Assessment Questionnaire

Following the systematic review, the development of a questionnaire tool was necessary to assess the identified environmental risk factors in the communities of interest. The questionnaire was created using five other questionnaire tools which were standardized, published, and previously utilized with communities in Canada, United States, and Singapore. These questionnaires encompassed different aspects of environmental risk factors assessing community and population exposures. The tools used for our study were the National Health and Nutritional Examination Study (NHANES) (2009-10), Joint Canada/US Survey of Health (JCUSH) (2004), Cape Cod Breast Cancer Study (1999), Canadian Community Health Study (CCHS) (2010), and the Genes and Environment in Lung Cancer Study (2005) (CDC, 2010; Statistics Canada, 2004; Silent Spring Institute, 1999; Statistics Canada, 2010; Lam, 2005). The selected questions were inserted into the new questionnaire and focused on general health, housing and socio-demographics, as well as exposures to tobacco smoke, alcohol, toxic metals, and chemicals in residential and occupational settings. The questionnaire was reviewed by all authors and piloted among 11 individuals with the purpose of determining if the tool was consistent, comprehensible, and time efficient.

For this survey-based ecological approach, individuals 18 years of age and older were invited to participate from the Timiskaming Ontario Early Years Centre and the Mississauga Centre Ontario Early Years Centre. The target population were parents as they are the most frequent visitors of these centres and are recognized as the key providers of health for his or her family. The study was approved by the Research Ethics Board at the University of Ontario Institute of Technology, Oshawa, Ontario. The questionnaire tool was administered to a group of participants and an online printable version and pick up/take home method was also provided for participants. A

feedback letter was provided to each participant to inform them of when the study results would be presented to the community after the completion of the project. The Timiskaming location provided 53 completed questionnaires which were all included in the study. The reference location of Peel completed a total of 65 questionnaires, four of which were not applicable due to incompletion or not being returned, totalling to 61 completed questionnaires. Questionnaires deemed as incomplete were those with two or more sections incomplete and thus were excluded from the study. The data from the questionnaires was tabulated and organized by sections. The data was verified by the primary investigator by randomly selecting 4 to 8 questions per section of each questionnaire and confirming if the correct response was transferred from the questionnaire to the spreadsheet.

2.3 Data Analysis

The statistical analysis tool SPSS (Statistics Version 19) was utilized for analysis by two authors (J.S & R.K). The data was first normalized to ensure all values were standardized across both community data sets and the data was then coded to simplify the datasets. The coding scheme used to aggregate the survey results were then standardized using binary values for Yes/No answers and the questions containing Likert scales were coded numerically ranging from 1=strongly disagree to 5=strongly agree. For questions containing 'not applicable' and 'do not know' responses, codes -1 and -2 were used respectively. Normalizing and coding the data sets prepared the data for manipulation. The data was then checked by random data verification to ensure the accuracy of the data entry for all datasets. The corresponding sections from each community group were examined to ensure comparability among sections. Each section was assessed using descriptive statistics and the frequencies were plotted as histograms to identify normalization. Responses that were 'do not know' or deemed as a 'missing value' were not included in most response values within each category. However, there were cases where the missing values were deemed as 'not applicable' these responses however, were usable as a response set.

To determine the differences pertaining to parametric curves, we employed parametric tests such as the independent sample t-test and one way ANOVA. The t-test was used to examine categorical variables with only up to two categories within the questions, values of $p < 0.05$ were determined to be statistically significant. The one way ANOVA was used when examining categorical or continuous variables with three or more categories and was used for all questions that fit this criterion (Hill & Lewicki, 2007). Normality was observed using the Kolmogorov-Smirnov (KS) non-parametric test. This would ensure that the correct tests had been utilized for the categorical and continuous data. The non-parametric Mann-Whitney U test was the test of choice to evaluate the distribution of the variables with non-uniform normality, as it is a reliable and widely used test.

3. Results

A total of 114 participants took part in the study, a majority of them being females between the ages of 25 to 45 years from Timiskaming and Peel. Table 1 demonstrates the socio-demographic findings of the participants. Timiskaming participants were found to report a lower health status ($p<0.01$) and an overall lower level of education ($p<0.001$) than Peel participants. Birth place and ethnic background also significantly varied between the communities ($p<0.001$) as Timiskaming participants demonstrated little diversity and Peel demonstrated significantly more diversity. There were also more participants in Timiskaming with an Aboriginal background when compared to Peel participants ($p<0.01$). No statistical significant differences were observed regarding age, gender, relationship status, language preference, and total household income.

Table 1. Socio-demographic and health characteristics of participant populations (Total sample = 114)

	Timiskaming	Peel	P value
Age			0.972
18-24	4 (7.5%)	2 (3.3%)	
25-45	38 (71.7%)	49 (80.3%)	
46-59	10 (18.9%)	9 (14.8%)	
60-75	1 (1.9%)	1 (1.6%)	
76+	0 (0%)	0 (0%)	
Health Status			0.002
Excellent	4 (7.5%)	10 (16.4%)	
Very Good	16 (30.2%)	29 (47.5%)	
Good	24 (45.3%)	19 (31.1%)	

Fair	7 (13.2%)	3 (4.9%)	
Poor	2 (3.8%)	0 (0%)	
Gender			0.798
Female	47 (88.7%)	55 (90.2%)	
Male	6 (11.3%)	6 (9.8%)	
Relationship			0.623
Married	31 (58.5%)	44 (72.1%)	
Living Common Law	12 (22.6%)	2 (3.3%)	
Living with a partner	2 (3.7%)	1 (1.6%)	
Widowed	1 (1.9%)	2 (3.3%)	
Separated	1 (1.9%)	2 (3.3%)	
Divorced	3 (5.7%)	2 (3.3%)	
Single	3 (5.7%)	8 (13.1%)	
Education			<0.001
Less than High School	2 (3.8%)	0 (0%)	
High School	8 (15.1%)	4 (6.6%)	
Trades certificate/diploma	4 (7.5%)	3 (4.9%)	
Non-university/college certificate	16 (30.2%)	11 (18.0%)	
University or college certificate	11 (20.8%)	9 (14.8%)	
Bachelor degree	9 (17.0%)	21 (34.4%)	
Professional School degree	3 (5.7%)	13 (21.3%)	
Birthplace			<0.001
Asia	2 (3.8%)	22 (36.7%)	
Europe	2 (3.8%)	10 (16.7%)	
Middle East	0 (0%)	3 (5.0%)	
North America	49 (92.5%)	23 (38.3%)	
South America	0 (0%)	2 (3.3%)	
Aboriginal Ethnic Background			0.007
Yes	6 (11.3%)	0 (0%)	
No	47 (88.7%)	61 (100%)	
Ethnic Background			<0.001
Caucasian	51 (96.2%)	21 (34.4%)	
Hispanic or Latino	0 (0%)	2 (3.3%)	
Black or African American	0 (0%)	5 (8.2%)	
South Asian	2 (3.8%)	16 (26.2%)	
East Asian	0 (0%)	14 (23.0%)	
West Asian or Middle Eastern	0 (0%)	2 (3.3%)	
More than one	0 (0%)	1 (1.6%)	
Language			0.153
English	40 (75.5%)	39 (63.9%)	
French	6 (11.3%)	1 (1.6%)	
Other	1 (1.9%)	17 (27.9%)	
More than one	6 (11.3%)	4 (6.6%)	
Total Household Income			0.122
< 25,000	6 (12.2%)	1 (1.8%)	
25,000 < 50,000	14 (28.6%)	9 (16.1%)	
50,000 < 80,000	9 (18.4%)	17 (30.4%)	
80,000 < 100,000	7 (14.3%)	18 (32.1%)	
100,000 +	13 (26.5%)	11 (19.6%)	

3.1 Tobacco Smoking Patterns

Table 2 demonstrates the reported active and passive smoking exposures of participants. Significant differences between the communities were observed when participants were asked if they had smoked a whole cigarette in his or her lifetime ($p<0.001$), age of first whole cigarette smoked ($p<0.01$), highest number of cigarettes smoked daily ($p<0.05$), and if others smoked every day or almost every day in the household ($p<0.05$). No statistically significant differences were found for age of initiation of smoking daily, cessation of smoking, and for any second-hand smoke exposure in the household, public, or vehicle environments.

Table 2. Active and passive tobacco smoking patterns (Total sample = 114)

	Timiskaming	**Peel**	**P-value**
Smoked a whole cigarette in lifetime			<0.001
No	18 (34%)	42 (68.9%)	
Yes	35 (66%)	19 (31.1%)	
Age of first whole cigarette smoked			0.003
10-13	7 (33.3%)	0 (0%)	
14-17	11 (52.4%)	9 (56.2%)	
18-21	3 (14.3%)	5 (31.2%)	
22-25	0 (0%)	1 (6.3%)	
26-29	0 (0%)	1 (6.3%)	
Current smoking pattern			0.010
Every day	8 (23.5%)	3 (50.0%)	
Some days	1 (3.0%)	3 (50.0%)	
Not at all	25 (73.5%)	0 (0%)	
Age of initiation of smoking daily			0.458
10-13	2 (11.8%)	0 (0%)	
14-17	8 (47.0%)	4 (44.4%)	
18-21	5 (29.4%)	4 (44.4%)	
22-25	2 (11.8%)	1 (11.1%)	
Cessation of daily smoking			0.352
Never smoked every day	1 (6.25%)	0 (0%)	
<1 year ago	1 (6.25%)	0 (0%)	
1 year to < 2 years ago	1 (6.25%)	0 (0%)	
2 years to < 3 years ago	0 (0%)	1 (12.5%)	
3 or more years ago	13 (81.3%)	7 (87.5%)	
Complete cessation of smoking			0.630
< 1 year ago	1 (6.25%)	0 (0%)	
1 year to < 2 years ago	1 (6.25%)	0 (0%)	
2 years to < 3 years ago	0 (0%)	1 (14.3%)	
3 or more years ago	14 (87.5%)	6 (85.7%)	
Others smoking every day or almost every day in the household			0.011
No	3 (25.0%)	11 (73.3%)	
Yes	9 (75.0%)	4 (26.7%)	
Exposure to second hand smoke every day or almost every day in car or vehicle in the past month			0.552
No	46 (88.5%)	56 (91.8%)	
Yes	6 (11.5%)	5 (8.2%)	
Exposure to second hand smoke every day or almost every day in public places in the past month			0.763
No	45 (84.9%)	53 (86.9%)	
Yes	8 (15.1%)	8 (13.1%)	

3.2 Alcohol Drinking

Alcohol consumption was assessed and is presented in Table 3. Significant differences between Timiskaming and Peel were identified regarding the number of days during lifetime with at least one drink of alcohol ($p<0.05$), the number of drinks in the past 12 months ($p<0.01$), having five or more drinks of alcohol in one occasion in the past 12 months ($p<0.001$), and for having five or more drinks in a row or in two hours in the past month ($p<0.05$). No statistically significant differences were present for the age of first drink of alcohol, having a drink of alcohol in the past 12 months, and for having a drink of alcohol in the past week.

Table 3. Alcohol drinking patterns (Total sample = 114)

		Timiskaming	**Peel**	**P-value**
Age at first drink of alcohol				0.340
	Never had a drink	2 (3.9%)	15 (25.9%)	
	8 years or younger	1 (2.0%)	0 (0%)	
	9 or 10 years old	1 (2.0%)	0 (0%)	
	11 or 12 years old	4 (7.8%)	0 (0%)	
	13 or 14 years old	17 (33.3%)	4 (6.9%)	
	15 or 16 years old	12 (23.5%)	14 (24.1%)	
	17 years old or older	14 (27.5%)	25 (43.1%)	
Number of days during lifetime with at least one drink of alcohol				0.015
	1 or 2 days	2 (4.6%)	2 (5.0%)	
	3 to 9 days	4 (9.3%)	3 (7.5%)	
	10 to 19 days	0 (0%)	7 (17.5%)	
	20 to 39 days	4 (9.3%)	9 (22.5%)	
	40 to 99 days	6 (14.0%)	9 (22.5%)	
	100 or more days	27 (62.8%)	10 (25.0%)	
Alcohol beverages in the past 12 months				0.079
	No	8 (15.7%)	14 (31.1%)	
	Yes	43 (84.3%)	31 (68.9%)	
Number of drinks in the past 12 months				0.004
	Less than once a month	15 (35.7%)	18 (58.1%)	
	Once a month	3 (7.1%)	6 (19.3%)	
	2 or 3 times a month	9 (21.4%)	4 (12.9%)	
	Once a week	4 (9.5%)	1 (3.2%)	
	2 to 3 times a week	10 (23.8%)	2 (6.5%)	
	4 to 6 times a week	1 (2.4%)	0 (0%)	
	Every day	0 (0%)	0 (0%)	
5 or more drinks of alcohol in one occasion in the past 12 months				<0.001
	Never	17 (40.5%)	24 (75.0%)	
	Less than once a month	13 (31.0%)	8 (25.0%)	
	Once a month	4 (9.5%)	0 (0%)	
	2 to 3 times a month	4 (9.5%)	0 (0%)	
	Once a week	3 (7.1%)	0 (0%)	
	More than once a week	1 (2.4%)	0 (0%)	
Number of days in the past month with a drink of alcohol				0.090
	None	13 (31.0%)	8 (25.8%)	
	1 or 2 days	10 (23.8%)	16 (51.6%)	
	3 to 5 days	9 (21.4%)	5 (16.1%)	
	6 to 9 days	5 (11.9%)	2 (6.5%)	
	10 to 19 days	4 (9.5%)	0 (0%)	

	20 to 29 days	1(2.4%)	0 (0%)	
	All 30 days	0 (0%)	0 (0%)	
5 or more drinks in a row or in two hours in the past month				0.032
	None	32 (74.4%)	28 (87.5%)	
	1 day	3 (7.0%)	4 (12.5%)	
	2 days	2 (4.7%)	0 (0%)	
	3 to 5 days	5 (11.6%)	0 (0%)	
	6 to 9 days	0 (0%)	0 (0%)	
	10 to 19 days	0 (0%)	0 (0%)	
	20 or more days	1 (2.3%)	0 (0%)	
Alcohol beverages in the past week				0.257
	No	24 (55.8%)	22 (68.7%)	
	Yes	19 (44.2%)	10 (31.3%)	

3.3 Household Pesticide Use

Table 4 presents significant differences between the communities regarding their reported use of insecticides at the home/residence ($p<0.01$), having a lawn at the current home/residence ($p<0.001$), the use of chemical products to regularly control mould or mildew ($p<0.01$), and the use of paint thinner/stripper at the home/residence ($p<0.05$). There were no statistically significant differences for the time frame and number of times using insecticides, the use of various chemicals on the lawn, the use of professional pesticide lawn services, and the use of pesticides/insecticides/herbicides by the participant or other household members.

Table 4. Household pesticide use (Total sample = 114)

		Timiskaming	**Peel**	**P-value**
Use of insecticides at current home/residence				0.008
	No	33 (67.3%)	49 (89.1%)	
	Yes	16 (32.7%)	6 (10.9%)	
Number of times insecticides were used at current home/residence				0.772
	Never	0 (0%)	1 (14.3%)	
	Once or twice	11 (78.6%)	4 (57.1%)	
	3 to 10 times	3 (21.4%)	2 (28.6%)	
	More than 10 times	0 (0%)	0 (0%)	
Lawn at current home/residence				<0.001
	No	2 (4.0%)	20 (33.3%)	
	Yes	48 (96.0%)	40 (66.7%)	
Use of chemicals on lawn at current home/residence				0.879
	No	21 (52.5%)	19 (54.3%)	
	Yes	19 (47.5%)	16 (45.7%)	
Total number of times lawn was treated with chemicals				0.354
	Once or twice	17 (89.5%)	13 (81.3%)	
	3 to 20 times	2 (10.5%)	2 (12.5%)	
	More than 20 times	0 (0%)	1 (6.2%)	
First time lawn was treated with chemicals				0.988
	1996-1999	1 (5.3%)	0 (0%)	
	2000-2003	1 (5.3%)	3 (27.3%)	
	2004-2007	7 (36.8%)	1 (9.1%)	

	2008-2011	10 (52.6%)	7 (63.6%)
Most recent time lawn was treated with chemicals			0.822
	1996-1999	1 (5.3%)	0 (0%)
	2000-2003	1 (5.3%)	2 (18.2%)
	2004-2007	5 (26.3%)	1 (9.1%)
	2008-2011	12 (63.1%)	8 (72.7%)
Use of chemicals like pesticides/insecticides/herbicides/weed killers household members			0.082
	No	33 (75.0%)	48 (88.9%)
	Yes	11 (25.0%)	6 (11.1%)
Use of chemical products regularly to control mould or mildew			0.003
	No	33 (62.3%)	52 (86.7%)
	Yes	20 (37.7%)	8 (13.3%)
Use of paint thinner or paint stripper at current home/residence			0.015
	No	33(64.7%)	51 (85.0%)
	Yes	18 (35.3%)	9 (15.0%)

3.4 Other Factors

We also found differences between Timiskaming and Peel regarding factors concerning metals and occupational exposures. As the Timiskaming region has had silver and gold mining, 52.0% of participants identified gold mining and 23.9% of participants identified silver mining near or within his or her residence. When compared with Peel Region, more Timiskaming participants indicated their household being built prior to 1978 ($p<0.001$) and reported having had past or current dental amalgam ($p<0.001$). When asked about occupational exposures, more Timiskaming participants than Peel participants reported working in occupations involving cooking (n=29 vs. n=19), industrial food processing (n=10 vs. n=2), contact with exhaust fumes from vehicles (n=17 vs. n=9), and with burning of coal/wood/oil (n=5 vs. n=0).

4. Discussion

This is the first study exploring environmental factors that may be associated with the high incidence of colorectal cancer in Timiskaming, Ontario. Our survey particularly investigated reported exposures to non-nutritional lifestyle, behavioural, occupational and geographical factors, in comparison to a reference population with the lowest incidence of colorectal cancer in Ontario. Our study found that tobacco smoking and alcohol drinking patterns were significantly different between the communities. Other reported differences related to residential use of pesticides and knowledge of mining exposures.

The socio-demographic and health characteristics of Timiskaming and Peel vary in particular areas such as education, birth place, ethnic background, Aboriginal background, and self-reported health status. These were expected differences, excluding the self-reported health status. As health status was a part of the survey administered to participants, it was regarded as their own perception of health. Assessing this provided knowledge that Timiskaming participants varied in how they viewed their own health reporting from ‘excellent’ to ‘poor’, whereas a majority of Peel participants reported from ‘excellent’ to ‘good’. This self-reported health status not only identifies participant perception on health but may also represent each participant’s actual health status.

Regarding tobacco smoking, there were significant differences between the communities concerning age of first whole cigarette smoked, current smoking pattern, the highest number of cigarettes smoked daily, and for other household member smokers smoking every day or almost every day. A comprehensive meta-analysis observed similar findings with an overall increased risk in relation to cigarette smoking and significant associations between variables of daily cigarette smoking, duration, pack years, age of initiation, and colorectal cancer (Liang, Chen, & Giovanni, 2009). Another meta-analysis also found a significant relationship between cigarette smoking and colorectal cancer (Chen, Qiu, Zhang, & Zhao, 2003). Tobacco smoke has been linked to specific forms of cancer, especially lung cancer; however the link to colorectal cancer is less determined. Cigarette smoke may be responsible for the formation and growth rate of adenomatous polyps that can lead to colorectal cancer, particularly with long term smoke exposure (Haggar & Boushey, 2009). The influence of tobacco smoke on

cancer can be due to the roughly 4000 carcinogenic chemicals present in the tobacco (Liang et al., 2009).

With alcohol exposure, significant differences between the communities were found for the number of days during lifetime with at least one drink of alcohol, number of drinks in the past 12 months, having five or more drinks of alcohol in one occasion in the past 12 months, and for having five or more drinks in a row or in two hours in the past month. A meta-analysis of five Japanese cohort studies found a clear dose response relationship between alcohol consumption and colorectal cancer risk in males (Mizoue et al., 2008). Furthermore, another meta-analysis found that high alcohol intake was associated with risk of colon cancer when comparing the highest and lowest categories of alcohol intake (Moskal, Norat, Ferrari, & Riboli, 2006).

The use of pesticides and organochlorines demonstrated significant differences regarding insecticide use at the home/residence, having a lawn at the current home/residence, the most recent time of use of professional lawn service using pesticides/insecticides/weed killers, and the use of chemical products to control mould or mildew in the household. The risks with metal toxins presented significant differences when participants were asked about knowledge of silver or gold mining taking place near or within the community, if the home were built prior to 1978, having a dental amalgam, and the time frame of having this dental amalgam. The Timiskaming region was known for silver mining in the 1900s and is now known for its gold mining. Silver mining was commonly extracted with the use of nickel and arsenic compounds and gold mining was extracted using mercury metal. The corresponding mine tailings and waste rock possibly expose the community to metal toxins.

In our study, a majority of participants were females between the ages of 25 to 45 years, indicative of the group of individuals who often used the participant community centres. Self-reported health status among both communities presented a significant difference as Timiskaming participants reported a generally lower health status than those in Peel. This was an unexpected finding that may relate self-perceived health to the actual health of these participants. Education status among participant communities significantly varied, however income level did not. These two factors are often associated with one another to account for socioeconomic status. This may suggest that education and income level are not associated to one another in each of the participant communities.

There is speculation that as communities migrate to host nations, environmental influences may alter the colorectal cancer rates in these migrant communities towards that of the host nation (Kim, Masyn, Kawachi, Laden, & Colditz, 2010). Western Europe, North America, and Australia have shown to have higher incidence of colorectal cancer rates in comparison to South Asia, Latin America, and Africa. As populations of the latter nations migrate to the former nations, the incidence among these migrated communities becomes similar to that of the nations they migrated to (Virk, Gill, Yoshida, Radley, & Salh, 2010). The participants from Timiskaming were primarily of Caucasian background and of North American (Canadian) descent. The Peel participants, on the other hand, were primarily of Caucasian, South Asian, and East Asian background. The high ethnic diversity and large population size of Peel (Statistics Canada, 2011a) may contribute to the low risk of colorectal cancer rates, as the population is constantly changing. Birth place and ethnic background tie together and represent the main differences between the two communities. Timiskaming also has a low Aboriginal participant population which was still significantly different from Peel, as the latter community had no self-identifying Aboriginal participants. This difference may not be significant as it is a very small difference but it does relate to the general population statistics of both communities where only 5.6% of the entire Timiskaming population and 0.5% of the entire Peel population are of Aboriginal descent (Statistics Canada, 2011a; Statistics Canada, 2011b).

Our study presented different strengths, notably as it is the first study performed in Timiskaming, an Ontario region with high incidence of colorectal, breast and lung cancer relative to other provincial regions. This primary study assessed the possible relationship between non-nutritional modifiable environmental risk factors and colorectal cancer at a community level. It provided insight on the potential non-nutritional modifiable environmental risk factors and the further diverging disparities between Timiskaming and Peel. Our study allowed for recognition of potential environmental risk factors in the community of Timiskaming, contributing to enhancing community and individual knowledge, understanding, and empowerment.

There are evident limitations inherent to this survey-based ecological study. Two community centres were utilized as a convenience sample and this may have excluded members of the community who were not in access of the community centres. This relates to the most important limitation of this study which is the small sample size. The Timiskaming community centre had two satellite centres which helped to be more inclusive, however only one centre in Peel was used so this may have prevented those living outside the region of the centre to participate. As a questionnaire tool was used as the primary method of data collection, this may have presented recall bias as participants may not have been able to remember exposures or they may have answered questions

inaccurately. The questionnaire tool was only printed in English, creating a limitation for other language users. A limitation in the recruitment process through the use of community centres is that a majority of the participants from the centres were females excluding male populations.

The findings from this study indicate that there are dominant non nutritional modifiable environmental risk factors in the region of Timiskaming, specifically regarding tobacco smoking, alcohol use, household chemical use, and mining exposures. These may contribute to the high colorectal cancer incidence rates and colorectal cancer disparities present in Ontario communities. Our findings are important for future research as disparities in cancer incidence are present not only in Ontario but in many regions of Canada. Our study contributes to knowledge on communities like Timiskaming where cancer risks are higher than in other communities and where environmental risks are less acknowledged. Future research can stem from our study to incorporate a more rigorous approach and utilize better methodology. It is recommended that future studies utilize cohort study designs accompanied by collaborating with community health units, looking at disparities across provincial boundaries, expanding data collection methods, and addressing other factors affecting incidence such as screening programs or barriers to accessing health services. Ultimately, community cancer disparities may be reduced by understanding and examining the contributing environmental risk factors.

Conflict of Interest

The authors declare that there are no conflicts of interest.

References

Adami, H. O., Hunter, D., & Trichopoulos, D. (Ed.). (2008). *Textbook of Cancer Epidemiology* (2nd ed). New York: Oxford University Press Inc. http://dx.doi.org/10.1093/acprof:oso/9780195311174.001.0001

Alexander, D. D., Cushing, C. A., Lowe, K. A., Sceurman, B., & Roberts, M. A. (2009). Meta-analysis of animal fat or animal protein intake and colorectal cancer. *The American Journal of Clinical Nutrition,* 89, 1402-1409. http://dx.doi.org/10.3945/ajcn.2008.26838

Canadian Cancer Society. (2011). Canadian cancer statistics 2011 featuring colorectal cancer.

Centers for Disease Control and Prevention. (2011). Fast facts about colorectal cancer.

Centers of Disease Control and Prevention. (2010). Survey questionnaires, examination components and laboratory components 2009-2010.

Chen, K., Qiu, J. L., Zhang, Y., & Zhao, Y. W. (2003). Meta-analysis of risk factors for colorectal cancer. *World Journal of Gastroenterology, 9*, 1568-1600.

Cho, E., Smith-Warner, S. A., Spiegelman, D., Beeson, W. L., van den Brandt, P. A., Colditz, G. A., ... Hunter, D. J. (2004). Dairy foods, calcium, and colorectal cancer: A pooled analysis of 10 cohort studies. *Journal of the National Cancer Institute, 96*(13), 1015-1022. http://dx.doi.org/10.1093/jnci/djh185

Haggar, F. A., & Boushey, R. P. (2009). Colorectal cancer epidemiology: Incidence, mortality, survival, and risk factors. *Clinics in Colon and Rectal Surgery, 22*(4), 191-197. http://dx.doi.org/10.1055/s-0029-1242458

Henry, K. A., Niu, X., & Boscoe, F. P. (2009). Geographic disparities in colorectal cancer survival. *International Journal of Health Geographics, 8*(48), 1-13.

Hill, T. & Lewicki, P. (2007). *STATISTICS: Methods and Applications*. Tulsa: OK, StatSoft: 2007.

Jemal, A., Bray, F., Center, M., Ferlay, J., Ward, E., & Forman, D. (2011). Global cancer statistics. *A Cancer Journal for Clinicians, 6*1(2), 69-90. http://dx.doi.org/10.3322/caac.20107

Kim, D., Masyn, K. E., Kawachi, I., Laden, F., & Colditz, G. A. (2010). Neighbourhood socioeconomic status and behavioural pathways to risks of colon and rectal cancer in women. *Cancer, 116*(17), 4187-4196. http://dx.doi.org/10.1002/cncr.25195

Lam, W. K. (2005). Lung cancer in Asian women – the environment and genes. *Respirology, 10*(4), 408-417. http://dx.doi.org/10.1111/j.1440-1843.2005.00723.x

Liang, P. S., Chen, T., & Giovannucci, E. (2009). Cigarette smoking and colorectal cancer incidence and mortality: Systematic review and meta-analysis. *International Journal of Cancer, 124*, 2406-2415. http://dx.doi.org/10.1002/ijc.24191

Mizoue, T., Inoue, M., Wakai, K., Nagata, C., Shimazu, T., Tsuji, I., ... Tsugane, S.; Research Group for Development and Evaluation of Cancer Prevention Strategies in Japan. (2008). Alcohol drinking and colorectal cancer in Japanese: a pooled analysis of results from five cohort studies. *American Journal of*

Epidemiology, 167(1397), 1406.

Moghaddam, A. A., Woodward, M., & Huxley, R. (2007). Obesity and risk of colorectal cancer: a meta-analysis of 31 studies with 70,000 events. *Cancer Epidemiology, Biomarkers, & Prevention, 16*(12), 2533-2547. http://dx.doi.org/10.1158/1055-9965.EPI-07-0708

Moskal, A., Norat, T., Ferrari, P., & Riboli, E. (2006). Alcohol intake and colorectal cancer risk. A dose-response meta-analysis of published cohort studies. *International Journal of Cancer, 120*, 664-671. http://dx.doi.org/10.1002/ijc.22299

Park, Y., Hunter, D. J., Spiegelman, D., Bergkvist, L., Berrino, F., van den Brandt, P. A., ... Smith-Warner, S. A. (2005). Dietary fibre intake and risk of colorectal cancer. *JAMA, 294*(22), 2849-2857. http://dx.doi.org/10.1001/jama.294.22.2849

Public Health Agency of Canada. (2011). Chronic disease infobase. Ottawa, ON: Government of Canada, 2011. Retrieved January 15, 2011, from http://204.187.39.30/surveillance/Index.aspx

Robb, K., Miles, A., & Wardle, J. (2004). Demographic and psychosocial factors associated with perceived risk for colorectal cancer. *Cancer Epidemiology, Biomarkers, & Prevention, 13*, 366.

Sanjoaquin, M. A., Allen, N., Couto, E., Roddam, A. W., & Key, T. J. (2004). Folate intake and colorectal cancer risk: A meta- analytical approach. *International Journal of Cancer, 113*, 825-828. http://dx.doi.org/10.1002/ijc.20648

Silent Spring Institute. (1999). Cape Cod breast cancer and environment study survey instruments. Silent Spring Institute.

Statistics Canada. (2011a). Health profile, January 2013: Peel regional health unit.

Statistics Canada. (2011b). Health profile, January 2013: Timiskaming health unit.

Statistics Canada. (2004). Joint Canada/United States survey of health (JCUSH).

Statistics Canada. (2010). Canadian community health survey (CCHS).

Virk, R., Gill, S., Yoshida, E., Radley, S., & Salh, B. (2010). Racial differences in the incidence of colorectal cancer. *The Canadian Journal of Gastroenterology, 24*(1), 47-51.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

On Pump Coronary Artery Bypass Graft Surgery Versus Off Pump Coronary Artery Bypass Graft Surgery: A Review

Mohammad Yousuf-ul Islam[1], Muhammad Umer Ahmed[2], Muhammad Shahzeb Khan[1], Faizan Imran Bawany[1], Asadullah Khan[3] & Mohammad Hussham Arshad[4]

[1] Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan

[2] Ziauddin Medical University, Karachi, Pakistan

[3] Cardiac Surgery Department, Civil Hospital, DUHS, Karachi, Pakistan

[4] Aga Khan University Hospital, Karachi, Pakistan

Correspondence: Muhammad Shahzeb Khan, 109/2 Khayabane Amir Khusro Phase 6 DHA, Karachi, Pakistan. Tel: 92-032-1206-6743. E-mail: shahzebkhan@gmail.com

Received: December 30, 2013 Accepted: February 11, 2014 Online Published: March 24, 2014

doi:10.5539/gjhs.v6n3p186 URL: http://dx.doi.org/10.5539/gjhs.v6n3p186

Abbreviations

CAD: coronary artery disease

CABG: Coronary artery bypass graft surgery

PTCA: Percutaneoustransluminal coronary angioplasty

ONCAB: On pump Coronary artery bypass

OFCAB: Off pump coronary artery bypass

CPB: cardiopulmonary bypass

Abstract

There are two basic ways of performing coronary artery bypass graft surgery (CABG): on pump CABG and off pump CABG. Off pump CABG is relatively a newer procedure to on-pump CABG and does not require the use of the cardiopulmonary bypass machine. On pump CABG is the more traditional method of performing bypass surgery. However its resultant inflammatory effects cause renal dysfunction, gastrointestinal distress and cardiac abnormalities which have forced the surgeons to look for alternatives to the procedure. An extensive literature search revealed that on pump CABG causes better revascularization as compared to off pump CABG while off pump CABG has a much lower post operative morbidity and mortality especially in high risk patients. We suggest that the technique used should depend on the ease of the surgeon doing the operation as both the methods seem almost equally efficient according to the review.

Keywords: coronary artery bypass graft surgery, off pump, on pump, CABG

1. Introduction

Coronary artery bypass graft surgery (CABG) has become recognized as one of the principle therapies to prolong survival and improve the quality of life of patients suffering from coronary artery disease (CAD) (Bonow & Epstein, 1985). CABG was introduced by Alexis Carrel in the early 20th century when he experimented with grafting on canine models (Shumacker, 1992). His ideas were revived in the early 1960s by Konstantinov (2004), who became the first person to successfully perform the coronary artery bypass on a human being. The procedure was popularized by Favaloro, who in 1967 published the results of his successful operation on 15 patients.

Different studies have shown CABG to be the most superior method of treatment to CAD, especially in high-risk patients. In comparison to medical therapy (taking drugs like Beta blockers, nitrates etc), CABG has shown to statistically increase survival in high risk patients. Yusuf et al. (1994) reported that patients who underwent CABG had significantly lower mortality then those who opted for medical treatment after 5 years (10.2%

mortality for CABG vs 15.8% mortality for medical treatment, $p < 0.001$), after 7 years (15.8% mortality for CABG vs 21.7% mortality for medical treatment, $p < 0.001$) and after 10 years (26.4% mortality for CABG vs 30.5% mortality for medical treatment, $p < 0.05$).

Moreover, in contrast to Percutaneoustransluminal coronary angioplasty (PTCA), CABG has shown to be a better option in the long term treatment of CAD. It was found that that patients undergoing PTCA were five times more likely to have revascularizations in 5 years succeeding treatment as opposed to patients choosing CABG (BARI, 1996). This blunted the initial cost-effectiveness of the PTCA procedure (Rihal, Raco, Gersh, & Yusuf, 2003). Serruys et al. (2009) reported that in severe cases of CAD, if patients underwent PTCA they had a significantly higher chance of encountering adverse cerebrovascular or cardiac events in the 12 months following treatment, as compared to those who underwent CABG. While Hannan et al. (2008) reported that CABG was associated with lesser deaths and myocardial infarctions as opposed to drug eluting stents over an 18 month period.

There are two basic ways of performing CABG: On pump CABG and off pump CABG. They both begin with the surgeon harvesting blood vessels from the leg, chest or the arm. The surgeon gains access to the heart using midline sternotomy. In on-pump CABG the heart is stopped with the body's blood supply being maintained by the cardiopulmonary bypass (CPB) machine. While the heart is stopped the surgeon performs the graft procedure by sewing one end of a section of a blood vessel over a tiny opening made in the aorta and the other end over a tiny opening made in the blocked coronary vessel, distal to its blockage. With the grafting complete, the body is removed from the cardiopulmonary bypass machine and the heart is restarted (Shekar, 2006).

In off-pump CABG, the area around the blocked coronary artery is stabilized while the surgeon grafts the blood vessel on the pumping heart. Off pump CABG is relatively a newer procedure to On-pump CABG and doesn't require the use of the cardiopulmonary bypass machine.

On pump Coronary artery bypass (ONCAB) is the more traditional method of performing bypass surgery. However its resultant inflammatory effects cause renal dysfunction, gastrointestinal distress and cardiac abnormalities which forced the surgeons to look for alternatives to the procedure (Godinho, Alves, Pereira, & Pereira, 2012).

Off pump coronary artery bypass (OFCAB) has been around since the times of Kolesov. But it gained popularity, as a variant of on-pump coronary artery bypass, due to its recently discovered effects of causing less inflammation, less morbidity and being more cost effective (Hijazi, 2010). Hence in this review we will discuss the advantages of ONCAB over OFCAB and vice versa.

2. Advantages of On-Pump

An extensive literature search reveals that ONCAB causes more complete revascularization as compared to OFCAB. According to Robertson and colleagues (2013), on-pump patients tend to have significantly higher frequencies of complete revascularization as compared to patients treated via Off-pump method (88.3% to 79.2%, $p = 0.002$). These finding are supported by Ivanov et al. (Ivanov, Borger, Tu, Rao, & David, 2008; Synnergren, Ekroth, Odén, Rexius, & Wiklund, 2008; Nakano, Okabayashi, Noma, Sato, & Sakata, 2013).

Ivanov et al. (2008) further showed that a fewer amount of distal anastomosis were formed during off-pump coronary artery bypass surgeries as compared to on-pump procedures (2.6+/- 1to 3.1 +/- 1, $p < 0.001$). Due to incomplete revascularization, Lattouf and colleagues (2008) have reported that patients requiring more than 3 grafts are more likely to be treated on-pump.

Incomplete revascularization has traditionally been associated with increased mortality. In 1981, Buda et al. revealed that only 69% of incompletely revascularized patients survive for the 5 year follow up as compared to 84% of completely revascularized patients. A more recent study (Jones & Weintraub, 1996) showed that incomplete revascularization correlates with decreased patient survival, in the long term, and significantly higher prevalence of recurrent angina. This body of evidence supports the argument that incomplete revascularization caused by off pump bypass surgery could lead to increased mortality in off pump bypass surgeries as compared to on-pump surgeries.

Incomplete revascularization also leads to increased repeat procedures. Hence OFCAB patients have higher rates of repeat revascularizations as compared to ONCAB patients (Ivanov et al., 2008). One study noted this difference to be quite stark when the calculated hazard ratio of OFCAB patients getting repeat procedures as compared to ONCAB came out to be 1.55 (95% CI, 1.33-1.8) (Hannan et al., 2007).

On pump bypass is preferred to off-pump bypass in emergency situations. This makes sense, as loading an already ischemic heart with additional workload by performing Off-pump surgeries seems counterproductive.

Darwazah, Sham'a, Isleem, Hanbali and Jaber (2009) further showed that mean ejection fraction is significantly lower in patients going for OFCAB as opposed to those going for ONCAB (28% +/- 9% vs. 39% +/- 10%) in emergency situations. They also proved that using cardiopulmonary bypass (CPB) machines during emergency procedure lowers rates of recurrent angina, lessens symptoms of heart failure and decreases re-hospitalization frequency.

Though it was initially thought that using cardiopulmonary bypass machine increases the incidence of ischemic cerebral injury (Knipp et al., 2004), however many studies have failed to show the superiority of off-pump bypass over on-pump in avoiding cerebral injury (Puskas et al., 2003; Angelini, Taylor, Reeves, & Ascione, 2002). Indeed, Hammon and colleagues (2007) have reported that neuropsychological deficits in patients undergoing ONCAB with single cross-clamping and minimal aortic manipulation is lower than those undergoing OPCAB. They further hypothesized that mild hypothermia as obtained in on-pump surgeries could actually be beneficial for the brain.

The final advantage that on-pump procedures have over off-pump is the surgeons' familiarity with this surgery (Légaré & Hirsch, 2006). Considering OFCAB is said to be very technically demanding and is supposed to have a prolonged learning curve, most surgeons are comfortable with using ONCAB, the time honored procedure (Lamy et al., 2012). As Brown et al. (2001) demonstrated that a surgical team's experience and familiarity are crucial factors for a good outcome, making ONCAB slightly more superior to OFCAB in this regard.

3. Advantages of Off-Pump

Comparing the morbidity and mortality rate, both the off- and on-pump techniques yield very good results with very low mortality. However a much lower post operative morbidity with the off-pump operation is established. The much higher morbidity in the on-pump bypass is seemed to be much attributable to cardiopulmonary bypass process itself (Sabik et al., 2002). This is further supported by a research which shows that off-pump technique was associated with a much decreased risk-adjusted operative mortality from 2.9% with the on-pump group to 2.3% amongst the off-pump group. The adoption of an off-pump procedure also decreased the risk-adjusted complication rate from 14.15% with ONCAB to 10.62% in OFCAB (Cleveland, Shroyer, Chen, Peterson, & Grover, 2001). In short the patients who underwent OFCAB were much less likely to die and have major complications (Cleveland et al., 2001). Adding even more to this point a research highlighted that the patients who were treated off-pump had both lower complication rates (8.8% versus 14.0%) and lower mortality rates (2.7% versus 4.0%) (Plomondon et al., 2001). The aforementioned facts therefore highlight the importance of OFCAB in reducing both mortality and morbidity and lesser post operation complications.

CABG involvesa systemic inflammatory response associated with cytokine release and complement activation due to the fact that it is an invasive process. Comparing the degree of inflammatory response via the levels of pro inflammatory cytokines and the markers of inflammation in both procedures, it was revealed that the release of interleukin-8, interleukin-6, and tumor necrosis factor receptors 1 and 2 were higher in the ONCAB group than the OFCAB group (Strüber et al., 1999). Another research showed that the serum levels of tumor necrosis factor-alpha were detected in higher amounts in patients with ONCAB. Similarly, the patients in ONCAB group had more hypotension, required more inotropic drugs, had higher heart rates, higher temperature, increased postoperative bleeding, a longer orotracheal intubation time and a much more pronounced leukocytosis compared with OFCAB group (Brasil, Gomes, Salomão, & Buffolo, 1998). Therefore the much increased levels of the pro inflammatory cytokines in the ONCAB group could be the factor which causes more post op complications and mortality amongst patients.

Many studies using transcranial Doppler have shown much higher rates of cerebral vessel embolization in ONCAB patients in comparison with OFCAB patients. Majority of the studies which examined the neurocognitive function have established a little more decline amongst the ONCAB patients in comparison with OFCAB patients in the short term (<2 to 3 months) period but have failed to prove anoteworthy difference at the 1 year time period (Van Dijk etal.,2002).Another study established that ONCAB was linked to more cerebral microemboli (575 ± 278.5) as compared to OFCAB (160 ± 19.5) and lead to a significantly reduced cerebral perfusion postoperatively to the thalami, cerebellar, precunei, bilateral occipital, and left temporal lobes. However cerebral perfusion with OFCAB was found to be unchanged (Jeffrey et al., 2003). Therefore OFCAB significantly reduces the occurrence to cerebral microemboli as compared to those getting the ONCAB operation.

Comparing patients with multiple co-morbidities, 4 studies were reviewed and patients were classified as being high risk if there was the presence of multiple preoperative co morbid factors. The risk factors taken were recent myocardial infarctions, left ventricular dysfunction, left main stem disease, kidney failure, previously occurred

strokes, shock, unstable angina ,heart failure, chronic obstructive pulmonary disease, age greater than 70 years and urgent or emergent surgery (Bittner & Savitt, 2002; Chamberlain, Ascione, Reeves, & Angelini, 2002; Meharwal et al., 2002; Gaudino et al., 2004). A significant number of patients in the ONCAB group had 3 vessel disease, severe heart failure symptoms and unstable angina. The OFCAB patients were inclined towards having higher numbers of risk factors. However there were no significant differences to be accounted for almost all of the preoperative risk factors present. In about two researches, the number of grafts placed was found to be greater in the ONCAB group in comparison to the OFCAB group, but however the number of grafts was found to be alike in other studies. Mortality was found to be much higher in ONCAB group in one of the studies but however not much difference was found in the other 3 studies. Intensive care unit and hospital length of stay were found to be lower in the OFCAB group. In these studies, the postoperative blood loss, need for blood transfusion, arrhythmias, and ventilation time was found to be higher in the oncab group as compared to the ofcab group. According to 2 meta anlaysis the ofcab procedure significantly reduced the incidence of postopertive stroke (Afilalo, Rasti, Ohayon, Shimony, & Eisenberg, 2012; Sa et al., 2012). Similarly, peri-operative myocardial infarction was found to be lower in the OFCAB group in one study but was found not to be significantly different in the other 3 studies. However the infectious, renal, and neurological complications were found to be similar in all the studies. Therefore OFCAB can be done with a much lower mortality and morbidity in the selected groups of high-risk patients with multiple co morbid. OFCAB is a reasonable, and may even be a preferable, operative strategy for the high-risk group of patients.

Two studies were found which assessed the possibility that whether coronary revascularization surgeries in individuals with severely damaged atheromatous aorta could be performed using the off pump technique or not (Sharony et al., 2003; Sharony et al., 2004). Both the studies used the propensity matching in order to have same number of individual patients in the OFCAB and the ONCAB groups with similar preoperative characteristic and echocardiography findings of ascending aortic atheromatous disease. The incidence of stroke and mortality were found to be greater in the ONCAB groups in both the studies. The 1st study (Sharony et al., 2003) reported a stroke rate of 4.7% for the ONCAB in comparison to 2.4% for the OFCAB group and in hospital mortality rate of 11.4% and 3.8% respectively. The second study (Sharony et al., 2004) reported in hospital mortality rate of 11.4% for the traditional CABG group whilst 6.5% for the OFCAB group and a stroke rate of 5.7% and 1.6% respectively. In both the studies three years follow up was done. One study showed an increased survival in the OFCAB group whilst the other showed no significant difference. These facts therefore help reinstate that patients who had severe atherosclerotic aortic disease and underwent OFCAB show a significantly lower prevalence of complication, strokes and in hospital mortality in comparison with the patients who underwent ONCAB.

For older patients, the off pump procedure yielded better prognosis and outcome in comparison with its ONCAB counterpart. This fact is supported by 2 researches, in which one study selected patients greater than 75 years of age whilst the other study focused on patients greater than 80 years of age. However the preoperative patient characteristics were similar in both the studies. Moreover, the number of grafts placed in both the studies was found to be higher in the ONCAB group (Hoff et al., 2002; Hirose, Amano, & Takahashi, 2001). The occurrence of bleeding, transfusions, stroke, prolonged respiratory failure, and ICU and hospital length of stay were all found to be higher in the ONCAB groups in comparison to the OFCAB group. However, kidney failure, myocardial infarction, reoperation for bleeding, operative mortality and wound infections were not found to be significantly different amongst the two types of procedures. The aforementioned facts therefore help conclude that OFCAB procedure is much more beneficial when performed in elderly patients.

For patients with acute myocardial infarction a research carried in Israel highlighted the efficacy of the OFCAB procedure for such patients. The research included 225 patients who underwent CABG sometime soon after an acute myocardial infarction. All the patients who were a part of the research had similar pre operative characteristics and had the operation performed within one week after the occurrence of an acute myocardial infarction (Locker et al., 2003). The OFCAB group had more patients with one or two grafts whilst the ONCAB group had more patients with greater than three grafts. The mortality rate was significantly higher in the ONCAB group (12% compared to 3.8%), but majority of deaths in the ONCAB group were within 2 days of myocardial infarction. However the mortality rate was not significantly different in patients operated more than 2 days after myocardial infarction. The incidence of late mortality was however found to be much lower in the traditional CABG group. Therefore the use of OFCAB procedure in emergency patients being operated within the first 2 days of the onset of symptoms has found to be much beneficial in comparison to its traditional counterpart.

4. Conclusion

Table 1. The main advantages of each technique

Advantages of ON Pump CABG
1) Leads to more complete revascularization
2) Leads to increased formation of distal anastomosis
3) Is a better option in emergency situations
4) Most surgeons are familiar with this form of CABG
Advantages of Off Pump CABG
1) Decreased morbidity and mortality rates
2) Associated with decreased levels of post-CABG inflammatory cytokines
3) Reduces occurrence of post-surgical cerebral microemboli
4) Preferred option in high risk patients and those with severe atherosclerotic aortic disease
5) Preferred option in older patients (i.e. > 75 years)

Table 1 shows a summary of the advantages of each technique. To conclude we could say that short term morbidity and mortality is less in very high-risk patients with off-pump, possibly because the procedure is shorter. It would be right to say that shorter the procedure, the better, especially for older, sicker patients. The length of the procedure is significantly shorter with off-pump than on-pump. However we suggest that the technique used should depend on the ease of the surgeon doing the operation as both the methods seem almost equally efficient according to the review otherwise. Certainly more data over large randomized trials is required before off pump superiority over on-pump can be firmly established.

References

Afilalo, J., Rasti, M., Ohayon, S. M., Shimony, A., & Eisenberg, M. J. (2012). Off Pump Vs on Pump Coronary Artery Bypass Surgery: A Maetanalysis and Meta Regression of Randomized Clinical Trials. *Eur Heart J, 33*(10), 1257-67. http://dx.doi.org/10.1093/eurheartj/ehr307

Angelini, G. D., Taylor, F. C., & Reeves, B. C. (2002). Ascione R. Early and midterm outcome after off-pump and on-pump surgery in Beating Heart Against Cardioplegic Arrest Studies (BHACAS 1 and 2): a pooled analysis of two randomised controlled trials. *Lancet, 359*, 1194-9. http://dx.doi.org/10.1016/S0140-6736(02)08216-8

Bittner, H. B., & Savitt, M. A. (2002). Off-pump coronary artery bypass grafting decreases morbidity and mortality in a selected group of high-risk patients. *Ann Thorac Surg, 74*, 115-118. http://dx.doi.org/10.1016/S0003-4975(02)03646-9

Bonow, R. O., & Epstein, S. E. (1985). Indications for coronary artery bypasssurgery in patients with chronic angina pectoris: Implicationsof the multicenter randomized trials. *Circulation, 72*(suppl V), V-23-V-30.

Brasil, L. A., Gomes, W. J., Salomão, R., & Buffolo, E. (1998). Inflammatory response after myocardial revascularization with or without cardiopulmonary bypass. *Ann Thorac Surg, 66*(1), 56-9. http://dx.doi.org/10.1016/S0003-4975(98)00181-7

Brown, P. P., Mack, M. J., Simon, A. W., Battaglia, S. L., Tarkington, L. G., Culler, S. D., & Becker, E. R. (2001). Comparing clinical outcomes in high-volume and low-volume off-pump coronary bypass operation programs. *Ann Thorac Surg, 72*(3), S1009-15. http://dx.doi.org/10.1016/S0003-4975(01)02937-X

Buda, A. J., Macdonald, I. L., Anderson, M. J., Strauss, H. D., David, T. E., & Berman, N. D. (1981). Long-term results following coronary bypass operation. Importance of preoperative actors and complete revascularization. *J Thorac Cardiovasc Surg, 82*(3), 383-90.

Chamberlain, M. H., Ascione, R., Reeves, B. C., & Angelini, G. D. (2002). Evaluation of the effectiveness of off-pump coronary artery bypass grafting in high-risk patients: an observational study. *Ann Thorac Surg, 73*, 1866-1873. http://dx.doi.org/10.1016/S0003-4975(02)03550-6

Cleveland, J. C. Jr., Shroyer, A. L., Chen, A. Y., Peterson, E., & Grover, F. L. (2001). Off-pump coronary artery bypass grafting decreases risk-adjusted mortality and morbidity. *Ann Thorac Surg, 72*(4), 1282-8.

http://dx.doi.org/10.1016/S0003-4975(01)03006-5

Darwazah, A. K., Sham'a, R. A., Isleem, I., Hanbali, B., & Jaber, B. (2009). Off-pump coronary artery bypass for emergency myocardial revascularization. *Asian Cardiovasc Thorac Ann, 17*(2), 133-8. http://dx.doi.org/10.1177/0218492309103288

Favaloro, R. G. (1968). Saphenous vein autograft replacement of severe segmental coronary artery occlusion: operative technique. *Ann Thorac Surg, 5*, 334-339. http://dx.doi.org/10.1016/S0003-4975(10)66351-5

Gaudino, M., Glieca, F., Alessandrini, F., Nasso, G., Pragliola, C., Luciani, N., Morelli, M., & Possati, G. (2004). High risk coronary artery bypass patient: incidence, surgical strategies, and results. *Ann Thorac Surg, 77*, 574-580. http://dx.doi.org/10.1016/S0003-4975(03)01534-0

Godinho, A. S., Alves, A. S., Pereira, A. J., & Pereira, T. S. (2012). On-pump versus off-pump coronary-artery bypass surgery: a meta-analysis. *Arq Bras Cardiol, 98*(1), 87-94. http://dx.doi.org/10.1590/S0066-782X2012000100014

Halkos, M. E., & Puskas, J. D. (2009). Off-pump versus on-pump coronary artery bypass grafting. *Surg Clin North Am, 89*(4), 913-22. http://dx.doi.org/10.1016/j.suc.2009.06.015

Hammon, J. W., Stump, D. A., Butterworth, J. F., Moody, D. M., Rorie, K., Deal, D. D., ... Kon, N. D. (2007). Coronary artery bypass grafting with single cross-clamp results in fewer persistent neuropsychological deficits than multiple clamp or off-pump coronary artery bypass grafting. *Ann Thorac Surg, 84*(4), 1174-8. http://dx.doi.org/10.1016/j.athoracsur.2007.04.100

Hannan, E. L., Chuntao, W., Walford, G., Culliford, A. T., Gold, J. P., Smith, C. R., ... Jones, R. H. (2008). Drug Eluting Stents vs Coronary Artery Bypass Grafting in Multivessel Coronary Disease. *N Engl J Med, 358*(4), 331-341. http://dx.doi.org/10.1056/NEJMoa071804

Hannan, E. L., Wu, C., Smith, C. R., Higgins, R. S., Carlson, R. E., Culliford, A. T., ... Jones, R. H. (2007). Off-pump versus on-pump coronary artery bypass graft surgery: differences in short-term outcomes and in long-term mortality and need for subsequent revascularization. *Circulation, 116*(10), 1145-52. http://dx.doi.org/10.1161/CIRCULATIONAHA.106.675595

Hijazi, E. M. (2010). Is it time to adopt beating-heart coronary artery bypass grafting? A review of literature. *Rev Bras Cir Cardiovasc, 25*(3), 393-402. http://dx.doi.org/10.1590/S0102-76382010000300017

Hirose, H., Amano, A., & Takahashi, A. (2001). Off-pump coronary artery bypass grafting for elderly patients. *Ann Thorac Surg, 72*, 2013-2019. http://dx.doi.org/10.1016/S0003-4975(01)03147-2

Hoff, S. J., Ball, S. K., Coltharp, W. H., Glassford, D. M. Jr., Lea, J. W. IV., & Petracek, M. R. (2002). Coronary artery bypass in patients 80 years and over: is off-pump the operation of choice? *Ann Thorac Surg, 74*, S1340-S1343. http://dx.doi.org/10.1016/S0003-4975(02)03913-9

Ivanov, J., Borger, M. A., Tu, J. V., Rao, V., & David, T. E. (2008). Mid-term outcomes of off-pump versus on-pump coronary artery bypass graft surgery. *Can J Cardiol, 24*(4), 279-84. http://dx.doi.org/10.1016/S0828-282X(08)70177-6

Jones, E. L., & Weintraub, W. S. (1996). The importance of completeness of revascularization during long-term follow-up after coronary artery operations. *J Thorac Cardiovasc Surg, 112*(2), 227-37. http://dx.doi.org/10.1016/S0022-5223(96)70243-X

Knipp, S. C., Matatko, N., Wilhelm, H., Schlamann, M., Massoudy, P., Forsting, M., ... Jakob, H. (2004). Evaluation of brain injury after coronary artery bypass grafting. A prospective study using neuropsychological assessment and diffusion-weighted magnetic resonance imaging. *Eur J Cardiothorac Surg, 25*(5), 791-800. http://dx.doi.org/10.1016/j.ejcts.2004.02.012

Konstantinov, I. E. (2004). A Surgeon to Remember. *Tex Heart Inst J, 31*(4), 349-358.

Lamy, A., Devereaux, P. J., Prabhakaran, D., Hu, S., Piegas, L. S., Straka, Z., ... Yusuf, S. (2012). Rationale and design of the coronary artery bypass grafting surgery off or on pump revascularization study: a large international randomized trial in cardiac surgery. *Am Heart J., 163*(1), 1-6. http://dx.doi.org/10.1016/j.ahj.2011.10.007

Lattouf, O. M., Thourani, V. H., Kilgo, P. D., Halkos, M. E., Baio, K. T., Myung, R., ... Puskas, J. D. (2008). Influence of on-pump versus off-pump techniques and completeness of revascularization on long-term survival after coronary artery bypass. *Ann Thorac Surg, 86*(3), 797-805. http://dx.doi.org/10.1016/j.athoracsur.2008.04.065

Lee, J. D., Lee, S. J., Tsushima, W. T., Yamauchi, H., Lau, W. T., Popper, J., ... Dang, C. R. (2003). Benefits of off-pump bypass on neurologic and clinical morbidity: a prospective randomized trial. *Ann Thorac Surg, 76*, 18-26. http://dx.doi.org/10.1016/S0003-4975(03)00342-4

Légaré, J. F., & Hirsch, G. (2006). Off-pump coronary artery bypass graft surgery is standard of care: where do you stand? *Can J Cardiol, 22*(13), 1107-10. http://dx.doi.org/10.1016/S0828-282X(06)70945-X

Locker, C., Mohr, R., Paz, Y., Kramer, A., Lev-Ran, O., Pevni, D., & Shapira, I. (2003). Myocardial revascularization for acute myocardial infarction: benefits and drawbacks of avoiding cardiopulmonary bypass. *Ann Thorac Surg, 76*, 771-777. http://dx.doi.org/10.1016/S0003-4975(03)00732-X

Meharwal, Z. S., Mishra, Y. K., Kohli, V., Bapna, R., Singh, S., & Trehan, N. (2002). Off-pump multivessel coronary artery surgery in high-risk patients. *Ann Thorac Surg, 74*, S1353-S1357. http://dx.doi.org/10.1016/S0003-4975(02)03915-2

Nakano, J., Okabayashi, H., Noma, H., Sato, T., & Sakata, R. (2013). The impact of incomplete revascularization and angiographic patency on midterm results after off-pump coronary artery bypass grafting. *J Thorac Cardiovasc Surg, 147*(4), 1225-32. http://dx.doi.org/10.1016/j.jtcvs.2013.03.026

Patrick, W. S., Morice, M. C., Kappetein, A. P., Colombo, A., Holmes, D. R., Mack, M. J., ... Mohr, F. W.; SYNTAX Investigators. (2009). Percutaneous coronary intervention versus coronary artery bypass grafting for sever coronoary artery disease. *N Engl J Med, 360*(10), 961-972. http://dx.doi.org/10.1056/NEJMoa0804626

Plomondon, M. E., Cleveland, J. C. Jr., Ludwig, S. T., Grunwald, G. K., Kiefe, C. I., Grover, F. L., & Shroyer, A. L. (2001).Off-pump coronary artery bypass is associated with improved risk-adjusted outcomes. *Ann Thorac Surg, 72*(1), 114-9. http://dx.doi.org/10.1016/S0003-4975(01)02670-4

Puskas, J. D., Williams, W. H., Duke, P. G., Staples, J. R., Glas, K. E., Marshall, J. J., ... Guyton, R. A. (2003). Off-pump coronary artery bypass grafting provides complete revascularization with reduced myocardial injury, transfusion requirements, and length of stay: a prospective randomized comparison of two hundred unselected patients undergoing off-pump versus conventional coronary artery bypass grafting. *J Thorac Cardiovasc Surg, 125*, 797-808. http://dx.doi.org/10.1067/mtc.2003.324

Rihal, C., Raco, D., Gersh, B., & Yusuf, S. (2003). Indications for coronary artery bypass surgery and percutaneous coronary intervention in chronic stable angina: review of the evidence and methodological considerations. *Circulation, 108*(20), 2439-45. http://dx.doi.org/10.1161/01.CIR.0000094405.21583.7C

Robertson, M. W., Buth, K. J., Stewart, K. M., Wood, J. R., Sullivan, J. A., Hirsch, G. M., & Hancock Friesen, C. L. (2013). Complete revascularization is compromised in off-pump coronary artery bypass grafting. *J Thorac Cardiovasc Surg, 145*(4), 992-8. http://dx.doi.org/10.1016/j.jtcvs.2012.03.052

Sá, M. P., Ferraz, P. E., Escobar, R. R., Martins, W. N., Lustosa, P. C., Nunes, E. O., ... Lima, R. C. (2012). Off Pump Versus on Pump Coronar Artery Bypass Surgery, Metaanalysis and Mete Regression of 13524 Patients from Randomized Trials. *Rev Bras Cir Cardiovasc, 27*(4), 631-41. http://dx.doi.org/10.5935/1678-9741.20120106

Sabik, J. F., Gillinov, A. M., Blackstone, E. H., Vacha, C., Houghtaling, P. L., Navia, J., ... Lytle, B. W. (2002). Does off-pump coronary surgery reduce morbidity and mortality? *J Thorac Cardiovasc Surg, 124*(4), 698-707. http://dx.doi.org/10.1067/mtc.2002.121975

Sharony, R., Bizekis, C. S., Kanchuger, M., Galloway, A. C., Saunders, P. C., Applebaum, R., ... Grossi, E. A. (2003). Off-pump coronary artery bypass grafting reduces mortality and stroke in patients with atheromatous aortas: a case control study. *Circulation, 108*(suppl II), II-15-II-20. http://dx.doi.org/10.1161/01.cir.0000087448.65888.21

Sharony, R., Grossi, E. A., Saunders, P. C., Galloway, A. C., Applebaum, R., Ribakove, G. H., ... Colvin, S. B. (2004). Propensity case-matched analysis of off-pump coronary artery bypass grafting in patients with atheromatous aortic disease. *J Thorac Cardiovasc Surg, 127*, 406-413. http://dx.doi.org/10.1016/j.jtcvs.2003.08.011

Shekar, P. M. (2006). On-Pump and Off-Pump Coronary Artery Bypass Grafting. *Circulation, 113*, e51-e52. http://dx.doi.org/10.1161/CIRCULATIONAHA.105.566737

Shumacker, H. B. (1992). *The Evolution of Cardiac Surgery*. Bloomington, IN: Indiana University Press.

Strüber, M., Cremer, J. T., Gohrbandt, B., Hagl, C., Jankowski, M., Völker, B., ... Haverich, A. (1999). Human

cytokine responses to coronary artery bypass grafting with and without cardiopulmonary bypass. *Ann Thorac Surg, 68*(4), 1330-5. http://dx.doi.org/10.1016/S0003-4975(99)00729-8

Synnergren, M. J., Ekroth, R., Odén, A., Rexius, H., & Wiklund, L. (2008). Incomplete revascularization reduces survival benefit of coronary artery bypass grafting: role of off-pump surgery. *J Thorac Cardiovasc Surg, 136*(1), 29-36. http://dx.doi.org/10.1016/j.jtcvs.2007.07.059

The Bypass Angioplasty Revascularization Investigation (BARI) Investigators. (1996). Comparison of coronary bypass surgery with angioplasty in patients with multivessel disease. *N Engl J Med, 335*, 217-25. http://dx.doi.org/10.1056/NEJM199607253350401

Van, D., Jansen, E. W., Hijman, R., Nierich, A. P., Diephuis, J. C., Moons, K. G., ... Kalkman, C. J.; Octopus Study Group. (2002). Cognitive outcome after off-pump and on-pump coronary artery bypass graft surgery: a randomized trial. *JAMA, 287*(11), 1405-12. http://dx.doi.org/10.1001/jama.287.11.1405

Yusuf, S., Zucker, D., Peduzzi, P., Fisher, L. D., Takaro, T., Kennedy, J. W., ... Norris, R. (1994). Effect of coronary arterybypass graft surgery on survival: overview of 10-year resultsfromrandomised trials by the Coronary Artery Bypass Graft Surgery Trialists Collaboration. *Lancet, 344*, 563-70. http://dx.doi.org/10.1016/S0140-6736(94)91963-1

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Clinical Assessment of Dizzy Patients: The Necessity and Role of Diagnostic Tests

Mahsa Bakhit[1,2], Alireza Heidarian[3], Sara Ehsani[4], Maryam Delphi[1,2] & Seyed M. Latifi[5]

[1] Musculoskeletal Rehabilitation Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

[2] Department of Audiology, School of Rehabilitation, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

[3] Emergency Department, Apadana Hospital, Ahvaz, Iran

[4] Department of Radiology, Golestan Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

[5] Diabetic Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Correspondence: Mahsa Bakhit, Department of Audiology, Faculty of Rehabilitation, Ahvaz Jundishapur University of Medical Sciences, Khouzestan, Ahvaz, Iran. Post Code 61357-33133. Tel: 98-611-374-3101(226). Fax: 98-611-374-3506. E-mail: bakhit-m@ajums.ac.ir

Received: December 17, 2013 Accepted: January 15, 2014 Online Published: March 24, 2014

doi:10.5539/gjhs.v6n3p194 URL: http://dx.doi.org/10.5539/gjhs.v6n3p194

Abstract

Over administration of diagnostic tests in health care settings is a critical issue, imposing a great deal of expenditure on health sector. Vertigo and dizziness are common complaints of many patients who seek medical advice, and the vast majority of them undergo several evaluations, including Brain Magnetic Resonance Imaging (MRI), Laboratory tests, Pure Tone Audiometry (PTA), and Electrocardiography (ECG). The aim of this study was to investigate the performing rate of these diagnostic tests, and to evaluate their necessity and medical indications. This study was conducted on 270 dizzy patients referred to Apadana Dizziness and Vertigo Clinic, Ahvaz, Iran, from July 2008 to February 2013. Of these, 71.9% were diagnosed with peripheral lesions while laboratory assessment (58.1%) and brain MRI (38.1%) were the most requested tests. Age was an important factor, affecting the frequency of performing the ECG and Brain MRI. Medications were still administered widely even to those who seemed to respond well enough to vestibular rehabilitation. These findings revealed that many unnecessary and time-consuming diagnostic tests were performed, which had minor contribution to the final diagnosis and treatment of the patients. Therefore, a modification in the assessment methods of the dizzy patients with emphasis on history and clinical presentation seems essential.

Keywords: vertigo, dizziness, electrocardiography, magnetic resonance imaging, videonystagmography

1. Introduction

Dizziness is a rather vague and unspecified term used by patients to describe the sense of unawareness of the surroundings (Froehling, Silverstein, Mohr, & Beatty, 1994; Katsarkas, 2008), which is divided into three categories: Vertigo, Disequilibrium, and Syncope. Patients developing vertigo usually have a sense of forward-backward movement and rotation (Baloh, 1998b; Saccomano, 2012). On the other hand, disequilibrium is the patient's inability to keep balance of the torso and is not necessarily accompanied by the sense of movement (Cohen, 1991). As for syncope, loss of consciousness, tonic-clonic movements, and a history of death in any family members before the age of 30 differentiate it from vertigo and disequilibrium (Saccomano, 2012). Peripheral lesions and psychiatric problems account for more than 70% of the causes of dizziness (Kroenke, Hoffman, & Einstadter, 2000), and laboratory tests such as evaluation of lipid profile and brain computerized tomographic scan have been found unjustifiable (Polensek & Tusa, 2009; Torres-Castro, Hendauss-Waked, Baena-Rivero, & Granados-Gomez, 2011). Furthermore, most cases of dizziness can be easily differentiated by a thorough history taking and physical examination (Saccomano, 2012). However, dizzy patients are usually visited by different specialists and undergo a variety of rather expensive evaluations in order to find a solution to their problem. This research tries to investigate the different types of medical evaluations usually applied for the dizzy patients, and to evaluate the request rate, necessity and medical indications for these diagnostic tests.

2. Materials and Methods

This study was conducted on the medical records and clinical findings of the 270 dizzy patients referred to Apadana Dizziness and Vertigo Clinic, Ahvaz, Iran from July 2008 to February 2013. Initially, the basic assessments including taking a history and otoscopic examination were conducted for all the patients. In the History form, there was a section allotted to the evaluations previously performed for the patient, including Laboratory assessments, Brain Magnetic Resonance Imaging (MRI), Electrocardiography (ECG), and Pure Tone Audiometry (PTA). Patients were asked if any anti-vertigo medication had been administered to them, and what specialist had referred them to the clinic. Video Nystagmography (VNG) test was conducted for each patient, using Video Nystagmography Chartr system manufactured by ICS Corporation, the United States of America and Hortmann GN-Otometrics Airmattic II made by Otometrics Corporation, Denmark for cold and warm air stimulation in the Bitheraml Calorics test. Oculomotor tests (Random Saccade, Sinusoidal Smooth Pursuit, Gaze and Spontaneous Nystagmus), Positioning (Dix-Hallpike maneuver), Positional and Bithermal Caloric tests (24°C and 50°C for cold and warm air stimulation respectively) were also performed. Based on the history, physical examination performed by our otolaryngologists, and VNG test results, the final diagnoses were defined and categorized in five groups: Benign Paroxysmal Positional Vertigo (BPPV), Ménière's Disease (MD), Central Nervous System (CNS) Lesions, Other Peripheral Lesions, and Inconclusive results. The diagnostic criteria for these pathologies were as following:

2.1 Diagnostic Criteria

2.1.1 BPPV

A history of at least 3 attacks of rotational vertigo lasting for less than a minute, provoked by head position changes or rolling in bed, fatigable nystagmus with vertigo in Dix-Hallpike maneuver, and the absence of any signs and symptoms of a central lesion (Polensek & Tusa, 2009).

2.1.2 Ménière's Disease

Fluctuating hearing loss, a history of episodic rotational vertigo lasting for minutes associated with nausea and vomiting, aural fullness, perspiration, tinnitus, the absence of head trauma, and the elevated SP/AP index in the Electrocochleography (EcochG) test (SP/AP > 0.5) (Devaiah, Dawson, Ferraro, & Ator, 2003).

2.1.3 Central Lesions

The patient's inability of standing without support, direction changing nystagmus in a fixed position, persistent spontaneous nystagmus, and pure horizontal, torsional or vertical spontaneous nystagmus with changes in direction as the gaze changes. Other neurological signs such as facial numbness, lack of coordination, and suspicious findings in oculomotor tests (Baloh, 1998a, 1998b).

2.1.4 Other Peripheral Lesions

Unilateral/Bilateral Caloric Weakness or Directional Preponderance, severe nausea and vomiting, normal oculomotor results and lack of any neurologic symptoms such as numbness and direction changing nystagmus (Baloh, 1998b).

2.1.5 Inconclusive results: Normal Findings in all the Tests without any Neurological Symptoms

The results were statistically assessed with SPSS software version19, and the Chi-Square test and independent T-Test was performed to analyze them.

3. Results

Two hundred and seventy patients were evaluated in our clinic of which 58.4% were female, and 45.20 % were male. Mean age was at 49.48±12.16, with the minimum and maximum being 21 and 86 years respectively. The patients were divided into 3 subgroups based on their age: 21 to 40, 41 to 60, and 61 to 86 years old. 54.10 % of the patients were 41 to 60 year old, and the age category of 61 to 86 year olds had the least population (19.60%). Most patients were referred to the clinic by the ENT specialists (121 patients – 44.80%) and Emergency Department (ED) practitioners (94 patients – 34.80%). Neurologists, Cardiologists, and other specialists referred 13% (35 patients), 1.9% (5 patients), and 5.6% (15 patients) respectively.

Among the diagnostic modalities, laboratory tests had the highest rate of request by physicians, performed in 58% of all the patients in which 84% had the normal results while the ECG was ordered in only 14.1%. Medications including Betahistine hydrochloride and Dimenhydrinate were administered to 83.7% of the patients. The Brain MRI and PTA were requested in 103(38.14%) and 57(21.11%) patients respectively. 77 patients (28.5%) suffered from BPPV, whereas 28(10.40%) were finally diagnosed with Ménière's disease. 44

patients (16.3%) diagnosed with CNS lesions were referred to neurologists, and 89 patients (33%) had other peripheral lesions. Furthermore, in 32 patients (11.85%), the results were inconclusive. Tables 1 and Table 2 show the diagnostic findings of all the patients.

Table 1. Distribution of the specialities who referred the patients by different pathologies

	BPPV n=77(28.5%)	**Ménière's n=28(10.4%)**	**Other Peripheral n=89(33%)**	**CNS n=44(16.3%)**	**Inconclusive n=32(11.85%)**
ENT	33(42.9%)	15(53.6%)	41(46.1%)	18(40.9%)	14(43.8%)
ED	31(40.3%)	8(28.6%)	29(32.6%)	16(36.4%)	10(31.3%)
Neuro.	8(10.4%)	2(7.1%)	16(18%)	5(11.4%)	4(12.5%)
Cardio.	2(2.6%)	0(0.0%)	1(1.1%)	1(2.3%)	1(3.1%)
Other	3(3.9%)	3(10.7%)	2(2.2%)	4(9.1%)	3(9.4%)
Total	77(100%)	28(100%)	89(100%)	44(100%)	32(100%)

Table 2. Distribution of diagnostic tests in different pathologies

	MRI n=103(%)	**PTA n=57(%)**	**ECG (%) n=38**	**Laboratory Tests n=157(%)**	**Medication n=226(%)**
BPPV	27(26.21)	18(31.35)	11(28.94)	41(26.11)	61(26.99)
Ménière	12(11.65)	3(5.26)	7(18.42)	17(10.82)	23(10.17)
CNS	22(21.35)	9(15.78)	4(10.52)	21(13.37)	41(18.14)
Other Peripheral	28(27.18)	20(35.08)	12(31.57)	58(36.94)	75(33.18)
Inconclusive	14(13.59)	7(12.28)	4(10.52)	20(12.73)	26(11.50)
Total	103(100)	57(100)	38(100)	157(100)	226(100)

Pearson Chi-Square test revealed that the frequency of the performing Brain MRI and ECG, was significantly higher in the age group of 61 to 86 year olds than the other two age groups ($p<0.001$), but this was not the case in Pure Tone Audiometry (Table 3). On the other hand, the independent T-Test indicated that there was no relation between the final diagnosis and sex, the sex and the number of requested tests, and different age groups and the final diagnosis ($p>0.05$).

Table 3. Comparison of request rate for brain MRI, PTA, and ECG in different age groups

Age	**MRI**	**PTA**	**ECG**	**Total**
21-40	23(32.39%)	16(22.22%)	4(5.55%)	71(100%)
41-60	48(32.87%)	34(23.28%)	7(4.79%)	146(100%)
61-86	32(60.37%)*	7(13.20%)	27(50.94%)*	53(100%)
Total	103(100%)	57(100%)	38(100%)	

* p value< 0.05.

4. Discussion

The findings showed that 71.90% of our cases suffered from peripheral lesions, 11.85% were inconclusive, and in 16.30%, there were evidence of central lesions. These findings were similar to those of Kroenke and colleagues (2000). Laboratory tests, Brain MRI, PTA, and ECG were commonly ordered by physicians prior to our evaluation at the Vertigo and Dizziness clinic. Polensek and Tusa (2009) also found that these tests along with Brain CT-Scan and MRI with angiography (MRA) were requested frequently for their BPPV patients.

Like another survey (Vannucchi, Pecci, & Giannoni, 2012), 28.5% of our patients were diagnosed with BPPV of

which 35.1% had an MRI imaging done, but it has been proved that it is of no diagnostic value in BPPV (Polensek & Tusa, 2009). Regarding the central lesions resembling BPPV, a proper differentiation can be reached by focusing on the symptoms and signs of these lesions. Unconventional nystagmus in Dix-Hallpike, resistance to the usual rehabilitation, hearing loss, tinnitus and spontaneous nystagmus are some of these symptoms, which are not usually seen in BPPV (Herdman, Blatt, & Schubert, 2000). Dix-Hallpike is a simple diagnostic maneuver introduced in 1952, and is one of the most effective methods to diagnose BPPV, yet it is not usually practiced by most physicians. Vestibular rehabilitation, on the other hand, is the best treatment for BPPV (Fujino et al., 1994; Vaz Garcia, 2005), yet anti-vertigo medications including Dimenhydrinate, Betahistine hydrochloride and Diazepam (Valium) were administered to the 79.2% of our BPPV patients as their first choice of treatment.

Brain MRI was applied for 38.1% of our patients, and in 65% of them, the results was normal. Literatures show that peripheral and psychiatric etiologies, account for more than 70% of all vertigo cases. Vertigo and disequilibrium are rare signs of skull base neoplasms, and in most cases, these neoplasms are accompanied by other neurological signs and symptoms, including facial numbness, headaches and diplopia (Herdman et al., 2000; Marzo & Leonetti, 2000). Literatures urge physicians to order a Brain MRI more in the patients presenting with sustained vertigo for at least 6 months (Marzo & Leonetti, 2000). An effective bed-side method to differentiate peripheral and central lesions is Head Thrust Test (HTT), which is fast to perform, and requires no special equipment. Patient's head is quickly turned to one side and then to the other side in about 10º. The observation of corrective saccades in this test reveals a deficiency in Vestibulo-Ocular Reflex (VOR), which is a sign of peripheral lesions. The Central pathologies on the other hand, leave the VOR intact, and no corrective (catch-up) saccades will be observed (Baloh, 2004). By using this method it is possible to come to a general decision about whether to perform a Brain MRI or not.

PTA was performed in 21.1% of the patients. The presence of hearing loss in purulent labyrinthitis and perilymphatic fistula plays a critical role in differentiating these two lesions from vestibular neuritis (Lee, 2012). Moreover, hearing loss along with tinnitus are some of the main features of Ménière's disease (Perez-Fernandez, Montes-Jovellar, Cervera-Paz, & Domenech-Vadillo, 2010). Considering the high incidence of peripheral vestibular lesions (Kroenke et al., 2000), performing PTA in the only 21.1% of the patients seems like negligence in the diagnostic process of the giddy patients.

Despite the fact that the laboratory tests were the most commonly ordered investigation, 84% of the results were unremarkable. Most research show that metabolic disorders such as diabetes mellitus and high blood pressure affect the patients suffering from vertigo, hearing loss and tinnitus; however, dizziness is rarely seen in hyperlipoproteinemia or other lipid metabolism disorders (Kazmierczak & Doroszewska, 2001). Similar to our findings, a retrospective study of the medical records of 201 vertigo patients unveiled that metabolic evaluations including lipid profile had been performed in 76% of patients in which 80% of them had normal results (Torres-Castro et al., 2011). In an investigation of 2,332 patients with progressive hearing loss, tinnitus and vertigo, hyperlipoproteinemia was found in the only 5.1% of the patients and that most of them had already been diagnosed with other metabolic disorders including diabetes (Pulec, Pulec, & Mendoza, 1997).

ECG and Brain MRI were performed significantly more in the age group of 61-84 year olds ($p<0.001$). In elderlies, myocardial infarctions are often presented with unconventional symptoms such as headaches, vertigo, malaise and tinnitus. Vertigo is more common in frontal myocardial infarctions (Culic, Miric, & Eterovic, 2001), and symptoms of Lateral Medullary, Lateral Pontine and Inferior Cerebellar Infarctions are similar to Acute Peripheral Vestibular Lesions, such as vestibular neuritis and labyrinthitis (Delaney, 2003). In contrast, the risk of vascular disorders in the elder patients is higher than the others (Baloh, 2004).

5. Conclusion

The findings of this research more and more reveal that currently, the health care settings and medical staffs have a significant tendency towards administration of diagnostic tools, even when there is no scientific basis for them. The prevalence of peripheral vertigo is considerably higher than centrally-evoked vertigo; therefore, strong indications should exist to implement most of the diagnostic tests such as Brain MRI and CT-Scans. In fact, performing these evaluations should be preserved for those whose symptoms point to a central lesion, or their history calls for further investigation at the level of the brain. However, when it comes to the geriatrics, even in the absence of central signs, performing a Brain MRI and ECG is required to rule out infarctions. Regarding the laboratory assessments, these tests are of limited value, and do not contribute significantly in diagnosing the nature of vertigo.

The proper diagnosis of the underlying cause of vertigo is the key to successful treatment and effective rehabilitative programs. Through investing more time familiarizing ourselves with symptoms, signs and

scientific facts around various pathologies, and by taking a comprehensive history and bed-side physical examinations prior to administration of sophisticated tests, we can contribute to a better approach to diagnosis and treatment of the dizzy patients, and reduce the number of unnecessary evaluations. On balance, to avoid waste of time, money, resources, and to reach a more precise diagnosis, a modification in the approach to assessment of the dizzy patients seems so imperative.

Acknowledgement

The authors truly appreciate medical consultations and supports of Nader Saaki (MD) and Arash Bayat (PhD).

References

Baloh, R. W. (1998a). Differentiating between peripheral and central causes of vertigo. *Otolaryngol Head Neck Surg, 119*(1), 55-59. http://dx.doi.org/10.1016/S0194-5998(98)70173-1

Baloh, R. W. (1998b). Vertigo. *Lancet, 352*(9143), 1841-1846. http://dx.doi.org/10.1016/S0140-6736(98)05430-0

Baloh, R. W. (2004). Differentiating between peripheral and central causes of vertigo. *J Neurol Sci, 221*(1-2), 3. http://dx.doi.org/10.1016/j.jns.2004.03.021

Cohen, N. L. (1991). The dizzy patient. Update on vestibular disorders. *Med Clin North Am, 75*(6), 1251-1260 .

Culic, V., Miric, D., & Eterovic, D. (2001). Correlation between symptomatology and site of acute myocardial infarction. *Int J Cardiol, 77*(2-3), 163-168. http://dx.doi.org/10.1016/S0167-5273(00)00414-9

Delaney, K. A. (2003). Bedside diagnosis of vertigo: value of the history and neurological examination. *Acad Emerg Med, 10*(12), 1388-1395. http://dx.doi.org/10.1111/j.1553-2712.2003.tb00015.x

Devaiah, A. K., Dawson, K. L., Ferraro, J. A., & Ator, G. A. (2003). Utility of area curve ratio electrocochleography in early Meniere disease. *Arch Otolaryngol Head Neck Surg, 129*(5), 547-551. http://dx.doi.org/10.1001/archotol.129.5.547

Dix, M. R., & Hallpike, C. S. (1952). The pathology symptomatology and diagnosis of certain common disorders of the vestibular system. *Proc R Soc Med, 45*(6), 341-354 .

Froehling, D. A., Silverstein, M. D., Mohr, D. N., & Beatty, C. W. (1994). The rational clinical examination. Does this dizzy patient have a serious form of vertigo? *JAMA, 271*(5), 385-388. http://dx.doi.org/10.1001/jama.1994.03510290067039

Fujino, A., Tokumasu, K., Yosio, S., Naganuma, H., Yoneda, S., & Nakamura, K. (1994). Vestibular training for benign paroxysmal positional vertigo. Its efficacy in comparison with antivertigo drugs. *Arch Otolaryngol Head Neck Surg, 120*(5), 497-504. http://dx.doi.org/10.1001/archotol.1994.01880290013003

Herdman, S. J., Blatt, P. J., & Schubert, M. C. (2000). Vestibular rehabilitation of patients with vestibular hypofunction or with benign paroxysmal positional vertigo. *Curr Opin Neurol, 13*(1), 39-43. http://dx.doi.org/10.1097/00019052-200002000-00008

Katsarkas, A. (2008). Dizziness in aging: the clinical experience. *Geriatrics, 63*(11), 18-20.

Kazmierczak, H., & Doroszewska, G. (2001). Metabolic disorders in vertigo, tinnitus, and hearing loss. *Int Tinnitus J, 7*(1), 54-58 .

Kroenke, K., Hoffman, R. M., & Einstadter, D. (2000). How common are various causes of dizziness? A critical review. *South Med J, 93*(2), 160-167.

Lee, A. T. (2012). Diagnosing the cause of vertigo: a practical approach. *Hong Kong Med J, 18*(4), 327-332 .

Marzo, S. J., & Leonetti, J. P. (2000). The importance of magnetic resonance imaging in the evaluation of vertigo and imbalance. *Skull Base Surg, 10*(4), 171-172. http://dx.doi.org/10.1055/s-2000-9334

Perez-Fernandez, N., Montes-Jovellar, L., Cervera-Paz, J., & Domenech-Vadillo, E. (2010). Auditory and vestibular assessment of patients with Meniere's disease who suffer Tumarkin attacks. *Audiol Neurootol, 15*(6), 399-406. http://dx.doi.org/10.1159/000310899

Polensek, S., & Tusa, R. (2009). Unnecessary diagnostic tests often obtained for benign paroxysmal positional vertigo. *Med Sci Monit, 15*(7), 89-94.

Pulec, J. L., Pulec, M. B., & Mendoza, I. (1997). Progressive sensorineural hearing loss, subjective tinnitus and vertigo caused by elevated blood lipids. *Ear Nose Throat J, 76*(10), 716-728.

Saccomano, S. J. (2012). Dizziness, vertigo, and presyncope:What's the difference? *The Nurse Practitioner, 37*(12), 46-52. http://dx.doi.org/10.1097/01.NPR.0000422206.92550.5b

Torres-Castro, I., Hendauss-Waked, H., Baena-Rivero, A., & Granados-Gomez, C. E. (2011). Lipid profile frequency and relevancy as an initial test for peripheral vertigo. *Rev Salud Publica (Bogota), 13*(5), 796-803. http://dx.doi.org/10.1590/S0124-00642011000500008

Vannucchi, P., Pecci, R., & Giannoni, B. (2012). Posterior semicircular canal benign paroxysmal positional vertigo presenting with torsional downbeating nystagmus: an apogeotropic variant. *Int J Otolaryngol, 2012*, 413603. http://dx.doi.org/10.1155/2012/413603

Vaz Garcia, F. (2005). Treatment failures in benign paroxysmal positional vertigo. Role of vestibular rehabilitation. *Rev Laryngol Otol Rhinol (Bord), 126*(4), 271-274.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Uterine Contractions' Pattern in Active Phase of Labor as a Predictor of Failure to Progress

Tahereh Galini Moghaddam[1], Nargess Moslemizadeh[1], Zahra Seifollahpour[1], Zohreh Shahhosseini[1] & Mahmonir Danesh[1]

[1] Mazandaran University of Medical Sciences, Sari, Iran

Correspondence: Mahmonir Danesh, Amir Mazandarani Road, Vesal Street, Sari, Iran. Tel: 98-151-226-7342. E-mail: mahmonir@danesh.org

Received: November 26, 2013 Accepted: January 24, 2014 Online Published: March 24, 2014

doi:10.5539/gjhs.v6n3p200 URL: http://dx.doi.org/10.5539/gjhs.v6n3p200

Abstract

Background: Failure to progress remains a key indication for cesarean section which caused by different factors including uterine contractions. If it is diagnosed in the primary phase of labor, a better prognosis can thus be made. The purpose of this study was to find a possible correlation between pattern of uterine contraction and progression of labor.

Method: During this study, 120 women referred for delivery to an educational hospital's maternity ward in the North of Iran in 2010 were included. Uterine contractions of mothers were recorded in dilatation of 4 to7 cm for an hour. In this way, F/R ratio which means the time that a contraction needs to return from its peak to baseline (Fall) divided to the time for a contraction to rise to its peak (Rise) was calculated. All of the participants were followed until delivery, vaginal delivery or caesarean section.

Results: Mean and standard deviation of fall to raise ratio was 1.54 ± 0.26 in mothers with vaginal delivery versus 1.74 ± 0.21 for others underwent caesarean section (OR = 0.44, 95% CI: 0.005- 0.42, P < 0.001). Sensitivity, specificity, and predictive values (positive and negative) of mentioned ratio were 68.32%, 70.01%, 69.55%, and 68.91%, respectively.

Conclusion: By considering acceptable predictive value of uterine contractions' pattern in the active phase of labor, it could help to timely diagnosis of failure to progress and consequently suitable intervention which probably maintain better health of both mother and fetus.

Keywords: failure to progress, uterine contraction, fall / rise ratio

1. Introduction

Failure to progress is the most important indication for cesarean section and represents 25% of all emergency cesarean sections in primigravida women (Danforth & Gibbs, 2008; Kumari & Thomas, 2012). This problem is developed when a large size of fetal head or unsuitable position between the fetus' head and mother's pelvis diameter as well as mismatch between two these components exists, which is named cephalo-pelvic disproportion (CPD) in the field of obstetrics (Gao et al., 2013; Kovavisarach & Buddeewong, 2012). CPD inhibits progress of labor which in turn increases the chance of maternal and fetal complications (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2011; Jongen, Halfwerk, & Brouwer, 1998). Some of these complications include: the risk of chorioamnionitis, birth trauma, postpartum hemorrhage and infection as well, which in the cases of forceps or vacuum delivery, these complications could be increase. On the other hand, fetal complications due to CPD include fetal distress, bleeding and increased intracranial cerebral palsy and an increasing in fetal death rates (Chen, Uryasev, & Young, 2004; Shields, Ratcliffe, Fontaine, & Leeman, 2007; Tsvieli, Sergienko, & Sheiner, 2012).

Many studies have been conducted to predict CPD at first stages of labor (Benjamin, Daniel, Kamath, & Ramkumar, 2012; Harper, Odibo, Stamilio, & Macones, 2013; Liselele, Boulvain, Tshibangu, & Meuris, 2000; Macones et al., 2013). The aim of these diagnostic procedures is to evaluate the capacity of mothers' pelvic in accordance to estimated fetal weight which was determined by ultrasound. Besides, some formulates are used to anticipate CPD based on the ratio of fetal size to mothers' pelvic diameter. Due to poor predictive value of these methods, they are less applicable (Ferguson II et al., 1998; Spörri et al., 2002). It's meanwhile, in a successful

vaginal delivery, there are three factors including: position and size of the fetus (as passenger), maternal pelvic dimensions (as passage) and uterine contractions (as power) (Cunningham, 2009). Studies performed on diagnosis of CPD have so far focused on the two first factors whereas the third factor, uterine contractions, is given less attention.

Over all, two types of uterine contraction disorders such as hypotonic and hypertonic contractions exist. In the hypotonic disorder regardless hypertonic uterine dysfunction, in the active phase of labor (dilatation > 4 cm), the base tonicity of uterus is not increased. In addition in the cases of hypertonic contractions, due to lack of harmony in the impulses which root from one or both cornea and because the contractions of the middle segment of the uterus are more powerful from fundal contractions' force, effective contractions during labor are absent (Cunningham, 2009; Shields et al., 2007; Savitsky et al., 2013).

Pattern of uterine contractions can be evaluated using external monitoring as well as internal. With the start of contractions and increase of intrauterine pressure, the height of the contraction curve increases and decreases following reduced intrauterine pressure (Gonçalves, Pinto, Ayres-de-Campos, & Bernardes, 2014). One landmark for evaluating quality of a contraction is F/R ratio which means the time that a contraction needs to return from its peak to baseline (Fall) divided to the time for a contraction to rise to its peak (Rise). In the case of a CPD, the interval between contractions increases and the height of the contraction curve is reduced, a warning sign for re-evaluating the patient.

Efforts in determining the factors that could anticipate CPD before failure to progress in labor and consequential complications has led many researchers to study the pattern of uterine contractions during delivery. The aim of this study was to determine the predictive value of uterine contractions in the active phase of labor to provide suitable criteria for a precise prediction of failure to progress.

2. Methods

This diagnostic study was done in 2010 on 120 women referred for delivery to an educational hospital's maternity ward in Mazandaran province, in the North of Iran. Inclusion criteria were: null parity, singleton pregnancy, normal cephalic presentation, lack of inherited defaults in the fetus, non-use of magnesium sulfate, absence of macrosomia and normal diameters of mother's pelvis. Pelvic examination for all of the mothers were done and if diagonal conjugate was equal or greater than 11.5 cm, the lateral pelvic walls was converging and the pubic angle arc was equal or more than 90°, the pelvic diameters were considered favorable. Excluding criteria were mothers who underwent cesarean delivery due to other indications, except failure to progress and CPD.

In the next step, uterine contractions of volunteers' pregnant women in the maximum slope of active phase of labor and dilatation of 4 to 7 cm were monitored continuously an hour by a Chinese external monitoring machine, named BISTUS. During this period the pattern of uterine contractions were recorded and F/R ratio was calculated in each contraction. For all of the participants, progress of labor was monitored using Friedman graph. When drawing curves fell below the alert line, the mothers' contractions were assessed and if contractions were inadequate, oxytocin infusion was established and if the registered curve was under the action line, a cesarean section was performed. Otherwise, mothers monitored until vaginal delivery except when other obstetrical indications of caesarean delivery were presented. Data gathering were continued until 120 mothers were included in either vaginal delivery group (60 cases) or caesarean delivery group (60 cases). This sample size was considered in attention to confidence level of 95 % and power of 90% for this study.

For eligible participants a check list of demographic and obstetrical characteristics was completed included age, pre-pregnancy body mass index, gestational age, results of pelvic diameters, use of oxytocin, cervical dilatation and effacement, fetal station and fetal membranes.

The collected data were coded and analyzed using the Statistical Package for Social Sciences for Windows version 16.0 (SPSS Inc., Chicago, IL, USA). Means and standard deviations were computed and reported. Also t-test, Chi square, Pearson correlation coefficients and Logistic Regression were used to analytical analysis. Finally to determine the diagnostic value of F/R ratio, the area under the receiver operating curve was used. In this regard, P value < 0.05 was considered statistically significant.

This study was approved by ethical committee of Research Vice Chancellors of Mazandaran University of Medical Sciences. All of the participants were informed of the purpose and design of the study as well as confidentiality of gathered data. They have right to withdraw the study at any time and they provided written informed consent before the beginning of study. Also, permission for data collection was obtained from the Area University Chief Executive Officers.

3. Results

The findings showed the mean of participants' age in vaginal delivery group were 23.02 ± 3.22 vs. 25.23±4.48 in the cesarean delivery group (p= 0.002). Some of the demographic and obstetrical characteristics of participants have shown in Table 1. Also it's found that the results of pelvic examination in both vaginal and cesarean delivery groups were different not significantly (Table 2).

Table 1. Demographic and obstetric characteristics of participants in vaginal and cesarean delivery groups

		Vaginal delivery group (n=60)	cesarean delivery group (n=60)	P value
Maternal age (Years)*		23.02 ± 3.22	25.23 ± 4.48	0.002
Gestational age (Weeks)*		38.97 ± 0.98	39.58 ± 1.11	0.002
BMI before pregnancy (Kg/m^2)*		26.88 ± 2.71	27.54 ± 1.99	0.132
Fetal weight(gr)*		3259.49 ± 322.97	3447.83 ± 789.21	0.002
Cervical dilatation(Cm)*		5.15 ± 1.05	4.93 ± 0.95	0.240
Cervical effacement(Percent)*		61.17 ± 9.58	58.17 ± 8.73	0.761
Station**	-3	21(35.00)	35(58.32)	
	-2	24(40.00)	20(33.33)	
	-1	13(21.67)	5(8.35)	0.024
	0	2(3.33)	0(0)	
Fetal membrane**	Intact	29(48.33)	39(65.00)	
	Ruptured	31(51.67)	21(35.00)	0.048
Apgar score**	<7	1(1.66)	0(0)	
	>7	59(98.34)	100(100)	0.315
Infusion of Oxytocin**	Yes	30(50)	36(60)	
	No	30(50)	24(40)	0.179

*Mean± SD; **Number (Percent).

Table 2. Characteristics of participants in vaginal and cesarean delivery groups based on pelvic examination

		Vaginal delivery group (n=60)	cesarean delivery group (n=60)	P value
Inlet pelvis*	Favorable	60(100)	60(100)	1.00
	Unfavorable	0(0)	0(0)	
Mid pelvis*	Favorable	58(96.66)	55(91.66)	0.219
	Unfavorable	2(3.34)	5(8.34)	
Outlet pelvis*	Favorable	60(100)	58(96.66)	0.248
	Unfavorable	0(0)	2(3.34)	

*Number (Percent).

To the base of this study, the average of F/ R ratio in the vaginal delivery group was 1.54 ± 0.26 compared to cesarean delivery group 1.74 ± 0.21 ($P < 0.001$). Logistic regression has showed a statistically significant relationship between F/ R ratio and failure to progress (OR = 0.44, 95% CI: 0.005- 0.42, $P < 0.001$). Also Pearson correlation coefficient has found relationship between F/ R ratio and maternal age ($r = 0.188$, $P < 0.001$), gestational age ($r = 0.193$, $P < 0.001$), fetal weight ($r = 0.352$, $P < 0.001$).

Another finding toward predictive value of F/ R ratio in failure to progress showed the sensitivity and specifity of test were 68.32% and 70.01% respectively. In this regard, the positive and negative predictive value was 69.55% and 68.91% accordingly. The area under the receiver operating characteristics curve was 0.747 with a cut-off point of 1.68.

4. Discussion

This study has shown that there is a relationship between the F/R ratio and cesarean delivery due to failure to progress. Higher average of F / R ratio in the cesarean delivery group compared to vaginal delivery group (1.74 vs 1.54) is in accordance with some studies which have shown if the F / R ratio is greater than 1.68, the number of cesarean sections due to failure to progress increases (Althaus et al., 2006).

Findings of this study in line with other studies have proved that increasing gestational age is associated with failure to progress of labor (Althaus et al., 2006; Khunpradit, Patumanond, & Tawichasri, 2005). Although in a study conducted by Oppenheimer, no relationship has been found between two these factors (Oppenheimer et al., 2002). It seems by increasing gestational age and subsequently fetal weight gain, the increased obstetric interventions lead to a higher probability of cesarean sections due to failure to progress (Chen et al., 2004; Cunningham, 2009). The finding of this study toward a significant relationship between maternal age and failure to progress like other studies (Althaus et al., 2006; Bayrampour & Heaman, 2010) may root in this issue that some uterine anomalies like uterine fibroma and cervical fibrosis increase with maternal age which in turn causes irregularity of uterine contractions and resulted in failure to progress (Cunningham, 2009). Despite these findings in some studies no association was found between maternal age and failure to progress (Chen et al., 2004; Khunpradit et al., 2005). In this study, in accordance of some studies there was a relationship between fetal weight and failure to progress (Althaus et al., 2006; Oppenheimer et al., 2002). It's speculated fetal head circumference increases with fetal weight gain and then cephalo-pelvic disproportion increases, particularly in cases where the mother's pelvis is relatively narrow (Chen et al., 2004). This study has proven that, when recording the contractions, the higher the fetal station, the higher the probability of lack of failure to progress. It seems if the fetal head is not engaged during the active phase of labor, failure to progress in labor will associate with primigravid women (Gilboa et al., 2013).

In conclusion this study showed that CPD influences uterine contractions and will causes longer contraction settling times. What factors are causing these changes in uterine contractions is still unknown that can be investigated in future studies. It's noticeable an issue that is important in the progression of delivery process, in addition to the duration, number and pattern of the uterine contraction, is the intensity of the contraction, which is a major factor that should be noted when evaluating uterine contractions. Thus by considering acceptable predictive value of uterine contractions' pattern in the active phase of labor, it could help to timely diagnosis of failure to progress and consequently suitable intervention which probably maintain better health of both mother and fetus. Finally, the results of this study have implications for policy and practice. This study emphasizes the importance of a health care providers' preparation to manage a pregnant mother from the moment she arrives in labor room until delivery. In this way, if the providers are able to understand the risky signs of an abnormal labor and established timely interventions, the safe motherhood is anticipated.

From limitation of this study were limited facilities for internal monitoring in Iran. Such that only the curve of the uterine contraction was used in this study and the intrauterine pressure was not measured in order to further evaluation of the quality of the uterine contractions. As studies performed on the pattern of uterine contractions are very limited, if there are more possibilities and better equipment in future studies, it's anticipated more relationships could be found.

Conflict of Interest

The authors declare that no conflict of interest exists.

Authors' Contributions

TGM, NM, MD, ZSh contributed to development of ideas and design of the study, analyzed the data. ZS assisted with the planning of the study, analysis and interpretation and wrote the first draft of the manuscript, which has been commented on by the other author. All authors read and approved the final manuscript.

Acknowledgement and Funding

This article was a part of thesis in MD degree in Obstetrics and Gynecology. Authors thank all the mothers who participated in this study. This study was sponsored by Mazandaran University of Medical Sciences (Grant Number: 89-1103).

References

Althaus, J. E., Petersen, S., Driggers, R., Cootauco, A., Bienstock, J. L., & Blakemore, K. J. (2006). Cephalopelvic disproportion is associated with an altered uterine contraction shape in the active phase of labor. *American journal of obstetrics and gynecology, 195*(3), 739-742.

http://dx.doi.org/10.1016/j.ajog.2006.05.053

Bayrampour, H., & Heaman, M. (2010). Advanced maternal age and the risk of cesarean birth: a systematic review. *Birth, 37*(3), 219-226. http://dx.doi.org/10.1111/j.1523-536X.2010.00409.x

Benjamin, S. J., Daniel, A. B., Kamath, A., & Ramkumar, V. (2012). Anthropometric measurements as predictors of cephalopelvic disproportion. *Acta Obstetricia et Gynecologica Scandinavica, 91*(1), 122-127. http://dx.doi.org/10.1111/j.1600-0412.2011.01267.x

Chen, G., Uryasev, S., & Young, T. K. (2004). On prediction of the cesarean delivery risk in a large private practice. *American journal of obstetrics and gynecology, 191*(2), 616-623. http://dx.doi.org/10.1016/j.ajog.2004.07.004

Cunningham, F. G. (2009). *Williams obstetrics* (Vol. 21). New York: McGraw-Hill Professional.

Danforth, D. N., & Gibbs, R. S. (2008). *Danforth's obstetrics and gynecology*: Wolters Kluwer Health.

Ferguson II, J., Newberry, Y. G., DeAngelis, G. A., Finnerty, J. J., Agarwal, S., & Turkheimer, E. (1998). The fetal-pelvic index has minimal utility in predicting fetal-pelvic disproportion. *American journal of obstetrics and gynecology, 179*(5), 1186-1192.

Gao, Y., Xue, Q., Chen, G., Stone, P., Zhao, M., & Chen, Q. (2013). An analysis of the indications for cesarean section in a teaching hospital in China. *European Journal of Obstetrics & Gynecology and Reproductive Biology, 170*(2), 414-418. http://dx.doi.org/10.1016/S0002-9378(98)70129-2

Gilboa, Y., Kivilevitch, Z., Spira, M., Kedem, A., Katorza, E., Moran, O., & Achiron, R. (2013). Head progression distance in prolonged second stage of labor: relationship with mode of delivery and fetal head station. *Ultrasound in Obstetrics & Gynecology, 41*(4), 436-441. http://dx.doi.org/10.1002/uog.12378

Gonçalves, H., Pinto, P., Ayres-de-Campos, D., & Bernardes, J. (2014). External Uterine Contractions Signal Analysis in Relation to Labor Progression and Dystocia. *XIII Mediterranean Conference on Medical and Biological Engineering and Computing 2013. IFMBE Proceedings, 41*, 555-558. http://dx.doi.org/10.1007/978-3-319-00846-2_137

Harper, L. M., Odibo, A. O., Stamilio, D. M., & Macones, G. A. (2013). Radiographic Measures of the Midpelvis to Predict Cesarean. *American journal of obstetrics and gynecology, 208*(6), 460.e461-460.e466. http://dx.doi.org/10.1016/j.ajog.2013.02.050

Hodnett, E. D., Gates, S., Hofmeyr, G. J., Sakala, C., & Weston, J. (2011). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews, 3*. http://dx.doi.org/10.1002/14651858.CD003766.pub3

Jongen, V., Halfwerk, M., & Brouwer, W. (1998). Vaginal delivery after previous caesarean section for failure of second stage of labour. *BJOG: An International Journal of Obstetrics & Gynaecology, 105*(10), 1079-1081. http://dx.doi.org/10.1111/j.1471-0528.1998.tb09939.x

Khunpradit, S., Patumanond, J., & Tawichasri, C. (2005). Risk indicators for cesarean section due to cephalopelvic disproportion in Lamphun Hospital. *Journal-Medical Association of Thiland, 88*, S63.

Kovavisarach, E., & Buddeewong, P. (2012). Diagnosis of Cephalopelvic Disproportion or Failure to Progress of Labor in Rajavithi Hospital Compare with The Criteria of Royal Thai College of Obstetricians and Gynaecologists. *Thai Journal of Obstetrics and Gynaecology, 18*(2), 77-81.

Kumari, P. S., & Thomas, V. (2012). A cross sectional study of rate and determinants of caesarean sections among mothers attending government maternity hospital, Hyderabad. *Int J Med Pharm Sci, 3*(05), 14-19.

Liselele, H. B., Boulvain, M., Tshibangu, K. C., & Meuris, S. (2000). Maternal height and external pelvimetry to predict cephalopelvic disproportion in nulliparous African women: a cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology, 107*(8), 947-952. http://dx.doi.org/10.1111/j.1471-0528.2000.tb10394.x

Macones, G. A., Jen Chang, J., Stamilio, D. M., Odibo, A. O., Wang, J., & Cahill, A. G. (2013). Prediction of Cesarean Delivery Using Fetal-Pelvic Index. *American journal of obstetrics and gynecology, 209*(5), 431.e431-431.e438. http://dx.doi.org/10.1016/j.ajog.2013.06.026

Oppenheimer, L. W., Bland, E. S., Dabrowski, A., Holmes, P., McDonald, O., & SHI, W. W. (2002). Uterine contraction pattern as a predictor of the mode of delivery. *Journal of perinatology, 22*(2), 149-153. http://dx.doi.org/10.1038/sj.jp.7210622

Savitsky, A. G., Savitsky, G. A., Ivanov, D. O., Mikhailov, A. V., Kurganskiy, A. V., & Mill, K. V. (2013). The myogenic mechanism of synchronization and coordination for uterine myocytes contractions during labor. *Journal of Maternal-Fetal and Neonatal Medicine, 26*(6), 566-570. http://dx.doi.org/10.3109/14767058.2012.738261

Shields, S. G., Ratcliffe, S. D., Fontaine, P., & Leeman, L. (2007). Dystocia in nulliparous women. *Am Fam Physician, 75*(11), 1671-1678.

Spörri, S., Thoeny, H. C., Raio, L., Lachat, R., Vock, P., & Schneider, H. (2002). MR imaging pelvimetry: a useful adjunct in the treatment of women at risk for dystocia? *American Journal of Roentgenology, 179*(1), 137-144.

Tsvieli, O., Sergienko, R., & Sheiner, E. (2012). Risk factors and perinatal outcome of pregnancies complicated with cephalopelvic disproportion: a population-based study. *Archives of gynecology and obstetrics, 285*(4), 931-936. http://dx.doi.org/10.1007/s00404-011-2086-4

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Hypertension among Rural Population in Four States: Sudan 2012

Siham Ahmed Balla[1], Asma Abdelaal Abdalla[1], Taha Ahmed Elmukashfi[1] & Haiedr Abu Ahmed[1]

[1] Department of Community Medicine, Faculty of Medicine, University of Khartoum, Sudan

Correspondence: Siham Ahmed Balla, Department of Community Medicine, Faculty of Medicine, University of Khartoum, Sudan. Tel: 249-123-543-951. E-mail:semam44@yahoo.com

Received: November 4, 2013 Accepted: January 6, 2014 Online Published: March 30, 2014

doi:10.5539/gjhs.v6n3p206 URL: http://dx.doi.org/10.5539/gjhs.v6n3p206

Abstract

Background: Hypertension is emerging as an alarming public-health problem causes organ damage.

Objectives: To identify prevalence of hypertension and predictor factors among rural population in four states in Sudan.

Methods: A community based cross-sectional study was conducted in sixteen rural areas in Sudan during April 2012. A total of 3020 adult were interviewed using structured questionnaire and blood pressure was measured before and after the interview. Hypertension was taken as ≥ 140 mmHg and ≥ 90 mmHg for systole and diastole respectively. **Analysis**: Descriptive statistic was presented; Sex and mean of systolic and diastolic blood pressure were tested using ANOVA for individuals on antihypertensive medication. Predictor factors to hypertension were tested by logistic regression.

Results: Prevalence of hypertension among rural population was 15.8%. Overall means of systolic and diastolic blood pressure were 128.6±17.7 and 81.5±11.6 respectively while the means among hypertensive individuals was154.74 ±14.4 and 97.98±8.4 respectively

Known hypertensive individuals were 20.1%; out of whom 71.7% were hypertensive and 22.4% have Target Organ Damage. Those on anti-hypertensive medications were 76.4% and normotensive were 55.1%. Individuals having both diabetes and hypertension were 3.3% and 80.2% were hypertensive. Log regression model showed age, smoking, diabetes and family hypertension were predictors of hypertension by 3.6%, 34.9%, 49.7% and 56.8% respectively (*P-value <0.05*).

Conclusion: Prevalence of hypertension among rural Sudan was 15.8%. Family history was the strongest predictor of hypertension.

Keywords: hypertension, rural, diabetes, predictors, target organ damage, Sudan

1. Introduction

The mortality due to hypertension (HTN) was accounted to 20%–50% of all deaths and the projected number of adults who will have hypertension by 2025 is 1.56 billion (Kearney et al., 2005; Arslantas et al., 2008). It was reported that the highest prevalence of HTN was in Africa and approximately 80% of deaths in low-middle income countries were due to commonest complication of HTN which is cardiovascular disease (WHO, 2011; 2013).

All published studies about hypertension in Sudan targeted small scale studies for different specific population. A study in some referral clinics in Khartoum had shown cardiac, neurological and renal symptoms were the major presenting complaints (Ahmed, 1991). Hypertension was detected in 18.2% of population with different occupations in Khartoum State and 10.2%were known hypertensive (Sherif, Ahmed, & Homeida, 2008). School based study in Khartoum State have shown 4.9% of obese primary school children in age group 6-12 years were hypertensive (Salman, Kirk, & DeBoer, 2011)

Passive screening program in Northern state in Sudan have shown 28.5% of village inhabitants were known hypertensive and 39.6% were having hypertension after screening (Abdelsatir, Al-Sofi, Elamin, & Abu-Aisha, 2013). Local studies were conducted in urban settings rather than rural and showed high prevalence of target organ damages and almost no data was available from rural areas in states (Suliman, 2011).

1.1 Objectives

The objectives of this study were to identify the prevalence of hypertension and known hypertensive in rural

population of Sudan and to estimate the strength of contributor factors.

2. Materials and Methods

This is a descriptive cross sectional, community bases study carried out in rural population in four states of Sudan. The states were River Nile, Northern, Gazera and Gadarif. Sixteen rural areas were selected within states (clusters). Adult rural male and female were the study population.

A two stage cluster sampling was used. The sample size was calculated from the prevalence equation; $n= z^2P (1-P)/e^2$multiplied by (de). To compare between states and individuals with and without hypertension, the prevalence was estimated at 50%. The target sample size considers the different ethnics variability in Sudan and to overestimate the sample size, to reduce the error and to increase the significance.

The design effect (de) for the two stages sampling was 2 and the marginal error (e) was 0.05. The standard deviate (z) was selected at 95% Confidence level.

Thereafter; the target sample size was 3073 adult individuals. The non-response rate was 1.7% resulted in a sample of 3020 individuals (510 households).The four states were purposively selected and the sixteen clusters were randomly allocated (four clusters per state). Simple random sampling was used to select the households within each cluster. Two to five adult individuals were interviewed from each household.

Structured questionnaire was used to interview the study population; it contains the variables of population characteristics, smoking status, known hypertension, known diabetes and presence of complications affected central nervous system, renal and cardiovascular. Calibrated mercury sphygmomanometers were used to measure blood pressure for all study population before and after the interview. The minimum interview time was estimated at 7-10 minutes.

Data collectors were the semifinal medical students in the faculty of medicine, university of Khartoum. They had to conduct a training field activity at the community and primary health care level during their fifth medical year. This activity is part of the community medicine curriculum and social accountability dimension. They were trained on the research questionnaire, calibration of sphygmomanometers and the skills of measuring blood pressure. They resided and interact with the communities in the sixteen rural areas (18 students per cluster) for two weeks during April 2012. For the purpose of this study the following definition was considered:

1) Target Organ Damage (TOD): defined as complications in cardiovascular, nervous and renal systems.
2) Known hypertensive: individuals who were diagnosed as hypertensive and on anti-hypertensive medication or not.
3) Hypertension /Hypertensive individuals: used for the measured blood pressure at the time of data collection which according to the cutoff point ≥140 over ≥90 mmHg.

Data was cleaned, entered and managed in SPSS version 20 and a small stata calculator was used for continuous variables. Descriptive statistics was presented in means and standard deviations regarding age, duration of hypertension and diabetes. The means of systolic and diastolic blood pressure were computed and recoded into the desired cutoff point (more than or equal 140 mmHg over more than or equal 90 mmHg).

Detailed description of population with high and normal blood pressure was presented by states as well as prevalence of known hypertensive and diabetic individuals.

Two sample means comparison calculator in small stata was used to test the significance difference between blood pressure of males and females.

Age, sex, education, occupation, education, marital status, family members with hypertension, diabetes and smoking were tested by binary logistic regression.

ANOVA was used for testing sex in relation to systolic and diastolic blood pressure variations and anti-hypertensive medication.

Permission from the states` ministries of health and states` authorities was obtained prior to the departure of the students. Written consent was obtained from each individual in the households. Individuals who were detected with hypertension were given referral sheet to the rural hospital in the area to follow their status. Known hypertensive Individuals with or without complications was provided adequate information to control their hypertensive status.

3. Results

The mean age of the total study population was 46.7±13.2 (Min: 18; Max: 95). The populations in the age group

30-60 years constituted 79.1%. Females were 60.7% and males were 39.3%. The first rank occupation was housewives (49.7%) and freelancers occupy the second rank 21.6% (for example, great merchants, sales of different domestic and none domestic goods, shopkeepers, drivers of private vehicles and travel trucks) Employees and farmers constituted 27 % and 72.9% of the population were having varied degrees of literacy (Table 1).

Table 1. Descriptive statistics of the study population in rural Sudan

Descriptive statistics		States				
		River Nile	Gadarif	Northern	Gazera	Total
Age /Years	18-30	1.2%	1.6%	1.7%	1.8%	6.2%
	>30-60	21.1%	17.7%	18.3%	22.0%	79.1%
	>60	3.8%	2.1%	3.9%	5.0%	14.8%
	Total	26.0%	21.3%	23.9%	28.8%	100.0%
Sex	Male	10.7%	8.4%	9.5%	10.7%	39.3%
	Female	15.3%	12.9%	14.4%	18.1%	60.7%
	Total	26.0%	21.3%	23.9%	28.8%	100.0%
Marital Status	Not Married	3.0%	1.2%	3.2%	2.1%	9.4%
	Married (Ever and current)	22.9%	20.1%	20.7%	26.8%	90.6%
	Total	26.0%	21.3%	23.9%	28.8%	100.0%
Occupation	Farmer	4.3%	3.8%	3.8%	1.4%	13.3%
	Employee	4.6%	1.7%	3.6%	3.7%	13.7%
	Housewife	11.3%	11.3%	11.6%	15.5%	49.7%
	Freelancers	5.4%	4.3%	4.3%	7.6%	21.6%
	Retired or no work	0.4%	0.2%	0.8%	0.6%	1.8%
	Total	26.0%	21.3%	23.9%	28.8%	100.0%
Education levels	Not educated	7.8%	5.9%	6.6%	6.8%	27.1%
	Primary	9.7%	10.4%	8.0%	11.4%	39.4%
	Secondary	5.4%	3.4%	6.7%	6.8%	22.2%
	University	2.9%	1.4%	2.5%	3.5%	10.3%
	Postgraduate	0.3%	0.1%	0.2%	0.3%	0.8%
	Total	26.0%	21.3%	23.9%	28.8%	100.0%

The overall means of systolic and diastolic blood pressure were 128.6±17.7 and 81.5±11.6 respectively and the mean blood pressure in females was lower than males, 127.9/80.6 versus 129.6/82.9 respectively; *p-value <0.05* (Table 2).

Hypertension among study population was 15.8% (Mean systolic and diastolic blood pressure was 154.74±14.4 and 97.98±8.4 respectively) with insignificant variation between states. Known hypertensive population (20.1%) showed significant variations between states with the highest prevalence in Gazera state (23.3%). Duration of the hypertension in known hypertensive individuals ranges from 1 to 50 years (Mean: 6.63±6.86). Known hypertensive population who has hypertension and target organ damage (TOD) was 71.7% and 22.4% respectively (Table 2).

Diabetic individuals accounted to 10.6% of rural populations in states and 53.9% have shown hypertension. The duration of diabetes ranges from 1 to 45 years (Mean 7.9±7.89) (Table 2).

Population known to have both hypertension and diabetes were accounting to 3.3% and 80.2% have hypertension. Individuals on antihypertensive drugs accounted to 76.4% and 44.9% have hypertension. Male and females on medication of anti-hypertension have shown mean systolic blood pressure 144.93±16.5 and 146.09±21.1 respectively (P- value > 0.05) and mean diastolic blood pressure 91.60±11.4 and 88.87±12.2 respectively

(*P-value < 0.05)* (Table 2).

Table 2. Distribution of hypertension and diabetes among population in rural Sudan

Hypertension and Diabetes Status	States▲					
	River Nile	Gadarif	Northern	Gazera	Total	*P*-value **
¥£Measured Blood Pressure Hypertension ≥140 /≥90	15.3%	17.9%	16.4%	14.4%	15.8%	*P*-value > 0.05
ф Known hypertensive population	19.9%	17.3%	19.3%	23.3%	20.1%	*P*-value <0.05
Hypertension among Known hypertensive individuals	75.6%	72.1%	66.2%	72.3%	71.7%	*P*-value >0.05
*TOD among known hypertensive	5.8%	4.1%	5.3%	7.2%	22.4%	*P*-value >0.05
ʊDiabetic population	12.6%	9.2%	10.119%	10.4%	10.6%	*P-value> 0.05*
Hypertension among diabetic population	50.5%	54.2%	61.6%	51.1%	53.9%	*P-value > 0.05*
Both diabetic and known hypertensive	4.3%	3.0%	2.8%	3.2%	3.3%	*P-value >0.05*
Hypertension among Both diabetic and known hypertensive	85.3%	73.7%	75.0%	82.1%	80.2%	*P*-value >0.05
Individuals on antihypertensive medications	74.8%	78.2%	76.3%	76.7%	76.4%	*P*-value > 0.05
Hypertension among individuals on anti-hypertensive medication	54.3%	50.0%	41.5%	37.4%	44.9%	*P*-value < 0.05

¥Overall mean systolic BP 128.6±17.7 and mean diastolic BP 81.5±11.6. Mean blood pressure in females and males was 127.9/80.6 versus 129.6/82.9 respectively (*P-value <0.05*). Mean systolic and diastolic blood pressure among hypertensive individuals was 154.74 ±14.4 and 97.98± 8.4 respectively

∫ ANOVA test: mean systolic blood pressure among male and females on anti-hypertension medication is 144.93±16.5 versus 146.09±21.1 respectively (*P- value > 0.05)* and mean diastolic blood pressure is 91.60±11.4 versus 88.87±12.2 respectively (*P-value < 0.05)*

ώ Mean duration of hypertension is 6.63±6.86

ʊMean duration of diabetes is 7.9±7.89

* (TOD): target organs damage defined as complications regarding central nervous system, renal and cardiovascular

**P value at 95% confidence level using Chi square test

▲Percent calculated from sample sizes in states.

Regarding factors contributing to hypertension, logistic regression model retained age, smoking, diabetes and history of family members with hypertension and removed from sex, education, occupation, education and marital status (Table 3).

Table 3. Predictors of hypertension

Predictor	Factor contribution	Odd Ratio(*p-value <0.05*)	Confidence Interval
Age	3.7%	1.037	1.029 : 1.044
Smoking	34.9 %	1.349	1.011 : 1.798
Diabetes	49.7%	1.497	1.127 : 1.989
Family History of HTN	56.80%	1.568	1.277 : 1.925

4. Discussion

Hypertension, defined as a systolic blood pressure equal to or above 140 mm Hg and diastolic blood pressure equal to or above 90 mm Hg (WHO, 2013), it causes 9.4 million deaths due to its complications worldwide.

In this study; mean systolic and mean diastolic blood pressure was 128.6±17.7 and 81.5±11.6 respectively. In our study; the mean blood pressure in females was lower than males (127.9/80.6 versus 129.6/82.9, *P-value <0.05*). Our findings are similar to studies conducted in rural population of Ghana-west Africa and rural India where the mean blood pressure of females was significantly lower than males (Agyemang, 2006; Kusuma & Das, 2008).

Our study showed the mean systolic blood pressure among male and females on anti-hypertension medication was not significantly different while mean diastolic blood pressure was significantly different. However a study

in semi-rural area in Turkey showed no difference of hypertension between males and females (Arslantas, Ayranci, Unsal, & Tozun, 2008) while another study showed significant association with sex (Wamala, Karyabakabo, Ndungutse, & Guwatudde, 2009).

Diastolic blood pressure in rural Sudan was exceeding 80 mmHg which may be due to salty and spicy food habits of Sudanese diet. Different ethnic groups in Africa consume more than 6 grams of salt per day while the recommended intake was 5 to 3 grams per day (He & MacGregor, 2004; Charlton et al., 2005). Reducing salt intake to 4.6 gram per day among hypertensive individuals had shown a reduction of the mean diastolic blood pressure by 2.74 mmHg and by 0.99 mmHg in normotensive population if their daily salt was 4.4 gram (He & MacGregor, 2004).

The prevalence of hypertension in our study is much lower than the prevalence in rural India, rural china and rural Uganda (Kusuma & Das, 2008; Maher, Waswa, Baisley, Karabarinde, & Unwin, 2011; Li et al., 2010; Wamala et al., 2009). Compared to semi urban areas in western Turkey, more than half of the population was hypertensive (Arslantas et al., 2008). The differences could be due the methodology of measuring the blood pressure. The time factor between the two measurements in our study was satisfactory to eliminate any personal fear compared to Uganda and china studies where a single measurement and the 5 minutes apart between measurements may be confounded by biological responses.

The mean duration of hypertensive and diabetic status were 6.63±6.86 years and 7.9±7.89 years respectively which are not different from a study carried out in Gazera state at primary health care clinics (Elsharif et al., 2013). The slight difference may be due to the large sample size in our study.

The prevalence of known hypertensive showed significant variations between states population showing the highest rate in Gazera state (23.3%). This state is ranking the second after Khartoum state and the population is similar to urban modern settings.

The target organ damage was 22.4% among hypertensive population. Hypertension causes end stage renal diseases in 14.3% of patients in Gazera State Hospital in Sudan (M. E. Elsharif & E. G. Elsharif, 2011) and contributes to 75% of cardiovascular diseases among diabetic population (Sowers, Epstein, & Frohlich, 2001). The study showed 71.7% of known hypertensive population has hypertension which reflected poor controlling status and they were at risk of developing complications related to hypertension. Compared to rural china, our hypertensive population was relatively controlling their hypertension status (Li et al., 2010).

Population with diabetes in this study showed 53.9% have hypertension which is similar to the findings in a reviewed data in United States (Ong, Cheung, Man, Lau, & Lam, 2007). The biological characteristics and behavioral lifestyle of diabetic individuals may intervene in controlling their normotensive status (Saydah et al., 2004).

Individuals on anti-hypertensive medication accounted to 76.4%, 55.1% were normotensive and 44.9% were hypertensive. This may reflect some adherence to antihypertensive medication compared to a study conducted among Mozambicans with anti-hypertensive medication showed 39.9% were normotensive (Damasceno et al., 2009). Our study is supported by a study in Kassala state in eastern Sudan showed the compliance of antihypertensive drugs among hypertensive patients was 59.6% where 92% of them were normotensive (Elzubier et al., 2000).

It is worth mention that 3.3% of study population of rural Sudan has both diabetes and hypertension and 80.2% was hypertensive reflecting poor control of blood pressure for both diseases.

However, the prevalence of hypertension, known hypertensive and diabetic population in this study is within the reported ranges reported in sub-Saharan Africa (Dalal et al., 2011).

Logistic regression model retained age, smoking, diabetes and family history of HTN as predictors of hypertension. Our study showed 56.8% chance of having hypertension among individual with positive family history of hypertension. This is similar to findings of a study of records in screened cohort which showed the increase in the prevalence of hypertension as the number of family members with history of hypertension increased (Tozawa et al., 2001).

Diabetes mellitus contributed to the prediction of hypertension by 49.7%. Diabetes is a strong factor associated with coronary artery disease and potentiates the risk of vascular and renal complications if co-exist with hypertension (Lago, Singh, & Nesto, 2007). Diabetes and hypertension are closely interrelated; diabetes mellitus could precede the occurrence of hypertension while studies at early of last decade showed hypertensive individuals were more likely to develop diabetes mellitus than normotensive persons (Sowers et al., 2001).

Our study showed smoking as a predictor of hypertension by 34.9% which is similar to a study carried out in rural community of Tamilnadu in India, it showed smoking as statistically significant predictor of hypertension and diabetes (Radhakrishnan & Balamurugan, 2013)

5. Conclusion

Prevalence of hypertension among rural Sudan was 15.8% with insignificant variation between the four states. Gazera state showed the highest prevalence of known hypertensive individuals. The mean diastolic blood pressure among known hypertensive on anti-hypertensive medication is significantly higher in males than females raising new information for further researches in Sudan. Family history was strong predictor for hypertension.

References

Abdelsatir, S., Al-Sofi, A., Elamin, S., & Abu-Aisha, H. (2013). The Potential Role of Nursing Students in the Implementation of Community-Based Hypertension Screening Programs in Sudan. *Arab journal of nephrology and transplantation, 6*(1), 51-54.

Agyemang, C. (2006). Rural and urban differences in blood pressure and hypertension in Ghana, West Africa. *Public health, 120*(6), 525-33. http://dx.doi.org/10.1016/j.puhe.2006.02.002

Ahmed, M. (1991). The clinical presentation of hypertension in Sudan. *Ethnicity & disease, 1*(3), 288.

Arslantas, D., Ayranci, U., Unsal, A., & Tozun, M. (2008). Prevalence of hypertension among individuals aged 50 years and over and its impact on health related quality of life in a semi-rural area of western Turkey. *Chinese Medical Journal (English Edition), 121*(16), 1524-31

Charlton, K. E., Steyn, K., Levitt, N. S., Zulu, J. V., Jonathan, D., Veldman, F. J., & Nel, J. H. (2005). Diet and blood pressure in South Africa: intake of foods containing sodium, potassium, calcium, and magnesium in three ethnic groups. *Nutrition, 21*(1), 39-50. http://dx.doi.org/10.1016/j.nut.2004.09.007

Dalal, S., Beunza, J. J., Volmink, J., Adebamowo, C., Bajunirwe, F., Njelekela, M., ... Holmes, M. D. (2011). Non-communicable diseases in sub-Saharan Africa: what we know now. *International Journal of Epidemiology, 40*(4), 885-901. http://dx.doi.org/10.1093/ije/dyr050

Damasceno, A., Azevedo, A., Silva-Matos, C., Prista, A., Diogo, D., & Lunet, N. (2009). Hypertension Prevalence, Awareness, Treatment, and Control in Mozambique Urban/Rural Gap During Epidemiological Transition. *Hypertension, 54*(1), 77-83. http://dx.doi.org/10.1161/HYPERTENSIONAHA.109.132423

Elsharif, M. E., & Elsharif , E. G. (2011). Causes of end-stage renal disease in Sudan: A single-center experience. *Saudi Journal of Kidney Diseases and Transplantation, 22*(2), 373.

Elsharif, M. E., Abdullha, S. M., Abdalla, S., & AllaElsharif, E. (2013). The magnitude of chronic kidney diseases among primary health care attendees in Gezira state, Sudan. *Saudi Journal of Kidney Diseases and Transplantation, 24*(4), 807. http://dx.doi.org/10.4103/1319-2442.113900

Elzubier, A. G., Husain, A. A., Suleiman, I. A., & Hamid, Z. A. (2000). Drug compliance among hypertensive patients in Kassala, eastern Sudan. *Eastern Mediterranean Health Journal, 6*(1), 100-105.

He, F. J., Li, J., & MacGregor , G. A. (2013). Effect of longer-term modest salt reduction on blood pressure. *The Cochrane Library, 4*, CD004937.

Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J. (2005). Global burden of hypertension: analysis of worldwide data. *Lancet, 365*(9455), 217-23. http://dx.doi.org/10.1016/S0140-6736(05)17741-1

Kusuma, Y. S., & Das, P. K. (2008). Hypertension in Orissa, India: a cross-sectional study among some tribal, rural and urban populations. *Public Health, 122*(10), 1120-23. http://dx.doi.org/10.1016/j.puhe.2007.10.007

Lago, R. M., Singh, P. P., & Nesto, R. W. (2007). Diabetes and hypertension. *Nat Clin Pract End Met, 3*(10), 667. http://dx.doi.org/10.1038/ncpendmet0638

Li, H., Meng, Q., Sun, X., Salter, A., Briggs, N. E., & Hiller, J. E. (2010). Prevalence, awareness, treatment, and control of hypertension in rural China: results from Shandong Province. *Journal of hypertension, 28*(3),432-38. http://dx.doi.org/10.1097/HJH.0b013e328334b39e

Maher, D., Waswa, L., Baisley, K., Karabarinde, A., & Unwin, N. (2011). Epidemiology of hypertension in low-income countries: a cross-sectional population-based survey in rural Uganda. *Journal of hypertension, 29*(6), 1061-68. http://dx.doi.org/10.1097/HJH.0b013e3283466e90

Ong, K. L., Cheung, B. M. Y., Man, Y. B., Lau, C. P., & Lam, K. S. L. (2007). Prevalence, Awareness, Treatment, and Control of Hypertension Among United States Adults 1999–2004. *Hypertension, 49*(1), 69-75. http://dx.doi.org/10.1161/01.HYP.0000252676.46043.18

Radhakrishnan, S., & Balamurugan, S. (2013). Prevalence of diabetes and hypertension among geriatric population in a rural community of Tamilnadu. *Indian J Med Sci, 67*(5-6), 130-6. http://dx.doi.org/10.4103/0019-5359.122742

Salman, Z., Kirk, G. D., & Deboer, M. D. (2011). High Rate of Obesity-Associated Hypertension among Primary Schoolchildren in Sudan. *Int J Hypertens, 2011*, 629492. http://dx.doi.org/10.4061/2011/629492

Saydah, S. H., Fradkin, J., & Cowie, C. C. (2004). Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA, 291*(3), 335-42. http://dx.doi.org/10.1001/jama.291.3.335

Sherif, S. M., Ahmed, M. E. K., & Homeida, M. M. (2008). Prevalence of hypertension in an urban community in Sudan. *Khartoum Medical Journal, 1*(2), 72-4.

Sowers, J. R., Epstein, M., & Frohlich, E. D. (2001). Diabetes, Hypertension, and Cardiovascular Disease: An Update. *Hypertension, 37*(4), 1053-59. http://dx.doi.org/10.1161/01.HYP.37.4.1053

Suliman, A. (2011). The state of heart disease in Sudan. *Cardiovasc J Afr, 22*(4), 191-96. http://dx.doi.org/10.5830/CVJA-2010-054

Tozawa, M., Oshiro, S., Iseki, C., Sesoko, S., Higashiuesato, Y., Tana, T., ... Fukiyama, K. (2001). Family history of hypertension and blood pressure in a screened cohort. *Hypertension research, 24*(2), 93-8. http://dx.doi.org/10.1291/hypres.24.93

Wamala, J. F., Karyabakabo, Z., Ndungutse, D., & Guwatudde, D. (2009). Prevalence factors associated with hypertension in Rukungiri district, Uganda-a community-based study. *African health sciences, 9*(3), 153-160.

WHO. (2011). Global status report on noncommunicable diseases 2010. Retrieved from http://www.who.int/nmh/publications/ncd_report2010/en/

WHO. (2013). A global brief on hypertension: Silent killer, global public health crisis. Retrieved from http://www.who.int/cardiovascular_diseases/publications/global_brief_hypertension/en/

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Patients Discharged Against Medical Advice from a Psychiatric Hospital in Iran: A Prospective Study

Fatemeh Sheikhmoonesi[1], Mohammad Khademloo[2] & Samaneh Pazhuheshgar[3]

[1] Psychiatry and Behavioral Sciences Research Center, Mazandaran University of Medical Sciences, Sari, Iran

[2] Department of Community Medicine, Mazandaran University of Medical Sciences, Sari, Iran

[3] Mazandaran University of Medical Sciences, Sari, Iran

Correspondence: Fatemeh Sheikhmoonesi, MD, Associate Professor of Psychiatry, Psychiatry and Behavioral Sciences Research Center, Zare Hospital, Sari, Iran. Tel: 98-911-353-9217. E-mail: fmoonesi@mazums.ac.ir

Received: October 1, 2013 Accepted: January 6, 2014 Online Published: March 28, 2014

doi:10.5539/gjhs.v6n3p213 URL: http://dx.doi.org/10.5539/gjhs.v6n3p213

Financial support was provided by Mazandaran University of Medical Sciences

Abstract

Aim: Self- discharged patients are at high risk for readmission and ultimately higher cost for care. We intended to find the proportion of patients who leave hospital against medical advice and explore some of their characteristics.

Methods: This prospective study of discharge against medical advice was conducted in psychiatric wards of Zare hospital in Iran, 2011. A psychologist recorded some information on a checklist based on the documented information about the patient who wanted to leave against medical advice. The psychologist interviewed these patients and recorded the reasons for discharge against medical advice. Descriptive statistics were calculated for the variables.

Results: The rate of premature discharge was 34.4%. Compared to patients with regular discharges, patients with premature discharge were significantly more likely to be male, self-employed, to have co morbid substance abuse and first admission and positive family history of psychiatric disorder. Disappearance of symptoms was the most frequent reason for premature discharge.

Conclusion: The 34.4% rate of premature discharge observed in our study is higher than rate reported in other studies. One possible explanation is our teaching hospital serves a low-income urban area and most patients had low socioeconomic status. Further studies are needed to compare teaching and non-teaching hospital about the rate of premature discharge and the reasons of patients who want to leave against medical advice.

Keywords: against medical advice (AMA), discharge, hospital, patient, psychiatry

1. Introduction

Discharge against medical advice (AMA) is a prevalent and vexing problem for patients and their psychiatrists (Wung, CC Chen, FC Chen, & Lin, 2010). Some risks of AMA discharge include younger age, single marital status, male gender, low socioeconomic status, and combined diagnosis of personality or substance use disorder, lack of health insurance and history of numerous hospitalizations ending in AMA discharge (Brook, Hilty, Liu, Hu, & Frye, 2006; Said, Ibrahim, Kent, & Eswar, 2007).

Patients who leave hospital against medical advice may be at risk of adverse health outcome and readmission. Stephen, Hwang, Rajesh, Vince and Rochelle (2003) identified increased risk of readmission among general medicine patients who leave hospital AMA is concentrated in the first two weeks after discharge. Some reasons for AMA discharge are dissatisfaction with care, personal, family and financial problems and subjective improvement in symptoms (Said et al., 2007).

The problem in Iran is different from the West in many ways which is linked to cultural differences and the resources available for the care and treatment of mentally ill patients. We intended to find the proportion of patients who leave hospital against medical advice and some of their characteristics in the year 2011.Very little

research in Iran has been conducted into AMA discharge from psychiatric hospitals. A drawback of the previous studies is that they are retrospective in nature and therefore susceptible to the bias of under-reporting of event. Moreover, they did not explore the reasons for AMA discharge.

As far as we know, this study is the first prospective study in Iran which was carried out through interviews with people who were willing to have AMA discharge. The reasons of AMA discharge are the main concerns of this study. Awareness of the factors involved in AMA discharge is important because of the potential to identify those at higher risk and thereby intervene earlier to prevent adverse consequences.

2. Materials and Methods

2.1 Subjects and Data Collection

This prospective study of AMA discharge was conducted in psychiatric wards of Zare hospital, a major psychiatric center in the north of Iran. AMA discharge was defined as "patients who signed a standard hospital form acknowledging that they were discharging themselves against medical advice contrary to the advice of their psychiatrist".

2.2 Participants Recruitment

Three hundred and sixteen patients who were discharged between 1 January 2011 and 1 January 2012 were randomly assessed. We use simple randomization to choose patients to be interviewed. As soon as AMA discharge was reported by nurses, a psychologist recorded some information on a checklist based on the documented information about the patient including socio-demographic variables, diagnosis according to DSM-IV-TR (Diagnostic and statistical Manual of Mental disorders, 4th edition; American Psychiatric Association, 1994), patients and their caregiver`s level of education, substance abuse, number of previous hospitalizations, and family history of psychiatric disorder. The psychologist interviewed the patients and recorded the reasons for AMA discharge on a checklist. More than one reason could be coded for each patient. The data was collected and then analyzed anonymously.

2.3 Statistical Analysis

Descriptive statistics were calculated for the variables. X2 test and independent t-test were applied to compare the variables between patients with AMA discharges and those with regular discharges. The data was analyzed using SPSS version 10.0 for windows.

2.4 Ethical Issues

This study was approved by the Ethical Committee of Mazandaran University of Medical Sciences. All the patients signed informed consents.

3. Results

Of 1171 patients discharged during the study period, 403 patients were discharged AMA. The rate of AMA discharge was 34.4% according to Molnar & Pinchoff equation (1993). Three hundred and sixteen patients were randomly assessed. Among the completed questionnaires there were 9 questionnaires with no information on profession and 6 of them did not provide the information on marital status. However, we included these questionnaires since they contained other information.

One hundred and thirty two (41.77%) were male and 184 (58.22%) were female. The mean age was 35.1±11.93 and 226 (71.51%) were discharged as planned but 90 patients (28.48%) were discharged AMA. Compared to patients with regular discharges, AMA discharge patients were significant differences between the groups regarding the age, marital status, educational level, previous suicide attempt. Table 1 summarizes the baseline characteristics of the study sample. AMA discharge was more prevalent in significantly more likely to be male, self-employed, to have co morbid substance abuse and first admission and positive family history of psychiatric disorder. There were no patients admitted for the first time (P=0.004).

Table 1. Characteristics of patients who left hospital AMA and patients discharged formally

Characteristic	**Left AMA** (n=90)	**Discharged formally** (n=226)	**Pvalue**
Sex			0.034
Male	46(34.8%)	86(65.2%)	
Female	44(23.9%)	140(76.1%)	
Mean age	33.7±12	35.63±11.8	NS
Profession			
Unemployed/housewife	59(65.6 %)	187(82.8%)	
Self-employed	20(22.2%)	23(10.17%)	0.006
Office worker	7(7.8%)	11(4.82%)	
Missing data	4(4.4%)	5(2.21%)	
Marital Status			NS
single	31(34.4%)	93(41.1%)	
Married	41(45.6 %)	90(40%)	
Widow	14(15.6 %)	32(14%)	
Divorced	0(0%)	9(4%)	
Missing data	4(4.4%)	2(0.9%)	
Educational level			
elementary school	27(30%)	69(30.5%)	NS
High school	47(52%)	98(43.4%)	
college	16(18%)	59(26.1%)	
First Admission	65(65%)	96(42%)	0.001
Positive family history	26(21.3%)	96(78.7%)	0.029
History of substance abuse	38(42.2%)	75(33.1%)	0.05
History of suicide attempt	24(26.7%)	36(16%)	NS

NS: not significant statistically.

Among the patients the educational level of 96 was elementary school of whom 28.1% were discharged against medical advice and 71.9% were formally discharged. There were 145 patients with educational background at high school level. Amongst them 32.4% had AMA discharge but 67.6% had regular discharge. From the total of 75 patients with college education 21.3% left the hospital AMA while 78.7% were discharged formally. These figures indicate no significant difference between the two groups regarding educational background.

There were no significant differences between the groups regarding season of admission, the data is presented in Table 2.

Table 2. Season of admission in two groups

Season	**Left AMA** (n=90)	**Discharged formally** (n=226)	**Pvalue**
Spring	16(17%)	55(25%)	0.161
Summer	26(29%)	52(23%)	
Autumn	6(7%)	29(13%)	
Winter	42(47%)	89(39%)	

Table 3. Reasons for AMA discharge from psychiatric ward

Reasons for AMA discharge	Frequency
Disappearance of symptoms	32(35.6%)
Lack of insight	23(25.6%)
Missing family	17(18.9%)
Boredom from ward environment	15(16.7%)
Economic problem	11(12.2%)
Fear of other patients	9(10%)
Anger over given treatment	8(8.9%)
Lack of trust to the doctor	3(3.3%)
Lack of satisfaction with staff behavior	4(4.4%)
Others	8(8.9%)

Disappearance of symptoms was the most frequent reason for AMA discharge (Table 3). As shown in Table 4, there was no significant difference between the groups with respect to diagnosis according to DSM-IV-TR.

Table 4. Comparison of diagnosis in two groups

	Diagnosis Left AMA (n=90)	Discharged formally (n=226)
MDD	13(41.9%)	18(58.1%)
Bipolar disorder (type I, II)	26(25.7%)	75(74.35%)
Psychotic disorder	44(27%)	119(73%)
Anxiety Disorder	7(33.3%)	14(66.7%)
Personality Disorder	5(25%)	15(75%)

4. Discussion

Self-discharged patients are at high risk for re-admission and ultimately higher costs of care (Anis et al., 2002). These patients are also at high risk for poor follow-up care for medical issues. Understanding the characteristics of patients who leave AMA and gaining insight into their reasons are great importance since delivery of medical care and quality of care are affected (Said et al., 2007). Prospective nature of this study with the opportunity to interview the patients and investigate their reasons to AMA discharge was an advantage of this study. We found that 34.4% of psychiatric hospitalization ended in patients leaving against medical advice. The 34.4% rate of discharge AMA observed in our study is higher than other rate reported in previous studies (Tavallaei et al., 2006; Said et al., 2007; Wung et al., 2010) one possible explanation is our hospital serves a low-income urban area and most patients had low socioeconomic status.

Weingart, Davis and Phillips (1998) reported male gender to be associated with AMA discharge. Our observations and those of others (Saitz et al., 1999; Jeremiah, O'Sullivan, & Stein, 1995) confirm these findings. Perhaps men are willing to come back home earlier for economic reasons since they feel most responsible for their family's income. Another possible explanation contributing to AMA discharges is that male patients are more likely to have a higher risk of poor medical adherence than female patients (Nose, Barbui, & Tansella, 2003), poor medical adherence leads to premature discharge consequently (Wung et al., 2010).

Patients with positive family history are less likely to leave against medical advice. One explanation might be that caregivers are more aware of psychiatric disorders and feel worried of not being able to provide better care at home.

Data analysis revealed more AMA discharge amongst self-employed, probably because they were more worried about their jobs while other patients such as office workers had the advantage of sick leave .

We found that the rate of AMA discharge was more prevalent among patients hospitalized for the first time, this may be due to unfamiliarity of the patient or his caregiver with hospital environment thereby resisting

hospitalization .In addition they are not aware of the course and probability of recurrence in psychiatric disorder.

Data analysis showed substance abuse as a risk factor for irregular discharge. There are some studies in support of this finding that substance abuse could increase the risk of AMA discharge (Gillis, Russell, & Busby, 1997; Glick, Braff, Johnson, & Showstack, 1981; Ahmadi et al., 2006; Saitz et al., 2002). Perhaps patients with substance abuse are unwilling to stay in hospital, as hospital stay makes it difficult for them to obtain the required substance. Chan, Palepu and Guh (2004) found that AMA discharges were less likely among injection drug abusers if they were receiving methadone in the hospital. Protocols to treat alcohol and opioid withdrawal to reduce AMA discharge have not been studied yet. Given the high prevalence of AMA discharges in these patients; this would be a worthy area of studying.

Data analysis showed that there was not any significant difference between two groups with respect to diagnosis but Brook et al. (2006) found antisocial personality disorder to be associated more with AMA discharge.

In our study, AMA discharge was not different among different seasons. The authors carried out a study about patients absconding from Zare hospital. In that study we found absconding was more frequent in summer (Sheikhmoonesi, Kabirzadeh, Yahyavi, & Mohseni, 2012).

We found that age and educational level were not the risk factor for irregular discharge. This conclusion is similar with those found in other studies carried out in Iran (Ahmadi et al., 2006). In most studies conducted in developed countries younger patients and those with low level of education most frequently discharged against medical advice (Senior & Kabbee, 1986; Ferber et al., 1985). It is difficult to explain the reason, nevertheless it could depends on cultural factors. Smith (1982) proposed that differences in hospital setting, client population and therapists' variety might be the cause of differences between the risk factors of a premature discharge.

Interviewing the patients in order to find the reasons for AMA discharge was done and the results of this study have shown disappearance of symptoms (feeling better) and lack of insight as the main reasons. The tolerance to hospitalization reduces if a person does not believe in his/her disease so proper orientation and psycho educational session during the early treatment phase is essential to keep the patient in hospital.

Targum, Capodanno, Hoffman and Foudraine (1982) found an approximately 30% decrease in total AMA discharges among psychiatric inpatients that used a nurse as a patient advocate. The advocate's responsibility was to help explore a patient's preconceptions about hospitalization and to address fears and complaints about it.

Limitation: Our results should be interpreted with several limitations in mind. The length of stay at hospital and its relationship with AMA discharge was not assessed. Our study was done in a teaching hospital so we cannot generalize our findings to other hospitals. Larger studies are needed to compare teaching and non-teaching hospitals about the rate of AMA discharge and the reasons of patients who want to leave AMA.

5. Conclusion

Awareness of the factors involved in AMA discharge is important because of the potential to identify those at higher risk and thereby intervene earlier to prevent adverse consequences. Male gender, self-employed, to have co morbid substance abuse and previous hospitalizations and positive family history of psychiatric disorder are risk factors to discharge against medical advice.

Acknowledgments

The authors wish to thank all the nurses in psychiatry wards in Zare hospital, Sari, Iran.

References

Ahmadiabhari, S. A., Monirabbasi, M., Jafarnejad, P., & Zerrati, H. (2006). Factors Associated With Premature Discharge of Patients With Psychosis Against Medical Advice. *Iran J Psychiatry, 1*, 27-30.

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th edition) (DSM-IV). Washington DC: American Psychiatric Association.

Anis, A. H., Sun, H., Guh, D. P., Palepu, A., Schechter, M. T., & O'Shaughnessy, M. V. (2002). Leaving hospital against medical advice among HIV-positive patients. *CMAJ, 167*, 633-637.

Brook, M., Hilty, D. M., Liu, W., Hu, R., & Frye, M. A. (2006). Discharge against medical advice from inpatient psychiatric treatment: a literature review. *Psychiatr Serv, 57*(8), 1192-8. http://dx.doi.org/10.1176/appi.ps.57.8.1192

Chan, A. C., Palepu, A., & Guh, D. P. (2004). HIV-positive injection drug users who leave the hospital against medical advice: the mitigating role of methadone and social support. *J Acquir Immune DeficSyndr, 35*(1), 56-59. http://dx.doi.org/10.1097/00126334-200401010-00008

Ferber, J. S., Oswald, M., Rubin, M., Ungemack, J., & Schane, M. (1985). The day hospital as entry point to a network of long-term services: a program evaluation. *Hosp Community Psychiatry, 36*, 1297-301.

Gillis, K., Russell, V. R., & Busby, K. (1997). Factors associated with unplanned discharge from psychiatric day treatment programs, a multi center study. *General hospital psychiatry, 19*, 355-61. http://dx.doi.org/10.1016/S0163-8343(97)00052-2

Glick, I. D., Braff, D. L., Johnson, G., & Showstack, J. A. (1981). Outcome of irregularly discharged psychiatric patients. *Am J psychiatry, 138*, 1472-6.

Jeremiah, J., O'Sullivan, P., & Stein, M. D. (1995). Who leaves against medical advice? *J Gen Intern Med, 10*, 403-405. http://dx.doi.org/10.1007/BF02599843

Molnar, G., & Pinchoff, D. M. (1993). Factors in patient elopements from an urban state hospital and strategies for prevention. *Hosp Community Psychiatry, 44*, 791-92.

Nose, M., Barbui, C., & Tansella, M. (2003). How often do patients with psychosis fail to adhere to treatment programmes? A systematic review. *Psychol. Med., 33*(7), 1149-1160. http://dx.doi.org/10.1017/S0033291703008328

Said, A., Ibrahim, C., Kent, K., & Eswar, K. (2007). Factors Associated With Patients Who Leave Acute-Care Hospitals Against Medical Advice. *Am J Public Health, 97*(12), 2204-2208. http://dx.doi.org/10.2105/AJPH.2006.100164

Saitz, R., Ghali, W. A., & Moskowitz, M. A. (1999). Characteristics of patients with pneumonia who are discharged from hospital against medical advice. *Am J Med, 107*, 507-509. http://dx.doi.org/10.1016/S0002-9343(99)00262-4

Saitz, R. (2002). Discharges against medical advice: time to address the causes. *CMAJ, 167*(6), 647-648.

Senior, N., & Kibbee, P. (1986). Can we predict the patient who leaves against medical advice: The_search for a method. *Psychiatr Hosp, 17*, 33-36.

Sheikhmoonesi, F., Kabirzadeh, A., Yahyavi, S. T., & Mohseni, B. (2012). A prospective study of patients absconding from a psychiatrichospital in Iran. *Medicinski Glasnik, 9*, 346-350.

Smith, H. H. Jr. (1982). Discharge against medical advice (AMA) from an acute care private psychiatric hospital. *J Clin Psychol, 38*, 550-4. http://dx.doi.org/10.1002/1097-4679(198207)38:3<550::AID-JCLP2270380313>3.0.CO;2-Q

Stephen, W., Hwang, J. L., Rajesh, G., Vince, C., & Rochelle, E. M. (2003). What happens to patients who leave hospital against medical advice? *CMAJ, 168*(4), 417-420.

Targum, S. D., Capodanno, A. E., Hoffman, H. A., & Foudraine, C. (1982). An intervention to reduce the rate of hospital discharges against medical advice. *Am J Psychiatry, 139*(5), 657-659.

Tavallaei, S. A., Asari, Sh., Habibi, M., Khodami, H. R., Siavoshi, Y., & Nouhi, S. (2006). Discharge Against Medical Advice from Psychiatric Ward. *Journal of Military Medicine, 8*, 24-30.

Weingart, S. N., Davis, R. B., & Phillips, R. S. (1998). Patients discharged against medical advice from a general medicine service. *J Gen Intern Med, 13*, 568-571. http://dx.doi.org/10.1046/j.1525-1497.1998.00169.x

Wung, Y. T., Chen, C. C., Chen, F. C., & Lin, C. H. (2010). Schizophrenia patients discharged against medical advice at a mental hospital in Taiwan. *Psychiatry Clin Neurosci, 64*(4), 415-20. http://dx.doi.org/10.1111/j.1440-1819.2010.02103.x

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Effect of Dance Labor on the Management of Active Phase Labor Pain & Clients' Satisfaction: A Randomized Controlled Trial Study

Somayeh Abdolahian[1], Fatemeh Ghavi[2], Sareh Abdollahifard[2] & Fatemeh Sheikhan[3]

[1] Department of Nursing and Midwifery, Firuzabad Branch, Islamic Azad University, Fars, Iran

[2] Department of Nursing and Midwifery, Jahrom University of Medical Sciences, Jahrom, Iran

[3] Department of midwifery, Khalkhal branch, Islamic Azad University, Khalkhal, Iran

Correspondence: Fatemeh Ghavi, Faculty member, Department of Nursing and Midwifery, School of Nursing and Midwifery, University of Medical Sciences, Motahari Street, Jahrom, Iran. Tel: 98-791-334-1501. E-mail: ghavi.fatemeh@yahoo.com

Received: December 28, 2013 Accepted: January 23, 2014 Online Published: March 30, 2014

doi:10.5539/gjhs.v6n3p219 URL: http://dx.doi.org/10.5539/gjhs.v6n3p219

This study was granted by the Researches Department of Shiraz University of Medical Sciences and Firuzabad Islamic Azad University, year 2012-2013

Abstract

Background: There are a wide variety of non- pharmacologic pain relief techniques for labor which include pelvic movement, upright position, back massage and partner support during the first stage of labor. The effectiveness of dance labor- which is a combination of these techniques- has not been evaluated.

Aim: This study aimed to evaluate the effectiveness of dance labor in pain reduction and woman's satisfaction during the first stage of labor.

Methods: 60 primiparous women aged 18-35 years old were randomly assigned to dance labor and control groups. In the dance labor group, women were instructed to do standing upright with pelvic tilt and rock their hips back and forth or around in a circle while their partner massaged their back and sacrum for a minimum of 30 minutes. In the control group, the participants received usual care during physiologic labor. Pain and satisfaction scores were measured by Visual Analogue Scale. Data were analyzed by using the t. test and Chi-square.

Findings: Mean pain score in the dance labor group was significantly lower than the control group ($P < 0.05$). The mean satisfaction score in the dance labor group was significantly higher than in the control group ($P < 0.05$).

Conclusion: Dance labor which is a complementary treatment with low risk can reduce the intensity of pain and increase mothers, satisfaction with care during the active phase of labor.

Keywords: dance, labor, management, pain, satisfaction

1. Introduction

Women are increasingly expecting to participate in decisions about their healthcare, especially during childbirth (Lothian, 2009). There are choices to be made during childbirth such as labor pain relief methods, and each method has risks and benefits, with different effectiveness, availability, and acceptability (Lally, Murtagh, Macphail, & Thomson, 2008). There are various kinds of non-pharmacologic pain relief techniques which include positioning, movement, and massage (Simkin & Bolding, 2004).

One common non-pharmacologic method is the upright position during the first stage of labor (Storton, 2007). The supine position is purported to adversely affect heart rate and blood flow of the fetus and might increase maternal stress hormones, thereby decreasing uterine contractility and progress of labor (Lawrence, Lewis, Hofmeyr, & Dowswell, 2009). But the upright position during the first stage of labor uses gravity to help contractions, while decreasing the pain most women feel (Souza, Miquelutti, Cecatti, & Makuch, 2006) and this may improve maternal comfort and reduce the need for analgesia (Simkin & O'hara, 2002). In addition, labor

without bed confinement became a symbol ofmothers, empowerment and the humanization of labor (Souza et al., 2006). Also the upright position enhances the descent of the fetal head with a shorter duration in first and second stages of labor (Liu, 1989; Calvo Aguilar, Flores Romero, & Morales, 2013; Lawrence, Lewis, Hofmeyr, Dowswell, & Styles, 2009).

The upright position can be help ful until the mother has enough energy to be upright; and then leaning on a labor partner makes it easier for the mother to support her body weight (http://www.birthingnaturally.net/cn/position/dance.html). Support by a family member during delivery could significantly decrease the number of invasive procedures during and after the delivery (Kaźmierczak, Fiegler, Wegrzyn, & Cholewa, 2006). This finding has strong implications for maternity practices in countries such as Islamic Republic of Iran, in which maternity wards rarely encourage husbands be present during childbirth (Sapkota, Kobayashi, Kakehashi, Baral, & Yoshida, 2012). The World Health Organization (WHO) (2009) has recommended that a parturient woman be allowed to have a birth companion she trusts and with whom she feels at ease. However, these recommendations do not tend to be followed in facility-based births in many developing countries, including Islamic Republic of Iran.

In addition, the massaged mothers, either on the back or sacrum in the first stage or on perinea in the second stage, reported a decrease in pain and also had significantly shorter labors, shorter hospital stay and less postpartum depression (Field, Hernandez-Reif, Taylor, Quintino, & Burman, 1979; Hajiamini, Masoud, Ebadi, Mahboubh, & Matin, 2012; Sanders, Peters, & Campbell, 2005)

Pelvic tilt exercise appears to be effective in reducing ligament pain intensity and also pain duration. As a nurse-midwifery strategy, this exercise promotes patient comfort and facilitates self-care in pain relief during pregnancy (Andrews & O'Neill, 1994). Pelvic movement or rocking, either on a chair or swaying back and forth, allows the woman's pelvic to move and encourages the fetus to descend. It must be reinforced that in upright position, gravity helps delivery of the fetus (Lawrence et al., 2009).

These inexpensive non-pharmacologic methods can be combined or used sequentially to enhance the overall effect (Simkin & Bolding, 2004). These combinations of upright position, pelvic movement, back massage, and partner support during the first stage of labor has been termed dance labor. The dance labor with music to encourage a gentle rhythm promotes a very relaxing environment and allows the partner to have access to the mother's back for massage or pressure (Simkin & Ancheta, 2011).

In Iranian society, vaginal birth is anticipated as a painful and lengthy process, with low cultural acceptance and resulting in less income for obstetricians. Therefore qualitative study conducted in Islamic Republic of Iran showed that most of the factors identified by participants facilitated the choice of cesarean section (Bagheri, MasoudiAlavi, & Abbaszadeh, 2013). Currently there are few educational opportunities and limited researches on complementary and alternative medicine used in midwifery practice; these shortfalls need to be addressed by the profession (Halla, McKennab, & Griffiths, 2012).

Women may have ideal hopes of what they would like to happen with respect to pain relief, control, and engagement in decision-making, but experience is often very different from expectations (Lally et al., 2008). The massaged mothers reported a decrease in depressed mood and anxiety, showed less agitated activity and had more positive affect during labor (Field et al., 1997). Also, when a woman's husband is present at birth, she feels more in control during labor (Sapkota et al., 2012) and this helps to reduce maternal anxiety during childbirth (Chunuan et al., 2009) and finally leads to a more positive birth experience (Campero et al., 1998). In the literature there is no study about the effects of dance labor on pain relief and satisfaction of women.

The purpose of this study was to evaluate the effectiveness of dance labor in pain relief and the woman's satisfaction during the first stage of labor.

2. Subjects and Methods

In this randomized controlled trial using convenience sampling, 60 volunteer primiparous women were recruited from one of the large general public hospitals of Shiraz University of Medical Sciences, in Fars province- Iran. The study protocol was approved by the ethics committee of Shiraz University of Medical Sciences, and ethical permission was obtained from this committee.

Demographic characteristics such as age, education level, gestational age, and occupation were obtained from the medical records of participants. The investigator, who was an experienced midwife, performed a clinical examination to record dilatation, effacement, station, position, duration and interval of uterine contractions, and fetal heart rate.

The study sample included primiparous women aged 18 to 35 years old with single pregnancies, cephalic

presentation of fetuses, 38 to 40 complete weeks of gestation, anticipation of a normal birth, and no history of infertility. After describing the aim of the research and obtaining informed consent, we randomized those women in the first stage of active-phase labor with cervical dilatation between 4 and 10 centimeters into 2 groups. Randomization was accomplished with a table of random numbers. If the number was even, the woman was assigned to the dance labor group (group 1), and if the number was odd, the woman was assigned to the control group (group 2). If there was a need for analgesic medication, or if obstetric complications occurred, the participant was immediately referred to an obstetrician and other professionals as needed, then excluded from the study.

In the dance labor group, women were instructed to do standing upright with pelvic tilt and rock their hips back and forth or around in a circle while their partner-who was instructed to stand in front of them, massaged their back and sacrum for a minimum of 30 minutes. During these movements, participants were instructed to rest their arms on their partner's shoulders. Women in this group were instructed to remain upright at least for 30 minutes to record pain score.

In the control group, the participants could select their own position and received usual care during physiologic labor, without ambulating or any intervention.

In both groups all stages of labor were completed in a labor room with equal environmental conditions such as room temperature, light, sound, equipment. No pain management intervention was provided to the control group. Women in both groups spent active phase of labor with their husband or family members and usual clinical examination (station, dilatation, effacement) was accomplished every 2 hours, and fetal heart rate was monitored every 30 minutes throughout the active phase of labor.

The study was supervised by an experienced midwife and in both groups the pain score was recorded by the participants using a visual analogue scale (VAS) of 0 (lack of pain) to 10 (most severe pain they had experienced). Pain scores were measured in both groups before labor and then obtained every 30 minutes in both groups until cervical dilation reached 10cm.

VAS was used for measurement of satisfaction as well as the pain recordings (0-10 cm, 0=worst possible, 10=best possible). The measurements of satisfaction were accomplished after birth and the mothers in both groups were asked to score their satisfaction about birth process.

To further reduce bias, researchers were instructed not to give verbal information about the possible effects of the dance labor to participants before and during the study. Also, the individual responsible for data analysis was masked to the study purposes to minimize any bias that might arise from knowledge about the participants. This ensured us that, as far as possible, differences came only from the effect of dance labor usage.

In this study the pain scores, duration of the active phase and satisfaction in dance labor and control groups were compared by using the t test in SPSS version 14. The demographic characteristics were analyzed by t test and chi-square test. P value less than 0.05 was considered significant.

3. Results

Sixty primiparous women were enrolled in this study. Demographic characteristics of subjects (mean age, educational level, occupation and gestational age) are shown in Table 1.

Table 1. Demographic characteristics of subjects in control and dance labor groups

Characteristic	Control	Dance labor	P. Value
Mean age (Mean ± SD)	25.13±4.82	22.96±4.37	0.07
Educational Level (Under diploma)	36.66%	40%	0.062
Occupation (House keeper)	96.66%	86.66	0.23

The mean score of pain severity in the dance labor group was significantly less than that of the control group.

There were significant differences between the pain scores of the women in the dance labor group before intervention (p=0,008) and 30 min after intervention (p=0.012) and 60 minutes after intervention (p=0.036) when compared with the pain scores of the women in the control group (Figure 1).

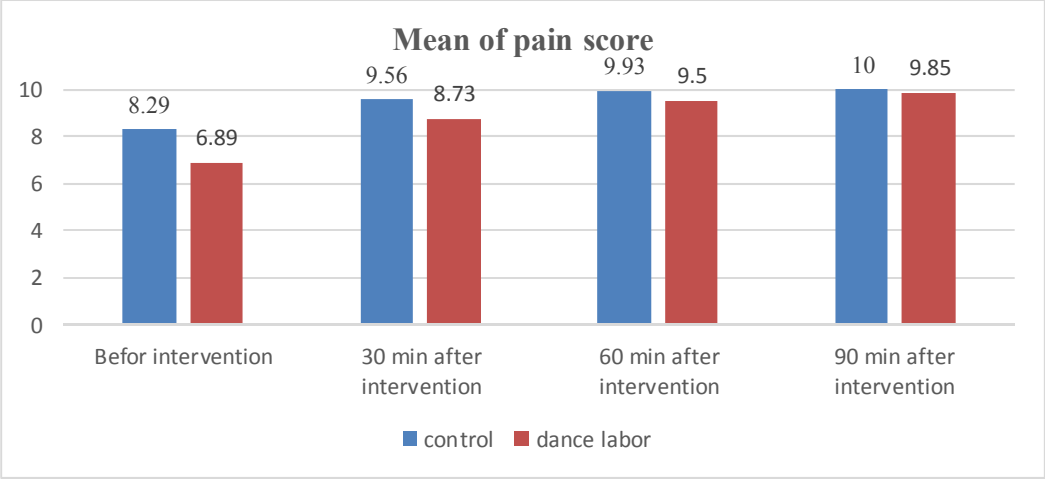


Figure 1. Mean of pain score in dance labor and control groups evaluated by (VAS)

Also, this study showed no significant difference in the duration of active phase of labor between groups.

There was significant difference in the mean scores of satisfaction between the two groups (p=0.021). The mean satisfaction score in the dance labor group was significantly higher than control group. (Table 2)

Table 2. Mean of satisfaction score after birth in dance labor and control groups evaluated by (VAS)

Satisfaction	Control	Dance labor
Mean±SD	4.13 ±1.041	4.66±0.6609
P.Value	P= 0.021*	

* Significant.

4. Discussion

This study found that dance labor can reduce the intensity of pain and increase the satisfaction of mothers during the active phase of labor.However, no study evaluated effects of dance labor but the effects of massage therapy, upright position, and partner contribution on pain labor, duration of active phase of labor, and maternal satisfaction have evaluated (Simkin & Bolding, 2004; Tournaire & Theau-Yonneau, 2007).

In our study, duration of first stage of labor was not significant between groups. Therefore upright position as a safe and well-accepted option for the women during the first stage of labor might not contribute towards a shorter duration of labor. But Lawrence's study showed that first stage of labor for upright women was approximately one hour shorter than recumbent women (Lawrence et al., 2009). In the study of Andrews and O'Neill (1994) women in the upright position group had significantly shorter phase of maximum slope in labor). In our study, labor pain was measured during active labor phase, hence not permitting the determination of the effect of dance labor during different stages of labor. Lawrence's (2009) study showed that there were no differences between upright women and recumbent women groups for length of the second stage of labor, or wellbeing of women and babies. The systematic review of six trials showed that three trials showed decreased pain in upright positions, two found no difference, and one (in which women were forced to remain upright throughout the first stage) found increased pain (Gupta & Hofmeyr, 2012). In our study, the upright women were forced to remain upright at least for 30 min to record pain and they had significantly lower pain than control group. Since standing position and pelvic movement cause women to become tired, most women in intervention group wanted to lie down after 90 min. Liu found that upright position enhanced the descent of the fetal head with a shorter duration of labor in first and second stages (Liu, 1989).

Effect of dance labor on pain was consistent with the findings of other studies which showed that there was significant reduction in pain reported by women in the massage group (Sanders et al., 2005), upright position (Simkin & O'hara., 2002) pelvic tilt (Suputtitada, Wacharapreechanont, & Chaisayan, 2002) accompanied by husband (Sapkota et al., 2012) or family at birth (Susan, Lindner, Jacqueline, & McGrath, 2012). This is also in

agreement with findings by Janssen, Shroff and Jaspar (2012) which demonstrated that massage in the first stage of labor reduced pain severity in pregnant women.

In our study, pain score in the dance labor group was significantly lower than the control group but Janssen et al. reported that scores on the McGill Pain Scale were insignificantly lower in the massage group. It must be stated that in our study back massage by the partner was combined with pelvic tilt and upright position was applied during the first stage of labor, but in the study by Janssen et al. (2012), massage was applied by a massage therapist on different locations of body. In the study by Field et al. (1997) massage of head, back, hands and feet of pregnant women by their partners during labor caused less pain and anxiety in women, and improved their mood. In the study by Chang et al. massage was performed three times and pain intensity, rated by using a present behavioral intensity (PBI) scale, reduced in the massage group at each phase of labor (Chang, Wang, & Chen, 2002). In another study performed by Chang et al. massage reduced pain intensity at cervical dilation up to 7 cm, but after this phase there were no significant differences between the groups. However, the study design and duration time of massage (60 min) was different from other studies (Chang, Chen, & Huang, 2006). Since in our study the participants in the control group only received usual care during labor, more attention to the intervention group by their partners might affect reporting pain scores and this might cause bias in the findings.

In this study dance labor reduced the pain scores reported by women during the active phase of labor. In the study of Taavoni et al. (2011) pelvic tilt by using a birth ball had no effect on the duration of the active phase of labor but this complementary treatment could reduce the pain during labor.

In other studies, sitting pelvic tilt exercises during the third trimester in primi gravid reduced back pain intensity (Suputtitada et al., 2002; Susan et al., 2012). However it must be stated that pelvic floor muscle activation during vaginal delivery might represent an obstacle to fetal descent and increase the risk of pelvic floor injuries (Parente, Natal Jorge, Mascarenhas, & Silva-Filho, 2010). Dance labor might detract the attention of women during labor and therefore reduce pelvic floor muscle activation. Mothers who have the support of a partner during delivery experience fewer childbirth complications and less postpartum depression (Iliadou, 2012). Since family support might cause bias in results, in our study partners were present in both groups. Providing the information to mothers, partners, and family members allows the pregnant women to feel that she is not alone during labor (Susan et al., 2012). Birth is the beginning of fatherhood for men and their lack of knowledge causes their unclear role during labor (Longworth & Kingdon, 2011). In our study, the pain score was not different between women who had husband and those who had another family member as partner during labor.

In recent decades, the importance of satisfaction with health care has been emphasized (Kankaanpaa, Taimela, Airaksinen, & Hanninen, 1999) and this is being used by health care managers in evaluating the quality of care, and by policy makers in making decisions about the organization of health services (Flint, 1997).

One trial assessed satisfaction of walking option during labor, which was very high in the upright group. No trial found any harm associated with the upright position (Gupta et al., 2012).

There are different methods to evaluate satisfaction and VAS, although a crude measurement, is one of many well-recognized methods to measure satisfaction (Brown & Lumley, 1997).

In this study the mean satisfaction score in dance labor group was significantly higher than in the control group. It is in agreement with the findings of Zahrani et al. that showed the application of back massage during labor increased mothers, satisfaction (Zahrani, Honariou, Jannesari, & Alavimajd, 2006).

In the study of Andrews and O'Neill (1994), the comfort level of upright women was not significantly different from women in the recumbent group.

In our study, satisfaction of mothers about the total experience of childbirth was evaluated but it seems that if women be able to successfully manage their childbirth pain, they may evaluate themselves more satisfactorily than they evaluate the total experience. Therefore, measuring only total childbirth satisfaction may give an incomplete reflection of women's satisfaction with the childbirth experience. It might be helpful in future studies if the comfort level of women during dance labor would be evaluated.

Many conceptualizations of satisfaction refer to expectations as a major determining factor of satisfaction (Hodnett, 2002). It must be stated that women whose expectations for childbirth were met are more satisfied than those whose expectations were not (Christiaens & Bracke, 2007). Expectations are related to several aspects of delivery, such as emotions (Goodman, Mackey, & Tavakoli, 2004), labor duration (Booth & Meltzoff, 1984), the need for interventions (Goodman et al., 2004), the condition of the child (Booth & Meltzoff, 1984) and the support of the partner and the medical staff (Gibbins & Thomson, 2001). The expectations of mothers were not considered in this study.

Limitations of our study should be considered. In this study, history of pain experience was not evaluated but this item could have effects on labor pain score. Although masking of women and their birth attendants was not possible, the person who analyzed the data was not informed about the aim of our study.

However future studies might be necessary to evaluate dance movements effectiveness during pregnancy and postpartum period. Dancing movements of women with their husbands during pregnancy might improve the relationship of family members and also these exercises might help them to do dance labor during labor.

5. Conclusion

Dance labor, which is a complementary treatment with low risk, can reduce the intensity of pain and increase the satisfaction of mothers with care during the active phase of labor.

References

Andrews, C. M., & O'Neill, L. M. (1994). Use of pelvic tilt exercise for ligament pain relief. *J Nurse Midwifery, 39*(6), 370-4. http://dx.doi.org/10.1016/0091-2182(94)90156-2

Bagheri, A., Masoudi Alavi, N., & Abbaszadeh, F. (2013). Iranian obstetricians' views about the factors that influence pregnant women's choice of delivery method: A qualitative study. *Women and Birth, 26*(1), 45-49. http://dx.doi.org/10.1016/j.wombi.2012.09.004

Booth, C. L., & Meltzoff, A. N. (1984). Expected and actual experience in labor and delivery and their relationship to maternal attachment. *Journal of Reproductieve and Infant Psychology, 2*, 79-91. http://dx.doi.org/10.1080/02646838408403452

Brown, S., & Lumley, J. (1997). The 1993 survey of recent mothers: issues in survey design, analysis and influencing policy. *International Journal of Quality in Health Care, 9*, 264-75. http://dx.doi.org/10.1093/intqhc/9.4.265

Calvo Aguilar, O., Flores Romero, A. L., & Morales, G. (2013). Comparison of obstetric and prenatal results of childbirth vertical position vs. *VE Ginecol Obstet Mex, 81*(1), 1-10.

Campero, L., Garcia, C., Diaz, C., Ortiz, O., Reynoso, S., & Langer, A. (1998). "Alone, I wouldn't have known what to do": A qualitative study on social support during labor and delivery in Mexico. *Soc Sci Med, 47*(3), 395-403. http://dx.doi.org/10.1016/S0277-9536(98)00077-X

Chang, M. Y., Chen, C. H., & Huang, K. F. (2006). A comparison of massage effects on labor pain using the McGill Pain Questionnaire. *J Nurs Res, 14*, 190. http://dx.doi.org/10.1097/01.JNR.0000387577.51350.5f

Chang, M. Y., Wang, S. Y., & Chen, C. H. (2002). Effects of massage on pain and anxiety during labour: a randomized controlled trial in Taiwan. *J Adv Nurs, 38*, 68. http://dx.doi.org/10.1046/j.1365-2648.2002.02147.x

Christiaens, W., & Bracke, P. (2007). Assessment of social psychological determinants of satisfaction with childbirth in a cross-national perspective. *BMC Pregnancy Childbirth, 7*, 26. http://dx.doi.org/10.1186/1471-2393-7-26

Chunuan, S., Somsap, Y., Pinjaroen, S., Thitimapong, S., Nangham, S., & Ongpalanupat, F. (2009). Effect of the presence of family members, during the first stage of labor, on childbirth Outcomes in a Province Hospital in Songkhla Province, Thailand. *Thai J Nurs Res, 13*(1), 16-27.

Field, T., Hernandez-Reif, M., Taylor, S., Quintino, O., & Burman, I. (1979). Labor pain is reduced by massage therapy. *J Psychosom Obstet Gynaecol, 18*(4), 286-91. http://dx.doi.org/10.3109/01674829709080701

Flint, C. (1997). Using the stairs. *MIDIRS Midwifery Digest, 7*(2), 186.

Gibbins, J., & Thomson, A. M. (2001). Women's expectations and experiences of childbirth. *Midwifery, 1*, 302-313. http://dx.doi.org/10.1054/midw.2001.0263

Goodman, P., Mackey, M. C., & Tavakoli, A. S. (2004). Factors related to childbirth satisfaction. *Journal of Advanced Nursing, 46*, 212-219. http://dx.doi.org/10.1111/j.1365-2648.2003.02981.x

Gupta, J., & Hofmeyr, G. (2012). Position for women during second stage of labour (Cochrane Review). *Cochrane Database Syst Rev, 5*, CD002006. http://dx.doi.org/10.1002/14651858

Hajiamini, Z., Masoud, S. N., Ebadi, A., Mahboubh, A., & Matin, A. A. (2012). Comparing the effects of ice massage and acupressure on labor pain reduction. *Complement Ther Clin Pract, 18*(3), 169-72. http://dx.doi.org/10.1016/j.ctcp.2012.05.003

Halla, H. G., McKennab, L. G., & Griffiths, D. L. (2012). Midwives support for Complementary and Alternative Medicine: A literature review. *Women and Birth, 25*(1), 4-12. http://dx.doi.org/10.1016/j.wombi.2010.12.005

Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: A systematic review. *American Journal of Obstetrics and Gynecology, 186*, 160-72.

Iliadou, M. (2012). Supporting women in labour. *Health science journal, 6*(3), 385-391.

Janssen, P., Shroff, F., & Jaspar, P. (2012). Massage therapy and labor outcomes: a randomized controlled trial. *AInt J Ther Massage Bodywork, 5*(4), 15-20.

Kankaanpaa, M., Taimela, S., Airaksinen, O., & Hanninen, O. (1999). The efficacy of active rehabilitation in chronic low back pain. Effect on pain intensity, self-experienced disability, and lumbar fatigability. *Spine, 249*(10), 1034-1042.

Kaźmierczak, W., Fiegler, P., Wegrzyn, P., & Cholewa, D. (2006). The role of a family delivery in the modern obstetrics. *WiadLek, 59*(5-6), 317-20. http://dx.doi.org/10.1097/00007632-199905150-00019

Labor position. Labor dance. (2013). Retrieved from http://www.birthingnaturally.net/cn/position/dance.html

Lally, J. E., Murtagh, M. J., Macphail, S., & Thomson, R. (2008). More in hope than expectation: a systematic review of women's expectations and experience of pain relief in labour. *BMC Medicine, 6*, 7 http://dx.doi.org/10.1186/1741-7015-6-7

Lawrence, A., Lewis, L., Hofmeyr, G. J., Dowswell, T., & Styles, C. (2009). Maternal positions and mobility during first stage labour. *Cochrane Database Syst Rev,* (2), CD003934. http://dx.doi.org/10.1002/14651858

Lindner, S. L., & McGrath, J. M. (2012). Family-Centered Care and Continuous Labor Support. *NAINR, 12*(2), 70-72.

Liu, Y. C. (1989). The effects of the upright position during childbirth. *Mage J Nurs Sch, 21*(1), 14-8. http://dx.doi.org/10.1111/j.1547-5069.1989.tb00091.x

Longworth, H. L., & Kingdon, C. K. (2011). Fathers in the birth room: what are they expecting and experiencing? A phenomenological study. *Midwifery, 27*(5), 588-94. http://dx.doi.org/10.1016/j.midw.2010.06.013

Lothian, J. E. (2009). Safe, Healthy Birth: What Every Pregnant Woman Needs to Know. *J Perinat Educ, 18*(3), 48-54. http://dx.doi.org/10.1624/105812409X461225

Parente, M. P., Natal Jorge, R. M., Mascarenhas, T., & Silva-Filho, A. L. (2010). The influence of pelvicmuscle activation during vaginal delivery. *Obstet Gynecol, 115*(4), 804-8. http://dx.doi.org/10.1097/AOG.0b013e3181d534cd

Sanders, J., Peters, T. J., & Campbell, R. (2005). Techniques to reduce perineal pain during spontaneous vaginal delivery and perineal suturing: a UK survey of midwifery practice. *Midwifery, 21*(2), 154-60. http://dx.doi.org/10.1016/j.midw.2004.12.003

Sapkota, S., Kobayashi, T., Kakehashi, M., Baral, G., & Yoshida, I. (2012). In the Nepalese context, can a husband's attendance during childbirth help his wife feel more in control of labour? *BMC Pregnancy and Childbirth, 12*, 49. http://dx.doi.org/10.1186/1471-2393-12-49

Simkin, P. P., & O'hara, M. (2002). Non pharmacologic relief of pain during labor: systematic reviews of five methods. *Am J Obstet Gynecol, 186*, S131-159.

Simkin, P., & Ancheta, R. (2011). The Labor Progress Handbook: Early Interventions to Prevent and Treat Dystocia (3th ed.). Willey Blackwell.

Simkin, P., & Bolding, A. (2004). Update on non pharmacologic approaches to relieve labor pain and prevent suffering. *Journal of Midwifery and Women's Health, 49*, 489-504. http://dx.doi.org/10.1016/j.jmwh.2004.07.007

Souza, J. P., Miquelutti, M. A., Cecatti, J. G., & Makuch, M. Y. (2006). Maternal position during the first stage of labor: a systematic review. *Reproductive Health, 3*, 10. http://dx.doi.org/10.1186/1742-4755-3-10

Storton, S. (2007). The Coalition for Improving Maternity Services: Evidence basis for the ten steps of mother-friendly care. Step 4: Provides the birthing woman with freedom of movement to walk, move, assume positions of her choice. *J Perinat Educ, 16*(suppl 1), 25-27. http://dx.doi.org/10.1624/105812407X173164

Suputtitada, A., Wacharapreechanont, T., & Chaisayan, P. (2002). Effect of the "sitting pelvic tilt exercise" during the third trimester in primigravidas on back pain. *J Med Assoc Thai, 85*(Suppl 1), 170-9.

Taavoni, S., Abdolahian, S., Haghani, H., & Neysani, L. (2011). Effect of Birth Ball Usage on Pain in the Active Phase of Labor: A Randomized Controlled Trial. *Midwifery and Women Health, 56*(2), 137-140. http://dx.doi.org/10.1111/j.1542-2011.2010.00013.x

TorkZahrani, S. H., Honariou, M., Jannesari, S. H., & Alavimajd, H. (2006). Effects of massage on delivery satisfaction in primipaous women referring to Ayatollah shaheedBeheshti hospital in Isfahan. *Faculty of nursing of midwifery, 16*(53), 3-10.

Tournaire, M., & Theau-Yonneau, A. (2007). Complementary and Alternative Approaches to Pain Relief during Labor. *Evid Based Complement Alternat Med, 4*(4), 409-417. http://dx.doi.org/10.1093/ecam/nem012

World Health Organization. (2009). *Integrated management of pregnancy and childbirth*. WHO recommended interventions for improving maternal and newborn health. Geneva: WHO Press.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

The Frequency of Smoking and Common Factors Leading to Continuation of Smoking among Health Care Providers in Tertiary Care Hospitals of Karachi

Muhammad Shahzeb Khan[1], Faizan Imran Bawany[1], Muhammad Umer Ahmed[2], Mehwish Hussain[1], Noreen Maqbool Bukhari[3], Nighat Nisar[3], Maham Khan[1], Ahmed Raheem[4] & Mohammad Hussham Arshad[4]

[1] Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan

[2] Ziauddin Medical University, Karachi, Pakistan

[3] Community Medicine Department, Dow University of Health Sciences, Karachi, Pakistan

[4] Aga Khan University Hospital, Karachi, Pakistan

Correspondence: Muhammad Shahzeb Khan, 109/2 Khayabane Amir Khusro Phase 6 DHA, Karachi, Pakistan. Tel: 0321-2066743. E-mail: shahzebkhan@gmail.com

Received: December 30, 2013 Accepted: January 24, 2014 Online Published: March 30, 2014

doi:10.5539/gjhs.v6n3p227 URL: http://dx.doi.org/10.5539/gjhs.v6n3p227

Abstract

Background: The primary objective of the study was to find out the frequency of tobacco smoking among health care providers in tertiary care hospitals of Karachi. The secondary objective was to identify the common factors responsible for the continuation of smoking.

Method: This cross sectional study was conducted in the wards and out-patient departments of three selected tertiary hospitals of Karachi. A total of 180 health care providers were enrolled in the study using proportionate stratified sampling. Postgraduate students, house officers and trainees were excluded from the study. Data were collected from randomly selected health care providers using survey methodology. SPSS v. 20.0 was used to enter and analyze the data.

Results: Fifty two participants out of 180 were smokers for past one year (28.9%). Among them, 21 (11.7%) smoked more than 5 cigarettes per day. Twenty smokers (11.1%) were found to smoke due to peer influence. It was found that those who were influenced by their peers were 8.33 times more prone to be addicted to smoking than those who were less influenced. Similarly, the likelihood of addiction increased up to 76.9% with the lack of incentives.

Conclusion: Our results clearly indicate that a large number of health care providers smoke which should be a serious concern. Hence our health agencies should take immediate action in order to curtail the heaving burden of smoking and its related health consequences.

Keywords: smoking, healthcare providers, tertiary care hospitals, factors

1. Introduction

Cigarette smoking is the largest preventable risk factor for morbidity and mortality in developed countries, where at least one in four adults smoke cigarettes (Thomson, Chaudhuri, & Livingston, 2004). Situation in the developing countries is even worse. It is estimated that by 2030 the developing world is expected to have 7 million deaths annually from tobacco use (Abdullah & Husten, 2004). Unfortunately, Pakistan is one of those countries where despite escalating knowledge and awareness programs, cigarette smoking is ever rising. With the smoking epidemic, the role of health care providers is most crucial in lowering down the smoking rates among the masses & thereby preventing many avoidable diseases.

Most ironical fact is that healthcare providers too have tendency to smoke. This is a global issue. Health Care Providers all over the world have been identified to be involved in smoking, at least to some extent. An American study (Serna, Bialuos, Sinha, Yang, & Wewers, 2010) indicates that in 2006/2007, Licensed Practical Nurses had the highest prevalence of tobacco smoking (20.55%) followed by respiratory therapists (19.28%). Physicians had a prevalence of 2.31%, dentists (3.01%), pharmacists (3.25%), and Registered Nurses (10.73%).

The overall prevalence of smoking among health care providers was 9.85% (Serna et al., 2010). Similarly, a study from China (Yan et al., 2008) identified 20.8% of health care providers as current smokers. Smoking among physicians was very high (35.7%) according to this study and 59.7% of the respondents believed that inadequate knowledge was responsible for their continuation of smoking.

There are very few local studies addressing this problem. Little work has been done on a large scale to find the prevalence of smoking among health care providers and the significant factor responsible for their continuation of smoking besides its hazardous effects. A recent study from Lahore (Malick et al., 2010) conducted at Mayo hospital found out the frequency of smoking among doctors to be 37.18% and in paramedical staff to be 35.74%. Most of them initiated smoking due to the influence of friends. Majority of doctors and paramedics found smoking as relaxing/addicting and was the main reason they couldn't quit. Main factors responsible for continuation of smoking were addiction (Doctors 38%, Paramedics 42%), lack of will power (Doctors 21%, Paramedics 27%) and lack of incentive (Doctors 24%, Paramedics 12%). On the other hand, among general practitioners, 36% were found to be cigarette smokers, who consumed 12.48 cigarettes per day and had 18.76 average years of smoking. Half of them had been smoking for more than 20 years (Nawaz & Naqvi, 2010).

Physicians who smoke are less likely to advise patients to quit smoking. Also, it is less expected from them to assess patient's will to refrain from smoking (Asfar, Al-Ali, Ward, Vander Weg, & Maziak, 2011). In addition to all the smoking related health hazards that health care providers are exposed to, they are also not able to counsel their patients effectively. It is evident that if health care providers themselves smoke, they cannot educate masses regarding smoking cessation.

There is a need of a large scale study involving more than one tertiary care hospitals to find out the frequency of smoking among health care providers (both doctors & paramedics) and to appraise the reasons behind their continuation of smoking despite their medical edification. This study will help to identify factors responsible for continuation of smoking so that recommendations can be made for its cessation among health care providers and thereafter the community. The primary objective of the study was to find out the frequency of tobacco smoking among health care providers in tertiary care hospitals of Karachi. The secondary objective was to identify the common factors responsible for the continuation of smoking among health care providers.

2. Methods

This cross sectional study was conducted in wards and out-patient departments of three selected tertiary hospitals of Karachi namely Civil Hospital, PNS Shifa and Liaquat National Hospital. A sample size of 163 was calculated at 95% confidence interval by keeping the smallest frequency of responsible factors that was lack of incentive among paramedics as 12% (Malick et al., 2010). So a total of 180 health care providers were enrolled in the study using proportionate stratified sampling.Postgraduate students, house officers and trainees were excluded from the study. Doctors and paramedics (nurses and technicians) of either gender who were working in tertiary care hospitals were only included in the study. However, doctors and paramedics who were working in hospitals where beds were less than 200 were also excluded from the study.

In Karachi there are 110 private and public hospitals in a ratio of 2:1. So 2 private and 1 public hospital were selected to generalize our findings accurately. Proportionate sample was taken from each hospital. Doctors and paramedical staff were listed according to their hospital identity number provided by the hospitals to form sampling frame. Total number of doctors and paramedical staff at civil hospital were 604 and 1850 respectively and their proportionate sample calculated was 32 and 96 respectively. Therefore randomly we selected first doctor and paramedical staff by random number table and moved down the column selecting appropriate numbers that identified 32 doctors and 96 paramedical staff. Similarly for PNS Shifa and Liaquat National Hospital randomly we selected first and moved down until we identified 5 doctors and 16 paramedical staff for PNS Shifa and 6 doctors and 25 paramedical staff for Liaquat National hospital.

After ethical review committee of Dow University of Health Sciences (DUHS) approval, data collection started. Principal investigator explained the nature and purpose of study to all selected participants. Data were collected from randomly selected health care providers using survey methodology until the sample size was achieved. Confounder was managed through randomized selection of subjects. Confidentiality and anonymity was maintained to obtain as frank answers as possible. To avoid non response bias, questionnaire used (Global adult tobacco survey collaborative group, 2011) was not too long and did not take much time to complete. The questionnaire comprised of three parts. Part A was designed to measure socio-demographic data including age, gender, type of health care provider, department, specialty, duration of occupation. Part B was about the smoking status. Part C determined the socio demographic, environmental and personal factors, which could contribute in the continuation of current smoking among health care providers. The factors that were assessed were influence

of friend/peer pressure, addiction, lack of will power and lack of incentive which have previously been identified as significantly associated with smoking among health care providers (Yan et al., 2008). The operational definition for these factors was taken as:

Lack of will power: It is the inability to try to quit smoking ever in the past.

Lack of incentive: Lack of due promotions and increments in salary despite putting in efforts.

Influence of friends and peer pressure: If a person spends more than 6hours (25% of the day) in the company of those friends or colleagues who smoke and if the majority (>50%) of his friends are smokers he is influenced by them.

Addiction: A person is addicted if he smokes even at workplace and home and the absence of smoking causes inability to continue routine work.

SPSS v. 20.0 was used to enter and analyze the data. Categorical variables were presented as frequencies with percentages. Mean and standard deviation was computed for continuous variable i.e. age. Chi-Square test of association was used to see effect of demographic variables on factors leading to smoking habits. Odds ratio was computed for estimating the effect within factors. P Value less than 0.05 was considered to show significant effect.

3. Results

There were total 116 (64.4%) males and 64 (35.6%) females. Most of them (n = 128, 71.1%) were from public university (DUHS). Forty three were doctors, 67 nurses and 70 were technicians. Fifty five percent were working in medicine department. The remaining 45% (n = 81) were employees of surgery department.

Fifty two participants were smokers for the past one year (28.9%). Among them, 21 (11.7%) smoked more than 5 cigarettes per day. (Table 1)

Twenty two (12.2%) participants had more than fifty percent smoker friends. The frequency of participants spending hours with such friends for more than 6 hours was same (n = 22, 12.2%). Though, 20 (11.1%) were found to smoke due to peer influenced as described in our operational definition.

At workplace, 18.9% (n = 34) participants smoked while 35 (19.4%) participants reported to smoke at home. Thirty one (17.2%) participants acknowledged that they were not able continue work in the absence of smoking. Though, only 21 (11.7%) of them were found to be addicted with smoking.

Twenty nine participants (16.1%) were unable to quit smoking ever and hence found to have lack of will power. Seventeen (9.4%) participants were not getting their promotion on time and 23 (12.8%) had no due salary increment. Sixteen (8.9%) ensued lack of incentive in their organization. (Table 1)

Table 1. Shows the frequency of different variables among the sample population

		Frequency	**Percent**
Gender	male	116	64.4
	female	64	35.6
Hospital/Institute	DUHS	128	71.1
	Shifa	21	11.7
	liaquat	31	17.2
Type of Health care provider	doctor	43	23.9
	nurse	67	37.2
	technician	70	38.9
Department	medicine	99	55
	surgery	81	45
Are you a smoker for the past one year?	yes	52	28.9
	no	128	71.1
Number of cigarettes that you smoke per day	less than 5	31	59.6
	more than 5	21	40.4
How many of your friends or colleagues smoke?	less than 50%	30	57.7
	more than 50%	22	42.3

How many hours do you spend in the company of your smoker friends?	less than 6 hrs	30	57.7
	more than 6 hrs	22	42.3
Influence of friends and peer pressure	Not Influenced	32	61.5
	Influenced	20	38.5
Do you smoke at work place?	no	18	34.6
	yes	34	65.4
Do you smoke at home?	no	17	32.7
	yes	35	67.3
Are you able to continue routine work in the absence of smoking?	yes	21	40.4
	no	31	59.6
Addiction	Not Addicted	31	59.6
	Addicted	21	40.4
Lack of will power	no	23	44.2
	yes	29	55.8
Are you getting your promotion on time?	yes	35	67.3
	no	17	32.7
Are you getting your due increment in salary?	yes	29	55.8
	no	23	44.2
Lack of incentive	No	36	69.2
	Yes	16	30.8

There was no leading significant effect of demographic variables on smoking habit and influencing factor for the same. (Table 2)

Table 2. Depicts the effect of demographic variables on smoking habit

		Gender		P Value	Hospital/Institute			P Value	Type of Health care provider			P Value	Department		P Value
		male	female		DUHS	Shifa	liaquat		doctor	nurse	technician		medicine	surgery	
Are you a smoker for the past one year?	yes	45	7	<0.001	32	12	8	0.0098	11	17	24	0.444	30	22	0.78
		86.54%	13.20%		60.40%	22.60%	15.38%		20.80%	32.10%	46.15%		56.60%	42.31%	
	No	71	57		96	9	23		32	50	46		69	59	
		55.47%	44.90%		75%	7.10%	17.97%		25.20%	39.40%	35.94%		54.30%	46.09%	
Number of cigarettes that you smoke per day	less than 5	24	7	0.033	22	3	6		5	11	15	0.554	18	13	0.947
		77.40%	22.60%		71.00%	9.70%	19.40%		16.10%	35.50%	48.40%		58.10%	41.90%	
	more than 5	21	0		10	9	2		6	6	9		12	9	
		100.00%	0.00%		47.60%	42.90%	9.50%		28.60%	28.60%	42.90%		57.10%	42.90%	
Influence of friends and peer pressure	Not Influenced	25	7	0.035	26	0	6		7	10	15	0.959	18	14	0.79
		78.10%	21.90%		81.30%	0.00%	18.80%		21.90%	31.30%	46.90%		56.30%	43.80%	
	Influenced	20	0		6	12	2		4	7	9		12	8	
		100.00%	0.00%		30.00%	60.00%	10.00%		20.00%	35.00%	45.00%		60.00%	40.00%	
Addiction	Not Addicted	25	6	0.219	23	3	5		5	9	17	0.289	21	10	0.075
		80.60%	19.40%		74.20%	9.70%	16.10%		16.10%	29.00%	54.80%		67.70%	32.30%	
	Addicted	20	1		9	9	3		6	8	7		9	12	
		95.20%	4.80%		42.90%	42.90%	14.30%		28.60%	38.10%	33.30%		42.90%	57.10%	
Lack of will power	No	19	4	0.686	16	3	4		7	5	11	0.2	12	11	0.473
		82.60%	17.40%		69.60%	13.00%	17.40%		30.40%	21.70%	47.80%		52.20%	47.80%	
	yes	26	3		16	9	4		4	12	13		18	11	
		89.70%	10.30%		55.20%	31.00%	13.80%		13.80%	41.40%	44.80%		62.10%	37.90%	
Lack of incentive	No	33	3	0.182	20	10	6		9	13	14	0.276	20	16	0.64
		91.70%	8.30%		55.60%	27.80%	16.70%		25.00%	36.10%	38.90%		55.60%	44.40%	
	Yes	12	4		12	2	2		2	4	10		10	6	
		75.00%	25.00%		75.00%	12.50%	12.50%		12.50%	25.00%	62.50%		62.50%	37.50%	

It was found that those who were influenced by their peers were 8.33 times more prone to be addicted to smoking than those who were less influenced. Similarly, the likelihood of addiction increased up to 76.9% with the lack of incentives causes. None of the other factors were significantly associated with each other. (Table 3)

Table 3. Shows the relation between peer pressure, addiction, lack of will power and incentive

		Addiction		P Value	Lack of will power		P Value	Lack of incentive		P Value
		Not Addicted	Addicted		no	yes		No	Yes	
Influence of friends and peer pressure	Not Influenced	25	7	0.001	16	16	0.289	21	11	0.476
		78.10%	21.90%	OR=8.33	50.00%	50.00%	OR=1.86	65.60%	34.40%	OR=0.64
	Influenced	6	14	(95%CI:	7	13	(95%CI:	15	5	(95%CI:
		30.00%	70.00%	2.34-29.72)	35.00%	65.00%	0.59-5.87)	75.00%	25.00%	0.18-2.22)
Addiction	Not Addicted				13	18	0.686	18	13	0.034
					41.90%	58.10%	OR=0.79	58.10%	41.90%	OR=0.23
	Addicted				10	11	(95%CI:	18	3	(95%CI:
					47.60%	52.40%	0.26-2.42)	85.70%	14.30%	0.06-0.95)
Lack of will power	no							17	6	0.515
								73.90%	26.10%	OR=1.49
	yes							19	10	(95%CI:
								65.50%	34.50%	0.45-4.98)

4. Discussion

In Lahore, Pakistan the average total prevalence of smoking amongst health care providers, which includes doctors and paramedic staff, is 37.18% and 35.74% respectively with a male to female gender prevalence being 50.31% to 7.04% amongst doctors and 61.53% to 2.22% amongst paramedic staff (Malick et al., 2010). In a research carried out in the neighboring country of Pakistan (China), amongst all the respondents sampled, 20.8% were found to be current smokers who represented about 35.7% of the physician doctors and 1.4% of the nurses (Yan et al., 2008). This is in comparison to our research which establishes that out of the 180 people sampled, 28.9% people smoked with 25 % being male smokers and only 3.9% being female smokers. Thus it can be stated that our data follows the regional trend, as per the gender aspect, showing a low frequency of female health care provider smokers and a moderate to high frequency of male smokers in our part of the region of Asia. This, as opposed to Italy which shows a higher percentage of smoking amid the female members, 41% of the hospital staff as compared to males (Zanetti et al., 1998). However, the exact reason for such a region wise change is yet unknown. Our research also shows an increasing trend of smoking from doctors (6.1%) to nurses (9.4%) and technicians (13.9%) which is opposed to a research in China which shows a high prevalence of smoking amongst doctors and a low prevalence amongst nurses (Yan et al., 2008). The lower level of smoking amongst doctors, as indicated by our research, is supported by a research in Poland (Cofta & Staszewski, 2008).

Of the total people who do smoke, our research established that 40.4% of the people smoked more than 5 cigarettes per day. This is consistent with the Pakistani trend supported by the fact that about 26.44% doctors and 41.89% paramedics smoked 11-20 cigarettes a day (Malick et al., 2010). Furthermore, 65.4% of smokers also smoked in their work place. Therefore, it can be stated that of the hospital staff who smoke, a much significant proportion are more prone towards smoking in their work place, which could be a representative measure of the level of addiction and tolerance .Our research also laid down strong association of smoking with peer pressure and the attitude of friends as shown by the fact that of the total people who smoked, 42.3% had more than 50% friends who smoked and spent more than 6 hours in the presence of their smoking friend company. This is supported by a number of researches at both, medical student and hospital level. In fact a research established an independent association of smoking and peer pressure amongst medical students (Ganesh Kumar, Subba, Unnikrishna, Jain, & Badiger, 2011) and another research highlighted its strong role amongst 14 -17 year old teenagers (Husain et al., 2012). This is further pressed upon by a research which found the role of peer pressure in smoking in 83.6% of the future physicians out of which 42% had addictions and was one of the most

important risk factor (57.69%) for the initiation of the habit of smoking (Basu et al., 2011). The dominating role of peer pressure was also a strong determinant amongst doctors and paramedic staff, supported by a research which stated that 55.17% doctors and 75.68% paramedics started smoking under influence of friends. This is further supported by a research which found that 31% of the hospital staff was smoking under influence of peer pressure (Chaudhry, Chaudhry, & Mamood, 2009). Association of peer pressure with smoking is following an increasing trend and therefore a strong relationship between peers' habbitsand an individual susceptibility towards smoking exists. Therefore steps taken to reduce peer pressure can significantly help reduce the incidence of smoking. In terms of the level of addiction, our data reveals a high level of addiction shown by the fact that of the total people who smoked, 65.4% smoked at the work place which includes hospitals. This can be used as an indicator showing the level of addiction amongst hospital staff which is further supported by the fact that 59.6% of the people couldn't carry out their routine work without smoking. Therefore, it is vital that important steps must be taken to make hospitals completely smoke free to aid healing of patients.

The exact cause of smoking is debatable but our statistics demonstrated that inadequate salaries and lack of promotion opportunities may also have a role in smoking. The reason that could be hypothesized is that such factors play a role in up regulating the level of anxiety amongst health care providers who then resort to smoking initially as an escape and then end up in being addicted. In a developing country like Pakistan, reasons other than monetary issues like political instability and violence could be amongst contributing factors towards smoking. Other perpetuating factors could be increased workload, which may be both psycho-social and physical in nature (Zysnarska, Bernad, Adamek, & Maksymiuk, 2008). It is therefore important that such issues must be solved at both hospital and government level so as to ensure and maintain appropriate levels of hospital functioning which would ultimately aid the patient's needs. It can also be hypothesized that if such factors are overlooked, they could yield devastating results in future, with the health care providers then resorting to more harmful substances of abuse and eventually culminating in disaster of the profession.

The moderately high prevalence of smoking amongst health care providers is alarming as they are setting a bad example to patients by being uncritical to this habit by rarely asking patients about their smoking and rarely advising them not to smoke (Stojanović et al., 2013). This is further elaborated by a research which found out that of the physicians who smoke, 25% do not warn their patients about the risks of smoking and about 22% not always give advice to them about quitting (Araya et al., 2012). Therefore strong steps must be taken to decrease it amongst health care providers to indirectly reduce its prevalence in the general population. This could be achieved by early identification of smokers.Therefore researches like these must be carried out at medical school level to identify smokers at an early stage. Schools must devise rules and policiesto discourage smoking (Ghimire, Sharma, Niraula, Devkota, & Pradhan, 2013). The exact causes of smoking must be identified and then eradicated. The government can also play its part by imposing heavy taxation on cigarette to limit its availability and restricting cigarette advertisements. Moreover, motivation by friends and family members could also help. Other researches so as to percept the risk of smoking amongst the general population and health care providers could also be carried out (Power, Neilson, & Perry, 2004). Important steps must be taken so as to promote smoke free environmental policies as it could help reduce the levels of smoking in hospitals and also amongst hospital staff as supported by a research which shows that after such implementations the level of smoking in staff could be reduced by 44% in a 2 year period (Poder, Carroll, Wallace, & Hua, 2012). In fact the ban on smoking in public places has shown that amongst nurses 68% had decreased their tobacco consumption in their working hours and about 28 % had reduced their overall daily consumption (Maurel-Donnarel, Baumstarck-Barrau, Barlesi, & Lehucher-Michel, 2010). To our knowledge this is amongst the few researches which cover such an important aspect in our region.

Our research only focused on doctors, nurses and technicians.It should be noted, however, that inclusion of other members of paramedic staff and dentists in the sample population may have given a better picture.

The doctors could have been further subdivided according to the departments, so as to highlight the department which is involved more in smoking. The sample size of 180 people was very small and couldhave been increased by including more tertiary care hospitals. An increase in sample size increases the reliability of study and the study becomes more representative of the targeted population. A much more validated scale for the measurement of addiction and stress like the Fagerstorm Test could have been used to make the results more valid and consistent. Much more detailed correlates to the multiple causes of smoking, other than stress and promotion, could have been pinpointed so as to identify the correct and exact cause. Furthermore it could have been of great use if attitude of doctors and paramedics towards smoking cessation was asked.

5. Conclusion

Our results clearly indicate that a large number of health care providers smoke which should be a serious concern. We also found that addiction was significantly associated with lack of incentives and peer pressure. Hence our health agencies should take immediate action in order to curtail the heaving burden of smoking and its related health consequences.

References

Abdullah, A. S. M., & Husten, C. G. (2004). Promotion of smoking cessation in developing countries: a framework for urgent public health interventions. *Thorax, 59*, 623-630. http://dx.doi.org/10.1136/thx.2003.018820

Araya, A. M. V., Leal, S. F., Huerta, G. P., Fernández, A. N., Fernández, O. G., & Millones, E. J. P. (2012). The influence of smoking habits of Chilean physicians on the use of the structured medical advice about smoking. *Rev Med Chil, 140*(3), 347-52.

Asfar, T., Al-Ali, R., Ward, K. D., Vander Weg, M. W., & Maziak, W. (2011). Are primary health care providers prepared to implement an anti-smoking program in Syria? *Patient Educ Couns, 85*(2), 201-5. http://dx.doi.org/10.1016/j.pec.2010.11.011

Basu, M., Das, P., Mitra, S., Ghosh, S., Pal, R., & Bagchi, S. (2011). Role of family and peers in the initiation and continuationof smoking behavior of future physicians. *J Pharm Bioallied Sci, 3*(3), 407-11. http://dx.doi.org/10.4103/0975-7406.84452

Chaudhry, M. A., Chaudhry, I. A., & Mamood. (2009). Prevalence of smoking among health care providers in tertiary care hospitals. *Rawal Med J, 34*(1), 40-2.

Cofta, S., & Staszewski, R. (2008). Hospital staff and smoking habits: do we need modification of smoking behavior in Polish hospitals? *J Physiol Pharmacol, 59*(Suppl 6), 191-9.

Ganesh Kumar, S., Subba, S. H., Unnikrishna, B., Jain, A., & Badiger, S. (2011). Prevalence and factor associated with current smoking among medical students in coastal South India. *Kathmandu Univ Med J (KUMJ), 9*(36), 233-7.

Ghimire, A., Sharma, B., Niraula, S. R., Devkota, S., & Pradhan, P. S. (2013). Smoking Habit among Male Medical and Dental Students of B.P.Koirala Institute of Health Sciences, Nepal. *Kathmandu Univ Med J (KUMJ), 11*(41), 32-6.

Global adult tobacco survey collaborative group. (2011). *Tobacco questions for surveys: A subset of key questions from the global adult tobacco survey* (GATS) (2nd Edition). Atlanta, GA: Centers of disease control and prevention.

Husain, M. O., Duddu, V., Husain, M., Drury, A., Chaudhry, N., & Husain, N. (2012). Smoking behavior among 14-17 year old students: a comparison between Pakistan and the UK. *Southeast Asian J Trop Med Public Health, 43*(1), 219-28.

Malick, A. K., Chaudhry, A., Karamat, A., Arif, N., Cheema, M. A., & Rauf, A. (2010). Cigarette smoking and health care professionals at Mayo hospital, Lahore, Pakistan. *J Pak Med Assoc, 60*(6), 509-12.

Maurel-Donnarel, E., Baumstarck-Barrau, K., Barlesi, F., & Lehucher-Michel, M. P. (2010). The ban on smoking in public places (Decree No. 2006-1386 of 15th November 2006): Impact over 12 months onsmoking status of hospital nurses. *Rev Mal Respir, 27*(3), 199-212. http://dx.doi.org/10.1016/j.rmr.2010.01.007

Nawaz, A., & Naqvi, S. A. S. (2008). Attitudes, perceptions, habits of smoker, Non-smoker general practitioners and why they fail to motivate patients to quit smoking. *Pak J Med Sci, 24*, 1152-56.

Poder, N., Carroll, T., Wallace, C., & Hua, M. (2012). Do smoke-free environment policies reduce smoking on hospital grounds? Evaluation of a smoke-free health service policy at two Sydney hospitals. *Aust Health Rev, 36*(2), 158-62. http://dx.doi.org/10.1071/AH11998

Power, B., Neilson, S., & Perry, I. J. (2004). Perception of the risks of smoking in the general population and among general practitioners in Ireland. *Ir J Med Sci, 173*(3), 141-4. http://dx.doi.org/10.1007/BF03167928

Serna, L., Bialuos, S. A., Sinha, K., Yang, Q., & Wewers, M. E. (2010). Are Health care Providers Still Smoking? Data From the 2003 and 2006/2007 Tobacco Use Supplement-Current Population Surveys. *Nicotine Tob Res, 12*(11), 1167-1171. http://dx.doi.org/10.1093/ntr/ntq161

Stojanović, M., Musović, D., Petrović, B., Milosević, Z., Milosavljević, I., Visnjić, A., & Sokolović, D. (2013).

Smoking habits, knowledge about and attitudes toward smoking among employees in health institutions in Serbia. *Vojnosanit Pregl, 70*(5), 493-500. http://dx.doi.org/10.2298/VSP1305493S

Thomson, N. C., Chaudhuri, R., & Livingston, E. (2004). Asthma and cigarette smoking. *European Respiratory J, 24*, 822-33. http://dx.doi.org/10.1183/09031936.04.00039004

Yan, J., Xiao, S., Ouyang, D., Jiang, D., He, C., & Yi, S. (2008). Smoking behavior, knowledge, attitudes and practices among health care providers in Changsha city, China. *Nicotine Tob Res, 10*(4), 737-44. http://dx.doi.org/10.1080/14622200801901930

Zanetti, F., Gambi, A., Bergamaschi, A., Gentilini, F., De Luca, G., Monti, C., & Stampi, S. (1998). Smoking habits, exposure to passive smoking and attitudes to a non-smoking policy among hospital staff. *Public Health, 112*(1), 57-62. http://dx.doi.org/10.1038/sj.ph.1900419

Zysnarska, M., Bernad, D., Adamek, R., & Maksymiuk, T. (2008). Tobacco smoking among nurses--a lack of knowledge or effect of work overload? *Przegl Lek, 65*(10), 602-4.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Re-Birth After Coronary Bypass Graft Surgery: A Hermeneutic-Phenomenological Study

Mohammad Abbasi[1], Nooredin Mohammadi[2], Alireza Nikbakht Nasrabadi[3], Suh Boudouin Fuh[4] & Tahereh Sadeghi[5]

[1] International Campus, Iran University of Medical Sciences, Tehran, Iran

[2] Center for Nursing Care Research, Department of Critical Care Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

[3] School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

[4] Department of Critical Care Nursing, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

[5] Tehran University of Medical Sciences, Tehran, Iran

Correspondence: Nooredin Mohammadi, Assistant Professor, Department of Critical Care Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences; Center for Nursing Care Research, Tehran, Iran. Tel: 98-91-2200-1587. Fax: 98-21-6690-4252. E-mail: mohammadi_no@sina.tums.ac.ir

Received: December 25, 2013 Accepted: January 26, 2013 Online Published: March 31, 2014

doi:10.5539/gjhs.v6n3p235 URL: http://dx.doi.org/10.5539/gjhs.v6n3p235

Abstract

Although coronary artery bypass graft surgery has significant effects on reducing the symptoms of coronary artery disease, there is not enough knowledge and understanding of lived experience of patients after surgery. Understanding lived experience of this group of patients would be helpful for healthcare staff to provide better services to the patients. The aim of this study was to describe with a deeper understanding, the lived experiences of patients after Coronary Artery Bypass Graft Surgery. Using a hermeneutic phenomenological approach and a Van-Manen analysis method, in-depth semi-structured interviews were conducted with eleven participants who had lived experienced of at least six months post - coronary artery bypass graft surgery. Re-birth was the main theme that emerged in the process of data analysis. This theme was derived from four sub-themes including "feels younger", "vigorous heart", "intrepid life" and "oriented to be healthy". Life after a coronary artery bypass graft surgery is often appreciated as a re-birth by persons with these experiences as surgery did not only provide a feeling of wellness, but also added a sensation of youthfulness and improvement in the quality of life for these participants. In addition, they would actively participate in health promotional activities such as; adherence to medication and diet regimes, changes in lifestyle to maintain their health.

Keywords: coronary artery bypass graft surgery, hermeneutic - phenomenological, lived experience, re-birth

1. Introduction

Today, cardiovascular diseases (CVDs) are known as major health problems and the leading cause of high morbidity and mortality in both developed and developing countries (Roger et al., 2011). Despite advances in prevention, treatment and surgery in CVDs, the mortality rate of these diseases are still increasing significantly (Lopez, Ying, Poon, & Wai, 2007). In Iran like other developing countries, CVDs are the leading one of the major cause of death (Hadaegh et al., 2009). Based on published reports, about 45% of death in general population is due to CVDs (Dans et al., 2011) and coronary artery disease (CAD) is the most common CVDs in Iran (Azizi et al., 2009; Shakeri et al., 2012).

Although, there is a considerable progress in the non-surgical methods of management CAD, Coronary Artery Bypass Graft Surgery (CABGs) is still the most effective treatment to manage CAD. However, it needs to be pointed out that CABG is usually required when other medical and invasive treatments are not effective (Gersh, Sliwa, Mayosi, & Yusuf, 2010; Leegaard & Fagermoen, 2008). The number of CABGs is increasing around the world. In Iran, the number of CABGs which performed from 2002 to 2007 was reported between 21,000 and 30,000 cases (Babaee, 2007).

CABGs has significant effects on reducing the symptoms of CAD; improving the health condition (Karlsson, Johansson, & Lidell, 2005); enhancing the daily life activities (Tolmie, Lindsay, & Belcher, 2006); improving the quality of life; increasing survival rate (Zhang et al., 2006); improving the life expectancy (Karlsson et al., 2005) and increasing the life-satisfaction in patients (Najmzadeh, 2007). Although CABGs has positive effects on patients, current literature reports that patients may still suffer from some consequences such as pain (Leegaard & Fagermoen, 2008); anxiety (Ivarsson, Larsson, & Sjöberg, 2004); fear (Karlsson et al., 2005); depression, anger (Leegaard & Fagermoen, 2008) and hospital re-admissions (Mousavi, Sabzevari, Abbaszade, & Hosseinnakhaie, 2011) in post-surgical period.

Although there are plenty studies which have focused on the physical and psychological complications of CABGs and their consequences on patients' life, there is limited knowledge about the experiences of patients after CABGs. Therefore, the lived experience of patients after coronary bypass is not well known. Understanding the lived experience of this group of patients helps health care professionals to provide a better service to these patients. This study was aimed to explore a deeper understanding of the lived experience of patients after CABGs.

2. Methods

An interpretive phenomenology inquiry with the Heidegger's approach was used in this study. Van-Manen's six methodological activities were used to guide the researcher to conduct the study (Van Manen, 1990). Table 1 summarizes the six activities of van Manen's which used in the study.

Table 1. van Manen's method of doing phenomenological study and its use in the study

van Manen's methodical activities	Researchers' activities
Turning to the nature of lived experience	selected participants having the life experience with CABG to acquire humanistic experiences
Investigating experience as we live it	collect data through people having the lived experience with CABG
Reflecting on essential themes	by using thematic analysis
Hermeneutic phenomenological writing	writing and rewriting to create a phenomenological text
Maintaining a strong and oriented nursing relation to the phenomenon	Discussing the themes in relation to phenomena
Balancing the research context by considering parts and whole	movement between transcripts and themes in relation to CABG lived experience

2.1 Participants

Participants were made up of seven men and four women with an average age of 59.60 ± 3.77 years, married and living with their families. Inclusion criteria for participation were patient who had lived experiences with CABGs of at least six months and had no mental problems and malignant disease at the time of their participation in the study.

The first contact of the researcher with the patients was in the follow-up clinic. When the potential participants attended in the clinic, the researcher assessed their eligibility to participate in the study. Then the research purpose of the study was explained to the eligible participants and they were encouraged to participate in the study. The recruited participants provided their contact detail to the researcher to schedule appointments for the introductory meeting and interviews at a place and time which they were convenient to both.

Therefore the researcher had an introductory session with the participants before the interview. The purpose of the introductory meeting was to establish trust between the participants and the researcher by answering all queries with regards to the study. At the end of introductory meeting, the researcher left an informed consent form to the participants and organized the interview session with the participants.

2.2 Data Collection

In-depth semi-structured interviews were conducted by the principle researcher to collect data. Before the interview, the researcher collected the signed consent form from all participants. The researcher again explained the objectives of the study to the participants and answered to their questions and concerns. Individual face-to-face interviews were performed with participants in a quiet room at the treatment centers or at the

participants' home. All interviews were performed in native language (Persian).The interviews lasted on average between 55 to 70 minutes. During the interviews, participants were encouraged to express their lived experiences after the CABGs as a story. In situations where the researcher did not accurately understand the participant, he probed more into the story and asked questions such as; "... can you give me an example?" or "What did you mean by…?" for a better understanding. All interviews were conducted by the principle researcher and they were recorded on a tape recorder and some notes were also taken in writing

2.3 Data Analysis

Analysis of the data was done on texts obtained from the interviews. First, the researchers listened to the audio interviews for several times, and wrote them word verbatim on paper. To ensured texts accuracy, they listened and read text files simultaneously. The researchers then extracted themes or units of meaning using a holistic approach, selective approach and detailed approach. They read the text over and over until a comprehensive understanding of the participants' experience was attained. Words, phrases and sentences from the participants' narrations were separated to extract the major themes of their lived experience with CABGs.

The validity of this study was achieved through an effective trust-based relationship that was established between participants and the researchers. Data from interviews were presented to the participants after analysis and their corrective feedbacks were considered. The extracted themes were discussed with most of the participants for their approval. Furthermore, every step of the study process had been checked with supervisors and experts to get their feedbacks to make sure the process of the study is going in right direction.

2.4 Ethical Consideration

This study was approved by the Ethics Committee of Tehran University of Medical Sciences.

3. Findings

Open heart surgery was a landmark for the participants to categorize their life into two separate phases, the life before CABGs and the life after CABGs. During interviews, the participants were expressing their lived experiences while they tried to compare their experiences in these two phases. For example, one of the participants stated: *"my life after surgery is extremely different with before surgery"*. Another participant expressed, *'To be honest, I am another person after surgery'*.

The reason why the participants were identifying these two separate phases in their life was the changes in their physical activities and psychological status. The significance of those changes caused that the participants believe that they were born again. Therefore the theme "re-birth" was extracted as the main theme in this study. As one of participants said that; "*Heart surgery was an opportunity given to me to live again, And to start a new life with the new heart. I was reborn and it was as a gift from surgery"*.

The theme "re-birth" comes from the participants' perception of changes in their heart after surgery. For some of the participants, heart surgery was a revolution of their life and they supposed their heart is like a child's heart. One of the participants pointed out, "*Someone who undergoes an open heart surgery will have a heart like child's heart"*. The theme "re-birth" was derived from four following sub-themes. These sub-themes are "feel younger", "vigorous heart", "intrepid life" and "oriented to be healthy".

3.1 Theme 1. Feel Younger

For the participants of the study, the limitation in daily life activity due to CAD was a reason which led to an undesirable feeling in the phase of before CABGs. Some of the participants said that they were feeling older and weaker in this phase. One of the participants stated:

"*Before undergoing for surgery, I was thinking that I am going to be old earlier because my ability to do works was going to be less and less, like a very old woman while I was just in the middle of 50's*."

Participants added the life after surgery was accompanied with a positive feeling of being younger. This feeling was a consequence of physical and psychological recovery and improving daily life activity among the participants. One of the participants stated "*After the heart surgery, I felt physically and mentally recovered. I had sensations of freshness, youthfulness and was highly spirited. I felt younger than I was"*.

3.2 Theme 2. Vigorous Heart

The participants of study pointed out that they had a fatigued heart in the phase of before CABGs. One of the participants told "*My heart was sick like an out of order car. It needed to be fix to work appropriately"*. Participants believed they had inactive life style before CABGs because of their heart was fatigued and had no sufficient ability to perform properly its function. For example, one of the participants said *"My heart was not*

working well before surgery. That's why I was staying home most times when my family was going somewhere".

Open heart Surgery for the participants was not only a treatment to manage their health problem, but also it was an intervention which reconstructed their exhausted heart and improved its function. Participants thought they have a healthy heart in the post CABGs life. The following statement is a typical statement which has been taken from one of the participants. *"The surgery repaired my sick heart and now I'm living with a healthy heart".*

3.3 Theme 3. Intrepid Life

Life before surgery was a life with full of fear and apprehension for most of the participants. They said that they were often afraid for a heart attack and sudden death in the phase of before the surgery. A participant was talking about his fears and concerns narrated: "*Before, I was always afraid my heart is stop suddenly and I was often worried about a heart attack or death"*. Some other participants expressed the fear of heart attack and sudden death was even when they were asleep and consequently they suffered from insomnia and fatigue. The following quotation is from one of the participants. *"Before surgery, I was so worried and anxious and very sad too. Sometimes at night, I couldn't sleep because I was scared to die when I am asleep".* Fear of heart attack also forced the participants to avoid social activities. Another participant stated:

"Before the heart surgery when I was going out, I was always scared of falling suddenly and nobody would recognize me [due to heart attack]. *So I always carried my identification card with myself to help people identify me if I unconciseness".*

Although participants narrated their fear and concern during interviews, they insisted that there was no fear of heart attack and sudden death after the surgery. For example, this excerpt is from one of the participants. *"..I am not scared to go out alone any more*". Although participants were experiencing fear in the phase of post CABGs, the nature of fear was totally different with the phase of before CABGs. For instance, the same participant added *"When I was discharged from the hospital, I was always scared to cough hard because of stitches'.* Another participant added *'I was scared for a long time that my grafts not working well".*

3.4 Theme 4. Oriented to Be Healthy

Participants expressed that they had little attention to their medical orders and diet regimens before surgery, although some of them had good knowledge in this regards. As an example, one participant said, *"I was not sensitivity to my diet before surgery. ...I used to have salty food. However I was informed by my doctor that it was not good for me".* Therefore participants' adherence to treatment plan was weak in the life before CABGs.

For participants in this study, the life after CABGs was accompanied with more adherences to the medical treatment plans. One of the participants emphasized the importance of following medical instructions and believed that following the instructions can help to prevent the re-infection of CAD. The following statement is from one of the participants in this study. "*I'm caring myself now. I follow my instructions in order to not have the heart problems again".* Thus the participants were eagerly following their medication and dietary regimens after surgery in order to maintain and promote their health condition.

4. Discussion

Re-birth, as the main theme of this study, was obtained from the participants experiences. Re-birth does not mean that all of the participants believed that their organs have been born a second time, but this theme was chosen due to the importance and role of the heart in human life according to the participants. After CABGs, participants felt that they had regained their health and this is because before CABGs they felt dizziness, weakness, chest pain and dyspnea. They had problems in performing their daily activities, but many of these problems decreased after the CABGs, relieving participants of their discomforts and enabling them to resume their activities normally. CABGs does not only provide a feeling of wellness, but also adds a sensation of youthfulness and improves the quality of life as demonstrated in many studies (Najmzadeh, 2007; Tolmie, 2006; Zhang, 2006).

Perhaps one of the factors that have been effective in the feeling of youthfulness in participants was the improved quality of life after CABGs. Participants were without difficulty after CABGs in terms of mobility and daily activities thus considering their quality of life improved. Hawkes and colleagues reported that patients resume their activities after CABGs (Hawkes, Nowak, Bidstrup, & Speare, 2006). The increased activity and personal tasks make sense of freshness and high spirits in participants. Lindquist and colleagues reported that CABGs improves the quality of life in domains of social, physical, emotional functioning and satisfaction in their lives (Lindquist et al., 2003). Participants believed that their hearts were reconstructed after the CABGs. The reason for this believes was that since the participants returned to their normal daily activities after the CABGs and did not have chest pain and dyspnea anymore, they knew that they are living with a healthy heart.

They associated chest pain and dyspnea with heart disease, so the relief of chest pain and dyspnea was a gift of CABGs. To them, after the CABGs, they were certain that they will not have heart problems anymore as their hearts have been rescued of pain and now they live with a healthy and trustworthy heart. This agrees with the findings of study of Tolmie, Lindsay and Belcher (2006), that CABGs helps the patients to be free of angina symptoms and improves on their quality of life.

The recovery period after the CABGs is a dynamic process and participants have a unique experience during this period. They may express fear immediately after the CABGs. Fears and concerns after CABGs have been noted in many studies (Mousavi et al., 2011; Schou, 2008; Bergvik, 2008). In this study, participants had experienced fears and concerns too, but the nature of these fears and concerns were different. They were not afraid about heart attack and sudden death but were rather afraid complications they think may arise from dehiscence of the coronary sutures due to them sneezing, having a strong cough or frequent mobility. Here one can realize the importance of education in the period after surgery. Thus, if the patients do not receive adequate and appropriate discharge training after the CABGs, they may not perform the post-operative exercises such as deep breathing and effective coughing; and consequently suffer from some complications such as atelectasis (Hulzebos et al., 2006; Jensen, 2007).

5. Conclusion

CABGs provided the opportunity for the acquisition and promotion of good health, free of cardiovascular problems for the participants of this study. They acknowledged that they had no proper lifestyle immediately they knew they had a heart disease. However, they have regained their lost health after the CABGs. Thus they have tried to be involved actively in effective measures to maintain their health. They concluded by stating that a modification of their lifestyle with programs such as regular exercises and a modified diet of low salt and low fat consumption would help them prevent another episode of heart disease. More so, they requested nutritional consultation support for a healthy diet, as they try to lose weight too. Stress management activities such as avoiding stressful environments and coping with others were also pinpointed as necessary for their health. These recommendations agree with Lindsay and Colleagues findings that some participants identified some measures to protect their health (Lindsay, Hanlon, Smith, & Belcher, 2003). Goldsmith and Colleagues also reported lifestyle changes after a cardiac event (Goldsmith, Lindholm, & Bute, 2006).

Acknowledgements

The authors are grateful to Iran University of Medical Sciences International Campus for financing this study which is part of the first authors' PhD dissertation. We would also like to thank the participants for sharing their experiences in the study.

References

Azizi, F., Ghanbarian, A., Momenan, A. A., Hadaegh, F., Mirmiran, P., Hedayati, M., ... Zahedi-Asl, S. (2009). Prevention of non-communicable disease in a population in nutrition transition: Tehran Lipid and Glucose Study phase II. *Trials, 10*(1), 5. http://dx.doi.org/10.1186/1745-6215-10-5

Babaee, J., Keshavarz, M., Haidarnia, A., & Shayegan, M. (2007). Effect of a Healtheducation program on quality of line in patients undergoing coronary arterybypass surgery. *Acta Medica Iranica, 45*(1), 69-74.

Gersh, B. J., Sliwa, K., Mayosi, B. M., & Yusuf, S. (2010). Novel therapeutic conceptsThe epidemic of cardiovascular disease in the developing world: global implications. *European heart journal, 31*(6), 642-648. http://dx.doi.org/10.1093/eurheartj/ehq030

Goldsmith, D. J., Lindholm, K. A., & Bute, J. J. (2006). Dilemmas of talking about lifestyle changes among couples coping with a cardiac event. *Social science & medicine, 63*(8), 2079-2090. http://dx.doi.org/10.1016/j.socscimed.2006.05.005

Hadaegh, F., Khalili, D., Ghasemi, A., Tohidi, M., Sheikholeslami, F., & Azizi, F. (2009). Triglyceride/ HDL-cholesterol ratio is an independent predictor for coronary heart disease in a population of Iranian men. *Nutrition, Metabolism and Cardiovascular Diseases, 19*(6), 401-408. http://dx.doi.org/10.1016/j.numecd.2008.09.003

Hawkes, A. L., Nowak, M., Bidstrup, B., & Speare, R. (2006). Outcomes of coronary artery bypass graft surgery. *Vascular health and risk management, 2*(4), 477. http://dx.doi.org/10.2147/vhrm.2006.2.4.477

Hulzebos, E. H., Helders, P. J., Favié, N. J., De Bie, R. A., de la Riviere, A. B., & Van Meeteren, N. L. (2006). Preoperative intensive inspiratory muscle training to prevent postoperative pulmonary complications in high-risk patients undergoing CABG surgery. *JAMA: the journal of the American Medical Association,*

296(15), 1851-1857. http://dx.doi.org/10.1001/jama.296.15.1851

Ivarsson, B., Larsson, S., & Sjöberg, T. (2004). Patients' experiences of support while waiting for cardiac surgery. A critical incident technique analysis. *European Journal of Cardiovascular Nursing, 3*(2), 183-191. http://dx.doi.org/10.1016/j.ejcnurse.2004.03.001

Karlsson, A.-K., Johansson, M., & Lidell, E. (2005). Fragility—the price of renewed life. Patients experiences of open heart surgery. *European Journal of Cardiovascular Nursing, 4*(4), 290-297. http://dx.doi.org/10.1016/j.ejcnurse.2005.03.009

Leegaard, M., & Fagermoen, M. S. (2008). Patients' key experiences after coronary artery bypass grafting: a synthesis of qualitative studies. *Scandinavian Journal of Caring Sciences, 22*(4), 616-628. http://dx.doi.org/10.1111/j.1471-6712.2007.00556.x

Lindquist, R., Dupuis, G., Terrin, M. L., Hoogwerf, B., Czajkowski, S., Herd, J. A., ... Treat-Jacobson, D. (2003). Comparison of health-related quality-of-life outcomes of men and women after coronary artery bypass surgery through 1 year: findings from the POST CABG Biobehavioral Study. *American heart journal, 146*(6), 1038-1044. http://dx.doi.org/10.1016/S0002-8703(03)00451-4

Lindsay, G., Hanlon, W., Smith, L., & Belcher, P. (2003). Experience of cardiac rehabilitation after coronary artery surgery: effects on health and risk factors. *International journal of cardiology, 87*(1), 67-73. http://dx.doi.org/10.1016/S0167-5273(02)00208-5

Lopez, V., Ying, S., Poon, C.-Y., & Wai, Y. (2007). Physical, psychological and social recovery patterns after coronary artery bypass graft surgery: a prospective repeated measures questionnaire survey. *International journal of nursing studies, 44*(8), 1304-1315. http://dx.doi.org/10.1016/j.ijnurstu.2006.06.005

Mousavi, S., Sabzevari, S., Abbaszade, A., & Hosseinnakhaie, F. (2011). The effect of preparatory face to face education to reduce depression and anxiety in open heart surgery adult patient in Shafa hospital in Kerman, 2008. *Iranian Journal of Nursing Research, 6*(21), 29-38.

Najmzadeh, Z. (2007). *Quality of life after coronary artery by pass grafting in woman*. Paper presented at the 5th congress of Iranian society cardiac surgen, Tehran, Iran.

Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Adams, R. J., Berry, J. D., Brown, T. M., ... Ford, E. S. (2011). Heart Disease and Stroke Statistics—2011 Update1. Glossary A Report From the American Heart Association. *Circulation, 123*(4), e18-e209. http://dx.doi.org/10.1161/CIR.0b013e3182009701

Shakeri, J., Jaberghaderi, N., Rezaei, M., Saeedi, M., Naleini, M., & Moloodi, A. (2012). Psychosocial risk factors in patients with cardio-vascular diseases in Kermansh. *Journal of Kermanshah University of Medical Sciences, 16*(3), 246-254. http://dx.doi.org/10.1016/j.clineuro.2011.08.019

Tolmie, E. P., Lindsay, G. M., & Belcher, P. R. (2006). Coronary artery bypass graft operation: Patients' experience of health and well-being over time. *Eur J Cardiovasc Nurs, 5*(3), 228-236. http://dx.doi.org/10.1016/j.ejcnurse.2006.01.007

Zhang, Z., Mahoney, E. M., Spertus, J. A., Booth, J., Nugara, F., Kolm, P., ... Weintraub, W. S. (2006). The impact of age on outcomes after coronary artery bypass surgery versus stent-assisted percutaneous coronary intervention: one-year results from the Stent or Surgery (SoS) trial. *American heart journal, 152*(6), 1153-1160. http://dx.doi.org/10.1016/j.ahj.2006.06.011

Van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. Suny Press.

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

The Comparison of the Effect of Transactional Model-Based Teaching and Ordinary Education Curriculum- based Teaching Programs on Stress Management among Teachers

Seyed Saeed Mazloomy Mahmoodabad[1], Maryam Mohammadi[1], Davood Shojaei Zadeh[2], Abolfazl Barkhordari[1], Fatemeh Hosaini[1], Mohammad Hossain Kaveh[3], Amal Saki Malehi[4] & Mohammadkazem Rahiminegad[5]

[1] Department of Health Sciences, School of Health, Yazd Shahid Sadoughi University of Medical Sciences, Yazd, Iran

[2] Department of Health Sciences, School of Health, Tehran University of Medical Sciences, Tehran, Iran

[3] Department of Health Sciences, School of Health, Shiraz University of medical sciences, Shiraz, Iran

[4] Department of Health Sciences, School of Health, Jondishapoor University of Medical Sciences, Ahvaz, Iran

[5] Department of Education and Training Office, Yazd, Iran

Correspondence: Maryam Mohammadi, Department of Health Sciences, School of Health, Yazd Shahid Sadoughi University of Medical Sciences, Yazd, Iran. Tel: 98-351-623-8555. E-mail: M_mohammadimm@yahoo.com

Received: December 2, 2013 Accepted: March 4, 2014 Online Published: April 9, 2014

doi:10.5539/gjhs.v6n3p241 URL: http://dx.doi.org/10.5539/gjhs.v6n3p241

Abstract

Background and Objectives: Regarding the effect of teachers' stress on teaching and learning processes, the researchers decided to provide a stress management program based on Transactional Model to solve this teachers' problems. Thus, this study is going to investigate the effect of Transactional Model- based Teaching and the Ordinary Education Curriculum- based Teaching programs on Yazd teachers.

Methods: The study was a semi- experimental one. The sample population (200 people) was selected using categorized method. The data were collected via PSS Questionnaire and a questionnaire which its validity and reliability had been proved. Eight teaching sessions were hold for 60-90 min. Evaluation was performed in three steps. The data were described and analyzed using SPSS software version 15. Value of $P<0.05$ was considered as significant.

Results: The participants were 200 people of Yazd teachers of primary schools. Mean age of group 1 and 2 was 42.05±5.69 and 41.25±5.89 respectively. Independent T- Test indicated a significant mean score ($p=0.000$) due to perceived stress of interference groups in post interference step and follow-up one respectively.

Conclusion: Results showed a decreasing effect of both programs, but the Transactional Model- based interference indicated to decrease stress more than the other.

Keywords: transactional model, education program, stress management

1. Introduction

Education system is regarded as one of the most important, complicated and large–scale organizations of the society. Most of these organization goals are realized by teachers –as an important core of the organization. Being neglected teachers' mental health affected students and educational system badly (Shahmansuri et al., 2013; Bush, 2007). Stress or tension -one of the important issues of mental health- imposes a great damage on teaching and learning processes. It also results in physical, emotional and attitude burnout (Shimazu et al., 2003). Stress is defined by Lazarus and Folkman as individual response against the threatening environment and against her/his abilities, sources and health (Lundberg, 2005). The teachers' responsibilities of students' improvement, happiness and activities are particular ones. Therefore, teachers' stress is separated from other jobs' stress (Tolbert et al., 2007). Since the emotional and physical pressures due to stress are regarded as harmful and undesirable, the individuals are encouraged to do something to decrease the stress (Sarafino, 1999). In fact, a set of activities done to decrease the stress is called coping. According to Folkman and Lazarus, coping consists of individual cognitive and behavioral attempts which are going to decrease the stresses due to internal or external

needs. According to individual perception, these needs go beyond the individual sources available (Lazarus & Folkman, 1984)

Studies showed an important role of transactional model for reducing stress (Yong Wah, 2010; Akihito, 2003; Lauga, 2008; Sharron, 2011). But in regard to our knowledge, this study was evaluating all components of transactional model for the first time. Besides, in this study was compared routine method and thransactional model for teachers.

Most cure professions including nursing, medicine and other human services ones are considered stressful (Russel, 1997). Teaching is also particular in view of the responsibility to health, bliss and activities of the students. Teachers are responsible for promotion of knowledge, pedagogy of students and creating discipline so, teachers, stress is of different type.

Although many teachers are fond of their job and experience little strain, several surveys have documented that up to a third of the teachers consider teaching as highly stressful (Farsani, 2012)

Despite the researches indicating a high value of stress among Iranian teachers and their sources (Allahverdipou, 2005; Karbasi, 2000; Ahmady et al., 2007; Kyriacou et al., 1987) unfortunately, little has been done to cope with them. In addition, teaching the health using cultural and social patterns plays an important role in prevention and controlling diseases and health problems. Lazarus and Folkman Transactional Model is considered as one of the most completed models concerning with stress which combine both cognitive and coping processes (WHO, 1993; Folkman & Lazarus, 1990; Khan et al., 1991). Thus, We compare the efficacy of interventions based on transactional model of stress and coping with stress for reducing of stress in teacher of Yazd city and this study was aimed to answer to these questions as follows:

1) Is education based- routine program useful for reducing stress in teachers?

2) Is education based- transactional model program useful for reducing stress in teachers?

3) Is difference in stress level after the intervention program in the intervention group based on transactional model and routine method?

4) Does the effectiveness of intervention programs transtheorical model is better than routine method?

1.1 Transactional Model of Stress and Coping

Transactional Model of Stress and the approaches of coping with it, are regarded as the framework to evaluate the coping with stress process. The model is consists of a perceptual theory of stress containing the following components:

Primary Appraisal: this concern with the importance of stressor event in first glance of individual, and whether it is a positive, controllable, problematic or unrelated one (Folkman, 2000)

Secondary Appraisal: It is a type which investigates coping sources (Cohen et al., 1984) considering his/her possibilities; the individual chooses a solution to face threat or challenge.

Coping Efforts: The efforts in Transactional Model consist of two aspects:

- Problem Management: In this step it is suggested to solve the problem using problem- based coping to change stressor condition.
- Emotional Regulation: The object of the strategy is to change individual thought and emotion against stressor conditions (Carver, 2001).

Meaning-based Coping: The approach aims positive emotion and includes positive reappraisal, acceptance and using religion power. Stressor conditions are interpreted using meaning-based approach.

Moderators: Moderators are divided as follows:

- Dispositional Coping Style: Despite of the condition-specific coping, coping styles are regarded as stable characteristic representing general tendencies toward interpretation and reaction to stress. The styles may sometimes last a long time and vary due to different individual and characters (Lazarus, 1993).
- Social supporting: Social supporting has been presented in form of theory in different ways. Some believe in objective and subjective dimensions, while others emphasize on non-subjective aspects including dependence and belonging emotions, or qualitative aspects, for example, subjective appraisals (Cohen et al., 1984). Social supporting, influencing some of the key processes of

Transactional Model may positively affect individual approach due to stressor situations (Heitzman et al., 1998).

1.2 The Result of Coping

The results show the individual adaptation against stressor factor when environment appraisals done.

2. Methods

2.1 Participants and Study Design

This semi-experimental research was conducted to determine the effect of Ordinary Education Curriculum-based Teaching and Lazarus and Folkman Transactional Model- based Teaching programs on decreasing the stress and its factors related. The sample population concluded 200 teacher of Yazd, a big city of Iran (Ghasemi, 2011; Jöreskog, 1993). One hundred people as interference group 1 (following Ordinary Curriculum-based teaching) and 100 people as group 2 (following Transactional Model-based teaching) were chosen in a categorical method.

Teachers were divided into two classes based on Girl´s School and Boy´s School. Then, one hundred teachers randomly selected using equal allocation of each class. Data were collected using PSS questionnaire for stress (Cohen, 1983). PSS questions about was designed based on a person's thoughts and feelings that have been proposed in the past month and responders explain their opinion about being uncontrollable, unpredictable and challenging time of his life .In addition, the scale has a number of direct questions about levels of stress. There are 14 questions and 10 questions on this scale version that the 14-item version was used in this study.

The constructs of Transactional Model were measured by the questionnaire provide. The questionnaire concluded demographic data and 62 questions measuring model constructs, which their validity and reliability were evaluated by researchers. Content validity, and CVR=0.85 methods were used to study validity and internal adaptation respectively. Criterion validity with Pierson correlation showed a significant estimation power ($r= 0.75$) i.e. ($p<0.001$). Coronbach alpha coefficient value (0.87) indicated a good reliability. Entering the study criteria were as follows: being a teacher of primary schools, no previous participating in stress management course and regular attending in educational program presented. In addition to taking participants' consent, they were assured that data will be patented. After the questionnaires were planned and confirmed by experts, the project and its object were introduced to Education Administration of Yazd. Then, the implementation license was issued by the officials.

2.2 Intervention Program

Eight sessions of 60-90 min were hold observing syllabuses and contents specified. The interference with Transactional Model group programs concluded lecture, panel discussion and teaching sources including teaching package provided based on Transactional Model, power point, pamphlet, CD of muscle relieving (as homework).

2.3 Content of Education for Groups

Content of education - based on education and training (group 1)

Section 1: definition of Stress

Section2: stages of stress

Section3: causes of stress

Section4: Stress symptoms

Section5: Burnout

Section6: Ways decrease of Stress

Section7: Coping Strategies

Section8: recommendation for preventive of burnout in teachers

Content of education based on Transactional Model (group 2)

Section 1: Overview of program and transactional model

Section2: Introduction to stress and its role

Section3: emotional regulation (emotion-focused coping)

Section4: Problem management (problem-focused coping)

Section5: Self-efficacy and self-confidence

Section6: Social relationship

Section7: Meaning-based coping

Section8: Time management and physical ways for prevention of stress

Evaluation was done in three steps: before the period began, immediately after it's finishing, and one month later it finished, in which instrument questions were answered by participants of both groups.

2.4 Data Analysis

The K-S test was used to describe and analyze the data and determine whether they were distributed normally or not. The value of $p<0.05$ was considered as significant. SPSS software version 15 was used to analyze the data.

3. Results

3.1 Demographics

Mean age of interference group 1 and 2 were 42.05±5.69 and 41.25±5.89 respectively. Most of the participants were married, enjoying more than 20 years work experience. They had been received B.A in Primary Teaching too. The mean stress score showed no significant difference between two groups in pre-interference step, i.e. they were equal.

3.2 Explanatory Analyses

The bilateral variance analysis test results indicated that none of the variables studied had significant effect on perceived stress scores in pre-test and follow-up steps. Stress mean scores of group 1 in pre- interference step i.e. 45.49±5.15 decreased to 40±6.28 in follow-up step while the mean in group 2 was 44.71±0.48 and 30.76±0.55 in pre-interference and follow-up steps respectively (Figure 1).

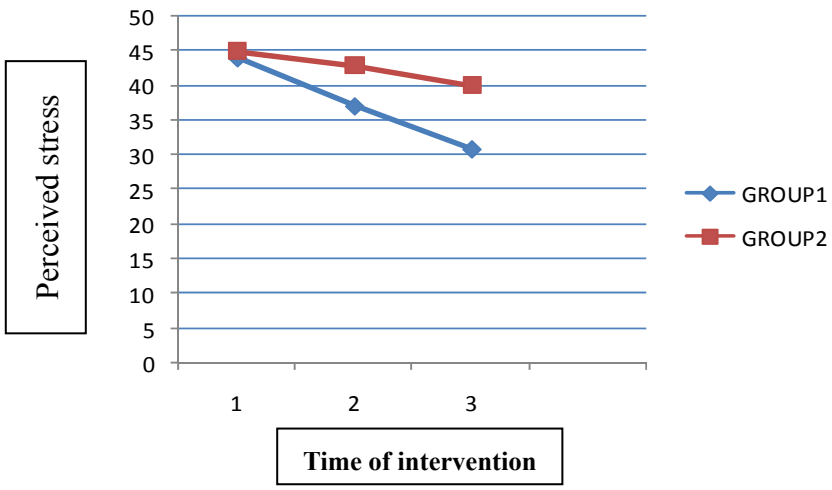


Figure 1. Comparison of perceived stress in pre-test, post- test and follow up

The independent t-test results indicated a significant difference in mean scores due to perceived stress in interference groups in post- interference and follow-up steps ($P<0.05$). The study of mean scores difference in between the groups represented a significant value in interference group 2 concerning all constructs in follow-up step, confirming long-term effects of the program on stress value. This mean indicated a significant value in interference group 1 in pre-test and post-test steps. The effects of teaching decreased after taking post-test, but the difference was not significant (Table 1).

Table 1. Results of pair comparison of pre-test, post- test and follow up

Construct	Time	Group 1		Group 2	
		Significant Level	Mean Difference	Significant Level	Mean Difference
Primary appraisal	Pre-test, Post-test	1	0.000	1.7	0.021
	Pre-test, Follow up	1.083	0.642	3.79	0.000
	Post-test , Follow up	0.830	0.642	2.09	0.006
Secondary Appraisal	Pre-test, Post-test	0.650	0.294	1.59	0.002
	Pre-test, Follow up	0.630	0.392	2.43	0.000
	Post-test , Follow up	1.280	0.052	0.84	0.056
Problem Management	Pre-test, Post-test	5.210	0.000	0.14	0.752
	Pre-test, Follow up	5.830	0.000	3.15	0.000
	Post-test , Follow up	0.620	0.547	3.29	0.000
Emotional Regulation	Pre-test, Post-test	0.260	0.60	0.71	0.60
	Pre-test, Follow up	1.050	0.020	3.15	0.002
	Post-test , Follow up	1.310	0.007	1.62	0.007
meaning-based coping	Pre-test, Post-test	1.630	0.069	0.77	0.069
	Pre-test, Follow up	1.650	0.054	1.19	0.014
	Post-test , Follow up	2.020	0.22	0.42	0.22
Adaptation	Pre-test, Post-test	2.050	0.002	0.88	0.12
	Pre-test, Follow up	0.980	0.101	1.53	0.001
	Post-test , Follow up	1.070	0.087	0.65	0.087
Moderators	Pre-test, Post-test	0.790	0.197	2.81	0.000
	Pre-test, Follow up	0.750	0.097	0.52	0.097
	Post-test , Follow up	0.040	0.950	3.33	0.000
Perceived Stress	Pre-test, Post-test	2.250	0.14	2.33	0.03
	Pre-test, Follow up	5.490	0.025	4.95	0.000
	Post-test , Follow up	3.240	0.12	2.62	0.005

These means were compared using independent t-test, statistic analysis method and repeated variance to study the effect of teaching on Transactional Model constructs, and possibly difference between the model constructs mean scores in pre-test, post-test and follow-up steps. Variance analysis results, containing repeated values, indicated that the difference between pre-test, post-test and follow-up mean scores in both groups were generally significant. Mauchely' s test results confirmed "equal co-variances between dependant variables" presupposition, and the values (Table 2).

Table 2. Results of repeated measures variance analysis on Transactional Model constructs of pre-test, post test and follow up

Constructs	pre-test				T-test	post test				T-test	follow up				T-test	repeated measures
	Group1		Group2			Group1		Group2			Group1		Group2			
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD		
Stress	45.49	6.28	44.71	0.48	P=0.132 t=0.325 F=0.973	43.24	6.62	37.38	0.53	P=0.000 t=8.05 F=5.27	40.00	5.15	30.76	0.55	P=0.000 t=6.327 F=0.265	P=0.000 F=32.127
Primary appraisal	19.67	3.05	19.52	0.49	P=0.089 t=1.70 F=0.69	20.67	5.91	20.22	0.43	P=0.005 t=2.87 F=0.077	21.50	4.44	23.31	0.47	P=0.000 t=6.241 F=0.687	P=0.000 F=15.611
Secondary Appraisal	17.77	5.40	18.20	0.30	P=0.342 t=0.363 F=0.833	18.42	4.43	20.79	0.29	P=0.000 t=13.398 F=43.47	17.14	4.68	20.63	0.22	P=0.000 t=19.799 F=3.763	P=0.000 F=96.837
Problem Management	35.61	4.03	35.35	0.48	P=0.679 t=0.414 F= 1.55	40.83	4.03	35.21	0.55	P=0.000 t=13.148 F= 24.64	41.44	6.01	44.50	0.32	P=0.000 t=18.992 F=20.36	P=0.000 F=88.816
Emotional Regulation	18.23	3.00	18.13	0.39	P=0.920 t=0.101 F= 4.53	17.79	3.71	18.47	0.31	P=0.000 t=9.276 F=4.642	19.28	3.15	21.03	0.22	P=0.000 t=10.951 F=6.870	P=0.000 F=197.00
meaning-based coping	18.71	3.43	19.24	0.38	P=0.304 t=1.022 F=0.682	20.34	8.00	23.41	0.38	P=0.000 t=13.435 F=45.51	21.36	3.62	24.83	0.34	P=0.000 t=31.07 F=0.016	P=0.000 F=171.25 2
Moderator	11.25	3.03	14.02	0.45	P=0.000 t=0.853 F=0.034	12.04	5.17	15.14	0.34	P=0.000 t=8.088 F=0.262	12.00	3.39	16.49	0.32	P=0.000 t=5.644 F=0.336	P=0.000 F=40.99
Adaptation	27.91	4.51	28.14	0.43	P=0.161 T=1.406 F=14.87	25.86	4.86	28.33	0.48	P=0.000 t=11.165 F= 16.35	26.93	4.06	33.66	0.41	P=0.000 t=6.327 F=0.265	P=0.000 F=95.856

4. Discussion

The object of this semi-experimental project was to measure the effect of Transactional Model on decreasing stress among teachers in comparison with Ordinary Education Curriculum. The research attempted to measure the effect of a teaching package –provided based on Transactional Model- on stress management skill in comparison with Ordinary Education Curriculum.

The findings indicated that perceived stress mean scores of interference group with Transactional Model significantly were decreased in post-interference and follow-up steps in relation to another group in interference step. The finding evidenced decreasing effect of the program on stress. The results of this study comply with Lauga et al research demonstrating the decreasing effect of Transactional Model on teachers, tension and mental fatigue (Lauga, 2008). Also, Akihito et al showed in their study that using an intensive program for a certain group improves coping skills, social supporting and decreases stress reactions (Akihito et al., 2003).

In this research, the effect of Model-based program in follow-up step was more than post- interference step. The possible reason was that participants had a chance to apply the skills learnt in real life situations and fix them in their routine activities (Meichenbam, 2007).

Besides, Sharron and colleagues showed the efficacy of a brief cognitive-behavioral program for reducing the work-related stress of teachers (Sharron, 2011).

This was probably because of using both lecture and questions and answers methods as well as training materials (audio-visual). It tends to have lasting effects training. Besides, using group discussion was caused the development of intellectual and cognitive skills of individuals as well as a lasting education.

In addition, coping with stress behaviors (stress management, emotional regulation, meaning- base coping and moderators) were studied in the research. According to findings, mean scores of interference group increased in post-interference step and the difference in relation to pre-interference step of the same group and control group in post-interference step was significant. This finding complies with Rezaee research demonstrating the effect of

teaching stress on nurses' stress value (Rezaei et al., 2006).

Akihito and coworkers reported that a stress management program might be effective in enhancing social support and decreasing stress responses in teachers (YongWah et al., 2010)

Perhaps it is for this reason that the model has a certain structure and it combine cognitive and behavior processes and it makes the program more efficient than other programs.

Generally, the results demonstrated that Transactional Model- based interference program decreased teachers' stress more than Ordinary Program. This complied with Yong Wah et al research showing the decreasing effect of Transactional Model- based program on stress (YongWah et al., 2010).

5. Conclusion

Totally, the program provided a chance for participants to learn some efficient techniques which complied with their work conditions familiarizing teachers with stress nature and effects. It also reminded them the esoteric and social skills which could use in different situations. Being hopefully effective the Transactional Model- based program in improving teachers' mental health and decreasing stress among them, it is recommended to provide similar teaching programs for other stressor jobs, for example nursing and medicine, or implement the present program in other education environments.

Acknowledgements

We are deeply grateful of Medical Science University of Yazd and Education Administration of Yazd Personnel and the teachers who patiently took part in this study.

References

Akihito, S. H., Okada, Y., Sakamoto, M., & Masae, M. (2003). Effect of stress management program for teachers in japan: apilot study. *J Occup Health, 45*, 202-208. http://dx.doi.org/10.1539/joh.45.202

Allahverdipour, H. (2005). Transient from health education traditional to health education based on theory. *Journal of Health Education, 1*, 75-79.

Bush, T. (2007). Educational leadership and management: theory, policy, and practice. *South African Journal of Education, 27*, 391-406.

Carver, C. S. (2001). How Coping Mediates the Effect of Optimism on Distress: A Study of Women with Early Stage Breast Cancer. *Journal of Personality and Social Psychology, 65*(2), 375-390. http://dx.doi.org/10.1037/0022-3514.65.2.375

Cohen, F. J., Matarazzo, D., & Weiss, S. M., Herd, J. A., Miller, N. E., & Weiss, S. M. (1984). *Behavioral Health: A Handbook of Health Enhancement and Disease Prevention*. New York: Wiley.

Cohen, S., Kamarck, T., & Mermelstein, R. A. (1983). Global measure of perceived stress. *J Health Soc Behave, 24*, 385-396. http://dx.doi.org/10.2307/2136404

Cohen, S., Kamarck, T., & Mermelstein, R. A. (1983). Global measure of precieved stress. *J Health Soc Behav, 24*, 385-396. http://dx.doi.org/10.2307/2136404

Cohen, S., & McKay, G. (1984). Social Support, Stress and the Buffering Hypothesis: A Theoretical Analysis. In A. Baum, J. E. Singer, and S. E. Taylor (eds.), *Handbook of Psychology and Health*. Hillsdale, N.J.: Erlbaum.

Farsani1, M., Aroufzad, S., & Asadi, F. (2012). Relationship between burnout with mental health and personality traits among physical education teachers. *Euro J of Experimental Biology, 6*, 2140-2.

Folkman, S., & Lazarus, R. S. (1990). An analysis of coping in a middleaged community sample. *J Health Soc Behav, 21*, 219-239. http://dx.doi.org/10.2307/2136617

Folkman, S., & Moskowitz, J. (2000). Positive Affect and the Other Side of Coping. *American Psychologist, 55*, 647-654. http://dx.doi.org/10.1037/0003-066X.55.6.647

Ghasemi, V. (2011). *Structural equation modeling in social research*. Print sociologists.

Heitzmann, C. A., & Kaplan, R. M. (1988). Assessment of Methods for Measuring Social Support. *Health Psychology, 7*, 75-109. http://dx.doi.org/10.1037/0278-6133.7.1.75

Jöreskog, K., & Sörbom, D. (1993). L*ISREL 8: Structural Equation Modeling With SIMPLIS Command Language*. Hillsdale, NJ Scientific Software International.

Kahn, R., & Byosiere, S.(1991). stress in organization. Handbook of industrial and organizational psychology,

571-649.

Karbas, M. (2000). prevalence sources and symptoms of stress on the mental health of teachers of Islamic University of Hamedan, 37, 25-32.

Kyriacou, C., & Sutcliffe, J. (1987). A model of teacher stress. *Educational Studies, 4*, 1-6. http://dx.doi.org/10.1080/0305569780040101

Lauga, D. (2008). Stress and burnout among French elementary school teachers: A transactional approach. *Psychologies appliqué, 6*, 241-251.

Lazarus, R. S. (1993). Coping Theory and Research: Past, Present, and Future. *Psychosomatic Medicine, 5*, 234-247.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Lundberg, U. (2005). stress hormones in health ann illness. The role of work and gende. *Psycho neuo endocrin ology, 30*(10), 1017-21.

Meichenbam, D. (2007). Stress inoculating training: a preventative and treatment approach: Guilford press.

Rezaei, S. H., & Fallahi, M. (2006). Evaluation impact of communication skills training on level of job stress among nursing personnel working at rehabilitation centers in cities. *The Journal of Tehran Faculty of Medicine, 64*, 21-26.

Russel, A. (1997). Job-related stress burnout. *J App.Psych, 17*, 269-74.

Sarafino, E. P. (1999). *Health psychology: Biopsychosocial interactions* (3rd Ed.). New York: Wiley.

Shahmansuri, E., & Ghanbari, Sh. (2013). A Survey on Financial Strategies in Corporations. *Universal Journal of Management and Social Sciences, 3*, 7-20.

Sharron, S. K. (2011). A brief cognitive- behavioral stress management program for secondary school teacher. *J occup health, 53*, 23-35. http://dx.doi.org/10.1539/joh.L10037

Shimazu, A., Yusuke, O., & Mitsumi, S. (2003). Effects of study management program for teachers in japan: A pilot study. *J Occup Health, 45*, 202-208. http://dx.doi.org/10.1539/joh.45.202

Soleiman, A., Tahereh, Ch., Italo, M., & Mats, B. (2007). Organizational role stress among medical school faculty members in Iran: dealing with role conflict. *BMC Medical Education, 7*, 14. http://dx.doi.org/10.1186/1472-6920-7-14

The World Health Organization. (1993). *Education for health* (health education in primary health care instructions). Wisdom, Tehran, chehr published.

Tolbert, M. D. (2007). *NO teacher left behind: A predictive model of teacher stress and coping* [Unpublished Ph. D. Dissertation]. University of South Carolina.

YongWah, C., Sawang, S., & Oei, T. (2010). The Revised Transactional Model (RTM) of occupational stress and coping: an improved process approach. *Australian and New Zealand Journal of Organizational Psychology, 3*, 13-20. http://dx.doi.org/10.1375/ajop.3.1.13

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Organizational Entrepreneurship and Administrators of Hospitals: Case Study of Iran

Mehdi Raadabadi[1], Ahmad Fayaz-Bakhsh[2], Aslan Nazari[3], Seyed Masood Mousavi[4] & MohammadAli Fayaz-Bakhsh[5]

[1] Research Center for Health Services Management, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

[2] School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran

[3] Health Management and Economics Sciences Research Center, Iran University of Medical Sciences, Tehran, Iran

[4] Hospital Management Research Center, Iran University of Medical Sciences, Tehran, Iran

[5] Islamic Azad University-South Tehran Branch, Tehran, Iran

Correspondence: Ahmad Fayaz-Bakhsh, School of Allied Medical Sciences, Tehran University of Medical Sciences, Poursina St, Tehran, IRAN, Postcode: 14155-6446. Tel: 98-(0)91-2327-7218/98-(0)21-8895-1391. Fax: 44-(0)70-9201-9895. E-mail: fayaz@tums.ac.ir

Received: February 2, 2014 Accepted: March 19, 2014 Online Published: April 11, 2014

doi:10.5539/gjhs.v6n3p249 URL: http://dx.doi.org/10.5539/gjhs.v6n3p249

Abstract

Due to rapid changes of technology and scientific advances in health systems and need for fast planning in health care, entrepreneurial spirit among employers and employees is a crucial element. According to the field of entrepreneurship research has not been solved and where learning and innovation for healthcare organizations due to the nature of the work required.

This study aims to examine the entrepreneurial activities within the hospitals affiliated to Tehran University of Medical Sciences, Iran. To achieve the aim of the study, a questionnaire containing 29 items regarding the areas of innovation, creative behavior, flexibility, empowerment, rewarding systems and the management support was distributed among the hospitals' managers. Establishment of a culture of entrepreneurship in healthcare organizations led to the development unit controlled, changing the culture of the hospital.

The analysis of the data showed that the majority of the managers agreed with all five areas of entrepreneurship namely the existence of innovation and innovative behavior, flexibility, decision making, rewarding and encouraging system, as well as management supportive system of personnel's new ideas. In fact, the managers generally had positive attitude towards entrepreneurship in their organizations The Pearson correlation test also showed that there is a significant relationship between the areas of entrepreneurship and the managers' age as well as their working experience ($P<0.05$).

Entrepreneurial activities in healthcare can be improved through providing a suitable environment, adjusting reward and encouragement systems, giving more authority to subordinates, promoting awareness and education, and mobilizing managers to attract appropriate opportunities for organization. Further active involvement of employees, more stable in front of changes and increased ability managers to capture opportunities in domestic and foreign situation.

Keywords: entrepreneurship, hospitals, creativity, health system, healthcare activities, hospitals' manager

1. Introduction

Today, organizational environment is so complex and uncertain that institutions can no longer survive through superficial changes such as changes in the method, system and structure (Amirkabiri & Fathi, 2010). In the recent years, several attempts have been made in the field of competition with the aim of detecting entrepreneurs who have capabilities in creating new workflows, in creative problem solving and in developing other necessary capacities (Ernesto-Amoros et al., 2010; Alimardani & Ghahramani, 2009).

Entrepreneurship is a significant source of social mobility that covers various subjects, but the problem is that

many areas of entrepreneurship in research are still virgin (Luke & Verreynne, 2006). Some studies have shown that about one third of America's workforces in business are women showing that gender does not play a significant role in creating entrepreneurship (Peris-Ortiz et al., 2012). Entrepreneurship is one of the most efficient methods of operation and management of change, which the motion of the operation (bureaucracy) is converted into the attitude, culture and entrepreneurial management (Jahangiri & Kalantari-Saghafi, 2008).

Learning and innovation are fundamental requirements for organizations that are seeking effectiveness and survival. Many organizations are also looking for highly innovative and entrepreneurial approaches to improve their effectiveness, efficiency and flexibility (Haghshenas et al., 2008). Based upon previous conducted research studies and evidences about management and policy in Latin American countries, to achieve economic and entrepreneurship dynamism, and to become innovative companies with high added value, the policy makers need to establish entrepreneurial culture (Ernesto-Amoros et al., 2012). The importance and capabilities of organizational entrepreneurship is fully perceptible because employees give new value to the services and products offered by the organization, and this highlights the learning, creation and innovation synchronization that will not be complete without any information factor (Vilaseca-Requena et al., 2007). Entrepreneurship is like an environmental organization in which creativity and innovation of staff are blossomed, and issues like communications and information technology flourish more by providing timely and uniform distribution of the information (Antoncic, 2007). Every year, entrepreneur world scout examines the rates of entrepreneurial activities and barriers to entrepreneurship by implementing field research in member states. These cases represent a global effort on this issue on the basis of offering the practical recommendations and encouraging the exchange of best practices and benchmarking so that it provides a basis for synergy and strengthens entrepreneurship development programs at the country level (Bosma et al., 2008). In general, the processes of organizational entrepreneurship in private and public organizations can be presented for nonprofit organizations. Researchers in various disciplines have studied public entrepreneur-ship, but there is little work in management and economics on the natur (Klein, Mahoney, McGahan, & Pitelis, 2010).

Due to rapid changes in technology and scientific advances among health care provider organizations, determining the future needs and planning them appropriately are very difficult. Health care systems like other economic organizations in the world are very complex and chaotic in which traditional approaches no longer apply. Lack of accurate planning and management in these systems will limit the expectations and creativity which is required to solve complex and new prospective problems of health care. Accordingly, for the conservation and sustainability of the organizations in the era of development and reconstruction of health care systems, innovation and entrepreneurship are a prerequisite (Asefzade & Rezapor, 2007).

Factors such as increasing costs of services, competition, expensive equipment, old population and high cultural diversity affect health services environment. Healthcare related organizations exposed to these challenges are more complex; therefore, they seek solutions for their long-term survival. Achieving such solutions wont be possible without change, innovation and an entrepreneur attitude (Robey, 1998). Different experts have offered numerous scientific and practical frameworks for the study of entrepreneurship within the organization. Many researchers have examined the results of entrepreneurship within organizations and its different dimensions. The growth and profitability of the organizations as well as the customers' satisfaction have been the principal dimensions of entrepreneurship outcomes (Antoncic & Hisrich, 2001). According to the relevant previous studies conducted in this field and due to the importance of managers' viewpoints and their performances in promoting the entrepreneurial culture, learning and innovation for healthcare organizations with regard to the nature of their activities are an essential need. In addition, rapid technological changes and scientific advances in healthcare systems and the need for immediate planning in healthcare will necessitate the presence of entrepreneur managers in this area. The study aims to examine the business activities in hospitals but it seems there is an analysis of point of view of managers about the possibility/need to develop a more organizational entrepreneurship

2. Method

This cross-sectional study was conducted among senior and middle managers in 10 selected hospitals affiliated to Tehran University of Medical Sciences (TUMS), Iran. Study population was all senior and middle executives, including chairmen and chief executives, directors of hospital financial departments, directors of administrative-support departments, senior supervisors, as well as training and clinical supervisors in the hospitals affiliated to TUMS. Ten hospitals were randomly selected from among all 26 hospitals affiliated to TUMS. Data collection tool was a reliable and validated questionnaire consisting of two main parts. The content validity and face validity of the questionnaire were checked by two experts in the field based upon two designed forms (content validation form and face validation form). Moreover, to see the internal reliability of the

questionnaire, Cronbach's alpha coefficient was calculated. The coefficient was found to be 0.77 (Yadolahi-Farsi et al., 2008). The obtained coefficient indicated a good internal reliability for the the questionnaire.

The first part of the questionnaire deals with the respondents' demographic information including age, sex, years of working experience and education level. The second part included 29 items in the areas of innovation, creativity, flexibility, empowerment, reward systems and the management support. The items were designed on a five-point Likert scale of agreement, where 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = strongly agree. While distributing the questionnaires, more explanations were given to the respondents regarding the aim and scope of the study, as well as how the questionnaire should be filled out. Furthermore, if the respondents were interested in the research results, they were assured that the findings will be sent to them after analyzing the obtained information. Moreover, the respondents were given enough time to fill out the questionnaire. At the end, the collected data was entered into the SPSS software, version 18, and then data analysis was performed using the t-test, two-way ANOVA and Pearson correlation test.

3. Results

This study was conducted in 10 hospitals affiliated to Tehran University of Medical Sciences. In total, 120 questionnaires were distributed among the managers but 95 questionnaires were returned. About 70 % of the respondents were female and the rest of 30 % surveyed managers were male. The age distribution showed that about half of the surveyed managers were in the age range of 40-49 (45.6%). Most of the respondents had bachelor's degree and they had managerial experience between 10 to 20 years (see Table 1).

Table 1. Frequency distribution of managers in terms of demographic characteristics

Variable		Number	Percent
Age range	20-29	8	8.9%
	30-39	32	32.8%
	40-49	44	45.6%
	50-59	11	12.7%
Educational degree	Diploma	2	2.2%
	Associate`s degree	2	2.2%
	BA	67	68.8%
	MA	17	18.2%
	Ph.D.	7	8.6%
Work experience in managerial posts	0-5	13	13.4%
	6-10	10	10.4%
	11-15	28	28.4%
	16-20	28	29.9%
	21-25	16	17.9%

The results showed that the majority of the managers agreed with all five areas of entrepreneurship namely the existence of innovation and innovative behavior, flexibility, decision making, rewarding and encouraging system, as well as management supportive system of personnel's new ideas. In fact, the managers generally had positive attitude towards entrepreneurship in their organizations (see Table 2).

Table 2. Average areas related to entrepreneurship among the managers of the hospitals

Areas	Strongly agree & Agree	Undecided	Disagree & Strongly disagree
Level of innovation and innovative behavior	46.5 %	32.3%	21. 2 %
Level of flexibility	55.6 %	23.8%	20.6 %
Decision making	63 %	21.4%	15.6 %
Rewarding and encouraging system	45 %	32.8%	22.2 %
Management supportive system of personnel's new ideas	45.4 %	33.6 %	21. %
Average	51.1 %	28.8%	20.1 %

The t-test did not show any significant relationships between the managers' gender and the areas under investigation. The Pearson test showed that, except for the second area namely level of flexibility, there is a significant relationship between managers' working experience and the areas under investigation (see Table 3).

Table 3. Relationship between the areas of entrepreneurship and managers' working experience

Areas	Pearson	P value
Level of innovation and innovative behavior	-0.359	0.003
Level of flexibility	-0.22	0.072
Decision making	-0.25	0.040
Rewarding and encouraging system	-0.32	0.008
Management supportive system of personnel's new ideas	-0.37	0.002

The Pearson negative value indicates a negative relationship between the areas under investigation and the managers' working experience. In other words, younger managers agree much more with entrepreneurship within their organizations.

Table 4 shows the relationship between the managers' age and the areas of entrepreneurship. Pearson test showed that there is a negative. In other words, the level of entrepreneurship is lower in the older managers. In total, the overall average of the five areas under investigation showed that most of the managers agree with entrepreneurship in their hospitals.

Table 4. Relationship between the areas of entrepreneurship and managers' age

Areas	Pearson	P value
Level of innovation and innovative behavior	-0.36	0.001
Level of flexibility	-0.27	0.016
Decision making	-0.26	0.021
Rewarding and encouraging system	-0.23	0.040
Management supportive system of personnel's new ideas	-0.30	0.008

4. Discussion

4.1 Level of Innovation and Innovative Behavior

In this area, less than half of the respondents (46.52%) agreed with the innovation and innovative practices in their organizations. However, about one-fifth of the surveyed managers (21.12%) disagreed with this level of entrepreneurship in their organizations. Therefore, this factor can be regarded as an important factor in entrepreneurship in the hospitals. The results of this study are in accordance with the findings of Reisi et al. (2008) in which they found that creativity and innovation are effective factors in entrepreneurship. Moreover,

Tafazoli (1994) stated that the major reason for economic backwardness in developing countries is the lack of individual creativity understanding. He pointed out that although the human spirit for success is formed in childhood, it is possible to make a creative spirit and business mission in people by proper training programs. Without any doubt, both innovation and entrepreneurship are essential components for obtaining desirable results.

4.2 Level of Flexibility

In this area, more than half of the surveyed managers (55.60 %) agreed with the flexibility in their organizations. Sean (2005) also referred to a direct relationship between flexibility and improvement of organizations' performance and considered it as an effective factor in innovation and doing innovative practices. The concept of flexibility in the last decade has attracted a great deal of researchers' attentions. This concept has been defined as the organization's ability to respond to the diverse demands of its dynamic competitive environment (Ngo & Loi, 2008). Although the concept of flexibility covers both the employees and the structure of organizations, this concept is a subset of entrepreneurship. Accordingly, the success of an organization in entrepreneurship directly depends upon the level of flexibility in that organization.

4.3 Decision Making

In the area of considering empowerment as an encouragement to the employees, about two-third (63%) of the respondents agreed to give authority to managers and lower level employees. In his study, Shirzad (2001) concluded that implementation of empowerment programs attract managers' attention to the basic objectives, accelerate decision-making and increase motivation. Moreover, Shahab (1999) stated that empowerment is the second priority which management needs for doing better administrative and executive activities. Therefore, it can be concluded that entrepreneurship in organizations with empowerment raises the participation rate among the employees and increases their motivation to perform better so that it can be considered as one of the important pillars of entrepreneurship within the organization

4.4 Reward and Encouragement System

With regard to the hospitals equipped with rewarding and encouraging systems for the entrepreneurial ideas, less than half of the surveyed managers (45%) welcomed the presence of this system. However, 22.13% of the respondents disagreed with this system in the hospitals. In general, rewarding system in entrepreneurial organizations has its own characteristics. Practicality and feasibility of the considered reward is one of them. For example, bonuses considered for the employees should be payable. The rewards should also be available for the employees. In this regard, various incentives should be employed. Both financial and non-financial incentives are important, but more intrinsic encouragements should be used (Cornwall & Perlman, 1990). Sykes and Block (1989) believe that organizations must consider a rewarding system to overcome the bureaucratic barriers and move towards entrepreneurship with more emphasis on giving the reward on the basis of employees' performances. Providing appropriate encouragement and rewarding systems is one of the most important factors in entrepreneurial organizations. Traditional methods of promotion and reward can rarely be effective for entrepreneurs (Stevenson & Gumpert, 1985; Thompson, 1999). Using appropriate rewards can raise employees' desire to accept the risks associated with entrepreneurial activities. Thus, although reward system is supposed to be simple, several studies have shown that there is a direct relationship between the level of entrepreneurial organizations and reward system. In this study the majority of administrators agreed with this system in their organizations.

4.5 Management Supportive System of Personnel's New Ideas

In this area, less than half of the surveyed managers (45.39 %) believed in the presence of management supportive system of personnel's new ideas in their organizations. According to Paolini (1991), supporting the personnel is considered as one of the five major steps of entrepreneurship development process within organizations. In his study, Yusuf (1995) concluded that one of the critical factors affecting success of entrepreneurship is the organizational support such as providing infrastructures and training facilities. This study indicated that there is a significant relationship between managers' age and each areas of entrepreneurship. In this regard, Knight (1997) determined a set of criteria for measuring entrepreneurial tendencies that show a negative relationship between the managers' age and taking risks. Moreover, in his study, Ahmadpor-Daryani (2000) showed that younger people need to succeed more than older people. With regard to the managers' working experience, except for the second area namely level of flexibility, there was a significant relationship between managers' working experience and the entrepreneurial areas under investigation.

In their study, Hornsby et al. (2002) concluded that there is a negative relationship between managerial

experiences and the amount of managers' entrepreneurial activities. They stated that more experienced managers are more cautious than younger managers in dealing with organizational issues. Moreover, in their study on middle level managers, Floyd and Woolridge (1994) found that there is a negative relationship between managerial experiences of middle level managers and their tendency to do entrepreneurial activities; however, this relationship was not highly significant. All in all, the results of this study and the findings of other related studies illustrate the importance of the five areas of study in entrepreneurship. Furthermore, it was shown that each of these factors is necessary to implement entrepreneurship in an organization such as a hospital.

5. Conclusion

It can be concluded that the more hospitals' managers strengthen the characteristics associated with entrepreneurship by giving value to their entrepreneurial ideas, the better they can develop entrepreneurial activities within their respective hospitals. This also leads to more staff participation within the hospitals. The process of entrepreneurial activities can be improved by changing the culture of hospitals through providing a suitable environment for creative people, creating a system of reward and encouragement, giving more authority to subordinates, promoting personnel's awareness, training the personnel in the field of working values and responsibility, and increasing managers' ability to absorb appropriate opportunities for organization. In the areas such as healthcare services, organizations can be more irresponsive against changes, because the entrepreneurial organization is an organization that is capable to strengthen creativity and innovation according to environmental changes and structural complexity. In organizational entrepreneurship, the structural dimensions are regarded as the important issues that seriously prevent the spread of entrepreneurship and act as a barrier against the employees. Several studies have shown that there is a negative relationship between entrepreneurship and complexity in the organization because complexity reduces the relationship among the group members within the organization. Moreover, there is a negative relationship between entrepreneurship and formality because the personnel's formality reduces the flexibility and freedom within an organization. For creating entrepreneurial activities within the organizations such as the hospitals, it is required to remove the barriers, such as structural complex aspects. Bureaucracy in organizations must be at the lowest level; however, due to the existence of bureaucracy in most of the Iranian organizations, it may be a little hard to imagine basic change in their structures. Nevertheless, in order to keep pace with the changes, particularly the global changes, considering the above mentioned entrepreneurial activities and their interactions seems inevitable.

Acknowledgements

The authors would like to extend their gratitude to Tehran University of Medical Sciences and Health Services for sponsoring the study. This research was funded by a grant number 132/1449 dated 26/09/2011.

References

Klein, P. G., Mahoney, J. T., McGahan, A. M., & Pitelis, C. N. (2010). Toward a theory of public entrepreneurship. *European Management Review, 7*(1), 1-15. http://dx.doi.org/10.1057/emr.2010.1

Ahmadpor-Daryani, M. (2000). *Entrepreneurship: Definitions, Theories, and Models*. Tehran: Pardis Publications.

Alimardani, M., & Ghahramani, M. (2009). On the Relationship between Organizational Structureand Entrepreneurship. *Quarterly Journal of New Approaches in Educational Administration, 2*(3), 131-144.

Amirkabiri, A., & Fathi, S. (2010). The relationship between psychological empowerment and Entrepreneurship. *Journal of Industrial Management Studies, 16*, 99-124.

Antoncic, B. (2007). Intrapreneurship: a comparative structural equation modeling study. *Industrial Management & Data Systems, 107*(3), 309-325. http://dx.doi.org/10.1108/02635570710734244

Antoncic, B., & Hisrich, R. D. (2001). Intrapreneurship: Construct Refinement and Cross-Cultural Validation. *Journal of Business Venturing, 16*(5), 495-527. http://dx.doi.org/10.1016/S0883-9026(99)00054-3

Asefzade, S., & Rezapor, A. (2007). *Health planning* (pp 163-175). Qazvin University of medical science, Hadise Emruz publication.

Bosma, N., Jones, K., Autio, E., & Levie, J. (2008). *Global entrepreneurship monitor, executive report 2007*. Babson College y London Business School. Babson Park, MA. y Londres, UK.

Cornwall, J. R. & Perlman, B. (1990). *Organizational entrepreneurship*, Irwin Homewood, IL.

Ernesto-Amoros, J., Fernandez, C., & Tapia, J. (2012). Quantifying the relationship between entrepreneurship and competitiveness development stages in Latin America. *International Entrepreneurship and*

Management Journal, 8(3), 249-270. http://dx.doi.org/10.1007/s11365-010-0165-9

Floyd, S. W., & Woolridge, B. (1994). Middle Management Involvement in Strategy and its Association with Strategic Type: a Research Note. *Strategic Management Journal, 13*(S1), 153-167. http://dx.doi.org/10.1002/smj.4250131012

Haghshenas, A., Jamshidian, M., Shaemi, A., Shahin, A., & Yazdanshenas, M. (2008). An Organizational Entrepreneurship Framework for Iran's Public Sector. *Iranian journal of management sciences, 2*(8), 31-73.

Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: assessing a measurement scale. *Journal of business venturing, 17*(3), 253-273. http://dx.doi.org/10.1016/S0883-9026(00)00059-8

Jahangiri, A., & Kalantari-Saghafi, R. (2008). Survey and Measurement Characteristics of entrepreneurial managers. *Journal of Entrepreneurship Development, 1*(1), 87-110.

Knight, G. A. (1997). Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation. *Journal of Business Venturing, 12*(3), 213-225. http://dx.doi.org/10.1016/S0883-9026(96)00065-1

Luke, B., & Verreynne, M. L. (2006). Exploring strategic entrepreneurship in the public sector. *Qualitative Research in Accounting & Management, 3*(1), 4-26. http://dx.doi.org/10.1108/11766090610659724

Ngo, H. Y., & Loi, R. (2008). Human resource flexibility, organizational culture and firm performance: an investigation of multinational firms in Hong Kong. *The International Journal of Human Resource Management, 19*(9), 1654-1666. http://dx.doi.org/10.1080/09585190802295082

Pavlin, I. (1991). *Entrepreneurship development in public enterprises*, International Labour Organization.

Peris-Ortiz, M., Rueda-Armengot, C., & Benito Osorio, D. (2012). Women in business: entrepreneurship, ethics and efficiency. *International Entrepreneurship and Management Journal, 8*(3), 343-354. http://dx.doi.org/10.1007/s11365-011-0177-0

Raeissi, P., Nasiripour, A., Rostami, L., & Khalesi, N. (2008). The Relation between Manager's Personality Traits and Entrepreneurship in Health Care Organizations affiliated with Tabriz University of Medical Sciences 2007. *Journal of Health Administration, 11*(33), 57-62.

Robey, D. (1998). *Designing Organization* (2nd Edition). New Jersey: Prenticed-Hall.

Shahab, A. (1999). *Education and Nurture Management Needs Assessment in Quchan to Increase Their Efficiency.* Master Thesis of Education Management. Islamic Azad University, Sari Branch.

Shirzad, Z. (2001). *The Effect of Delegation Authority in Management of Melli Bank Branches in Mazandaran Province in the View of Managers.* Master Thesis of Educational from Management. Islamic Azad University, Sari Branch.

Stevenson, H. H., & Gumpert, D. E. (1985). *The Heart of Entrepreneurship*. *Harvard Business, 63*(2), 85-94.

Sykes, H. B., & Block, Z. (1989). Corporate venturing obstacles: Sources and solutions. *Journal of business venturing, 4*(3), 159-167. http://dx.doi.org/10.1016/0883-9026(89)90018-9

Tafazoli, F. (1994). *History of Economical Principals from Plato to Present time*. Tehran: Nashr-e-Naey.

Thompson, J. L. (1999). The world of the entrepreneur–a new perspective. *Journal of workplace learning, 11*(6), 209-224. http://dx.doi.org/10.1108/13665629910284990

Way, S. A. (2005). *A firm-level analysis of HR flexibility*. Rutgers the state university of New Jersey-New Brunswick.

Yadolahi-Farsi J, Janesari S. A, Zamani, M. (2008). Study of Organizational Entrepreneurship In government organizations: Case Study of Khuzestan. *Journal of Entrepreneurship Development, 1*(1), 171-206.

Yusuf, A. (1995). Critical success factors for small business: perceptions of South Pacific entrepreneurs. *Journal of Small Business Management, 33*(2).

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

The Comparison of the Effects of Education Provided by Nurses on the Quality of Life in Patients with Congestive Heart Failure (CHF) in Usual and Home-Visit Cares in Iran

Hosseinali Mehralian[1], Shahriar Salehi[1], Jafar Moghaddasi[1], Masoud Amiri[2] & Hossein Rafiei[1]

[1] Department of Medical Surgery, School of Nursing and Midwifery, Shahrekord University of Medical Sciences, Shahrekord, Iran

[2] Social Health Determinants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

Correspondence: Hosseinali Mehralian, Department of Medical Surgery, School of Nursing and Midwifery, Shahrekord University of Medical Sciences, Shahrekord, Iran. Tel: 98-381-333-5652. E-mail: Mehralian_2003@yahoo.com

Received: December 27, 2013 Accepted: March 21, 2014 Online Published: April 11, 2014

doi:10.5539/gjhs.v6n3p256 URL: http://dx.doi.org/10.5539/gjhs.v6n3p256

Abstract

Aim: Quality of life (QOL) can be considered as a quality indicator of health care systems and nurses can play an important role to improve QOL in patients with congestive heart failure (CHF). The aim of this study was to determine the effects of education provided by nurses on the QOL in patients with CHF in home-visit care compared to usual care.

Method: In a single-blind randomized controlled trial conducted from September 2011 to June 2012, 110 patients with CHF were randomly assigned into two groups. While patients in group I were received usual education at the time of hospital discharge, patients in Group II, in addition to usual education, were received special education regards to their illness by nurses who visited patients in their homes. The 36-item short-form (SF-36) questionnaire was used to evaluate the patient's QOL at the time of discharge and also six months after hospital discharge.

Results: At the time of hospital discharge, mean score of all 8 sub-score of SF-36 questionnaire was 63.4±7.8 in patients of group II and 61.1±6.4 in patients of group I, respectively (P> 0.05). QOL was decreased in group I and increased in group II compared to the time of hospital discharge. After six months, mean score of QOL was higher in group II than in group I.

Conclusions: QOL of patients with CHF were decreased after hospital discharge. Education provided by nurses in home-visit care could improve the QOL in patients with CHF, based on the findings of this study.

Keywords: quality of life, education, nurse, home-visit, congestive heart failure

1. Introduction

Incidence of heart diseases has increased from 5.8% to 16.8% from 1995 to 2001 in Iran (Iranian Ministry of Health and Medical Education, 2010) which one of the most common forms of heart diseases is congestive heart failure (CHF) (Coelho et al., 2005; Fonarow, 2004; Sadeghi Sherme, Ahmadi, Babatabar, & Haji Amini, 2009; Saccomann et al., 2011; Murray-Thomas, & Cowie, 2005). In fact, about 15 million patients throughout the world and 4.9 million patients in the United States (US) may suffer from CHF (Carelock & Clark, 2001; Sadeghi Sherme et al., 2009). Furthermore, according to the report of Iranian health care agency in 2001, the rate of CHF was 3.3 in every 100 people (Iranian Ministry of Health and Medical Education, 2010). It means that the rate of readmission among patients with CHF is high and may impose the health care systems with many further problems (Hou et al., 2004).

The physical restrictions and advanced symptoms derived from this disease might result in decreasing the QOL in patients with CHF (Sadeghi Sherme et al., 2009). Compared to other chronic diseases such as rheumatoid arthritis and chronic obstructive pulmonary disease, negative effects of CHF on patients' QOL are substantial. Yousefi, Sabzevari, Mohammadalizade and Haghdoost studied the QOL of patients with CHF in Iran in 2011 and reported that these patients had not appropriate QOL. They have also found that illiterate patients and women

had lower QOL. In another study in Iran, Rahnavard, Zolfaghari, Kazem Nejad and Hatami Poor (2007) examined the QOL and its related risk factors in patients with CHF. They found that almost half of patients had lower levels of QOL in physical, psychological, social and economical dimensions. They also reported that the education, job, severity of disease, number of readmission, edema, high level of blood lipids and fatigue during activity could impact on QOL among patients with CHF. Study of Juenger et al. (2002) in Germany showed that New York Heart Association (NYHA) functional class is most dominant predictor of changing the QOL in patients with CHF. They also reported that there was no clear association between QOL and left ventricular ejection fraction (LVEF), duration of disease, and age. In Sweden, Martensson, Stromberg, Dahlstrom, Karlsson and Fridlund (2005) studied on the effects of a nurse-led intervention on QOL and depression in 153 patients with CHF and reported that nurse-led intervention in a primary health care setting had limited effects on the QOL and depression in these patients.

QOL could be considered as a quality indicator of health care systems. One of the main goals of caring of CHF patients is QOL improvement (Yousefi et al., 2011). It is obvious that to achieve this goal, nurses have an important role. However, in Iran the role of nurses in improvement of QOL in CHFs outpatients has not received enough attention. In our study, the main aim was to assess the effects of education provided by nurses in home-visit care compared to regular education at the time of hospital discharge on QOL in patients with CHF.

2. Materials and Methods

This single-blind randomized controlled trial conducted from September 2011 to June 2012 in Shahrekord, southwest of Iran. The study has been obtained permission from the Ethics Board of the Shahrekord University of Medical Science. Inclusion criteria were: having CHF diagnosed by cardiologist, age more than 18 years, NYHA class II–IV, ejection fraction less than 45%, ability to reading and writing and accept to participant in study. Patients with history of other diseases who needed to have a surgery during study period and psychological disorder were excluded. Each patient was asked to fill in a written consent form.

One hundred ten patients randomly assigned in two groups. Patients in group I, were received usual education provided by nurses in the time of hospital discharge (one hour before patients discharge, nurses visited patients in their room and answered the questions of the patients and their family). In addition to the usual education in the time of hospital discharge and during home visits, patients in group II were received special education regards to their illness by nurses who visited patients in their homes. Special education according to the checklist of home-visit care in CHF patients was included: information about their disease, usual signs and symptoms and potential complications of their illness, prescribed medications, potential change in their lifestyle, special signs and symptoms which they have to know in order to go to the hospital on time and any other information about the illness which patients may request to be answered. Patients in group II also received one simplified booklet about CHF. Patients' education in both groups provided by nurses whom had more than five years experience in caring of CHF patients. Home-visits were scheduled two times per month in 1, 3 and 6 months after patients' discharge from hospital. Patients and their families were encouraged to make contact in the event of problems to their condition.

QOL of patients was measured by the Iranian version of the 36-item short form (SF-36) questionnaire at discharge time and also six months after hospital discharge (Thompson, Roebuck, & Stewart, 2005). The SF-36 is a generic multidimensional instrument consisting of eight multi-item components representing physical functioning (PF; the extent to which health limits physical activities, such as self care, walking and climbing stairs), role of physical functioning (RP; the extent to which physical health interferes with work or other daily activities), bodily pain (BP; the intensity of pain and the effect of pain on normal work, both inside and outside the home), general health perceptions (GH; personal evaluations of current health, health outlook, and resistance to illness), vitality (VT; feeling full of energy rather than tired and worn out), social functioning (SF; the extent to which physical health or emotional problems interfere with normal social activities), role of emotional functioning (RE; the extent to which emotional problems interfere with work or daily activities) and mental health (MH; general mental health including depression, anxiety, behavioral-emotional control, and general positive affect). SF-36 scores were converted to a scale of 0 to 100, in which a higher score is indicating a better QOL. Baseline demographic and clinical characteristics including age, sex, medical history, the establishment of the diagnosis, and prescribed medication were extracted from the patients' medical records. The data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 17. A P-value of less than 0.05 was considered as statistically significant. Descriptive statistics (expressed as mean and standard deviation (SD), paired T-test and independent T- test for comparing the means of normally distributed independent-samples were used.

3. Results

Of 55 patients of group I, 4 patients died and one patient rejected to continue the study (Table 1). In group II, 2 patients died and 4 patients withdrew due to their own request. 62.2% of patents in group I and 54% of patients in group II were men. Mean age of patients in group I and II were 62.7±10 and 61.28±13, respectively. Most of the patients were married: 96% in group I and 100% in group II. According to NYHA criteria, the most prevalent CHF degree was class III in both groups (82% in group I and 67.3% in group II). At the time of hospital discharge, mean score of all 8 sub-score of SF-36 questionnaire was 63.4±7.8 in group II and 61.1±6.4 in group I, respectively (P>0.05). In both groups, largest score was related to sub-scale of GH and smallest score was related to sub-scale of PF. After six months, mean score of QOL was higher in group II than in group I (P<0.05). In addition, after six months, compared to the time of hospital discharge, QOL was improved in patients of group II (P<0.05). However, in patients of group I, QOL scores were declined after six months (P<0.05). Table 1 shows the comparison of the QOL scores before and after intervention.

Table 1. Comparison of the QOL scores before and after intervention

QOL Domain	Groups					
	Before intervention		P value	After intervention		P value
	Group I	Group II		Group I	Group I	
Physical functioning	55.08±8.62	52.22±10.87	p > 0.05	49.92±7.24	55.16±12.19	p < 0.05
Role-physical	55.14±9.91	54.32±12.41	p > 0.05	51.32±7.51	55.74±11.65	p < 0.05
Bodily pain	72. 80±16.55	69.10±22.47	p > 0.05	64.43±16.38	72.88±17.96	p < 0.05
General health	73.33±17	72.62±21.93	p > 0.05	67.92±18.50	75.28±19.33	p < 0.05
Vitality	57.43±11.67	56.92±13.62	p > 0.05	54.12±9.76	58.58±13.06	p < 0.05
Social functioning	67.82±15.68	64.62±19.71	p > 0.05	59.90±11.51	66.56±18.74	p < 0.05
Role-emotional	58.84±10.33	57.18±12.39	p > 0.05	56.43±8.67	58.34±12.27	p > 0.05
Mental health	62.90±13.76	61.12±16.83	p > 0.05	59.76±12.28	61.78±16.29	p > 0.05

4. Discussion

The QOL is defined as perception of people about their life, values, goals, standards, and interests (Yaghoubi et al., 2012). Our study showed that educations provided by nurses in home-visits may improve QOL more than educations only in discharge time of patients with CHF.

Vavouranakis and colleagues (2003) studied the effect of home-based intervention on hospital readmission and QOL in middle-aged patients with severe CHF. They reported that the use of continuous education and intervention in these patients could increase physical function and decrease physical pain and rate of readmission, which is similar to our findings. In another study, in 2010 in Iran, Sadeghi Sharmeh (2009) studied the effects of applying continuous care model (an Iranian care model) on QOL of patients with heart failure. They reported that applying care continuous model in these patients could enhance QOL in physical, emotional and general dimensions. Furthermore, the results of Chinaglia's (2002) study were also similar to our results. They examined a nurse-based heart failure management program on hospitalization rate, functional status, QOL and medical costs in patients with CHF and reported that nurses can play an important role in management of patients with CHF.

However, Martensson and colleagues (2007) reported that the use of nurse-led intervention have limited effects on QOL in HF patients in a primary health care setting, which is not similar to our results. This difference might be due to the difference in health care systems of Iran and Sweden. Because in Iran, patients with CHF would receive education provided by nurses only at the time of hospital discharge and home-visits are not performing at this time. Thus, Iranian patients probably have less information about their disease at the time of hospital discharge; therefore, they would have lower levels of QOL compared to Swedish patients. In addition, the different method of two studies may result in the observed difference. In Sweden, educations and follow-up were performed using telephone; however, in our study, instead of using phones, home-visits were done by nurses.

Previous studies in Iran have reported that Iranian patients with CHF had lower level of QOL (Rahnavard et al.,

2007; Yaghoubi et al., 2012; Yousefi et al., 2011). They showed that many factors such as age, sex, duration of diagnosis, smoking, positive familial heart diseases decrease, educational status, job, treatment method, cardiac ejection fraction, diabetes and high blood pressure could affect on the QOL in this group of patients. Moreover, we found that usual educations for patients with CHF at the time of hospital discharge were insufficient and QOL decreased in patients with CHF as well as findings of Rahnavard et al. (2007) who reported incompleteness of education provided by nurses at the time of hospital discharge in Iranian hospitals. He suggested that nurses/nursing students should receive more training about giving information to the patients and their families about their diseases, especially in patients with CHF. There was also an emphasis on the important role of nurses to increase the QOL of patients with CHF. In addition, Yousefi and colleagues (2011) also reported that nurses have to pay more attention to QOL in patients with CHF. They suggested that to increase QOL of patients, their follow-up and home-visits after discharge should be considered as an important aspect of nursing care in CHF patients.

5. Conclusion

The QOL of patients with CHF may decrease after hospital discharge. Therefore, nurses have an important role in caring of this group of patients. Educations provided by nurses in home-visits could improve the QOL in patients with CHF. Nurses should pay more attention to all aspects of patients' QOL, especially physical functioning due to its nature to have more decrease after hospital discharge than other dimensions of QOL. Finally, Iranian health care systems are needed to change their programs in term of patients follow-up and home-visits after hospital discharge.

References

Carelock, J., & Clark, A. (2001). Heart failure: pathophysiologic mechanisms. *Am J Nurs, 101*(12), 26-33. http://dx.doi.org/10.1097/00000446-200112000-00017

Chinaglia, A., Gaschino, G., Asteggiano, R., Titta, G., Gullstrand, R., Bobbio, M., Trinchero, R. (2002). Impact of a nurse-based heart failure management program on hospitalization rate, functional status, quality of life, and medical costs. *Ital Heart J, 3*(5), 532-8.

Fonarow, G. C. (2004). Heart failure disease management programs: Not a class effect. *Circulation, 110*, 3506-3508. http://dx.doi.org/10.1161/01.CIR.0000151101.17629.20

Hou, N., Chui. M., Ekert, G., Oldridge, N. L., Murray, M. L., & Bennet, S. (2004). Relationship of age and sex to health-related quality of life in patients with heart failure. *Am J Crit Care, 13*(2), 153-61.

Juenger, J., Schellberg, D., Kraemer, S., Haunstetter, A., Zugck, C., Herzog, W., & Haass, M. (2002). Health related quality of life in patients with congestive heart failure: comparison with other chronic diseases and relation to functional variables. *Heart, 87*, 235-241. http://dx.doi.org/10.1136/heart.87.3.235

Martensson, J., Stromberg, A., Dahlstrom, U., Karlsson, J. V., & Fridlund, B. (2005). Patients with heart failure in primary health care: effects of a nurse-led intervention on health-related quality of life and depression. *Eur J Heart Fail, 7*(3), 393-403. http://dx.doi.org/10.1016/j.ejheart.2004.01.016

Murray-Thomas, T., & Cowie, M. R. (2003). Epidemiology and clinical aspects of congestive heart failure. *J Renin Angiotensin Aldosterone Syst, 4*(3), 131-6. http://dx.doi.org/10.3317/jraas.2003.020

Rahnavard, Z., Zolfaghari, M., Kazem Nejad, A., & Hatami Poor, K. H. (2007). Quality of life and related factors in patients with CHF. *Hayat, 12*, 77-86.

Saccomann, I. C. R., Cintra, F. A., & Gallani, M. C. (2011). Quality of life in older adults with heart failure: assessment with a specific instrument. *Acta Paul Enferm, 24*, 179-184. http://dx.doi.org/10.1590/S0103-21002011000200004

Sadeghi Sherme, M., Ahmadi, F., Babatabar, H. D., & Haji Amini, Z. (2009). Effect of applying continuous care model on quality of life in heart failure patients. *Journal of Behavioral Science, 3*(7), 9-13.

Thompson, D. R., Roebuck, A., & Stewart, S. (2005). Effects of a nurse-led, clinic and home-based intervention on recurrent hospital use in chronic heart failure. *Eur J Heart Fail, 7*(3), 377-84. http://dx.doi.org/10.1016/j.ejheart.2004.10.008

Tsoutsoumanou, K. (2003). Effect of home-based intervention on hospital readmission and quality of life in middle-aged patients with severe congestive heart failure: a 12-month follow up study. *Eur J Cardiovasc Nurs, 2*(2), 105-11. http://dx.doi.org/10.1016/S1474-5151(03)00006-9

Yaghoubi, A., Tabrizi, J., Mirinazhad, M., Azami, S., Naghavi-Behzad, M., & Ghojazadeh, M. (2012). Quality of

Life in Cardiovascular Patients in Iran and Factors Affecting It: A Systematic Review. *Journal of Cardiovascular and Thoracic Research, 4*, 95-101.

Yousefi, P., Sabzevari, S., Mohammadalizade, S., & Haghdoost, A. A. (2011). Study of quality of life in heart failure hospitalized patients in Kerman medical university hospital in 2008. *Research in Nursing, 6*, 59-67.

Vavouranakis, I., Lambrogiannakis, E., Markakis, G., Dermitzakis, A., Haroniti, Z., Ninidaki, C., & Borbantonaki, A. (2003). Effect of home-based intervention on hospital readmission and quality of life in middle-aged patients with severe congestive heart failure: a 12-month follow up study. *Eur J Cardiovasc Nurs, 2*(2), 105-11. http://dx.doi.org/10.1016/S1474-5151(03)00006-9

Global Journal of Health Science; Vol. 6, No. 3; 2014
ISSN 1916-9736 E-ISSN 1916-9744
Published by Canadian Center of Science and Education

Reviewer Acknowledgements for Global Journal of Health Science, Vol. 6, No. 3

Global Journal of Health Science wishes to acknowledge the following individuals for their assistance with peer review of manuscripts for this issue. Their help and contributions in maintaining the quality of the journal is greatly appreciated.

Global Journal of Health Science is recruiting reviewers for the journal. If you are interested in becoming a reviewer, we welcome you to join us. Please find the application form and details at http://www.ccsenet.org/reviewer and e-mail the completed application form to gjhs@ccsenet.org.

Reviewers for Volume 6, Number 3

Alberto Alves de Lima, Instituto Cardiovascular de Buenos Aires, Argentina

Ammar Eltayeb Ali Hassan, University of Tromsø, Norway

Brian Cook, Neuropsychiatric Research Institute, United States

Caroline Elizabeth Bulsara, University of Western Australia, Australia

Domitila Huber, Federal University of Santa Catarina, Brazil

Donna Wilson, University of Alberta, Canada

Emad Adel Shdaifat, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Malaysia

Farahnaz Amini, UCSI University, Malaysia

Fernanda Barbosa Lima-Christian, Federal University of Santa Catarina, Brazil

Francisco Rodenas Rigla, University of Valencia, Spain

Gabriele Messina, University of Siena, Italy

Meng Zhao, Texas A&M University at Corpus Christi, United States

Montarat Thavorncharoensap, Health Intervention and Technology Assessment Program (HITAP), Ministry of Public Health, Thailand

Myo Nyein Aung, Boromrajonani College of Nursing, Thailand

Kimberley Geissler, Boston University School of Management, United States

Kim Solez, University of Alberta, Canada

Pavlos Sarafis, Technological Educational Institute Lamia, Faculty of Nursing, Greece

Polly Yeung, Massey University, New Zealand

Qilong Wang, University of Oklahoma, United States

Roslyn Kane, University of Lincoln, United Kingdom

Samira Mansur, Federal University of Santa Catarina, Brazil

Sara Melo, Queen's University Belfast, United Kingdom

Steven Hoffman, University of Texas at San Antonio, United States

Tarek Tawfik Amin, King Faisal University, Saudi Arabia

Tugrul Erbaydar, Ankara University Medical School, Turkey

Zada Pajalic, School of Health and Society, Kristianstad University, Sweden

Call for Manuscripts

Global Journal of Health Science is a peer-reviewed journal, published by Canadian Center of Science and Education. The journal publishes research papers in the fields of public health, community health, environmental health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, and equity in health. The journal is published in both printed and online versions, and the online version is free to access and download.

We are seeking submissions for forthcoming issues. The paper should be written in professional English. The length of 3000-8000 words is preferred. All manuscripts should be prepared in MS-Word format, and submitted online, or sent to: gjhs@ccsenet.org

Paper Selection and Publication Process

a). Upon receipt of paper submission, the Editor sends an E-mail of confirmation to the corresponding author within 1-3 working days. If you fail to receive this confirmation, your submission/e-mail may be missed. Please contact the Editor in time for that.

b). Peer review. We use double-blind system for peer-review, both reviewers and authors' identities remain anonymous. The paper will be peer-reviewed by three experts, one is an editorial staff and the other two are external reviewers. The review process may take 2-3 weeks.

c). Notification of the result of review by E-mail.

d). The authors revise paper and pay publication fee.

e). After publication, the corresponding author will receive two copies of printed journals, free of charge.

f). E-journal in PDF is available on the journal's webpage, free of charge for download.

Requirements and Copyrights

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other languages, without the written consent of the Publisher. The Editors reserve the right to edit or otherwise alter all contributions, but authors will receive proofs for approval before publication.

Copyrights for articles published in CCSE journals are retained by the authors, with first publication rights granted to the journal. The journal/publisher is not responsible for subsequent uses of the work. It is the author's responsibility to bring an infringement action if so desired by the author.

More Information

E-mail: gjhs@ccsenet.org

Website: www.ccsenet.org/gjhs

Paper Submission Guide: www.ccsenet.org/submission

Recruitment for Reviewers: http://ccsenet.org/web/reviewer.html

The journal is peer-reviewed
The journal is open-access to the full text
The journal is included in:

Cabell Publishing, Inc.	PKP Open Archives Harvester
DOAJ	ProQuest
EBSCOhost	**PubMed/MEDLINE**
Google Scholar	Standard Periodical Directory
LOCKSS	Ulrich's
Open J-Gate	Universe Digital Library

Global Journal of Health Science

Bimonthly

Publisher	Canadian Center of Science and Education
Address	1120 Finch Avenue West, Suite 701-309, Toronto, ON., M3J 3H7, Canada
Telephone	1-416-642-2606
Fax	1-416-642-2608
E-mail	gjhs@ccsenet.org
Website	www.ccsenet.org/gjhs

ISSN 1916-9736