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Factors Influencing the Level of Oxygen Free Radicals in Female Nursing Students

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Abstract

This study was conducted to investigate the levels of oxygen free radicals and related health factors in 201 female nursing students. The questionnaire was completed by the participants and their oxygen free radical levels were measured by urine test. In this study, an oxygen free radical analyzer was used to measure oxygen free radical levels. The oxygen free radical analyzer analyzes the amount of oxygen free radicals in the body by measuring urinary malondialdehyde (MDA). To determine factors associated with oxygen free radical levels, multiple regression tests were conducted. Of the participants, 89.6% exhibited normal levels of oxygen free radicals and 10.4% had elevated levels. In this study, the factors that affected oxygen free radical levels were eating habit (β = .20, p =. 003), fatigue (β = .20, p = .004), and detox necessity (β = .18, p = .006). In order to lower oxygen free radical levels of female nursing students, the areas of eating habit, fatigue, and detox must receive increased focus.

Keywords: students, oxygen free radical, eating habit, fatigue, detox

1. Introduction

1.1 Necessity of Research

As modern health risk factors such as environmental pollution, lack of exercise, misinformed dieting, unbalanced dietary intake, and stress have increased, the disease pattern has also changed. Oxidative stress plays an important role in the occurrence and persistence of inflammation, and can eventually cause cardiovascular disease, diabetes, cancer, or neural degeneration (Lugrin, Rosenblatt-Velin, Parapanov, & Liaudet, 2014). Oxidative stress occurs when there is an imbalance between oxygen free radical production and antioxidants (Valko, Rhodes, Moncol, Izakovic, & Mazur, 2006). There is increasing scientific interest in oxygen free radicals, which are the main cause of oxidative stress.

“Oxygen free radical” is a generic term for various oxygen-containing compounds that are unstable and exhibit increased reactivity. Oxygen free radicals are generated during the breathing process and in other life-sustaining activities of human beings. In cytoplasmic mitochondria, nutrients and oxygen are combined and converted into energy. In this state, electrons are attached, and the highly reactive compound has a short life span. If oxygen free radicals are properly available, the human body will use them to kill germs and cancer cells. However, an excess of oxygen free radicals in the body can lead to oxidative stress, which can cause aging or disease from DNA, RNA, enzymes, or cell membrane damage (Kang, 2012; Mastaloudis et al., 2004). Oxygen free radicals can be generated as long as humans breathe and perform life-sustaining activities. Of the oxygen entering the body through respiration, 2–5% is converted to oxygen free radicals; there are four main types of oxygen free radicals: the superoxide anion (O_2-), hydrogen peroxide (H_2O_2), the hydroxyl radical (OH^-), and singlet oxygen ($^1O_2$) (Kang, 2012). The human body responds by generating antioxidants (alpha-tocopherol, beta-carotene, catalase, superoxide dismutase (SOD), glutathione, etc.) to defend against oxygen free radicals. However, when the level of oxygen free radicals generated exceeds the amount tolerated by the antioxidants, oxidative stress occurs.

Excessive production of oxygen free radicals is affected by many factors, including obesity; lack of exercise; excessive exercise; poor eating habits, such as overeating or frequent ingestion of instant food; radiation and environmental pollution; fatigue and overwork; and drinking and smoking (Choi & Kim, 2014; Fogarty et al., 2011). According to the Korean National Health and Nutrition Examination Survey (2017), 37.3% of male in the

19–29 age group smoked, compared with 9.7% in the same age female group (Korea Statistical Information Service, 2017). The difference in smoking rates between men and women was thought to affect the level of free radicals. Female nursing students are included in this study because most nursing students are female students.

This study investigated oxygen free radical level as an index of healthcare in female nursing students who will become nursing specialists. We determined the effects of obesity (Body Mass Index: BMI), exercise, eating habit, exposure to environmental pollution, fatigue, health perception, and detox (detoxification) necessity on oxygen free radical levels. This will be the basis for proper health management education to reduce oxygen free radical levels in female nursing students.

1.2 Research Objectives

1) To identify the level of oxygen free radicals and analyze the differences in oxygen free radical levels according to socio-demographic characteristics of female nursing students.

2) To identify health-related characteristics of female nursing students.

3) To investigate the correlation between female nursing students' health-related characteristics and oxygen free radical levels.

4) To identify the influencing factors on elevated oxygen free radical levels in female nursing students.

2. Methods

2.1 Research Design

This study is a descriptive study to identify female nursing students' oxygen free radical levels and correlated factors.

2.2 Research Participants

After obtaining permission to collect data from a nursing college, we recruited participants through the bulletin board. We explained to the nursing college students who wanted to participate in the study to measure free radicals using urine and collect data through questionnaires. The data were collected from 201 students who signed the consent form. Male nursing students, considered a minority, were excluded due to possible physiological sex-based differences. In addition, junior and senior students who had experience of hospital practice were included. The minimum required sample size was estimated using the G * power program (Faul, Erdfelder, Buchner, & Lang, 2009). On the basis of multiple regression, 174 subjects were required for significance level of .05, power of 0.95, effect size (f2) of 0.11, and number of predictors of 4. Data were collected from 201 students in consideration of dropout rate, and there were no dropouts.

2.3 Research Tools

2.3.1 Oxygen Free Radical Levels

An oxygen free radical is a highly reactive atom or group of atoms containing an unpaired electron. A free radical containing oxygen can be created in the body during the breathing process. It is then oxidized by attacking biological tissues and damaging cells that are generated during metabolic processes (Lugrin et al., 2014). In this study, an oxygen free radical analyzer (BS201 model, BioNics) was used to measure oxygen free radical levels. The BS201 oxygen free radical analyzer analyzes the amount of oxygen free radicals in the body by measuring urinary malondialdehyde (MDA). MDA is a small molecular aldehyde consisting of three carbons. It is a decomposition product of peroxide and is generated by the attack of a oxygen free radical on a polyunsaturated fatty acid. It is known that fat peroxidation is caused by highly reactive oxygen molecules, especially oxygen free radicals. Thus, MDA is an accurate measurement to determine oxygen free radical content in the body (Mukhopadhyay, Gongopadhyyay, Rani, Gaver, & Mishra, 2015; Ozmen et al., 2009).

Before oxygen free radical levels were measured, the BS201 was connected to the computer and the program to perform the calibration was activated. For the test procedure, the urine was stripped and placed in the analyzer. After 3 minutes, the amount of oxygen free radicals was measured. The criteria were: 0–500 fp (free radical point), normal; 501–1,000 fp, needs attention; 1,001–3,000 fp, somewhat high; 3,001–5,000 fp, high; and 5,001 fp and above, very high.

2.3.2 Body Mass Index (BMI)

BMI is used to indirectly measure obesity using body mass and height measurements. BMI is calculated as mass divided by the square of height. The units are kg/㎡. By the Korean Society of Obesity's standards, a BMI under 18.4 is classified as underweight, 18.5–22.9 is normal, 23.0–24.9 is overweight, and over 25.0 is obese.

2.3.3 Exercise

Participants were asked, “How often do you exercise?” Their answers were based on a five points scale ranging from 1 point (“not at all”) to 5 points (“very frequently”), meaning that the higher the score, the more frequently the participant exercises.

2.3.4 Eating Habit

To measure usual eating habits, each participant was given five diet-related statements. The statements were “I often overeat,” “I often eat midnight snack,” “I often eat instant food (ramen, hamburger, etc.),” “I often eat fried food,” and “I often eat synthetically-seasoned foods.” For each item, participants gave a point value ranging from one (“not at all”) to five (“very much”). The mean scores of the five items were calculated. The higher the score, the worse the eating habit is. Cronbach's α was 0.60 in this study.

2.3.5 Exposure to Exhaust Fumes and Dust

To measure the degree of exposure to environmental pollution, we gave the participants two statements: “Usually, I am heavily exposed to exhaust fumes” and “Usually, I am heavily exposed to dust.” For each item, participants reported a point value ranging from one (“not at all”) to five (“very much”). The mean scores of the two items were calculated. The higher the score, the greater the exposure to exhaust fumes and dust.

2.3.6 Fatigue

The participants were asked, "What is your usual fatigue level, assuming that 100 points correspond to the maximum fatigue?" The participants gave direct point values from 0 (minimum fatigue) to 100 (maximum fatigue), meaning that the higher the score, the higher the fatigue.

2.3.7 Awareness of Health

We asked, “How do you think your health condition is?” Participants gave points ranging from one (“very bad”) to five (“very good”), meaning that the higher the score, the better they perceived their health.

2.3.8 Detox Necessity

We asked, “How much do you think a detox is necessary for you?” We defined “detox” as “to release toxic substances and wastes accumulated in the body.” Participants gave points ranging from one (“not necessary at all”) to five (“very necessary”), meaning that the higher the score, the more necessary the detox.

2.4 Data Collection and Analysis Methods

The study was conducted from April to August 2016 on female nursing students from a university in a region. The purpose and method of the study were explained to them and consent forms were received from all participants. The questionnaire was completed by the participants and their oxygen free radical levels were measured by urine test, which took 15–20 minutes. The meaning of their oxygen free radical results, the effects of oxygen free radicals on the human body, and methods for reducing oxygen free radicals were briefly explained to the participants.

For data analysis, this study used descriptive statistics for demographic characteristics and health-related characteristics and analyzed oxygen free radical levels differences according to demographic characteristics with the independent *t*-test or ANOVA statistical test. Correlations between health-related characteristics and oxygen free radical levels were analyzed using Pearson’s correlation tests. To determine factors associated with oxygen free radical levels, multiple regression tests were conducted.

2.5 Ethical Considerations

Prior to the start of this research, the author submitted a research proposal to the Institutional Review Board of the affiliated institution. To comply with ethical considerations, the researcher explained the goals and the content of the study to the participants, as well as their right to refuse to participate at any stage, how their personal information would be protected, and what compensation they would receive for their participation.

3. Results

3.1 Difference in Oxygen Free Radical Levels According to Socio-Demographic Characteristics

For this study, 51.7% of the participants were seniors and 48.3% were juniors. Additionally, 58.7% were non-religious, and more than half (67.7%) had middle-class economic status. The mean oxygen free radical level of the participants was 200.41 fp, the maximum was 562.00 fp, and the minimum was 122.00 fp. Of the participants, 89.6% had normal levels (less than 500 fp), and 10.4% had elevated levels of 501–1,000 fp. There were no differences in oxygen free radical levels according to socio-demographic characteristics (Table 1).

Table 1. Differences in oxygen free radical levels according to socio-demographic characteristics (n = 201)

Characteristics	Category	Total	Oxygen free radical			Minimum-Maximum
		N (%)	Mean (SD)	t/F	*p*	
Oxygen free radical (fp)	<500 (normal)	180 (89.6)	200.41 (129.81)	-	-	122.00-562.00
	501-1,000 (elevated)	21 (10.4)				
Year	Junior	97 (48.3)	254.61 (168.18)	6.23	.067	
	Senior	104 (51.7)	219.86 (131.83)			
Religious	Yes	83 (41.3)	225.28 (152.19)	2.30	.058	
	No	118 (58.7)	200.92 (108.75)			
Economic status	Upper-class	24 (11.9)	177.33 (88.89)	4.04	.218	
	Middle-class	136 (67.7)	189.38 (114.51)			
	Lower-class	41 (20.4)	180.51 (179.31)			

3.2 Health-Related Characteristics of Female Nursing Students

The mean BMI of the participants was 20.78. Of the participants, 19.9% were underweight, 61.7% had a normal weight, 11.4% were overweight, and 7.0% were obese (according to the Korean Society of Obesity's criteria). The mean usual exercise level was 2.85 points, which was between "almost not frequent" and "normal." The mean eating habit was 3.45 points, which was between "mostly eat often" and "normal" for levels of overeating, instant food, midnight snacks, fried food intake, and synthetic seasoning intake. The mean level of exposure to environmental pollution was 2.95 points, which was between "almost not exposed" and "normal". The mean level of fatigue was 68.72 points (on a scale of 0–100 points). The mean health awareness was 3.25 points, meaning that the health of the participants was self-perceived as between "normal" and "generally good." The mean level of need for a detox was 3.69 points, which was considered to be between "normal" and "almost necessary" (Table 2).

Table 2. Health-related characteristics of the participants (n = 201)

Health-related characteristics	Category	N (%)	Mean (SD)
Body mass index	≤18.4	40 (19.9)	20.78 (2.69)
	18.5-22.9	124 (61.7)	
	23.0-24.9	23 (11.4)	
	25.0≤	14 (7.0)	
Exercise			2.85 (1.07)
Eating habits			3.45 (.63)
Exposure to pollution			2.95 (.96)
Fatigue			68.72 (21.11)
Health awareness			3.25 (.86)
Detox necessity			3.69 (.90)

3.3 Correlation Between Female Nursing Students' Health-Related Characteristics and Oxygen Free Radical Levels

Upon examining the health-related characteristics and oxygen free radical levels in study participants, a significant negative correlation between BMI and oxygen free radical level ($r = -0.14$, $p = 0.038$) was found. The oxygen free radical level had a significant positive correlation with unhealthy eating habit ($r = 0.18$, $p = 0.009$), fatigue ($r = 0.17$, $p = 0.014$), and awareness of detox necessity ($r = 0.16$, $p = 0.018$). When levels of unhealthy eating habits, fatigue, and need to detox were higher, oxygen free radical levels were significantly higher as well (Table 3).

Table 3. Correlation between health-related characteristics and oxygen free radical levels

	1	2	3	4	5	6	7	8
	r (*p*)							
1. Oxygen free radical	1							
2. Body mass index	-.14 (.038)	1						
3. Exercise	-.03 (.606)	.07 (.283)	1					
4. Eating habits	.18 (.009)	.06 (.332)	-.14 (.034)	1				
5. Exposure to pollution	.05 (.445)	.05 (.461)	-.06 (.335)	.18 (.010)	1			
6. Fatigue	.17 (.014)	.02 (.682)	-.19 (.005)	.07 (.324)	.14 (.040)	1		
7. Health awareness	-.07 (.279)	-.08 (.218)	.16 (.016)	.00 (.902)	-.17 (.012)	-.31 (<.001)	1	
8. Detox necessity	.16 (.018)	.26 (<.001)	.04 (.560)	-.02 (.708)	.05 (.482)	.07 (.323)	-.041 (.528)	

3.4 Influencing factors of oxygen free radical levels in female nursing students

To further investigate the variables affecting the oxygen free radical levels of the study participants, multiple regression analysis using the stepwise input method was conducted for the variables, which showed a significant correlation with oxygen free radical levels (BMI, eating habit, fatigue, and detox necessity). When there were worse eating habit ($\beta = .20$, $p = .003$), higher fatigue ($\beta = 0.20$, $p = 0.004$), and more detox necessity ($\beta = 0.18$, $p = 0.006$), the oxygen free radical level was significantly higher. The explanatory power of these variables was 10.3% ($R^2 = 0.103$, $p < 0.001$) (Table 4).

Table 4. Influencing variables of oxygen free radical levels (n = 201)

	B	S.E.	β	R^2	t	*p*	F (*p*)
Eating habits	41.07	13.79	.20	.033	2.97	.003	7.51 (<.001)
Fatigue	1.23	.41	.20	.068	2.95	.004	
Detox necessity	26.83	9.73	.18	.103	2.75	.006	

4. Discussion

This study was conducted to investigate oxygen free radical levels and possibly related variables in female nursing students. Of the participants, 89.6% had normal levels of oxygen free radicals and the remaining 10.4% had elevated levels. In a study of oxygen free radical levels in female college students similarly aged to the participants in this study (Choi & Kim, 2014), 41.8% of the participants had "normal" levels. Of those with "abnormal" levels, 36.3% were "caution," 9.1% had "low oxidative stress," 1.8% had "medium oxidative stress," and 3.6% had "high oxidative stress". In a study (Kang, 2012) that measured the oxygen free radical levels in adult males, only 7.4% of the participants were "normal." Of those at the "abnormal" level, 36.4% were "caution." 19.5% had "low oxidative stress," 22.5% had "medium oxidative stress," and 14.1% had "high oxidative stress." Both of these previous studies have fewer participants with "normal" levels of oxygen free radicals. In addition to having more "abnormal" participants, these studies also had participants in the higher "oxidative stress" stages. In this study, the highest level of abnormality attained by participants was the "caution" state. This may be because female nursing students, the participants of this study, are relatively well able to reduce oxygen free radical production compared to other college students or similarly aged men.

On the other hand, with regard to oxygen free radical level according to sex, there are reports that oxygen free radical levels in females are significantly higher than those of males (Khadir et al., 2015), and that females are more vulnerable to oxidative stress (Topic et al., 2016). However, another report states that there are no differences between the sexes (Kirshbaum, 2002). In the present study, male nursing students, considered a minority, were excluded due to possible physiological sex-based differences. Therefore, it is necessary to further study oxygen free radical levels of female and male according to sex.

As for health-related characteristics affecting oxygen free radical levels, it was found that worse eating habits was significantly correlated with higher oxygen free radical levels. It is therefore necessary to correct bad eating habits

such as overeating, ingesting instant foods, and frequently eating midnight snack, fried foods, and foods with synthetic seasonings. Conversely, regularity of meals, number of snacks consumed, and total mealtime are not significantly correlated with oxygen free radical levels (Choi & Kim, 2014). Other studies found that oxygen free radical levels were significantly higher in groups that either did not eat fruit more than once a day (Lee et al., 2012) or had a high fat intake (Reddy, Ramamurthy, Somasekaraiah, Reddy, & Rao, 1997) Therefore, it is more important to focus on avoiding overeating than on factors such as meal regularity or total mealtime. To reduce oxygen free radical levels, one must refrain from consuming foods containing fried foods, foods with synthetic seasonings, and instant foods, and must consume many fruits.

Another health-related characteristic that affects oxygen free radical levels is fatigue. It was found that higher fatigue was correlated with higher oxygen free radical level. In a study measuring oxidative stress in 56 patients with chronic fatigue syndrome (Maes, Kubera, Uytterhoeven, Vrydags, & Bosmans, 2011), the patients with chronic fatigue syndrome were reported to have significantly higher oxidative stress than the control group, suggesting that there is an association between chronic fatigue and oxidative stress. In the present study, fatigue had a significant negative correlation with exercise level and health awareness. Lesser amounts of exercise were associated with higher levels of fatigue. Higher amounts of fatigue were associated with worse health awareness. Therefore, it can be assumed that lowering fatigue by practicing regular exercise can not only lower oxygen free radical level, but also increase awareness of health.

It is reported that when oxygen free radical levels exceed those able to be fought by the body's antioxidant supply, exercise may increase antioxidant capacity (Simioni et al., 2018). However, the relationship between exercise and oxygen free radical level is affected by exercise intensity. This is because excessive high-intensity exercise increases the oxygen demand in the body by 10–15 times, and oxygen free radical levels are increased by adenine nucleotide catabolism caused by skeletal muscle ischemia (Lamina, Ezema, Theresa, & Anthonia, 2013; Vollaard, Shearman, & Cooper, 2005). Therefore, in order to lower oxygen free radical levels, it is important to avoid strong and sudden movement and to exercise to a degree appropriate to one's physical strength (Mastaloudis et al., 2004). Oxygen free radical levels are also affected by exercise duration. One study measured oxygen free radical amounts in elderly females who conducted exercise regimens combining walking and Thera Band exercise for six or twelve weeks. It was reported that participants in the six-week exercise program had unchanged amounts of oxygen free radicals, but participants in the twelve-week exercise program had significantly decreased oxygen free radical levels. Therefore, it is seen that a long-term regular exercise program may lower oxygen free radical levels, while a short-term exercise program is ineffective (Alikani & Sheikholeslami-Vatani, 2019).

Lastly, a health-related characteristic that is associated with oxygen free radical levels is awareness of detox necessity. It was found that participants that felt a higher need to detox had a higher oxygen free radical level. A high self-rated detox necessity may predict certain physiological situations. It is possible that one would be more likely to perceive the need for a detox in situations where he or she feels obese, does not exercise regularly, or feels tired at all times. Therefore, a high awareness of the need for detox would mean that there are unhealthy lifestyle habits that need to be corrected. Alternatively, a high self-rated detox necessity could mean that the subject is more likely to practice the detoxifying habits. However, in the present study, no significant correlations between detox necessity and the other health characteristics (exercise, eating) were found. These results suggest that even though someone is aware of the need to detox, they do not necessarily exercise or eat more healthily. In other words, they do not carry out activities that are associated with lower levels of oxygen free radicals. Therefore, it is necessary to provide strategies to induce healthier habits by providing concrete exercise methods or eating habit improvement measures. Then, female college students who are highly aware of their need to detox can engage in habits that are associated with lower oxygen free radical levels.

In conclusion, lowering oxygen free radical levels cannot be overlooked in healthcare. Of female nursing students, those who have bad eating habits, usually feel fatigued, or feel the need for a detox, are particularly at risk for high oxygen free radical levels. It is necessary to provide specific education to help these populations to lower oxygen free radical levels.

Competing Interests Statement

The authors declare no conflict of interest.

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The Role of Female Partners in the uptake of Voluntary Medical Male Circumcision in Sub-Saharan Africa: A Review

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Abstract

Background: Voluntary Medical Male Circumcision (VMMC) is a proven biological strategy for reducing heterosexual transmission of HIV/AIDS by up to 60%. Following recommendations from the World Health Organisation (WHO), Medical Circumcision (MC) was rolled out in South Africa. Several issues, among them being individual perceptual factors and female partner influence, have constituted as both obstacles and drivers to the uptake of VMMC.

Aim: To explore and synthesize research conducted on the role of female partners in the uptake of VMMC.

Methods: Electronic searches were conducted in PUBMED, MEDLINE and CIHNAL, studies included in the review are those that explored the importance of female partner involvement in the uptake of VMMC. The review was limited to sub-Saharan Africa with a focus on peer reviewed articles written in English only.

Results: The review has revealed that considering the gender dimensions of circumcision, the possible utilisation of women as vehicles to drive the uptake of MC could be key to achieving the desired uptake.

Conclusion: It is postulated that women play a key role in terms of promoting circumcision in order to facilitate a successful scale up of the service. Further research is therefore necessary so that the benefits of female partner involvement in VMMC may be achieved.

Keywords: voluntary medical male circumcision, uptake, female partners, sub-Saharan Africa

1. Introduction

While over 11 million voluntary medical male circumcisions (VMMC) have been performed in priority sub-Saharan African countries, (Hankins et al., 2016), there are still several barriers that hinder the uptake of VMMC by males (International Initiative for Impact Evaluation, 2013). Historically, circumcision has been widely practised on men and boys for traditional and cultural reasons, particularly in sub-Saharan African and Asia (Goshme, 2012). It is estimated that 30% of males, the majority of whom are Jewish and Muslim, are currently circumcised worldwide, since these religious groups perform circumcision as part of their religious rituals (WHO & UNAIDS, 2007).

Recent experimental studies conducted on Medical Male Circumcision (MMC) have provided tangible evidence that MMC reduces the transmission of HIV/AIDS by up to 60% in female-to-male penetrative sex (Auvert et al., 2005). Moreover, other studies have also proven that other benefits of MMC include; improved penile hygiene, a reduction in the susceptibility to Sexually Transmitted Infections (STIs) such as syphilis, herpes, etc. (Lau, Juykymar, & Sgaier, 2015). Indirect benefits of MMC for women have also been cited as including the reduced incidence of contracting cervical cancer (Gollaher, 2000).

The increasing number of HIV infections globally, with sub-Saharan Africa being the leading region contributing to this pandemic, warrants additional HIV/AIDS prevention strategies to avert new infections and prevent further complications of the disease. According to the UNAIDS (2010), Southern Africa is home to about two-thirds of the more than 33 million people living with HIV/AIDS in the world. In addition, more than 85% of the world's AIDS-related deaths have occurred in this region. This HIV epidemic has thus recently contributed to the

widespread advocacy of Voluntary Medical Male Circumcision (VMMC) as an additional biomedical preventive strategy (Aggleton, 2007). On the African continent, Medical Circumcision (MC) has also been rolled out in response to the rising number of HIV/AIDS related infections and deaths (Gow & George, 2013). The WHO and UNAIDS (2011, 2016) suggest that expanding the coverage of VMMC to 80% in sexually active men and teenage boys of reproductive age could avoid around 3.5 million people being infected with HIV in the Eastern and Southern African region. This represents a potential cost saving of about 16 billion dollars between 2011 and 2025 (WHO & UNAIDS, 2011), not to mention the potential for saving lives.

Following recommendations by the WHO and UNAIDS several departments of health in sub-Saharan Africa adopted VMMC as an additional HIV/AIDS prevention strategy following the results of three randomised control trials proving that VMMC is an effective HIV/AIDS prevention strategy, particularly in the prevention of heterosexual transmission of the virus (WHO & UNAIDS, 2011).

Since the roll-out of VMMC, governments have been robust in their attempt to scale up the services to reach targets set by the WHO so that the benefits of the service can eventually materialise. The review of existing research studies shows that the realisation of the effectiveness of the intervention is dependent on many factors such as addressing individual perceptual factors, namely cultural and religious issues, perceived and actual pain and associated complications, misconceptions about the procedure, perceived lack of female support, etc. (Westercamp & Bailey, 2007; Sgaier et al., 2015).

Experimental and empirical findings of research conducted have documented extensively the benefits of MMC in terms of HIV reduction in men who are involved in heterosexual relationships. The review of literature has also revealed the indirect benefits of male circumcision for females in terms of the reduction of Sexually Transmitted Infections (STIs) and the decreased risk of contracting cervical cancer. It is for this reason that women are also deemed to play a crucial role in terms of influencing their partners to undergo circumcision (Lanham et al., 2012). It has been found that partner communication plays a key role in the practice of HIV protective behaviours, which include VMMC (Desgrees-Dulou, 2009). The results of a survey conducted by the HIV prevention tracking project revealed that the majority of women would like to partake in decision-making with regards to VMMC (PEPFAIR & USAID, 2014).

Jones et al. (2014) suggested, in their study aimed at exploring acceptability, knowledge, beliefs and partners as determinants of Zambian men's readiness to undergo MMC, that the discussion of circumcision with a female sexual partner was a predictor of readiness to undergo VMMC. Cook et al. (2016) found that women's acceptance of VMMC significantly impacted on men's decision to undergo MMC, thus the inclusion of female partners in the promotion of VMMC was hypothesised as important.

Taking cognisance of the important role of women regarding the uptake of MMC, it is imperative that women be focused on in terms of communicating accurate information regarding VMMC. Knowledge of the attitudes and perceptions of females regarding MMC is therefore important in order for the appropriate measures to be instituted so that negative stereotypical attitudes and beliefs can be dealt with, allowing the benefits of female involvement to be reaped in terms of the increasing uptake of VMMC.

Madhivanan et al. (2008) found that religion was the strongest correlate for decision-making in terms of MC in Indian mothers. Nevertheless, most mothers with uncircumcised children indicated that they would consider VMMC for their children and recommend it to their spouses if they learned that the procedure would prevent serious health complications. These findings highlighted the need for educational programs to explain the health benefits and risks regarding circumcision so that informed decisions can be taken by these women regarding MC.

In Tanzania, Layer et al. (2013) conducted a qualitative study on women's attitudes and risk perceptions towards MMC. Semi-structured interview guides were used to collect data by means of in-depth interviews conducted on a sample of 33 participants. Although limited in terms of sample size and generalisability, the nature of the data collection process allowed for the results to form an integral foundation in terms of understanding female perceptions of male circumcision. The results of the study showed that MMC was slowly becoming a social norm in Tanzania. In addition, women seemed to demonstrate strong support for MC, which was mainly attributed to the perceived benefits of the procedure to both men and women. However there were misconceptions such as the misperception that it provided direct protection against HIV and protection from all forms of STIs. These perceptions could potentially result in the engagement in risky sexual behaviour on the part of females. It is therefore important that accurate and detailed gender-specific education be provided so that women can make healthy and informed decisions regarding reproductive and sexual health matters.

In a study by Ikwebue, Ross and Ogbonnaya (2015) which explored rural women's knowledge and attitudes

towards MMC, the authors concluded that women supported MMC, however the low level of knowledge that the participants had regarding the benefits of circumcision was of concern. The authors suggested that such results highlighted the need for an expansion of information to these women.

Scott, Weiss and Viljoen (2005) conducted a study in South Africa to determine the acceptability of MC as an HIV intervention among the Zulu population in KwaZulu-Natal (KZN). Short, structured interviews were carried out on a sample of 144 participants who were male and female. The results showed that most women favoured circumcision for themselves, their partners and male children due to the perceived protective effects of circumcision against STIs.

The results of the study by Maraux et al. (2017) found that women had favoured circumcised men before and after the roll-out of VMMC in South Africa. Furthermore, women had substantially good knowledge about MC. The objective of the study was to assess the knowledge and perceptions of women regarding MC prior to and after its roll-out in South Africa. A community-based, cross-sectional design was employed and data was collected using survey questionnaires from a population of approximately 3000 men and women over a period of three different years.

On the other hand, Mantell et al. (2013) noted that, although women were in support of MC, they also expressed concern about the potential risk of increased HIV infection as a result of men's failure to comply with the sexual abstinence period, moreover, they also expressed concerns that VMMC could potentially result in a refusal by men to engage in protected sexual intercourse. This study was, however, limited in sample size, meaning that the results could not be generalisable to the rest of the KZN population. A further limitation was the choice of the convenience sampling method. The study did, however, make a valuable contribution in terms of the gender dimensions of VMMC.

The role of women in the uptake or scale up of VMMC cannot be over emphasized. According to Semeere et al. (2016), women are considered to be health advocates in the communities they reside in, and are therefore a possible source of demand generation for circumcision, due to their given ability to influence men by providing the correct information and insight about the procedure. Research studies on the acceptability and perceptions regarding VMMC have documented extensively the fact that women occupy a central role in the scale up of VMMC (Westercamp & Bailey, 2007; Lanham et al., 2012; Maraux et al., 2017). A recent demand creation intervention by Semeere et al. (2016) highlighted the feasibility of pregnant women engaging their partners regarding VMMC. This study, although not statistically significant, contributed to the existing body of knowledge that supports women's role in the uptake of VMMC.

Although much has been documented concerning the fact that women play a crucial role in the scale up of VMMC, there is a dearth of literature on the actual role that women play in generating a demand for VMMC among men. Most research reveals that women are important instruments in the uptake, however sources fail to explicitly illustrate the part that women play, directly or indirectly, in the uptake of VMMC. The literature reviewed merely informs that correct knowledge and perceptions about the procedure are important as this helps direct how and what information female partners give their male counterparts to encourage them to undergo VMMC. According to Lanham et al. (2012), women are an important audience for VMMC scale up interventions. It therefore becomes imperative to explore the actual role they play in the uptake of VMMC, hence the review of studies that explore this role becomes necessary to determine the extent of such literature, its strengths and weaknesses, so that recommendations for policy and future research can be made.

2. Methods

2.1 Data Sources and Search Strategies

The criteria for studies to be considered in this review were established before the review of the literature and included studies that explored the role of women in the uptake of VMMC or highlighted the importance of female partner involvement in interventions directed towards the scale up of VMMC (Table 1). The review sought to include only formal studies or papers emanating from the sub-Saharan African region, published in peer-reviewed journals or presented at international conferences. The electronic searches were conducted in CINAHL, MEDLINE and PUBMED. The search words used were: "Voluntary Medical Male Circumcision" AND "The role of women" and "Women" AND "Voluntary Medical Male Circumcision". The results of the above searches only generated nine articles, only three of which dealt explicitly with the actual role played by women in the uptake of VMMC (Table 2). Other articles which are included in the introduction pertained to the knowledge, perception and acceptability of females regarding voluntary medical male circumcision. These studies are included in the review as they strengthen the knowledge base concerning the fact that women have an important role to play in the uptake

of VMMC. However, for the purpose of this review, the two studies that were found which address the actual role of women are scrutinised in terms of literature and application of research methodology. The other studies serve to strengthen the background of this review and further highlight the gap in the literature in terms of research exploring the role of females in influencing male partners to undergo VMMC. The summary of article selection for this review can be seen in Figure 1.

2.2 Summary of Inclusion and Exclusion Criteria

Table 1. Inclusion and exclusion criteria

Inclusion criteria	**Exclusion criteria**
Articles written in English only	Articles not written in English
Studies exploring women or female partner's roles in the uptake of VMMC	Studies exploring groups either than women or female partners in the uptake of VMMC
Study setting limited to sub-Saharan Africa	Study setting outside sub-Saharan Africa

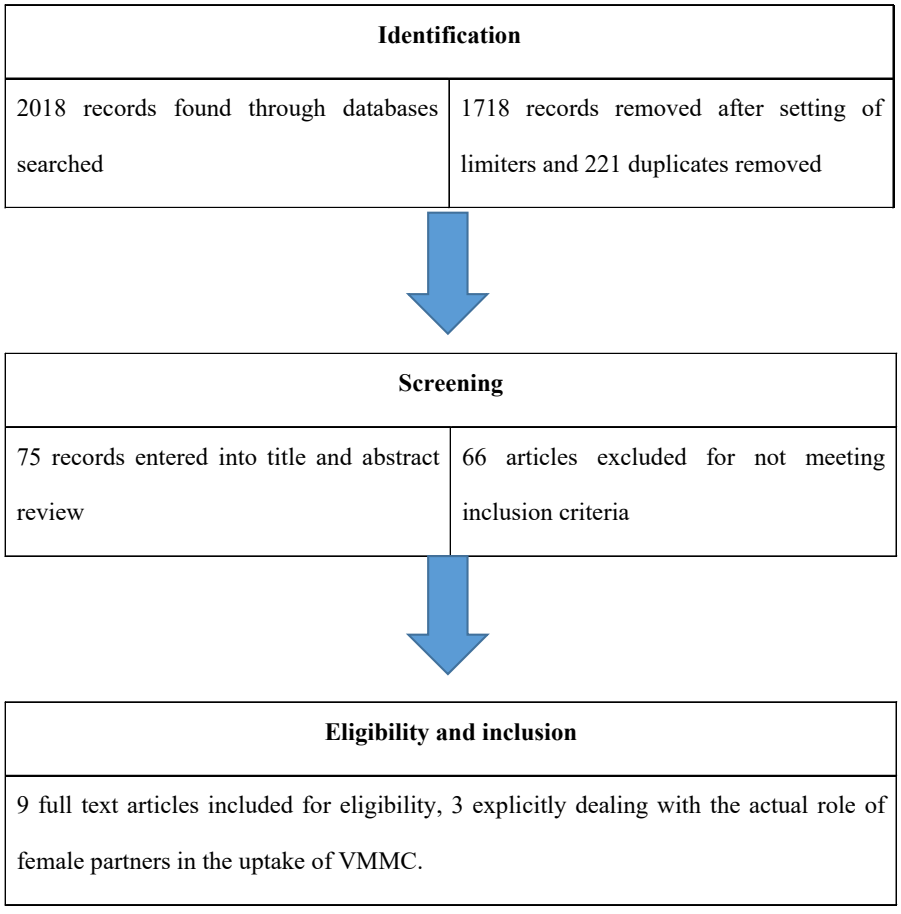

Figure 1. Article selection process

3. Results of Search Strategy

The results of the review revealed only 9 citations on the three search engines utilised. The results of most of the studies found show that women have a crucial role to play in the uptake of VMMC, in most studies acceptance and correct perception about the procedure was seen to be a predictor for successful uptake of VMMC.

The research studies included are diverse in terms of the methodologies they used in order to meet the objectives of

the study. The common strength in the qualitative studies found was the fact that in-depth interview and discussion was conducted with the target population, however there were weaknesses in the diversity of the study samples in terms of demographic characteristics and geographical location and therefore generalisability is to be questioned.

The strengths in the quantitative studies were in that they had a reasonable sample size and efforts to ensure validity and reliability were instituted such as pilot studies etc. However most of these studies were limited to South Africa and Kenya. More of such type of studies are required though the rest of Sub-Saharan Africa.

In most studies in the review the role of women in the uptake of VMMC was explore as part of a meeting a broader aim of the studies as opposed to it being the main aim of the study. The results of the review and papers found are summarized in Table 2.

Table 2. Summary of research papers found

Title	Research objective(s)	Country and year	Research methods	Key findings
Women's roles in voluntary medical male circumcision.	To assess: - Women's understanding of VMMC's partial protection against HIV. -Couples' communication about VMMC. -Women's engagement before and after the procedure.	Kenya (2012)	Two phase In-depth interviews, individual and focus group.	Women play an important role in encouraging men to get circumcised, hence reaching out to them is valuable, especially from a VMMC communication point of view.
Innovative demand creation for VMMMC targeting high impact male population: A pilot study engaging pregnant women at antenatal clinics.	To evaluate an approach at increasing uptake of circumcision within the context of an integrated antenatal care setting.	Uganda (2016)	Pilot behaviour change intervention using a Quasi-experimental design.	The intervention had no significant impact on increasing the demand for VMMC in this cohort, but highlighted the feasibility and importance of engaging women in the uptake of VMMC.
Women's knowledge and perception of male circumcision before and after its roll-out.	To assess knowledge and perceptions of women regarding male circumcision in a setting before and after its roll-out.	South Africa (2016)	Community- based, cross-sectional survey spanning three years.	Findings show that women demonstrate a favourable perception towards and knowledge of the procedure. The study highlighted that women should participate in VMMC promotion campaigns.
Factors associated with married women's support of male circumcision for HIV prevention.	To examine the role of women's sociodemographic characteristics, knowledge of HIV and sexual bargaining power as determinants of women's support for male circumcision.	Uganda (2016)	A population- based, cross-sectional survey.	A positive correlation exists between women's education level and knowledge of the benefits of VMMC which may correlate with support for VMMC and thus influence uptake among males. Women's ability to negotiate safe sex practices may influence uptake of VMMC.
Rural Zulu women's knowledge and attitudes of and towards medical male circumcision.	To explore Zulu women's knowledge and attitudes towards MMC.	South Africa (2014)	Quantitative survey design of 590 pregnant, isiZulu-speaking women.	Women supported MMC, however accurate knowledge base was poor, and prompting the need for education campaigns for these women, as the amount of female knowledge is hypothesised to influence uptake and acceptability of VMMC.
Medical male	To explore young women's	South	Qualitative focus group	The findings highlighted negative

circumcision and HIV risk: Perceptions of women in higher institutions of learning	perspectives of MMC.	Africa (2013)	discussions.	female perceptions regarding VMMC possibly stemming from long term gender inequalities. This study highlighted the need for these inequalities to be addressed so that women facing these challenges can overcome them to the point where they can exercise their individual roles in the scale up of VMMC.
"If you are not circumcised, I cannot say Yes" - The role of women in promoting the uptake of VMMC in Tanzania.	To analyse women's influence on the uptake of VMMC as reported by men and women.	Tanzania (2015)	Qualitative, in-depth interview and participatory group discussions with men and women.	Participants revealed that women have a role in the uptake of VMMC, directly and indirectly, by provision of accurate advice about VMMC and denying sex to partners not circumcised. The study findings suggest that expanding communication strategies to include women could significantly increase uptake of the service.
Female partner acceptance as a predictor of men's readiness to undergo VMMC in Zambia: The spear and shield project.	To examine the relationship between changes in women's acceptance of VMMC and men's readiness to undergo the procedure.	Zambia (2016)	A parallel intervention model guided by a mediation model to examine the relationship between the changes in women's acceptance.	Women's acceptance of VMMC significantly impacted on men's decision to undergo VMMC, thus supporting previous studies which emphasise the importance of including female partners in VMMC promotion efforts.

4. Discussion

Through the literature search conducted on electronic databases, only nine recent studies were found which investigated the role of women in the uptake of VMMC in sub-Saharan Africa. The few studies found were diverse in their research approaches to answering their objectives. Across the studies it was found that the level of acceptance regarding VMMC was great. Furthermore, the degree of knowledge, coupled with females' acceptance of the procedure, positively correlated with an increase in the uptake of VMMC. Although it is not clear exactly what it is about acceptability and knowledge that influences the uptake of VMMC, the literature does state that it increases uptake in the sense that women are able to act as motivators for circumcision, based on their level of knowledge and hence acceptability of the process becomes key. In addition to knowledge and acceptance, females' perceptions, behaviours and reactions towards safe sex practices play a role, in the sense that VMMC promotes hygiene, safe sex practices such as condom use and, subsequently, a reduction of sexually transmitted infection on the part of both males and females. Therefore, females' ability to negotiate safe sex either through education or denying of sex to males in the event that this does not occur, also influences the uptake of VMMC. This highlights the direct role that women play in the uptake of VMMC.

Baily et al. (2012) postulate that women's beliefs about circumcision influence men's acceptance of the procedure due to women's strong emphasis on penile hygiene and a desire to be protected from sexually transmitted infections. On the other hand, gender norms may contribute to a failure by women to be able to negotiate safe sex practices including VMMC, hence it becomes necessary for gender inequalities be dealt with at community level so that the benefits of female partner involvement in VMMC may be fully realised. Research in this area would be instrumental. Concurring with this, Perez et al. (2014) state that research studies carried out on VMMC using a gendered approach could provide a significant foundation for the development of policy and evidence-based implementation strategies to support and enhance the uptake of VMMC.

Cultural and religious notions associated with MC circumcision and the involvement of women must also be addressed, especially since these play a huge role in the way in which individuals respond to a particular disease and even specific health actions (Andrews & Boyle, 1999). Religion and culture are often used interchangeably by scholars to depict a sense of shared values which have an influence on human behaviours and may ultimately affect or influence the human response to health interventions. Hyder and Marrow (2005) argue that programs which fail

to engage the indigenous practices and beliefs of individuals cease to reach their goals. It thus becomes necessary that, with the involvement of women in medical circumcision, the religious and cultural beliefs governing women; sexuality; sexual roles and dynamics also be taken into account to ensure the yield of the maximum results from the benefits of female partner involvement in the uptake of VMMC.

More research is, however, required to explore the role of women in the uptake of VMMC. It is suggested that further qualitative studies be conducted to deduce from circumcised males the roles of their partners in their decision to undergo circumcision. Moreover studies on female partners of circumcised men should be conducted, in order to understand the roles they have played in encouraging their partners to undergo VMMC.

4.1 Limitations

The results of this review are limited in that only electronic search of papers were conducted and included only those research articles which were written in English which might have resulted in the exclusion of some pertinent studies. Furthermore only studies which met that inclusion criteria of the review, that is having addressed the role of women in either as an objective or as part of the discussion was included and this might have limited the scope of the review. Since the review of the study was limited in that only few articles were found and all were included, there was no real synthesis and critique of the findings and research methods as the methodologies were diverse.

4.2 Recommendations

It is suggested that further research be done to explore, analyse and understand the exact role that women play in the uptake of VMMC. Phenomenological and phenomenogrpahic studies need to be conducted to explore the experiences of women whose partners have undergone medical circumcision. In addition research also needs to be done to explore how women construct and perceive circumcision in varying context so that a more holistic understanding of VMMC may be attained

Participatory and action research needs to be conducted in order to deal with the gender norms of femininity and masculinity so that the benefits of female partner involvement in MC can be achieved. Policy makers must take into account and deal with gender norms associated with MC if we are to realise the benefits of female partner involvement in VMMC.

5. Conclusion

The review of research proves that women have a direct and indirect role to play in the uptake of VMMC by males, particularly their partners and adolescent male children. Acceptance and accurate knowledge about the nature and benefits of the procedure is crucial if women are to be used in campaigns to advocate for VMMC. Research shows that there is a positive correlation between partner acceptance and awareness of medical circumcision and uptake of VMMC by males. In order for the benefits of circumcision to materialise, part of the intervention strategy must involve females, hence it becomes necessary for more research to be conducted to determine the exact role of women in the uptake of VMMC. Existing female partners of circumcised men would be instrumental in this area of research.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Predicting Tobacco Smoking among Adolescents Using Social Capital and Media Exposure With Theory of Planned Behavior: Path Analysis Evidence From Indonesia

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Abstract

Tobacco smoking remains an ongoing and dire public health threat globally. Identifying factors that influence individuals' smoking behavior is critical especially among adolescents. This study aimed to determine the effects of media exposure to tobacco advertisement, social capital, and other factors, on tobacco smoking among adolescents using Theory of Planned Behavior (TPB). This cross-sectional study was conducted in KulonProgo District, Yogyakarta Province, Indonesia, in April 2018. The dependent variable was smoking behavior. The independent variables were intention to smoke, attitude toward smoking, knowledge about tobacco use, subjective norm toward smoking, perceived behavior control not to smoke, media exposure to cigarette advertisement, and social capital among peer adolescents. The data were collected by questionnaire and analyzed by path analysis run on Stata 13. The TPB constructs including attitude toward smoking (b = 0.90; 95% CI = 0.29 to 1.51; p = 0.004), subjective norm toward smoking (b = 1.59; 95% CI = 0.99 to 2.19; p < 0.001), and perceived behavior control not to smoke (b = -2.07; 95% CI = -2.68 to -1.45; p < 0.001), had impact on intention to smoke and smoking behavior. Exposure to tobacco advertisement had indirect impact on smoking behavior through attitude toward smoking and intention to smoke. Weak social capital had indirect impact on smoking behavior through subjective norm toward smoking and intention to smoke. It concludes thatTPB can be used to explain smoking behavior among adolescents.

Keywords: smoking, determinants, theory of planned behavior, social capital, adolescents

1. Introduction

Tobacco smoking remains an ongoing and dire public health threat globally, including Indonesia. Every year, more than 225,700 of Indonesian people are killed by tobacco-caused disease Deaths (%) caused by tobacco in 2016 was 21.37% in men and 7.02% in women in Indonesia. More than 53,248,000 adults (15+ years old) continue to use tobacco each day. Prevalence of tobacco smoking was 76.2% in men and 3.6% in women in Indonesia. Tobacco use among youth is even alarming and rapidly increasing. More than 469,000 children (10–14 years old) smoke daily. Prevalence of tobacco smoking was 3.51% among boys 0.39% among girls aged 10–14 years old (Tobacco Atlas, 2018). Tobacco use, both in smoke and smokeless mode, is a cause of concern among South Asian communities living in the Western World (Khaja et al., 2016). Another study from Colombia reported that smokers had a higher inclination to get involved in harmful alcohol consumption (Amaya, 2018).

Identifying factors that influence individuals' smoking behavior remains a huge public health concern. A study in Kuwait reported that several factors motivate students to smoke, including family members, friends and classmates who smoke (AlKandari, 2016). In an attempt to understand the psychosocial determinants of smoking initiation and maintenance, a variety of health behavior theories has been applied, including Theory of Planned Behavior

(TPB) (Topa & Moriano, 2010). For example, a study from China reported that the subjective norm, a TPB construct, was negatively associated with behavioral intention to cease smoking (Shimazaki et al., 2018). The TPB is an extension of the Theory of Reasoned Action (TRA). The theory states that attitude toward behavior, subjective norms, and perceived behavioral control (PBC), together shape an individual's behavioral intentions and ultimately behaviors. It incorporates personal factors as predictors of health behavior (LaMorte, 2018).

Social capital has lately received much attention in public health. Social capital has been defined as the resources to which individuals or groups have access through their social relationships (Moore &Kawachi, 2017). Social capital has been suggested to have effects on health by at least four different causal mechanisms, including: (1) the norms and attitudes that affect health-related behaviors; (2) psychosocial mechanisms that both serve to psychologically enhance self-esteem, confidence and control, and that may have biological effects (for instance by activating the hypothalamic–pituitary–adrenocortical axis); (3) social networks, which tend to increase the access to healthcare as well as other amenities; and (4) by a lowering effect on crime rates (Lindstorm, 2008). For example, a group randomized, controlled trial in 26 Dutch schools that provided junior secondary education demonstrated that promotion of certain norms and peer pressure could prevent smoking among adolescents (Lundborg, 2005). Another study reported that active social participation (as a common social capital proxy) was positively associated with smoking cessation (OR = 1.39; 95% CI = 1.07–1.82) (Lindstrom & Giordano, 2016).

There has been considerable debate as to how social capital influences behaviors such as smoking. However, there are plausible hypotheses as to how social capital may affect cigarette smoking, which include: i) deterring socially 'deviant' behavior; ii) increased dissemination of positive health messages; iii) increased access to resources, i.e. greater availability and use of (smoking) prevention services, and; iv) providing a buffer against psychosocial stress (Lindstrom & Giordano, 2016).

However, not all social capital is good capital. Social connections, which may lead to beneficial outcomes for some individuals or groups, may lead to detrimental outcomes for others (Moore et al., 2009). Social capital producing negative outcomes is generally called as negative social capital. The potential downsides include restrictions on individual freedom, excess claims on group members, putting a barrier in social mobility, and exclusion of outsiders. For example, a study reported that among persons with a high school degree or more, higher social capital was associated with a higher sense of mastery. However, among less-educated persons, higher individual social capital was associated with lower mastery (Moore et al., 2009). Mastery has been defined as the extent to which one sees one's life chances as being under one's own control, and is considered an important dimension of psychological well-being and distress (Ilany & Akçay, 2016).

To the extent of the author's knowledge, there were no earlier studies which incorporated the role of social capital into the Theory of Planned Behavior (TPB) in the explanation as to how social capital affects tobacco smoking behavior. This study aimed to analyze the determinants of tobacco smoking among youth using Theory of Planned Behavior, social capital, path analysis model, and empirical data obtained from an Indonesian population.

2. Method

2.1 Study Design

This was a cross-sectional study conducted in Kulon Progo District, Yogyakarta Province, Indonesia. The data were collected in April 2018.

2.2 Population and Sample

Target population was adolescents aged 12–18 years old. The accessible population was adolescents aged 12–18 years old who went to junior and senior high schools. The sample was selected based on smoking status. As smoking status was the dependent variable under study, this sampling method is called as fixed disease sampling. The sample size of this study was 400 subjects, consisting of 200 subjects who smoked and 200 subjects who did not smoke. Since sample data were analyzed using path analysis model, in order to have confidence in the goodness of fit test, a sample size of 100 to 200 is recommended. In general a model should contain 10 to 20 times as many observations as variables. This study analyzed 8 variables, therefore a minimum sample size of 160 (8 variables x 20 subjects) was required. Hence, the sample size of 400 subjects participating in this study exceeded the minimum required sample size (Wolf et al., 2013).

2.3 Study Variables

The dependent variable was smoking behavior. The independent variables were intention to smoke, attitude toward smoking, knowledge about tobacco use as it related to health, subjective norm toward smoking, perceived behavior control not to smoke, media exposure (e.g. exposure to cigarette advertisement), and social capital among peer

adolescents. Study subjects responded to a 20 minute questionnaire of smoking behavior.

2.3.1 Smoking Status

Study subjects were classified as current smoker if the subjects were daily smokers or non-daily smokers (also known as occasional smokers), or classified as non-smokers if otherwise. Daily smoker refers to those who respond "every day" to the question "At the present time do you smoke cigarettes every day, occasionally or not at all?". Non-daily smoker often referred to as "occasional" smoker, refers to those who respond "Occasionally" to the question "At the present time do you smoke cigarettes every day, occasionally or not at all?"(Government of Canada, 2008).Frequency of smoking was measured by asking question "how many cigarettes do you smoke per day?".

2.3.2 Intention Toward Cigarette Smoking

It was defined as the participant's subjective probability (i.e. perceived likelihood) that he/she would engage in tobacco smoking behavior. Seven questions assessed smoking intentions. Participants were asked 7 questions using a 5-point scale (from 1 to 5 where 1 = strongly disagree and 5 = strongly agree). For example, participants answered questions such as: "I intend to smoke within the next two weeks" (Strongly Agree/Strongly Disagree). The resulting continuous data were then reclassified into two categories coded 0 for weak (< mean) and 1 for strong (≥ mean) intention to smoke.

2.3.3 Attitude toward Cigarette Smoking

Attitude toward smoking was defined as a person's summary evaluation of smoking (the attitude object), which might be "positive" (good) or "negative" (bad) (Huong et al., 2016). Study participants reported their global evaluation toward smoking using a semantic differential measure of smoking such as "nice versus awful,""pleasant versus unpleasant," and "fun versus not fun" (Macy et al., 2012). The attitude construct was measured by 13 questions with a 5-points scale answer (from 1 to 5 where 1 = strongly disagree and 5 = strongly agree). The resulting continuous data were then reclassified into two categories coded 0 for positive (< mean) and 1 for negative (≥ mean) attitude toward smoking.

2.3.4 Knowledge on Smoking

Knowledge was defined as a theoretical or practical understanding, familiarity, and awareness of smoking as related to health issues, including cigarette types, hazardous smoke exposure, and smoking-related diseases. This construct was measured by 21 questions with "true" or "false" answers. For data analysis, the resulting continuous data were transformed into two categories coded 0 for poor knowledge (< mean) and 1 for good knowledge (≥ mean).

2.3.5 Subjective Norm

Subjective or perceived norm of smoking was defined as the perceived social pressure to perform or not to perform smoking behavior (Shimazaki et al., 2018). It was an individual's perception or "opinion" about what important others believe the individual should perform or not perform smoking behavior in a specific situation (Hanson, 2018). This construct was measured by 9 questions such as "Smoking is considered acceptable by the society", "It is common for host to offer cigarettes for guests", or "Smoking is permitted at any place as long as it does not disturb others". For data analysis, the resulting continuous data were transformed into two categories coded 0 for acceptable (< mean) and 1 for unacceptable (≥ mean).

2.3.6 Perceived Behavior Control

This variable was defined as the study subject's perception of the ease or difficulty of performing the behavior of interest, i.e. smoking behavior. This variable or construct was constructed by 10 questions with a 5-points scale answer including 1 = strongly disagree, 2 = disagree, 3 = doubtful, 4 = agree, and 5 = strongly agree. The typical questions include one such as: "It is difficult for me not to smoke", or "I refrain from smoking when my smoker friends are surrounding me". For data analysis, the resulting continuous data were transformed into two categories coded 0 for weak (< mean) and 1 for strong (≥ mean).

2.3.7 Media Exposure

Media exposure to tobacco advertisement was defined as exposure to commercials containing name, logo, product name, and trademark of a tobacco manufacturer, trader or distributor, displayed in television, radio, newspaper, magazine, billboard, pamphlet, or disseminated trough social media such as facebook, whatsapp, instagram. This variable was measured by 16 questions with a 5-points scale answer including 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always. For data analysis, the resulting continuous data were transformed into two categories

coded 0 for low (< mean) and 1 for high (≥ mean).

2.3.8 Social Capital

Social capital in this youth smokers study was defined associal relations within peer group with the notion of trusts, norms of reciprocity, and informal networks that can be capitalized as valuable resources for its members. It was measured by 8 questions such as "I trust that the other member of the peer group will handle his freedom and make socially controllable", "I trust that members will bring about mutual benefits for the peer group", and "When I give a hand to other peer group members in need, they will do the same when I need help". The questions were constructed with a 5-points scale answer (from 1 to 5 where 1 = strongly disagree and 5 = strongly agree). For data analysis, the resulting continuous data were transformed into two categories coded 0 for weak (< mean) and 1 for strong (≥ mean) social capital.

2.4 Data Analysis

The current study employed path analysis for data analysis run using Stata 13 (StataCorp, 2018). Path analysis is the statistical technique that allows an examination of causal relationships between one or more independent variables, either continuous or categorical, and one or more dependent variables, either continuous or categorical. First developed by Sewall Wright in the 1930s, path analysis is a second generation multivariate method (the first generation being a multiple regression) based upon a linear equation system, which was still used recently to analyze smoking behavior among adolescent using Theory of Planned Behavior (Gaioso et al., 2015). Path analysis was employed in this data analysis since it allows an estimation of both direct and indirect relationships between variables. As such it enables data analysis using Theory of Planned Behavior framework in this study. The analyses of both direct and indirect relationship between variables were not possible if a multiple regression analysis model was used instead.

Path analysis proceeded in 5 steps: (1) Model specification; (2) Model identification; (3) Model fit; (4) Coefficient estimates; and (5) Model re-specification (if necessary).

Model specification is the exercise of formally stating a model. Model identification concerns whether a unique value for each parameter can be obtained from the observed data, which implies that the researcher should calculate degree of freedom (df). Degree of freedom is calculated by comparing the number of observed variables with the sum of the number of endogenous variables, the number of exogenous variables, and the number of parameter to be estimated. A path model is called as just identified if df = 0. It is called as over-identified if df > 0. It is called as under-identified if df < 0. Path models need to be over-identified or just identified in order to be estimated and to test hypotheses about relationships among variables (Ullman, 1996). Model fit is the exercise of comparing the suitability of the path model specified by the researcher with the saturated (i.e. ideal) model based on sample data according to the computer. The path model is re-specified if it does not fit with the saturated model. To adjust a model, new pathways are added or original ones are removed.

2.5 Research Ethics

Research ethics approval was granted by the Research Ethics Committee at Universitas Jenderal AchmadYani Yogyakarta, No. SKep/330/KEPK/IV/2018. Study participants were taken through the process of informed consent and they signed consent forms before enrollment into the study. The information given to the participants included objective, procedures, potential risks, and benefits of the study. Participants had the right to refuse participation at any time.

3. Results

3.1 Sample Characteristics

Table 1. Sample characteristics (n = 400)

Variable	Frequency (n)	Percent (%)
Gender		
Male	341	85.3
Female	59	14.8
Total	**400**	**100**

Adolescent's age		
Early adolescent (12-16 years)	300	75
Late adolescent (17-18 year)	100	25
Total	**400**	**100**
Family income (rupiah)		
< Rp 1,500,000	204	51
Rp 1,500,000 to Rp 2,500,000	125	31.3
Rp 2,500,000 to Rp 3,500,000	38	9.5
>Rp 3,500,000	33	8.3
Total	**400**	**100**
Pocket money		
< Rp 15,000	328	82
Rp 15,000 to Rp 25,000	57	14.3
>Rp 25,000	15	3.8
Total	**400**	**100**
Number of cigarette smoked per day	Mean: 3.31	Min: 1 Max: 20
	Median: 2	Standard Deviation: 3.36

3.2 Bivariate Analysis

Table 2. Sample characteristics by smoking status among youth (n = 400)

Independent Variable	**Current smoker**		**Non-smoker**		**Total**		**OR**	**p***
	n	**(%)**	**n**	**(%)**	**n**	**(%)**		
Exposure to cigarette commercials								
Low <49	61	43	81	57	142	100	1.55	0.037
High ≥49	139	53.9	119	46.1	258	100		
Knowledge on smoking hazard								
Poor <17	119	76.8	36	23.2	155	100	0.15	<0.001
Good≥17	81	33.1	164	66.9	245	100		
Social capital of peer group								
Weak <29	123	57.5	91	42.5	214	100	0.52	0.001
Strong ≥29	77	41.4	109	58.6	186	100		
Intention to smoke								
Strong <31	150	78.9	40	21.1	190	100	0.08	<0.001
Weak ≥31	50	23.8	160	76.2	210	100		
Subjective norm toward smoking								
Acceptable < 19	165	76	52	24	217	100	0.07	<0.001
Unacceptable ≥ 19	35	19.1	148	80.9	183	100		
Attitude toward smoking								
Positive < 51	136	71.2	55	28.8	191	100	0.18	<0.001
Negative≥ 51	64	30.6	145	69.4	209	100		

PBC not to smoke								
Weak <30	150	76.1	47	23.9	197	100	0.10	<0.001
Strong ≥30	50	24.6	153	75.4	203	100		
Parental income								
<Rp 1,400,000 per month	104	51	100	49	204	100	0.92	0.689
≥ Rp 1,400,000 per month	96	49	100	51	196	100		
Access to cigarette								
Difficult <8	96	51.6	90	48.4	186	100	0.88	0.548
Easy ≥8	104	48.6	110	51.4	214	100		
Smoking-free area								
No	17	54.8	14	45.2	31	100	0.81	0.575
Yes	183	49.6	186	50.4	369	100		

p*= p value from Chi square test.

Table 2 showed sample characteristics by smoking status among youth. As expected, this bivariate analysis indicated that the risk of smoking increased with high exposure to cigarette commercials, and it was statistically significant ($p<0.05$). The bivariate analysis also indicated that the risk of smoking decreased with high knowledge of smoking hazard, high social capital, weak intention to smoke, unfavorable attitude toward smoking, unacceptable subjective norm toward smoking, and strong perceived behavior control not to smoke, and they were statistically significant ($p<0.05$). The differences in the prevalence of smokers were not statistically significant ($p\geq0.05$) by parental income status, existence of smoking free are, and access to cigarettes.

3.3 Path Analysis

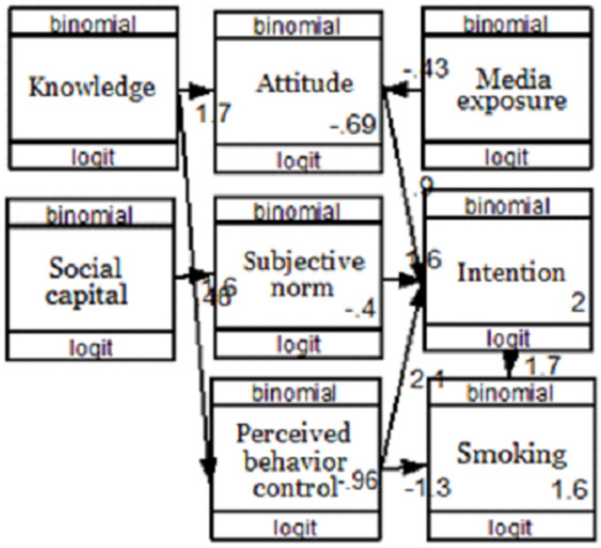

Figure 1. Path diagram on the determinants of tobacco smoking among youth

Table 3. The results of path analysis on the determinants of tobacco smoking among youth

Dependent variable		Independent variable	Path coefficient (b)	95% CI		p
				Lower limit	Upper limit	
Direct effect						
Smoking	←	Intention to smoke (strong)	1.74	1.19	2.30	<0.001
Smoking	←	Perceived behavior control (not to smoke)	-1.32	-1.87	-0.77	<0.001
Indirect effect						
Intention to smoke (strong)	←	Attitude (positive toward smoking)	0.90	0.29	1.51	0.004
Intention to smoke (strong)	←	Subjective norm (smoking acceptable)	1.59	0.99	2.19	<0.001
Intention to smoke (strong)	←	Perceived behavior control (not to smoke)	-2.07	-2.68	-1.45	<0.001
Attitude (positive toward smoking)	←	Knowledge about tobacco smoking (poor)	1.72	1.28	2.17	<0.001
Attitude (positive toward smoking)	←	Media exposure (e.g. cigarette smoking commercials)	0.43	-0.02	0.88	0.063
Perceived behavior control (not to smoke)	←	Knowledge about tobacco smoking (poor)	1.59	1.15	2.03	<0.001
Subjective norm (smoking acceptable)	←	Weak social capital (trust, norm of reciprocity, social network)	0.48	0.09	0.88	0.017

N observation= 400;

Log likelihood = -1130.63.

Table 3 showed the results of the final path model analysis, which retains the statistically significant relationships of variables under study. As customary, the path analysis table is divided into two panels, consisting of direct effects on the upper panel and indirect effects on the lower panel. On the direct effect, there was a positive and statistically significant relationship between intention to smoke and smoking behavior initiation. Specifically, on average youths with strong intention to smoke had logodd of smoking as much as 1.74 points higher than those with weak intention ($b = 1.74$; 95% CI = 1.19 to 2.30; $p < 0.001$).

On the direct effect, Table 3 also showed negative and statistically significant relationship between perceived behavior control not to smoke and smoking behavior initiation. Specifically, on average youths with strong perceived behavior control not to smoke had logodd of smoking as much as 1.32 points lower than those with weak perceived behavior control ($b = -1.32$; 95%CI = -1.87 to -0.77; $p < 0.001$).

On the indirect effect, Table 3 showed that intention to smoke had positive and statistically significant relationships with both attitude and subjective norm toward smoking. Specifically, on average youths with favorable attitude toward smoking had logodd of intention to smoke as much as 0.90 points higher than those with unfavorable attitude toward smoking ($b = 0.90$; 95%CI = 0.29 to 1.51; $p = 0.004$). Similarly, on average youths with subjective norm that smoking is acceptable had logodd of intention to smoke as much as 1.59 points higher than those with subjective norm that smoking is unacceptable ($b = 1.59$; 95%CI = 0.99 to 2.19; $p < 0.001$).

On the indirect effect, Table 3 also showed that intention to smoke had negative and statistically significant relationship with perceived behavior control not to smoke. Specifically, on average youths with strong perceived behavior control not to smoke had logodd of intention to smoke as much as 2.07 points lower than those with weak perceived behavior control not to smoke ($b = -2.07$; 95%CI = -2.68 to -1.45; $p < 0.001$).

On the indirect effect, Table 3 also showed that unfavorable attitude toward smoking had positive and statistically significant relationship with knowledge on smoking hazard. Specifically, on average youths with good knowledge on smoking hazard had logodd of unfavorable attitude toward smoking as much as 1.72 points higher than those

with poor knowledge on smoking hazard (b = 1.72; 95%CI = 1.28 to 2.17; p < 0.001).

On the indirect effect, Table 3 also showed that unfavorable attitude toward smoking had negative and statistically significant relationship with exposure to cigarette commercials. Specifically, on average youths with high exposure to cigarette commercials had logodd of unfavorable attitude toward smoking as much as 0.43 points lower than those with low exposure to cigarette commercials (b = -0.43; 95%CI = -0.88 to 0.02; p = 0.063).

On the indirect effect, Table 3 also showed that perceived behavior control not to smoke had positive and statistically significant relationship with knowledge on smoking hazard. Specifically, on average youths with high knowledge on smoking hazard had logodd of perceived behavior control not to smoke as much as 1.59 points higher than those with low knowledge on smoking hazard (b = 1.59; 95%CI = 1.15 to 2.03; p < 0.001).

On the indirect effect, subjective norm that smoking is unacceptable had positive and statistically significant relationship with social capital of peer group. Specifically, on average youths with high social capital of peer group had logodd of subjective norm that smoking is unacceptable as much as 0.48 points higher than those with low social capital of peer group (b = 0.48; 95%CI = 0.09 to 0.88; p = 0.017).

4. Discussion

Identifying factors that influence individuals' smoking behavior remains a huge public health concern. To our knowledge, this is the first study that utilized a theory-based approach to understand cigarette smoking behavior among adolescents using path analysis technique. Young adulthood is a critical period in the development of smoking behavior (Hammond, 2005). The current study aimed to test the hypotheses using Theory of Planned Behavior (TPB) that the stronger intention to perform smoking behavior, the more likely the person is to perform smoking behavior. Likewise, the more positive a person's attitude, the stronger subjective norms, and the weaker perceived behavior control (PBC) not to smoke, the more likely the person is to perform smoking behavior.

4.1 Smoking Behavior and Intention

The path analysis of the present study provides empirical evidence that supports Theory of Planned Behavior (TPB). Consistent with TPB, intention was shown to be a direct predictor of smoking initiation. This finding is consistent with earlier study among waterpipe smokers in Saudi Arabia using a multiple logistic regression, which reported positive and statistically significant relationship between smoking and intention to smoke (OR = 1.76; 95%CI = 1.41 to 2.21; p < 0.001) (Alanazi et al., 2017). The current study was also consistent with the TPB's predictions in Topa and Moriano (2010) using a meta-analytic structural equation modeling approach (MASEM), which reported that smoking behavior was related to smoking intentions (weighted mean r = 0.30).

4.2 Smoking Behavior and Attitude

The present study showed an indirect relationship between unfavorable smoking attitude and smoking behavior through intention to smoke. Participants with unfavorable attitude toward smoking were more likely to smoke than those with favorable attitude. The direct relationship between smoking attitude and smoking behavior was negligible and statistically non-significant and so was not included in the path model. The current study is also consistent with Lin et al. (2010), which reported that subjects with a higher attitude score about smoking had relatively lower risk for cigarette smoking when compared to those with a lower attitude score, even after adjusting for potential confounders (OR = 0.93; 95%CI = 0.91–0.94).

Grigaliūnaitė and Pilelienė (2017) elaborated further on the potential role of picture in modifying attitude toward smoking. Their study reported that smokers who saw unfavorable smoking-related pictures had more unfavorable attitude towards smoking when compared with those who saw favorable smoking-related pictures. The same situation is with the group of non-smokers: those non-smokers who saw unfavorable smoking-related pictures had a more unfavorable attitude towards smoking when compared with those who saw favorable smoking-related pictures.

4.3 Smoking Behavior and Perceived Behavior Control

According to the TPB, the behavior is a result of the intention to do the behavior and the PBC of the behavior. Finding from the current study supports the hypotheses that strong PBC not to smoke negatively predicts smoking behavior initiation among youth. According to TPB, the effect of PBC on the behavior can be direct or indirect. The direct negative relationship between PBC not to smoke and smoking behavior in the current study was statistically significant. Youth with strong PBC not to smoke were less likely to perform smoking. This finding is consistent with Alanazi et al. (2017), which reported that PBC (i.e. participants' confidence that they were able to perform cigarette smoking behavior) was positively related to smoking behavior (OR = 2.27; 95% CI = 1.51 to 3.43; p < 0.001). Another study by Smith et al. (2007) reported that PBC was associated with intention to smoke

among high school adolescents.

4.4 Smoking Behavior and Knowledge

Path analysis in the current study supports the hypothesis that poor knowledge about smoking and health is associated with an increased tendency for adolescents to start smoking, by two different indirect pathways. The first pathway refers to the effect of knowledge on smoking behavior via increasing unfavorable attitude toward smoking and stronger intention to smoke. The second pathway refers to the effect of knowledge on smoking behavior via weaker perceived behavior control of not smoking. This finding explains better than other studies such as a study among young adults in China, which conclude that knowledge and attitude toward smoking do not necessarily translate into health behavioral outcomes such as smoking. The study by Xu et al. (2015) employed multiple regression analysis, which estimated only direct effects of knowledge and attitude on smoking behavior. It did not treat attitude, perceived behavior control, and intention, as mediating variables between knowledge and smoking behavior as it was in the current study.

The current study found positive association between poor knowledge and unfavorable attitude toward smoking, positive association between unfavorable attitude and stronger intention to smoke, as well as strong intention to smoke and smoking behavior. Likewise, the current study found positive association between poor knowledge and weaker perceived behavior control not to smoke, as well as weak perceived behavior control and smoking behavior. In contrast with the study reported by Xu et al. (2015), we did not find statistically significant direct association between knowledge and smoking behavior. The direct relationship between smoking attitude and smoking behavior was negligible and statistically non-significant and so was not included in the path model.

The current study is consistent with Lin et al. (2010), which reported that subjects with greater knowledge about smoking had a lower risk of smoking (OR = 0.88; 95% CI = 0.86–0.91). But this characteristic diminished after being adjusted for potential confounders.

4.5 Smoking Behavior and Subjective Norm

The current study showed the indirect relationship between subjective norm toward smoking and smoking behavior through intention to smoke. Adolescents with favorable subjective norm were more likely to have stronger intention to smoke than those with unfavorable subjective norm. Subsequently, adolescents with strong intention to smoke were more likely to engage in smoking behavior than those with weak intention to smoke. The current study did not find direct significant relationship between subjective norm and smoking behavior. Accordingly, the path diagram dropped this path as it diminished the fitness of the model. This finding is consistent with Alanazi et al. (2017), which reported no direct effect of subjective norm on the cigarette use behavior, yet reported that subjective norm had a statistically significant indirect effect on intentions through attitude and perceived behavioral control.

4.6 Smoking Behavior and Media Exposure

Path analysis of the current study showed how smoking related messages on social media influenced high school students' smoking. High school students with high exposure to pro-smoking messages on electronic mass media, social media, and advertisement, were more likely to engage in smoking than those with low exposure to pro-smoking messages, via unfavorable attitude toward smoking and strong intention to smoke. This finding is consistent with a study in the USA by Yoo et al. (2016), which reported that reception of pro-smoking messages not only directly affected smoking but also had indirect effects on smoking through (1) perceived peer expression of pro-smoking messages and (2) perceived peer smoking norms.

4.7 Smoking Behavior and Social Capital

The current study found a positive indirect relationship between weak group social capital and smoking behavior among adolescents, through unfavorable subjective norm toward smoking and strong intention to smoke. Adolescents with weak group social capital were more likely to have unfavorable subjective norm toward smoking, to have strong intention to smoke, and eventually to engage in smoking behavior than those with strong group social capital. This finding is consistent with Lindstrom and Giordano (2016), which reported that active social participation was positively associated with smoking cessation (OR = 1.39; 95% CI = 1.07 to 1.82). Likewise, a systematic review reported the importance of social environment to help affect smoking cessation (Kristina et al., 2018).

As postulated by Kreider et al. (2016), active social participation in social capital may be an instrumental part of individuals' social networks, through which societal 'norms' regarding smoking behavior can be disseminated and reinforced. Group (participatory) interventions have already been shown to increase success rates of smoking

cessation.

4.8 Limitation

The cross-sectional survey design limits our ability to explore the causal relationship between the variables, because all observations were made at the same time.

5. Conclusion

Theory of Planned Behavior (TPB) can be used to explain psychological and social factors affecting smoking behavior among adolescents. The TPB constructs including attitude toward smoking, subjective norm toward smoking, and perceived behavior control not to smoke, have impact on intention to smoke, and eventually on smoking behavior. Social capital affects smoking behavior via subjective norm and intention. Knowledge about smoking and health affects smoking behavior via attitude toward smoking and perceived behavior control not to smoke. Mass media exposure affects smoking behavior via attitude and intention. The relationships involving multiple variables including mediating variable can be analyzed using path analysis. These findings can be used to design health promotion program to prevent and reduce smoking behavior among adolescents.

Authorship

SujonoRiyadi raised the original research questions, developed questionnaire, collected data, and sought ethical clearance letter. BhismaMurti designed the study, determined sampling approach, revised questionnaire, analyzed data, and interpreted the results, discussed the findings, and wrote up the manuscript. Muhammad Akhyar discussed and reviewed the data analysis approach. Suminah discussed the results.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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The Effect of Memorizing the Al Quran on Quality of Life in Stroke Patients With Aphasia Motoric Disorders

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Abstract

Background/aim: The purpose of this study was to determine and analyze the effect of memorizing the Al Quran surah Thaha verse 25–28 on functional communication skills, independence, and quality of life in stroke patients with motoric aphasia disorders.

Materials and Methods: The study was conducted at Ja'far Medika Karanganyar General Hospital, Central Java, Indonesia for approximately 3 months, with a total sample of 102 motor aphasia stroke sufferers, divided into 2 groups (n = 51) as controls receiving medical therapy, (n = 51) intervention group who received medical therapy and were trained to memorizing the Al Quran. The time of the study was carried out for three months starting December 4, 2017 to Maret 21, 2018. Type of quantitative research, using experimental design, simple randomized the pretest-posttest control group design.

Results: Based on the results of path analysis that memorizing the Al Quran significantly influences the quality of life in stroke patients with motoric aphasia disorders of (r = 0.735; p = 0.000), while family support is (r = 0.321; p = 0,000), functional communication is (r = 0.017; p = 0.618) and independence by (r = 0.035; p = 0.305). Thus the direct influence of memorizing the Al Quran and family support for the quality of life is better, without having to go through functional communication and the level of independence as mediation.

Conclusion: Memorizing the Al Quran surah Thaha verse 25–28 is very effective for improving functional communication skills, independence, and quality of life in stroke patients with aphasia motoric disorders.

Keywords: stroke, functional communication, family support, independence, quality of life

1. Introduction

The incidence of stroke ranks third as a cause of death after heart disease and cancer. Data from the American Heart Association/American Stroke Association (AHA/ASA) in Heart Disease and Stroke Statistics-2017 Updates, states that in America every 40 seconds an individual experiences a stroke and every 4 minutes someone dies from a stroke (Roger et al., 2017). Stroke is the third leading cause of death in developed countries, where 10 to 12% of all deaths are caused by strokes with a crude mortality rate of 50 to 100/100 thousand patients (Douiri et al., 2013). According to the basic health research of the Ministry of Health of the Republic of Indonesia (Riskesdas 2018), the prevalence of stroke increased when compared to the 2013 Riskesdas, the prevalence of stroke rose from 7% to 10.9% (Riskesdas 2018). Stroke will result in several effects including: 80% partial or total reduction in arm and leg movements, 80-90% problem in thinking and remembering, 70% suffering from depression, and 30% having difficulty speaking (aphasia), swallowing, right and left differentiation (WHO, 2016).

Health problems that arise due to stroke vary widely, depending on the area of the brain that experiences infarction

or death of the tissue and the affected location (Rasyid & Lyna, 2007). One symptom of stroke is aphasia, which is the loss of speech function, including interference in writing, communication, reading, listening and understanding language. Stroke is a common cause of aphasia and is estimated to be around 25% - 40% of stroke patients develop aphasia. During this time the handling of stroke with all its methods has not produced results as expected. Western medicine until now has not been able to cope well and perfectly, especially for stroke patients with motoric aphasia. To overcome this crucial problem, a stroke prevention strategy is needed which includes proper promotion, preventive, curative and rehabilitation aspects. Through memorizing the Al Quran that is repeated is expected to improve the quality of life of stroke patients. Recurring memorizing the Al Quran will be recorded in memory in the subconscious brain that sends signals to the conscious brain, can increase brain flexibility that can improve the brain (neuro plasticity) after experiencing a disorder (Huttenlocher, 2002). Memorizing the Quran regularly will cause neuroplasticity, which is the brain's ability to reorganize in the form of interconnections between brain nerves. Brain neural reorganization is influenced by stimulation, experience and the environment. Based on this concept, if there is damage to the part of the brain it is possible to experience recovery. This is in accordance with Murphy et al. (2009)'s research.

The Zulkurnaini et al. (2012) study shows that reading dhikr and verses of the Al Quran can increase Delta waves in the brain, shown in the Brodmann 8 area, where this area belongs to Broca's area which is responsible for processing semantic aspects of language and verbal fluency. According to Knyazev (2011) Delta wave activation contributes to the production of human growth hormone, human growth hormone (HGH) as a result of stimulation of the pituitary gland during activation of Delta waves. In addition, Delta waves also stimulate the release of anti-aging hormones such as dehydroepiandrosterone (DHEA) and melatonin, so memorizing repeated Al Quran is expected to also have an impact on improving functional communication in stroke patients with aphasia motor disorders. In general memorizing and listening to the Al Quran can improve mental health (Mahjoob et al., 2016; Fathilkamal et al., 2011; Eskandari et al., 2012; Bechir et al., 2017; Babamohamadi et al., 2015; Azis et al., 2015; Ashikin et al., 2012).

2. Materials and Methods

2.1 Instrument

(1) Aphasia screening observation sheet using the Frenchay Aphasia Screening Test (FAST) to determine the type of aphasia, namely motoric, sensory or global aphasia. (2) Questionnaire on functional communication skills using Derby Functional Communication Scale (DFCS). Used to measure the development and progress of functional communication skills of stroke patients. (3) Family support is a support system given to families towards family members which includes information support, instrumentation, emotional support and appreciation. (4) Barthel Index was used to assess the level of independence (Activities of Daily Living/ADL). The Barthel index was a very simple, easy to work measuring tool and is useful for evaluating patient dependence, which is related to ADL (Nakao et al., 2010; Sörbo, 2010). (5) The WHOQoL dimension was used to assess quality of life in stroke patients with motor affective disorders. The dimensions measured in WHOQoL cover 5 dimensions, namely physical health, psychological health, social relations, environment and spiritual well-being.

The study was conducted at Ja'far Medika Karanganyar General Hospital, Central Java, Indonesia for approximately 3 months, with a total sample of 102 motoric aphasia stroke sufferers, as evidenced by the results of head CT scan, divided into 2 groups (n = 51) as controls receiving medical therapy, (n = 51) intervention group who received medical therapy and were trained to memorizing the Al Quran. The time of the study was carried out for three months starting December 4, 2017 to Maret 21, 2018. Type of quantitative research, using experimental design, simple randomized the pretest-posttest control group design.

2.2 Inclusion Criteria

The sample inclusion criteria are as follows: (1) All stroke patients both bleeding and non-bleeding strokes that have been proven by CT scan of the head. And diagnosed clinically by a radiologist with a lesion abnormality in the left hemisphere. (2) Patients diagnosed with bleeding and non-bleeding strokes who experience motoric aphasia which routinely control for at least three months. Determination of motoric aphasia is based on the format of Frenchay Aphasia Screening Test (FAST), which is characterized by the inability of sufferers to coordinate or compile thoughts, feelings and wishes to be symbols that are meaningful and understood by others, but sufferers still have good understanding. (3) All stroke sufferers who are Muslim, both male and female, used to pray 5 times and without age restrictions. (4) Compostment awareness is normal awareness, fully aware, can answer all questions about the surroundings. (5) Patients with stroke who are awaited by their families and involved in communication exercises. (6) Patients and families are willing to become respondents.

2.3 Exclusion Criteria

Exclusion criteria are conditions that cause the subject to meet the inclusion criteria but cannot be included in the study. Exclusion criteria in this study were: (1) Patients with stroke both bleeding and non-bleeding with abnormalities in multiple lesions in the left and right hemispheres which were shown from the results of a head CT scan diagnosed clinically by a radiologist. (2) Patients with disturbance of verbal communication before a stroke. (3) Patients who have a history of depression before stroke. (4) Patients who get anti-depression therapy. (5) Increased intracranial pressure (projectile vomiting, dizziness, unstable blood pressure, decreased consciousness). (6) Patients with stroke like syndrome are strokes caused not by blockage or bleeding, but due to other factors, most often for example intra-cranial tumors or intra-cranial infections as indicated by the results of CT scan or MRI of the head by a radiologist

2.4 Dropout Criteria

(1) Stroke patients who die before 3 months at the time of the study. (2) Patients do not control the Ja'far Medika General Hospital Karanganyar Central Java, Indonesia and after a home visit turns out the address does not match or change address and cannot be tracked. (3) Patients have recurrent stroke attacks within the first 3 months before the study is complete.

2.5 Statistical Analysis

This study was a quantitative study, using an experimental design, simple randomized design of the pretest-posttest control group. Data analyzed with the Statistical Package for Social Science version 23 (SSPS Inc., Chicago, IL, USA). The data obtained were then tested first with homogeneity test (univariate test), this test aims to determine the basic subject matter of the research between the intervention groups given medical and memorizing Al Quran therapy and the control group that only received medical therapy. The second was carried out bivariate test explaining the effect of one independent variable on one dependent variable, with a confidence level of 95% (p value = 0.05). The third was carried out path analysis with the aim to determine the direct and indirect influence between giving Al Quran memorization intervention and family support to functional communication skills, level of independence and quality of life in stroke patients with aphasia motoric disorders.

3. Results

3.1 Characteristics Research Subject

This study was conducted on 102 stroke patients in both bleeding and non-bleeding strokes that have been proven by head CT scan. And diagnosed clinically by radiologists with impaired lesions in the left hemisphere, patients were divided into 2 groups, the control group only received medical therapy and the intervention group received medical therapy in addition to memorizing the Al Quran surat Thaha verse 25 to 28.

Table 1. Characteristics of Research Subjects

Subjects Characteristics		Prosentage		P
		Control group (n=51)	Intervention group (n=51)	
Gender[a]	Male	25 (49.0%)	29 (56.9%)	0.427
	Female	26 (51.0%)	22 (43.1%)	
Age[c]		57.75± 10.95	57.61± 8.50	0.944
Education[b]	Elemntary School	25 (49.0%)	31 (60.8%)	0.704
	Junior high School	12 (23.5%)	3 (5.9%)	
	High School	9 (17.6%)	8 (15.7%)	
	College	5 (9.8%)	9 (17.6%)	
Income[b]	0,5 – 1,5 million	25 (49.0%)	19 (37.3%)	0.173
	1,6 – 2,5 million	23 (45.1%)	26 (51.0%)	
	2,6 – 5 million	3 (5.9%)	6 (11.8%)	
	> 5 million	0 (0.0%)	0 (0.0%)	

Duration of stroke[b]	< 1 month	26 (51.0%)	32 (62.7%)	0.287
	>1 – 2 month	10 (19.6%)	7 (13.7%)	
	> 2 – 3 month	3 (5.9%)	2 (3.9%)	
	> 3 month	12 (23.5%)	10 (19.6%)	
Frequency of Stroke[a]	1 attack	44 (86.3%)	42 (82.4%)	0.586
	> 1 attacks	7 (13.7%)	9 (17.6%)	
Family support[b]		63.10 ±6.14	64.43 ±7.68	0.057

Note. a Chi Sqaure Test (nominal categorical data).

b The mann whitney test (ordinal or numerical categorical data is not normally distributed).

c Independent test t test (numerical data is normally distributed).

Based on the table above, it can be concluded that karcathics of research subjects between intervention groups who were given Quran memorization training and control groups were not significantly different or could be said to be homogeneous because the value of $p > 0.05$.

3.2 Effect of Memorizing the Al Quran on Ability Functional Communication in Stroke Sufferers With Motoric Aphasia Disorder

Table 2. Differences in functionality of communication between the control group and the intervention group

Functional Communication (FC)	Group		p[a]
	Control	Interventional	
Week I (FC 1)	7.20 ±3.79	7.47 ±3.62	0.704
Week III (FC 2)	9.39 ±2.45	10.45 ±2.41	0.026
Week VI (FC 3)	11.82 ±1.74	13.53 ±2.43	< 0.001
Week IX (FC 4)	14.24 ±1.88	16.18 ±2.25	< 0.001
Week XII (FC 5)	17.16 ±1.80	19.35 ±2.27	< 0.001

Note. [a]Mann whitney test (unpaired test for numeric data is not normally distributed).

Based on Table 2 in the control group, it is known that the functional communication ability on the first week averages at 7.20 + 3.79, then at week 3 functional communication skills increase, to 9.39 + 2.45, at week 6 the functional ability of communication increases, to 11.82 + 1.74, in the 9th week functional communication capabilities increased, to 14.24 + 1.88, and at week 12, functional communication capabilities increased, to 17.16 +1.80. The results of the difference test increase in the control group obtained a value of $p = 0{,}000$ ($p < 0.05$) which means that there is a significant change in functional communication skills in the control group.

In the treatment group it was known that functional communication skills at the first week's assessment, the average was 7.47 + 3.62, at week 3 functional communication skills increased to 10.45 + 2.41, at week 6, functional communication skills increased to 13.53 + 2.43, at week 9, functional communication capability increases to 16.18 + 2.25, and at week 12, functional communication capabilities increase on average to 19.35 + 2.27. The results of the different test increases in the intervention group obtained a value of $p = 0{,}000$ ($p < 0.05$) which means that there is a significant change in functional communication skills in stroke patients with aphasia motor disorders.

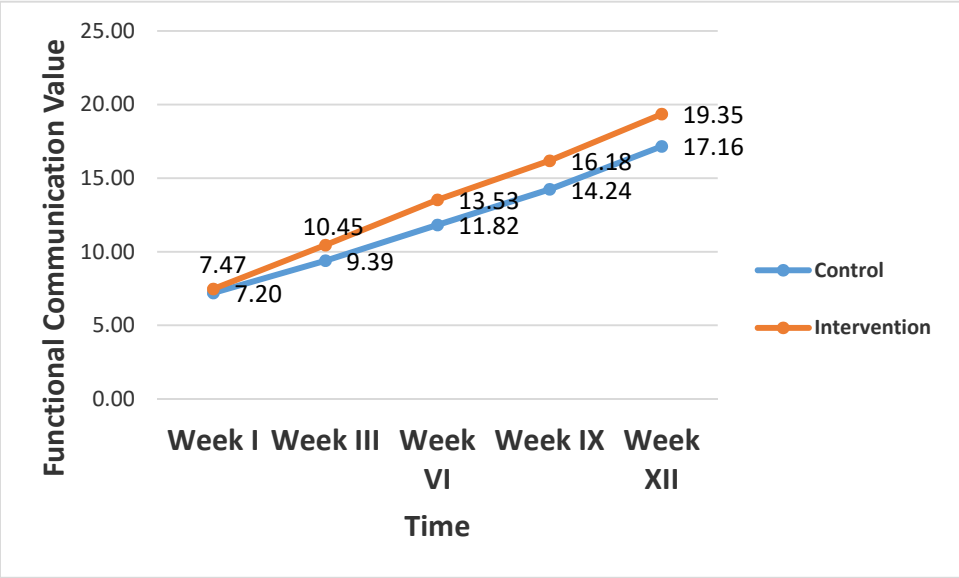


Figure 1. Comparative line diagram of functional communication capabilities between control groups and intervention groups

Based on Table 2 and Figure 1 it was known that the increase in functional ability of the intervesia group has improved better than the control group which is known at first week (FC1) does not show a significant difference ($p = 0.704$), starting from the third week to twelfth week shows significant ($p < 0.05$), thus giving the Al Quran memorization training intervention effective in improving the functional communication skills of stroke patients with motoric aphasia disorder. Table 2 and Fig. 1 also showed that the increase in functional ability of the intervesia group has improved better than the control group which is known at first week does not show a significant difference ($p = 0.704$), starting from the second to twelfth week shows significant ($p < 0.05$), thus giving the Al Quran memorization training intervention effective in improving the functional communication skills of stroke patients with motoric aphasia disorder

3.3 Effect of Memorizing the Al Quran on Independence in Stroke Patients With Motoric Aphasia Disorder

Table 3. Differences in independence between the control group and the intervention group

Independence (ADL)	Group		p[a]
	Control	Interventional	
Week I (ADL 1)	39.71 ±18.59	37.73 ±18.47	0.463
Week III (ADL 2)	46.55 ±14.38	50.88 ±12.41	0.109
Week VI (ADL 3)	56.16 ±11.60	62.39 ±9.70	0.002
Week IX (ADL 4)	65.47 ±11.10	74.75 ±9.78	< 0.001
Week XII (ADL 5)	74.31 ±11.34	85.04 ±10.35	< 0.001

Note. [a]Mann Whitney test (unpaired test for numeric data is not normally distributed).

Table 3 in the control group the level of independence at week 1 averaged 39.71 ± 18.59, the third week of independence increased on average to 46.55 ± 14.38, the 6th week of independence increased to 56 , 16 ± 11.60, week 9, independence increased to 65.47 ± 11.10, and the 12th week of independence increased to 74.31 ± 11.34. The results of different improvements in the control group obtained p = 0,000 ($p < 0.05$) which meant that there was a significant change in independence in the control group.

In the treatment group the level of independence of the 1st week averaged 37.73 ± 18.47, at week 3, independence increased to 50.88 ± 12.41, in the 6th week independence increased to 62.39 ± 9, 70, week 9, independence increased to 74.75 ± 9.78, and at week 12, independence increased to 85.04 ± 10.35. The results of the level of

independence in the intervention group obtained a value of p = 0,000 (p <0.05) which means that there is a significant change in the level of independence in stroke patients with aphasia motoric disorders.

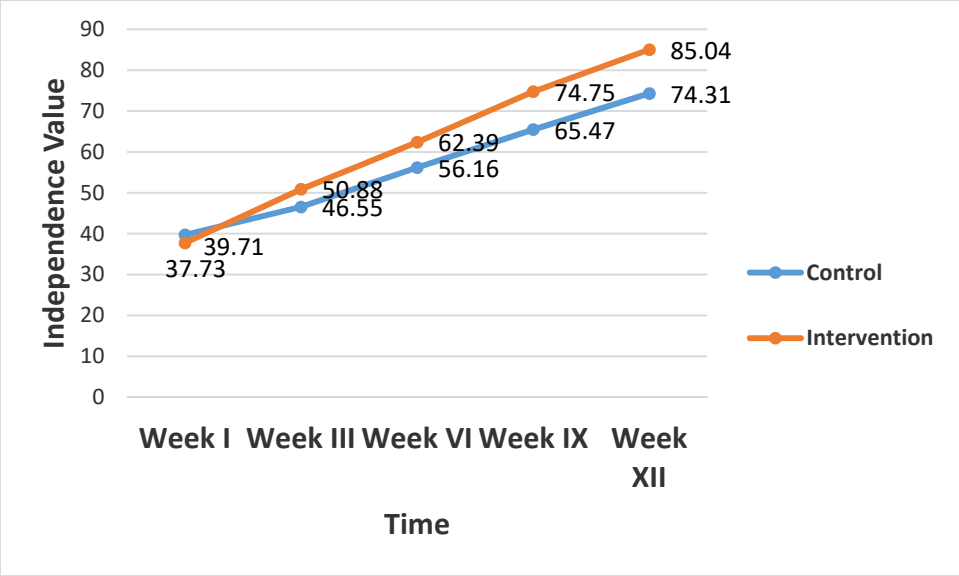


Figure 2. Comparative line diagram of independence between control groups and intervention groups

Table 3 and Figure 2 showed that the increase in the independence of the intervention group experienced a better increase compared to the control group where it was known that at the beginning the assessment at first week and third week did not show a significant difference (p > 0.05), starting at the sixth week until the twelfth week shows a significant difference (p < 0.05), thus giving intervention to the Al Quran memorization exercise is effective in increasing the independence of stroke patients with motoric aphasia.

3.4 Effect of Memorizing the Al Quran on Quality of Life in Stroke Sufferers With Motoric Aphasia Disorder

Table 4. Differences in quality of life between control groups and intervention group

Quality of Life (QoL)	Group		p[a]
	Control	Interventional	
Week I (QoL 1)	37.10 ±11.21	36.24 ±11.49	0.691
Week III (QoL 2)	40.98 ±9.86	48.75 ±13.43	0.001
Week VI (QoL 3)	53.49 ±14.09	68.16 ±17.74	< 0.001
Week IX (QoL 4)	70.75 ±19.83	88.43 ±19.42	< 0.001
Week XII (QoL 5)	88.43 ±19.42	102.24 ±14.48	< 0.001

Note. [a]Mann Whitney test (unpaired test for numeric data is not normally distributed)

Based on Table 4 in the control group it is known that based on questionnaire quality of life in the first week assessment (QoL 1) on average 37.10 ± 11.21, then in the third week assessment (QoL 2) questionnaire quality of life increased on average to 40.98 ± 9.86, in the assessment sixth week (QoL 3) questionnaire quality of life increased on average to 53.49 ± 14.09, in the ninth week assessment (QoL 4) questionnaire score of quality of life increased on average to 70.75 ± 19.83, and in the twelfth week assessment (QoL 5) questionnaire score quality of life increased on average to 88.43 ± 19.42. the results of different test increases in the control group obtained p = 0.000 (p <0.05) which means that there was a significant change in the quality of life in the control group

In the intervention group it was found that based on the quality of life questionnaire score at the first week assessment (QoL 1) an average of 36.24 ± 11.49, then in the third week assessment (QoL 2) the questionnaire

quality of life improved on average to 48.75 ± 13.43, in the sixth assessment (QoL 3) questionnaire score of quality of life increased on average to 68.16 ± 17.74, in the ninth week assessment (QoL 4) questionnaire score of quality of life increased on average to 88.43 ± 19.42, and in the twelfth week assessment (QoL 5) questionnaire quality of life increased average becomes 102.24 ± 14.48. the results of different test improvement in the intervention group obtained p = 0.000 (p <0.05) which means that there was a significant change in the quality of life in the intervention group.

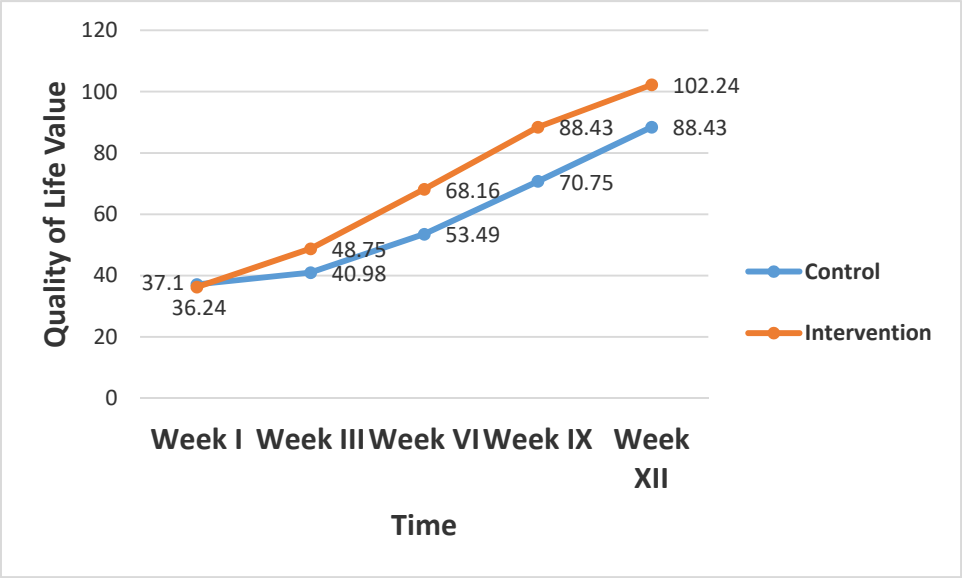
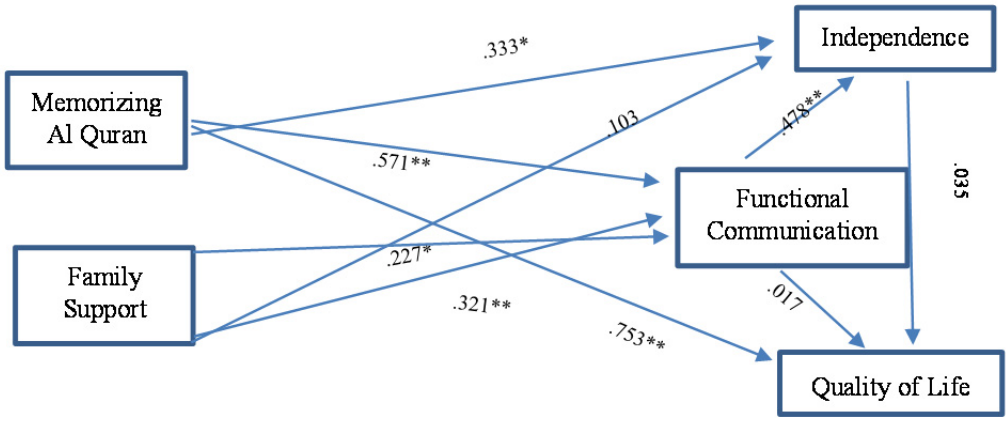


Figure 3. Line diagram of the comparison of Quality of Life between control groups and intervention groups

Based on Table 4 and Figure 3 it was known that the increase in functional ability of the intervention group experienced a better improvement compared to the control group where it was known at first week did not show a significant difference (p = 0.691), starting from the third week to twelfth week shows the difference significant (p < 0.05), thus giving the Al Quran memorization training intervention effective in improving the quality of life of stroke patients with motoric aphasia disorder.

3.5 Path Analysis

Path analysis in this study was to find out whether there was a relationship between Al Quran memorization training and family support with functional communication, and the effect of functional communication on independence and the effect of independence on improving quality of life in stroke patients with motoric aphasia.



Description: ** p <0.001

* p <0.05

Figure 4. Pathway influence analysis of memorizing Al Quran and family support to quality of life with functional communication and independence as mediation

Based on Figure 4 can be described as follows: (1) The effect of Al Quran memorizing variables and family support on the improvement of combined functional communication both in stroke patients with motoric aphasia disorders get r square = 0.579 with p = 0.000 (p < 0.001) which means that the variable memorizing the Al Quran and support the family has an effect on the improvement of joint functional communication in stroke patients with moderate motoric aphasia. Or it can be said that 57.9% of the variance in functional communication is influenced by the variable memorizing the Al Quran and family support. (2) Partially it is known that the variable that has the greatest influence on improving functional communication in stroke patients with motoric aphasia is memorizing the Al Quran (r = 0.571; p = 0.000) compared to family support (r = 0.227; p = 0.018). (3) The influence of Al Quran memorizing variables, family support and functional communication, on the combined independence of stroke patients with motoric aphasia disorders get the value of r square = 0.679 with p = 0.000 (p < 0.001) which means that the variable memorizing the Al Quran, support family and functional communication have an effect on the improvement of joint functional communication in stroke patients with strong levels of motoric aphasia. Or it can be said that 67.9% of the independence variance is influenced by the variable memorizing the Al Quran and family support and functional communication. (4) Partially functional communication variables (r = 0.478; p = 0.000) have more influence on independence compared to memorizing the Al Quran (r = 0.333; p = 0.009) and family support (r = 0.103; p = 0.332) thus functional communication has the greatest influence on independence in stroke patients with motoric aphasia, while family support partially has no significant effect. (5) The effect of Al Quran memorizing variables, family support, improvement of functional communication and the level of independence of the combined quality of life in stroke patients with motoric aphasia disorders get r square = 0.983 with p = 0.000 (p < 0.001) which means that the variable memorizes Al Quran, family support, improvement of functional communication and level of independence affect the quality of life combined in stroke patients with motoric aphasia disorders with very strong levels. Or it can be said that 98.3% of the variance in quality of life is influenced by the variable memorizing the Al Quran, family support, improvement of functional communication and level of independence. (6) Partially it is known that the variable that has the greatest influence on the quality of life in stroke patients with motoric aphasia is memorizing the Al Quran (r = 0.735; p = 0.000) compared to family support (r = 0.321; p = 0.000), whereas functional communication (r = 0.017; p = 0.618) and independence (r = 0.035; p = 0.305) had no significant effect on quality of life. So based on the description, it can be seen that the direct effect of the variable memorizing the Al Quran and family support for the quality of life is better, without having to go through functional communication and independence as mediation.

4. Discussion

4.1 Effect of Family Support on Stroke Patients

Family support was a factor that affects the recovery of stroke patients in general, especially in patients who experience impaired verbal communication or motor aphasia. The attitude of the family was an important factor in helping sufferers of aphasia motor to overcome their disability. According to Bullian et al. (2007) the involvement of family members and friends in training can increase the effectiveness of rehabilitation. In addition the family

environment was also a suitable environment to stimulate aphasia language skills, because the stimulation can be done informally, can choose the right time, when the patient is in a motivated state and family members know enough about the condition of the patient. With the accompaniment of the family the patient feels comfortable, calm and stronger in accepting his physical condition, so that it is expected to have a good impact on the healing process of the disease. The support provided in this study can cover four dimensions, namely information, emotional, appreciation and instrumental support related to the care of stroke patients with the Al Quran memorization method in stroke patients with motor aphasia.

4.2 Effect of Al Quran Memorizing Exercise on Functional Communication Ability in Stroke Patients With Motor Aphasia Disorders

Figure 1 and Table 1 shows that the increase in functional communication skills in the intervention group experienced a better improvement compared to the control group. At first functional communication (FC1) did not show a significant difference ($p = 0.704$), but at the second to fifth time showed a significant difference ($p < 0.05$), thus giving Al Quran memorization training intervention was effective in improving communication skills functional stroke sufferers with montoric aphasia.

Religious obedience, including reading and memorizing the Al Quran will lead to peace of mind, freedom from stress and can control anger through psychoneuroimmonology pathways (Syed, 2003; Tartaro et al., 2005). Based on the concept of psychoneuroimmunology, anxiety is a stressor that can reduce the body's immunity, this occurs through a series of actions mediated by the Hypothalamus-Pituatry-Adrenal (HPA-Axis), anxiety will also stimulate the hypothalamus to increase the production of Corticotropin Releasing Factor (CRF) to stimulate hormones pituitary anterior to increase the production of Adrenocorticotrofic hormone (ACTH) (Aghamohamadi et al., 2014; Steptoe et al., 2005; Nurdin, 2015; Tartaro, 2005). This hormone will stimulate the adrenal cortex to increase cortisol secretion, cortisol will further suppress the body's immune system (Guyton & Hall, 2008). Psychoneuroimmunology is an integrated concept of immune-regulation functions to maintain homeostasis. To maintain homeostasis, the immune system integrates with the brain's psychophysiological process, and therefore influences and is influenced by the brain. Through the psychoneuroimonology approach, stroke patients who always read and memorize the Al Quran will affect brain tissue neuroplasticity. Namely the brain's ability to reorganize in the form of interconnections of the brain's nerves which are influenced by stimulation, experience and the environment. Based on this concept, if there is damage to the part of the brain it is possible to experience recovery. This is in accordance with Rahayu research (2012) and Murphy (2009) activation of the brain during post-stroke nerve regeneration is very important to support brain repair. Brain activation which consists of breathing exercise, brain harmonization exercise and memory brain exercise is given to get a relaxing effect that will stimulate the formation of substances that are important for nerve cell growth, and have an influence on brain structures such as the visual cortex, hippocampus and cerebral cortex, this is in accordance with the research Moller (2006). Furthermore the effects shown are improvements in global sensory, motor and cognitive functions. The brain will regenerate faster, so it will affect the improvement of the general condition of stroke patients with motor aphasia. Likewise it will affect functional communication skills, level of independence and quality of life. This was confirmed by Nurdin (2015) research that the mechanism of interaction between behavior, nervous system, endocrine system, and immune function. The behavioral component of this interaction involves Pavlov's conditioning in the increase and suppression of antibodies and cellular immune responses. This conditioner expresses as an effect of the experience of stress on immune function.

This theory says that learning languages is related to the formation of a relationship between stimulus-response activities and the strengthening process. This strengthening process is reinforced by a conditioned situation, which is done repeatedly. Memorizing the Al Quran is the best condition for remembering God, so that the heart and mind are at ease. As in Al Quran surah Ar-Ra'ad verse 28:

(That is) those who believe, and their hearts are ensured by the remembrance of Allah. Remember, only by remembering God is the heart satisfied (Surah Ar-Ra'ad [13]: 28).

A calm heart will affect the decrease in the production of the hormone cortisol (stress hormone) and increase the production of endorphins (immune hormones) so as to increase immunity (Sholeh, 2013; Almerud, 2003; Khatoni, 1997; Chang et al., 2008). In stroke patients who always repeat memorization of the Al Quran the level of immunity, the quality of life is getting better, and the risk of repeated attacks is getting smaller.

The Dubuc (2004) study shows that reading the dzikir and verses of the Al Quran can increase Delta waves in the brain, shown in the Brodmann 8 area, where this area belongs to Broca's area which is responsible for processing semantic aspects of language and verbal fluency. Repeated memorization of the Al Quran will also have an impact on improving functional communication in stroke patients with motor aphasia. According to Mendoza (2013) delta wave activation contributes to the production of human growth hormone (HGH) as a result of stimulation of the pituitary gland during activation of delta waves. In addition, delta waves also stimulate the release of anti-aging hormones such as dehydroepiandrosterone (DHEA) and melatonin.

This is in accordance with the theory of Thorndike's law of exercise, that exercises that are always repeated will cause a stronger effect, namely the occurrence of strengthening the memory of what is always repeated, so it will affect strengthening at the level of functional communication, this memorization of stroke patients is more fluent and fluent so that it will have an impact on improving communication in general.

In Thorndike's theory of connectionism one can claim that practice can strengthen bonds, connections or relationships (Thorndike, 1932). Thorndike's theory introduces two aspects, namely the law of use and the law of disuse. Usability law is that if a relationship can be made between one situation and one response then the strength of the relationship in the situation that has that equation will increase. The more frequently used, repeated and tried, the stronger the relationship. Thorndike acknowledges that the magnitude of the relationship is influenced by various things such as power / strength and the length of time from the training period. So the more effort you make, both the costs, the energy and the time used to practice, the better the results will be. The law of uselessness is to follow the law of usability that is without training a relationship will be weak. In other words a relationship that can be changed between one situation and one response does not occur in the same situation, then the relationship will be weak. Factors to consider in exercise are the more frequent stroke sufferers repeat things, the more they remember the information provided. Providing repeated questions will improve their practice. So the more often memorizing the Al Quran and using it in dhikr, praying and being used for prayer recitations, the better, fluent and fluent, this will facilitate verbal communication skills in general in stroke patients with motor aphasia. So the theory of Thorndike's law of exercise is very appropriate to be used to train memorization of the Al Quran in stroke patients with aphasia motor disorders to improve functional communication skills well.

Pavlov's theory (Hergenhahn & Olson, 1997) also plays a role in providing learning to memorize, learning in principle is to imitate or imitate the behavior of someone who provides training. The more often imitated, accustomed or imitated the utterance of memorizing the Al Quran, the more fluent and fluent his speech, this would also strengthen verbal communication skills in general. Good communication skills in stroke patients against other people, it will increase self-confidence to recover. With good functional communication skills, it is expected to increase the independence and quality of life.

4.3 Effect of Al Quran Memorizing Exercises on Independence in Stroke Patients With Motorized Aphasia Disorders

Based on Figure 2 and Table 2 it is known that the increase in the independence of the intervention group experienced a better improvement compared to the control group where it was known that at the beginning the assessment at the time of Independence first week (ADL 1) and Independence third week (ADL 2) did not show a significant difference ($p > 0.05$), starting at the third to fifth time showed a significant difference ($p < 0.05$).

Thus the provision of Al Quran memorization training interventions can effectively increase the independence of stroke patients with motor aphasia. The better the communication, the stroke sufferers are better at understanding each incident, so that communication with family, friends, or interlocutors is more fluent. This makes it easy to understand each incident, especially the health problems it suffers. In accordance with the theory of the Health Belief Model (HBM) (Sulaeman, 2013; Tang et al., 2002) that is the readiness of individuals to change their behavior in order to avoid a disease or risk to their health. Thus stroke sufferers have readiness to change their behavior better, for example taking regular medication, regular control, obeying doctor's recommendations, including changing lifestyle such as mindset, eating and activities, all in order to increase independence in daily life (Stephen et al., 2005). The level of independence is also due to family support, this is in accordance with the research Sit et al., 2004.

The level of independence of stroke patients can be assessed using the Barthel Index assessment which is often used in evaluating disability when patients are admitted to hospital and during treatment (Rasyid, 2007). Sarafino (2006) states that family support refers to assistance received by individuals from other people or groups around who make the recipient feel comfortable, loved and valued and can have a positive effect on him. Increasing available family support can be an important strategy in reducing or preventing mental stress and post-stroke depression (Salter, Foley, & Teasell, 2010; Sooki et al., 2011).

Bosworth (2009) further stated that family support greatly influences the mental health of family members. Physical conditions experienced by patients suffering from a stroke will result in patients not believing in themselves, feeling inadequate, meaningless and worthless, especially stroke patients with motor aphasia. In addition, the process of healing and rehabilitation in stroke can occur for a long time, so it requires family assistance in providing planning and providing planning aspects (Smeltzer & Bare, 2002). What was seen during the research was that all respondents received real family support which can be seen directly when families always accompanied respondents to control, maintain and provide assistive devices in the form of wheelchairs, wolkers, tripods and communication devices.

Optimal family support can improve the health status of stroke patients in general, thus the level of independence is also getting better. In accordance with the study of Sit, Wong, Clinton, Li and Fong (2004) on the impact of social support on the health of home stroke patients by family care giver, it was found that giver family care in post-stroke patients could improve their ability to carry out daily living activities independently and get better with support and social support from the family that will improve the psychosocial health status of post-stroke patients. In this case, the family is the smallest social unit that is most closely related to the sufferer. Therefore, family support is needed by stroke patients as a support system that can support it in developing effective responses or coping to adapt to the stressors that they face related to their physical, psychological, social, environmental and spiritual health (IYW, 2005; Lasserman & Perkins, 2001; Pouralkhas et al., 2012). With adequate family support, stroke patients can also maintain their health status. Thus, it is further known that family support can have a positive impact on improving the quality of life for stroke patients (Nirmal et al., 2008; Wig et al., 2006).

4.4 Effect of Al Quran Memorizing Exercises on Quality of Life in Stroke Patients With Motor Aphasia Disorders

Figure 3 and Table 3 shows that the increase in functional ability of the intervention group experienced a better improvement compared to the control group where it was known that initially the quality of life (QoL 1) did not show a significant difference ($p = 0.691$), starting from the second to the fifth showed a significant difference ($p < 0.05$), thus giving an Al Quran memorization exercise intervention is effective in improving the quality of life of stroke patients with montoric aphasia. Quality of life is directly proportional to the level of independence, the more independent the life, the better the quality of life. Improving the quality of life in stroke patients because one of them is good family support, both information support, emotional support, instrumentation, and appreciation support. With optimal family support, both from family, friends or health workers, severe mental and emotional problems can be prevented, so stroke sufferers are more motivated to live independently and feel needed (Huang et al., 2010).

Living independently in stroke patients is shown in daily life, for example, can take their own medicine, both the time and dosage, as well as bathing, eating, changing clothes and going to the toilet can be done without the help of others. This is in accordance with the research conducted by Almborg (2010). By living independently, the quality of life is getting better. Good quality of life in stroke patients in terms of 5 aspects, namely physical, psychological, environmental, social relations and spiritual health. Physical health is shown to reduce pain, normal blood pressure is stable, blood sugar is normally controlled, blood cholesterol levels are getting better and the level of independence is getting better.

Improving psychological health in stroke patients is indicated by general mental health which was always increasing, reducing anxiety. worry and anxiety, always optimistic and confident, not easily angry, emotional and accepting his condition wholeheartedly (Kim, 2016; Miller et al., 2011). Increased psychological health in stroke patients with motoric aphasia disorders is also indicated by deep sleep. Deep sleep will produce optimal serotinin hormone, so the process of neurotransmitters is getting better, then the process of cell regeneration (neuro plastisity) in the brain gets better. Environmental health shows that stroke sufferers have an awareness and concern for the environment around their homes, for example being able to sweep, clean sewers, clean the grass around the house. Health social relations are demonstrated by friendship: being able to use social media services, attending to the invitation of neighbors who have work. Spiritual health is indicated by the increase in worship carried out, for example, five prayers in congregation to the mosque, a lot of dhikr, reading the Al Quran, attending recitations, listening to recitations via radio, youtube and carrying out other sunnah services.

Improving the quality of life in stroke patients with aphasia motoric disorder after being trained to memorize the Al Quran can also make the coping effect better, people who always remember Allah through memorizing the Al Quran will find their hearts calm, so that besides increasing immunity and reducing the effects of stress also increases the coping effect (Mohamed, 2010). Coping strategy is coping that is carried out consciously and directed in overcoming pain or facing a stressor. If coping is done effectively, the stressor no longer causes psychological stress, illness, or pain, but turns into a stimulant that stimulates achievement and good physical and

mental condition.

The coping mechanism refers to both mental and behavioral, to master, tolerate, reduce, or minimize a stressful situation or event. Coping mechanism is a process in which individuals try to handle and master stressful situations that suppress the consequences of the problems they are facing by making cognitive and behavioral changes in order to gain a sense of security in themselves, according to Sholeh research (2004). Coping effect is Coping is a mechanism to overcome the changes faced or the burden received. If this coping mechanism is successful, a person will be able to adapt to the changes they face, be more resilient in accepting the test and accepting his condition as wholeheartedly.

It can be concluded that stroke patients who are coping well will easily solve the problem at hand. Besides good coping will also affect behavior changes and changes in organ tissue in stroke patients (Hughes et al., 2004). Keliat (1999) and Folkman & Lazarus (1985) in their study stated that repair of organ tissue in stroke patients occurred before 6 months of occurrence. The results of the Kelly-Hayes et al. (2003) who said that 6 weeks after discharge planning in stroke patients had changes in physical, cognitive and emotional changes, depressive symptoms decreased, participation in social activities increased. Almborg (2010) conducted a study with results 2 to 3 weeks after discharge planning for depressive symptoms in decreased ischemic stroke patients and increased participation in social activities.

A good coping effect will affect repair of organ tissues, especially in the left hemisphere of the brain of stroke patients, while the left hemisphere is the center of language and communication. So that it will affect the improvement of verbal communication in general in stroke patients with aphasia motoric disorders. This language center makes humans able to communicate, interact and understand with their interlocutors.

This study is the first study that has assessed the effect of memorizing the Al Quran in stroke patients with motoric aphasia.The limitations of this study are the relatively small sample size, the short duration of the intervention, and the impossibility of assessing lifestyle factors, which might influence the results achieved. Thus, clinical trials with a larger sample size and longer duration of intervention are recommended.

5. Conclusion

Memorizing the Al Quran surah Thaha verse 25 to 28, is an effective way to improve functional communication skills in stroke patients with aphasia motoric. Memorizing the Al Quran continuously with good family support will also increase the level of independence and quality of life. Shown by the increase in psychological and spiritual health aspects, namely stable emotions, not irritability, relaxed mind and increasing coping effects. Spiritual health is shown by increasing worship, in addition to performing obligatory worship as well as performing sunnah worship, praying five times in congregation to mosques, attending religious activities, often listening and seeing religious lectures, so that religious understanding also increases. That all will contribute to improving the quality of life of stroke patients with aphasia motoric disorders.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Knowledge and Usage of Cervical Cancer Screening for Cancer Prevention by Reproductive Age Women

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Abstract

Cervical cancer –CCa screening is an effective measure mapped out for preventing cancer occurrences in women. This study determined the status of knowledge and usage of CCa screening for cancer prevention among reproductive age Nigerian women. The study was based on descriptive research design and was conducted in Nigeria, from October 2017 to April 2018 and comprised of reproductive age women. The participants, aged 15-49 years, were vulnerable to CCa. The instrument used for data collection was structured questionnaire. Statistical Package for Social Science version 21 was used for data analysis. All the participants were Nigerians totalling 1300. Of all, 1249(96.1%) completed the questionnaire correctly. Majority of the participants were: Christians 825(66.0%), Single 695(55.6%), aged 26-35 years 673(53.8%), and had Secondary education 753(60.2%). A greater proportion of the participants 1073(86.7%) knew about CCa screening. Among them, only 513(41.7%) were screened. The status of knowledge and usage of CCa screening varied within variables. A statistically significant difference was observed with regards to Age by birth (P-value <0.05) while none existed on marital status, religion and educational level (P-value >0.05). There is obvious gap between what is known about CCa screening service for cancer prevention and the actual usage by the women. The majority of the women knew about the available services but only few of them had used it. This implies that there is obvious imbalance between the quality of knowledge of a given health service and the actual usage.

Keywords: cervical cancer, screening service, knowledge, usage, women

1. Introduction

The increasing cases of morbidity and mortality due to cervical cancer - CCa particularly in developing regions such as Nigeria have constituted a huge concern to public health sector and other healthcare professionals. Cervical cancer is preventable if appropriate screening exercise is routinely applied (Mahlck, Jonsson, & Lenner, 1994; Elovainio, Nieminen, & Miller, 1997; Mutyaba, Mmiro, & Weiderpass, 2006). This screening service is one of the most effective strategies and reliable public health initiative mapped out to prevent the occurrences of CCa (Dusek et al., 2018). It is expected that the screening exercise would not only enhance early detection, but also aid in the prevention and subsequent treatment of the disease. Surprisingly, the alarming rates of CCa incidence and occurrences worldwide (Anantharaman, Sudharshini, & Chitra, 2013; Ferlay et al., 2013) and the obvious consequences on womens' health particularly in developing countries (Adewole, Benedet & Crain, 2005; Ferlay et al., 2013; Bray et al., 2013; Mutyaba, Mmiro, & Weiderpass, 2006) has dwindled the expectations. Although, low awareness about the risk factors of cancer is already pronounced (Sa'aku, Omaka-Amari, Agu, Ugwu, & Ugwu, 2019) yet, it is still quite worrisome and has placed a huge doubt on whether people equally know about the CCa screening services and the subsequent usage. The above situation motivated the researchers to conduct this study using the reproductive age women in developing country –Nigeria. The reproductive age women are the most vulnerable group to CCA disease and thus making the usage of the CCa screening indispensible for ensuring safety, prevention and quality of health. The study was set to determine the status of knowledge and usage of CCa screening for cancer prevention among reproductive age Nigerian women and also to verify the null hypotheses of no significant difference within variables. As one of the expectations of the researchers, the outcome of this

research would serve as a veritable tool in designing programmes on cervical cancer for the women. Currently, this research is the first survey of this kind in Nigeria. Specifically, the study seeks to determine:

1) The status of knowledge of cervical cancer screening for cancer prevention as possessed by reproductive age Nigerian women.
2) The status of usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women.
3) The differences in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women according to marital status
4) The age variations in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women.
5) The religious affilation difference in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women.
6) The status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women according to educational level.

1.1 Research Questions

The following research questions guided the study:

1) What is the status of knowledge of cervical cancer screening for cancer prevention as possessed by reproductive age Nigerian women?
2) What is the status of usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women?
3) What are the differences in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women according to marital status?
4) What are the age variations in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women?
5) What are the religious affilation differences in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women?
6) What are the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women according to educational level?

1.2 Hypotheses

The following null hypotheses were postulated to guide the study at .05 level of significance at appropriate degree of freedom.

$H0_1$: There is no statistically significant difference in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women based on marital status.

$H0_2$: Age at birth has no statistically significant difference in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women.

$H0_3$: Religious affiliation has no significant difference in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women

$H0_4$: There is no statistically significant difference in the status of knowledge and usage of cervical cancer screening for cancer prevention by reproductive age Nigerian women based on educational level.

2. Method

The study was based on descriptive research design and was conducted in Nigeria, from October 2017 to April 2018 (National Population Commission, 2018). The sample size of 1300 reproductive age women was anonymously drawn and surveyed. This was calculated using confidence level of 95% and confidence interval of 5 (Cohen, Manion, & Morrison, 2012). The inclusion criteria involved all the women within the age of 15–49 years, as this age bracket was considered reproductive age for all women (Nwala, Ebunoha, & Ugwu, 2013). Also, this criterion was in line with the recommended age for vaccination against CCa (Markowitz et al., 2007). All the female individuals below the age of 15 and those above 49 years of age were excluded from the study.

Data collection was completed using questionnaire. The study was carried out in all the public health facilities as

approved by the Nigerian government based on the established criteria. Prior to the distribution of questionnaires, formal introduction of the study was given by the researchers and informed consent obtained from all the prospective participants in the sampled health facilities. A structurally designed questionnaire which was written in English language, was the only instrument used for data collection. The administration and distribution of the questionnaire to all the participants was done by the researchers. The items of the questionnaire were organized to elicit responses from the participants without any bias.

For proper analysis, the data generated was entered into Microsoft Excel and then exported to SPSS 21 for detailed analysis using descriptive statistics. The Committee on Research Grants of the Faculty of Education, University of Nigeria Nsukka gave the approval for the study. [Ethical Approval code: ERA.029]. This is one of the Institutional Review Board Committees of the University that gives approval for studies of this kind and also in accordance with the principles of the Declaration of Helsinki (World Medical Association, 2013). The confidentiality of the participants was protected and no financial commitment was made to them for participating. There was no record of any harm or risks in the study. This is because the data collection process primarily relied on a descriptive non-invasive questionnaire.

3. Results

Table 1. Personal information of the participants (N = 1249)

Demographics		F	(%)
Marital status	Married	410	(32.8)
	Single	695	(55.6)
	Widow	144	(11.5)
Age at Birth	15-25	361	(28.9)
	26-35	673	(53.8)
	36>	215	(17.2)
Religious Affiliation	Christian	825	(66.0)
	Muslim	424	(33.9)
Educational level	No formal education	53	(4.2)
	Primary	111	(8.8)
	Secondary	753	(60.2)
	Tertiary	322	(25.8)

F=frequency; %=percentage; N= sample size.

All the participants were Nigerians. There were 1300 reproductive age women that responded to the questionnaire. Of all, 1249(96.1%) copies of the questionnaire were properly completed and thus used for the final analysis leaving only 51(3.9%) copies discarded. Among the participants, 695(55.6%) and 410(32.8%) were single and married, while only 144(11.5%) were widows respectively. A total of 673(53.8%) and 361(28.9%) participants were within the ages of 26-35 and 15-25 years while only 215(17.2%) were 35 years plus. Majority of the participants 825(66.0%) were Christians while only 424(33.9%) were Muslims. Majority of them 753(60.2%) and 322(25.8) had secondary and tertiary education while only 111(8.8%) had primary education respectively. Only 53(4.2%) had No formal education (see Table 1).

Table 2. Showing status of participants' knowledge and usage of cervical cancer screening (N = 1249)

Parameter	Yes		No	
	F	(%)	F	(%)
Knowledge of cervical cancer screening	1073	(85.9)	176	(14.1)
Usage of cervical cancer screening	513	(41.1)	736	(58.9)

f = frequency; % = percentage; N = sample size.

Majority of the participants 1073(85.9%) knew about CCa screening while only 176(14.1) did not. Only 513(41.1%) had used the CCa screening services while 736(58.9) never used it (see Table 2).

Table 3. Presenting demographic differences on the status of participants' knowledge and usage of cervical cancer screening and significant differences within variables (N = 1249)

Parameters		N	Knowledge		Usage		P-value
			Yes	No	Screened	Not Screened	
Variables			F(%)	F(%)	F(%)	F(%)	
Marital status	Married	410	377(92.0)	33(8.0)	124(30.2)	286(69.8)	0.34>0.05
	Single	695	521(75.0)	174(25.0)	226(32.5)	469(67.5)	
	Widow	144	125(86.8)	19(13.2)	45(31.3)	99(68.7)	
Age by birth	15-25	361	288(79.8)	73(20.2)	134(37.1)	227(62.9)	0.03<0.05
	26-35	673	607(90.2)	66(9.8)	255(37.9)	418(62.1)	
	36>	215	171(79.5)	44(20.5)	33(15.3)	178(82.7)	
Religion	Christian	825	703(85.2)	122(14.8)	267(33.4)	558(67.6)	0.21>0.05
	Muslim	424	326(76.9)	98(23.1)	27(6.4)	397(93.6)	
Educational level	No formal	53	37(69.8)	16(30.2)	21(39.6)	32(60.4)	0.31>0.05
	Primary	111	83(74.8)	28(25.2)	42(37.8)	69(62.2)	
	Secondary	753	681(90.4)	72(9.6)	255(33.9)	498(66.1)	
	Tertiary	322	288(89.4)	34(10.6)	133(41.3)	189(58.7)	

S = significant; NS = not significant.

The demographic differences on the status of participants' knowledge and usage of the services and significant differences within variables were presented. As shown in the Table, out of the 695 participants who were single, majority 521(75.0%) knew about the screening services but only few 226(32.5%) were screened. Among 377(92.0%) married participants who knew about the CCa screening services, only 124(30.2%) had been screened. A greater proportion of the widows 125(86.8%) knew about the service but only 45(31.3%) had used it. Also, majority: 607(90.2%); 288(79.8.0%); and 171(79.5%); who were within the ages of 26–35; 15–25; and 36 years plus respectively, knew about the service but only few 255(37.9%), 134(37.1%) and 33(15.3%) within the ages of 26-35 years, 15–25 years and 36 years plus respectively has used the service. Out of 703(85.2%) Christians and 326(76.9%) Muslims who knew about the service, only few 267(33.4%) and 27(6.4%) indicated been screened. Majority of the participants with secondary 681(90.4%), tertiary 288(89.4%), primary 83(74.8), and no formal education 37(69.8) knew about the service, but only few 255(33.9%), 133(41.3%), 42(37.8%), and 21(39.6%), with secondary, tertiary, primary, and no formal education respectively, were screened. A statistically significant difference was observed with regards to age by birth ($P = 0.03<0.05$) while none existed on marital status ($P = 0.34>0.05$), religion ($P = 0.21>0.05$) and educational level ($P = 0.31>0.05$).

4. Discussion

Currently, our study is the first descriptive survey to establish the status of knowledge and usage of CCa screening services by reproductive age women in Nigeria. As a result, the outcome of this study yielded useful facts which may serve as positive steps in designing programs on cervical cancer for women and public health policy making in Nigeria. Of all the participants surveyed, majority was single, aged 26–35 years, Christians and had secondary education. Interestingly, only 4.2% had no formal education which is a strong indication that the era of people with little or no formal education is gradually fading away. Our study indicated that a good number of the participants knew about cca screening services but only few were screened. The finding is quite surprising as it demonstrates a wider gap existing between what people know about available health service and the subsequent use of such service. This finding is in consistence with other report findings. For instance, in a cross-sectional study involving 260 market women in Nigeria, the respondents exhibited fair knowledge of CCa screening (Ahmed et al., 2013). Similarly, a study from Turkey comprising nursing students in tertiary hospital reported that the participants have theoretical knowledge but not in practice (Uzunla et al., 2013). Also, in a cross-sectional, hospital-based survey

involving 403 women attending Obstetrics and Gynecology Department of secondary care referral hospitals, it was reported that 62.5% knew about CCa but 86.6% never utilized the screening services (Narayana et al., 2017). In contrast, a study on awareness of cervical cancer and screening in a Nigerian female market population indicated that only 19.7% were aware of CCa screening (Ogunbode & Ayinde, 2005). Similarly, a study in Polish population among female students reported that the knowledge about cytological screening was poor (Kamzol et al., 2013). In another study, only 16% of women in Aba, South-Eastern Nigeria knew about CCa screening (Feyi-Waboso, Kamanu & Aluka, 2005). The similarities and differences as shown in the above findings are clear demonstrations that peoples' knowledge of CCa screening services is quite encouraging but failed to translate the actual usage. Our study therefore suggests that a well-organized public health empowerment program and sensitization campaign on the health benefits of using CCa screening services by all women, be routinely carried out by the Nigerian government and all the concerned non-governmental organizations as well as agencies in health.

In our study, majority of the participants who were single, aged 26–35 years, Christians and secondary education knew about the screening services but only few were screened. These results demonstrate that the quality of knowledge about a given phenomenon and the usage are greatly enhanced by certain socio-demographics. Our finding is in accordance with the results of other researchers who indicate that socio-demographic variables influenced greatly the outcomes of their researches in varying perspectives (Ogunbode & Ayinde, 2005; Mutyaba, Mmiro, & Weiderpass, 2006; Durowade et al., 2012). A statistically significant difference was observed with regards to age by birth while none existed on marital status, religion and educational level. This finding is parallel to study conducted by other researchers which show that adequate knowledge of CCa screening is linked with socio-demographics (Ogunbode & Ayinde, 2005; Narayana et al., 2017). In practice, our findings will be useful in designing educational program on knowledge and usage of CCa screening services for women with optimum consideration of socio-demographic differences. The outcome of this study may be attributed to the way or pattern in which awareness campaigns on CCa screening are being organized and carried out in Nigeria.

The strength of the current study lies in its descriptive approach involving reproductive age Nigerian women. Still, there is limitation of our study. Findings of the present study could not be generalized to the larger population of reproductive age women worldwide since the scope was restricted to Nigerian women only. Hence, there is need to carry out similar study in countries other than Nigeria. Finally, a well-programmed public health education and knowledge empowerment focusing on the positive health outcomes of patronizing health services is needed, since greater proportion of the women knew about the service but were unable to use it.

5. Conclusion

There is obvious gap between what is known about CCa screening service for cancer prevention and the actual usage by the women. The majority of the women knew about the available service but only few of them had used it. This implies that there is imbalance between the quality of knowledge of a given health service and the actual usage.The outcome of this study should awaken the Nigerian government to mobilize and increase sensitization and awareness campaign on the outstanding preventive roles and positive health benefits of using available health services by all and particularly CCa screening by the women.

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None to declare.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Record-Keeping: A Qualitative Exploration of Challenges Experienced by Undergraduate Nursing Students in Selected Clinical Settings

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Abstract

Good nursing practice requires detailed record-keeping, which should be timely, comprehensive and accurate. Undergraduate nursing students experience challenges with record-keeping. As a result, a phenomenal qualitative study aimed at exploring and describing the record-keeping challenges experienced by undergraduate nursing students was carried out in one of the northern-eastern regions, Namibia. The data were collected through three focus-group discussions with 23 second-year degree nursing students. It became evident that nursing students experienced challenges with record-keeping in clinical practice, as evidenced by the three themes: theory-practice gap, health system-related challenges and hospital staff-related challenges. This study has implications for nurse educators in terms of promoting uniformity and good record-keeping practices in clinical settings.

Keywords: record-keeping, undergraduate nursing students, clinical practice, clinical settings, qualitative study

1. Introduction

Record-keeping is an important primary tool in the practice of nursing. Records are the who, why, how, where, what and when of patient care during hospitalisation (Garba, 2018). According to Chelagat, Sum, Chebor, Kiptoo and Bundotich-Mosol (2013), since the time of Florence Nightingale, nurses viewed documentation or recording as being a very important aspect in the nursing profession. Records stand as a source of evidence of each health-care provider's accountability in the delivery of care. They also serve both as an educational tool and a method of monitoring patient status (Selvi, 2017). Record-keeping is important as it also provides data useful in research and education – be it retrospective, prospective or longitudinal. Moreover, record-keeping can help with the planning and budgeting of the hospital (Chelagat, Sum, Chebor, Kiptoo, & Bundotich-Mosol, 2013; Selvi, 2017).

Good record-keeping promotes continuity of care and demonstrates the quality of care delivered to the clients. Moreover, documentation provides the evidence necessary for any legal proceedings (Owen, 2005). However, poor record-keeping has a negative impact on care delivery and clinical decision-making. Record-keeping has, by far, become a low priority for busy nurses, and patient notes are now often poorly maintained (Jefferies, 2010). Good and quality record-keeping is linked with the improvement of patient care, while poor documentation is regarded as contributing to poor quality nursing care (Prideaux, 2011). Incomplete nursing records shows no evidence of care provided to the patient – like a saying in nursing that 'what is not recorded is not done' (Mutshatshi, Mothiba, Mamogobo, & Mbombi, 2018). Additionally, record-keeping demonstrates a full account of a nurse's assessment and care planned and provided to the patient, and includes all relevant information about patient condition at a given time and the measures a nurse took to respond to their needs.

Record-keeping demonstrates effective patient care and the response to nursing intervention. According to Mutshatshi et al. (2018), there have been complaints of poor record-keeping in hospitals, despite all the efforts to improve record-keeping challenges. Good recording ensures that hospital's management runs smoothly, but it also provides evidence of hospital accountability for its actions and forms key sources for medical statistical reports and the health information system. The art of keeping and managing health records is an issue that has generated concerns over time (Abdulazeez, Abimbola, Timothy, & Linda, 2015).

There are numerous documents to be recorded for patient care. These include six-hourly observation charts, progress reports, nursing care plans, nursing clinical records and many others. All these documents are part of the

care of the patient, and if they are incomplete, it could lead to wrong interpretations of care rendered. The nursing students are allocated to different health facilities for their practical training. Moreover, these nursing students perform routines and activities and this includes record-keeping. Poor record-keeping reflects poor care practices and nurses need to consider that this link is often exploited in court to the detriment of the nurse (Andrews & Aubyn, 2015). The previous studies focus on record-keeping challenges experienced by nursing staff; however, there is less focus on nursing students. This is in spite of one of the learning outcomes of nursing students in clinical practice in keeping accurate patient records and the appraisal of nursing care using available records. In addition, the researchers found that poor record-keeping is also a concern in most death reviews, and hence nursing staff are held accountable for poor practice because their actions were not recorded – which meant it was not done.

This study was conducted to explore and describe the challenges experienced by the Bachelor Honours Degree nursing students, with regard to record-keeping in clinical practice at selected clinical settings in north-eastern region, Namibia.

2. Methods

2.1 Design and Setting

In this study, a phenomenological qualitative design was used (Creswell, 2013). The study was conducted at the public university campus in the north-eastern region of Namibia. The campus offers the four-year undergraduate Bachelor of Nursing Science (clinical) Honours degree. The nursing students enrolled by the campus do their clinical practice at the intermediate hospital in the region, as well as at the selected regional clinics. Nursing students are placed in clinical units such as the medical ward, surgical ward, paediatric ward, casualty and outpatient department, operating theatre, maternity ward, and primary health-care clinics. They are exposed to clinical practice for two weeks a month. This commences three months after registration and extends to the fourth year of the programme.

2.2 Population Sampling Strategy

The participants were second year nursing students enrolled at the satellite campus of the public university. The researchers focused on second level students because they are the only group that does clinical practice in the selected region. The third and fourth year groups go for clinical practice in other regions, outside the context of the study. First year students only practised for a period of six months and therefore do not have adequate exposure to clinical settings. The researchers approached participants face-to-face in the classroom at the university campus and the purpose and objectives of the study were explained to them. A convenient sampling was used to drew a sample of twenty three (n = 23) readily available second year nursing students from a total of 91 registered at the campus. The participants' ages ranged from 18 to 35 years; there were 14 females and 8 males.

2.3 Data Collection

Data were collected between 25 September 2018 and 10 October 2018, via focus-group discussions. The students that were willing to participate were recruited by the researchers, and the time and venue for discussions were arranged with them. A total of three focus-group discussions were conducted, which consisted of nine, seven and seven participants each. The discussions lasted about 40 to 50 minutes, and the number of discussions held was determined by data saturation (Polit & Beck, 2017). The researcher used a semi-structured focus-group discussion guide, with a prepared written topic guide prior to the discussions; however, probing questions were used to further explore participants' responses and to stimulate more detailed information (Polit & Beck, 2017). All focus-group discussions were audio recorded using a digital voice recorder. Pilot testing was conducted with a focus-group discussion of 5 second year nursing students, which helps to refine the topic guide and other data-collection plans (Creswell, 2013).

2.4 Data Analysis

The content analysis method was used to analyse the data in this study, since it was the most reliable strategy used in qualitative research (Grove, Burns & Gray, 2013). After data were transcribed, member checking was carried out by the research participants in order to ensure trustworthiness. Coded data were then categorised and themes were identified. Furthermore, trustworthiness was ensured following the principles of Lincoln and Guba (1985), which consists of the criteria of credibility, dependability, conformability and transferability.

2.5 Ethical Considerations

The study was granted ethical clearance by the School of Nursing Ethics Committee on campus, and permission to conduct the study was granted. Participation in the study was voluntary and all participants signed informed consent forms prior to commencement of the focus-group discussions. Anonymity and confidentiality was ensured

by making sure no names were recorded during data collection, and all digital recordings were safely stored in a lockable cupboard. Participants could withdraw from the study at any time without giving explanations or without being threatened.

3. Findings

Themes that emerged as findings of the study were: (i) theory-practice gap; (ii) health system-related challenges, and (iii) hospital staff-related challenges.

3.1 Theory-Practice Gap

The students felt that principles of recording taught at the university were not correlating with what was taught in the clinical area. This was confusing for them, because they did not know which principles to follow. The following quote illustrates what was expressed by one participant:

... the way we are taught here at school! (shaking head), like in midwifery, our lecturers taught us to open a partograph when the client is in the latent phase, but at the hospital they do it differently. The sisters don't allow us to open the partograph when the patient is in the latent phase, it's only when the patient is in active phase – so it's really a challenge (p2a, Note 1)

Furthermore, the students experienced challenges with record-keeping owing to inadequate provision of resources, and these included a lack of record-keeping papers. During theoretical sessions, the students are taught how to document during simulation sessions, but going to practice it becomes a challenge – because the documents or record-keeping papers are not there. One participant mentioned that:

... other challenges can be that the nursing units where we practice, some papers are not there whereby you have to do proper record keeping. Like, for example, maybe the temperature chart is not there, the fluid balance chart is not there – so even though you want to do a full record-keeping, then it will not be complete. (p7a)

Moreover, during the clinical practice of students they rotate from ward to ward, and in that rotation it was a challenge, because they had to be taught different record-keeping styles in different wards. The lack of universality in the clinical area presented challenges among the students, because there is no consistence in what they are taught in the hospital. It seemed difficult to know what was right from wrong. With every clinical rotation, the record-keeping also has to change. One participant mentioned this:

... we find it hard when it comes to the nursing care plan, because different wards use different styles (p7b).

Nursing students also indicated that lack of knowledge on how to document led them to not wanting to do record-keeping. Some students ended up recording only in the papers they knew, and ignored the ones they did not know. Participants verbalised that some of the record-keeping documents were not used during their simulation sessions, which meant that they had to learn them in the practice only:

... some documents like the matron's report form, students don't know how to record them because it's really not taught – sometimes we just leave it blank (p1b).

3.2 Health System-Related Challenges

The participants reported challenges relating to how the hospital system is operating. Record-keeping papers were described as being complicated and too numerous. Participants felt that some papers were unnecessary and strenuous, which led to some documents being left out when record-keeping is done. Participants mentioned a few documents they found to be complicated: the nursing care plan, the fluid balance chart, the matron's report and the 6-hourly temperature chart. This was indicated as follows:

... I have experienced that there are a lot of things that you have to record, some of them are really not necessary (p2c)

Furthermore, participants conveyed that there is an increase in patients and there are but few staff, which resulted in record-keeping being straining. There is an overburden on staff and it is tiring – leading to some documents being left out and undocumented because the staff are tired and want to rest. Staff shortage has a negative impact on record-keeping, as few nurses attend to the many patients which have to be recorded in many papers. Students stressed they had to do a lot of work related to the patient, and this led to poor recording. Some participants mentioned that:

... there is really a challenge, sometimes we don't do patients' evaluation due to the fact that there are a lot of patients ... we only evaluate critical patients because the number is really large and the ward is congested; there's really a shortage of staff (p 1c).

... patients are many, and that means there is a lot of documentation to do, and we end up forgetting to write in some findings (p 9a).

Concerns about record-keeping being a time waster were stressed. Participants felt they spent more time recording than actually attending to the patients. The participants highlighted how they spent more time filling in all the forms for record-keeping. During assessment of patients, students felt they spend a lot of time documenting – rather than focusing on patient observations. Moreover, it seemed that because of the time spent on filling in the forms, students ended up forgetting to put in other records such as statistic books. One participant stated:

... we spend more time recording, imagine walking from patient to patient and doing recording. After that you get tired, and don't even have time to spend with the patient, you just do a quick observation because you want to go rest (p3b).

3.3 Hospital Staff-Related Challenges

Since the participants have limited knowledge of record-keeping, often they were not allowed to record in patient files. In some cases, they were told to not record some findings and procedures that they had done, which seemed to be a challenge because they felt that not recording would not help them learn the documentation of clinical procedures. Moreover, it seemed as if nurses preferred students doing the routine work, but not record-keeping. This was expressed as follows:

... on maternity records, uh! Students are not allowed to write in the green files (maternity records). Normally during client's evaluation in the maternity ward, students write on the piece of paper and the sisters copy information into the maternity records (p4c).

... I have faced one challenge, especially in the maternity ward, when we do parameters. They (the sisters) tell us to not record abnormalities in the files (p6a).

In clinical settings, one of the roles of a registered nurse is to teach students, but it seems this was another challenge experienced by participants. Participants stated that some nurses did not give them direction when it came to record-keeping. Since what they were taught in theory does not correlate with what they were taught in the clinical area, participants felt nurses not giving them assistance on how to do record-keeping was a big challenge. One participant stated:

...some students don't know how to record in some documents, [and] now when they ask the sisters to explain how to do it, sometimes they refuse and say that they are not our lecturers (p2b).

The participants experienced challenges with how some hospital staff would write in patients' files – and participants felt it was hard for them to read and carry out tasks, particularly doctors' notes in cases of a prescription. Moreover, the participants felt that poor handwriting leads to many mistakes being made in the clinical area – especially with students. This was expressed thus:

... some challenges with record keeping, especially in doctor's notes. Most doctors who deal with the surgical patients, uh, their handwriting is not easy to read. So we find it difficult to read unless you have to go [and] ask them to explain (p 2a)

4. Discussion

Record-keeping is an important primary tool in nursing practice, because the whole idea behind it is to provide better care of the patient through careful recording of every detail relating to their case (Inan & Dinç, 2013). This study highlighted some of the challenges experienced by nursing students in clinical practice. Despite the importance of record-keeping in clinical practice, the key findings in this study reveal a theory–practice gap and other challenges related to the health system and hospital staff.

Landers (2008) indicates that theory provides the basis for understanding the reality of nursing, and therefore the content learned in the classroom should correlate with what students experience in wards. However, during the researcher's discussions with participants, they expressed the opposite: how what they were taught at university did not correlate with what they were taught in hospital. This gap in the learning process is affecting the students, as it left them confused about what to do and what not to do. The participants said they were confused as they believed that what they were taught about record-keeping at university was correct and not what they were taught in the clinical area. Nevertheless, students followed what they were taught in clinical practice instead.

This study also revealed how a lack of resources resulted in poor record-keeping. Students stated how some wards did not have record-keeping papers and that even when they really wanted to do proper record-keeping, it would be incomplete because of other missing recording documents. Mutshatshi et al. (2018) supports the findings of this

study – that an inadequate supply of recording materials leads to incomplete recordings. Logan (2015) also confirms that a lack of resources is a challenge in the health system, as it leads to inaccurate or incomplete records. Furthermore, nurses can perform various activities and plan patient care, but such activities are not completely recorded due to a lack of recording materials.

Like the incompatibility between hospital teaching and university teaching, this study revealed a lack of uniformity between the wards. With each unit students practised, record-keeping was done differently and they had to adjust to it. However, even so, the knowledge taught from that ward was only for that ward and was not carried across to another ward, because it would also have a different way of recording. Slone et al. (2013) agree with the findings of this study that there is inconsistency in record-keeping. A nurse in one country should have to read the work of a nurse in another country and make sense of what the person was recording. However, inconsistency in how nurses record things, breaks the universality code.

Another record-keeping challenge was complexity of the recording forms. Participants detailed how some of the recording forms were too complicated for their understanding, and the record-keeping papers were numerous. Nurses perceive that they spend much time on manual recording – leading to incomplete recording (Mutshatshi et al., 2018). Furthermore, participants itemized how the recording forms were sometimes misunderstood and questioned if they were even necessary – and this was also challenge. Students in this study felt the large number of patients was a challenge because they become over worked, and were too tired and stressed out. The expansion in the number of patients also meant that recording was increased. One patient has about 5-10 forms to be recorded and you need to multiply this by the number of patients with only a few staff available. There are many factors emerging from the personnel shortage and negative attitudes of nursing personnel towards recording (Mutshatshi et al., 2018). Portoghese, Galletta, Coppola, Finco and Campagna (2014) support the findings of this study that nurses and student nurses are not recording because of their high workload. Students found it difficult to cope with the increased workload associated with documenting patient information on multiple records.

Another record-keeping challenge in this study is that recording was time-consuming and it took most of nurses' time. It seemed that more time was spent on recording and not attending to patient needs. This concurs with Mutshatshi et al. (2018), who indicated that record-keeping takes too much of nurses' time and they end up exhausted and this leads to documentation being half done or not at all. Keeping good records is regarded as an essential professional and legal requirement of being a nurse, and postponement of documenting patient information right after an event might lead to medico-legal hazards (Inan & Dinç, 2013). However, in this study the participants expressed how they left work undone because they were tired and wanted to rest for a while – and sometimes they then forgot to go back to the necessary recording.

Furthermore, nursing students experience challenges with hospital staff, and this included all categories of nurses, medical practitioners and allied health professionals. Nursing students felt that some nurses were not willing to teach them how to record, and often negative comments were made if they did not know how to record some files. Students expressed having less knowledge on how to record in some documents, and because they did not get guidance from nurses, they wrote incorrectly in patient files. This agrees with Shihundla, Lebese and Maputle (2016), who stated that record-keeping is a vital part of nursing and education needs to be provided to everyone accessing the records – including students. However, in this study, participants felt they were just delegated to only do routine work, which included bed making and taking of parameters – but not recording in the files. This was not supported by nursing students, because they are in training, and for them learning how to do record-keeping is vital.

Despite the computer revolution, information in clinical records continues to be handwritten. The originator may understand what has been written, but difficulties may arise when other parties are involved (Sokol & Hettige, 2006). Nursing students in this study experienced challenges with how hospital personnel were writing in patient files. Being students they would find it very hard to read what had been written. This made nursing care deficient, because personnel handwriting was hard to read and thus students needed to either ask for assistance to help with the reading or they ignored the orders, which now affected patient care. Landers (2008) indicates that nurses are mentors and role models in the clinical area; they are also teachers and students look up them. Therefore they are required to do proper recording with legible handwriting so that nursing students can learn the correct practices. Poor record-keeping reflects poor practice and nurses need to consider that this link is often exploited in court to the detriment of the nurse (Andrews & Aubyn, 2015). Nurses not doing it properly sets a bad example for students.

In understanding the findings of this study, the following limitations need to be considered: Despite the findings being consistent with the current literature, generalisability is limited because it was a qualitative study. In addition, this study did not include challenges experienced by nursing staff such as registered and enrolled nurses – it only

focused on the record-keeping challenges of nursing students. Therefore a study exploring hospital staff recording challenges would address issues faced by nurses of other categories. There are also certain areas in this study that need to be explored further – such as contributing factors to the theory–practice gap.

5. Conclusion and Implications

The study explored nursing student record-keeping challenges in clinical practice. The study concluded that challenges of recording were more to do with clinical settings related to practical and theory gap, hospital-related challenges and hospital staff-related challenges.

This study has implications for teaching and the learning of nursing students; record-keeping challenges are known and therefore nurse educators need to work toward attaining uniformity to lessen the theory–practice gap. Nurse educators in clinical settings and training institutions need to work together to follow the same recording principles in order to avoid confusion among students. As it was suggested that nursing staff are overloaded with work, the training institutions need to hire clinical instructors that follow up on students during their clinical placement – in order for them to demonstrate some procedures in the clinical area. All these factors will ensure that nursing students master the principles of record-keeping, which is a skill that should accompany procedural performance skills. Things

Competing Interests Statement

The authors declare they have no competing or potential conflicts of interest.

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Notes

Note 1. Participant code.

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Direct Treatment Costs of Invasive Candidiasis in Haematology Patients at a South African Private Hospital

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Abstract

Background: Haematology patients are at a high risk of developing invasive candidiasis (IC). Fluconazole has been the mainstay of prophylaxis and treatment with a newer class of therapeutic options, the echinocandins, having seen a considerable improvement in treatment success. However, these agents are associated with substantial acquisition costs when compared to fluconazole.

Objective: This study analysed the direct treatment costs of invasive candidiasis in haematology patients, comparing the costs between three groups depending on the treatment, namely, the fluconazole only group, the echinocandin only group or the group that was treated with both fluconazole and an echinocandin. To determine which variables contributed to the overall costs and whether there were differences between the groups.

Methods: This was a retrospective, single-centre economic analysis at a private hospital of patients with IC in the haematology ward in Durban, KwaZulu-Natal Province, South Africa. The direct medical costs related to managing IC were analysed. Adult patients (≥18 years old) diagnosed with a haematology disorder and a positive blood culture for Candida who were prescribed fluconazole and/or an echinocandin as treatment were included in the study. Patients treated with echinocandins, fluconazole or both classes of antifungals were analysed separately and compared.

Results: No statistically significant difference for duration of antifungal treatment or length of hospital stay between the three groups existed. Mean overall direct treatment costs per patient were*:* ZAR130 326 (95% CI: -4 932 – 265 584) for patients treated with fluconazole, ZAR241 165 (95% CI: 159 175 – 323 155) for patients receiving an echinocandin and *ZAR*270 802 (95% CI: 68 277 - 473 327) for patients treated with the combination

Conclusion: The results of this cost analysis found that treatment with fluconazole only is considerably less expensive, almost half of the mean daily treatment cost, than an echinocandin only and treatment using both agents, is less expensive than an echinocandin only as first-line therapy.

Keywords: cost, echinocandin, fluconazole, haematology, invasive candidiasis

1. Introduction

Candidaemia is the fourth most common hospital acquired bloodstream infection in the United States of America (USA) and the most frequently occurring worldwide, with its frequency rising rapidly (Kontoyiannis, 2001). According to the Lancet laboratories Annual Surveillance Report and Antibiotic Guide (2017), Candida species are also the fourth most frequently isolated organism from blood cultures in the private sector in KwaZulu-Natal Province, South Africa. Invasive candidiasis (IC) is an important clinical entity, specifically among critically ill Intensive Care Unit (ICU) patients, with crude mortality rates of 40–60% (Playford, Lipman, & Sorrell, 2010). Invasive fungal infection poses a serious risk to critically ill and immunocompromised patients, particularly hematopoietic stem cell transplant (HSCT) recipients and those who have received intensive chemotherapy for acute leukaemia (Cornely et al., 2011). These patients experience febrile neutropenia, which complicates the differential diagnosis between a fungal infection and colonisation (Gedik et al., 2014). The outcome of IC is dependent on early initiation of effective antifungal therapy as inadequate first line treatment results in a significant increase in mortality (Glöckner & Karthaus, 2011). The main therapeutic agents that are currently used to treat IC include broad-spectrum oral and parenteral triazoles such as fluconazole and itraconazole, lipid formulations of amphotericin B, and the newest class of antifungals, echinocandins, including caspofungin,

micafungin and anidulafungin (Kontoyiannis, 2001). The growing incidence of fungal infections, and the expenditure related to their treatment, have been increasing worldwide (Gedik et al., 2014). IC, along with life-threatening complications, are associated with increased hospital length of stay, costly care in the ICU and the use of expensive antifungal agents, resulting in a significant rise in healthcare costs (Heimann et al., 2014). The objectives of this study was to conduct a cost analysis of the direct treatment costs of invasive candidiasis in haematology patients, to assess whether the choice of treatment had an impact on the length of hospital stay and to determine which of the direct costs contributed the most to the overall cost of treating an episode of IC. This study utilizes the perspective of a South African private hospital, and included direct medical costs, specifically hospital ward fees, medication acquisition and administration, haematology consultation and laboratory blood culture costs. This assessment is important in order to understand the contributing cost drivers in an episode of IC, and to use the data to establish improved and more cost-effective treatment strategies in high risk haematology patients.

2. Materials and Methods

2.1 Study Design

This was a descriptive, retrospective, non-interventional, cost analysis study using quantitative data from patient files to compare the direct treatment cost of treating IC in high-risk haematology patients. These patients were defined as having an existing haematology condition, such as lymphoma, leukemia and myeloma, which results in them being immune compromised and thus increases their likelihood of invasive fungal infections. The patients were divided into three groups according to the antifungal medicine they were prescribed during their admission: fluconazole, echinocandin or both medicines.

2.2 Study Setting and Population

The study took place in a private urban hospital in Durban, South Africa, which consists of 36 beds, of which 12 are used exclusively for haematology patients. Data was collected from the 1st August 2015 to 31st August 2017, with all patients admitted during this period, and meeting the inclusion criteria, being included in the study. The following inclusion criteria applied, adult patients (aged 18 years and older) with an existing haematology diagnosis, such as lymphoma, leukaemia, myeloma, haemolytic anaemia and those undergoing HSCT, with a positive blood culture for Candida. The following exclusion criteria applied, patients who died before being treated with an antifungal agent and those who were treated with an antifungal other than an echinocandin and/or fluconazole.

2.3 Data Collection

Data was extracted from the electronic and paper medical records for all patients meeting the inclusion criteria that were maintained on the private institution's information system, specifically those from 1st August 2015 to 31st August 2017. A data collection sheet was created as the data extraction instrument, with the following variables being extracted: Demographic data (age, gender and underlying haematology diagnosis, name of medical aid); hospital data (admission and discharge date, total length of stay, length of stay in each level of care (i.e. general, high care, isolation and ICU), number of blood cultures during hospital admission, and number of doses of fluconazole and an echinocandin that were administered).

2.4 Costing

Only direct medical costs were considered for this study, the South African Rand (ZAR) to United States Dollar (USD) average exchange was ZAR13.83 in 2015, ZAR14.71 in 2016 and ZAR13.21 in 2017. Included in the direct medical costs were the antifungal medications and consumables used for their administration (which are detailed below), blood cultures, haematology consultations and hospitalisation costs. Direct non-medical costs and indirect medical costs, as well as intangible costs, were not included in the study. The antifungal administration costs were based on the Single Exit Price (SEP) of the antifungal medication, as obtained from the Medicine Price database for the years 2015, 2016 and 2017. Single Exit Price refers to section 22G of the Medicine Amendment Act which came into effect on the 2nd May 2004 mandating that medicine manufacturers may only sell their products at one price to all customers. The term means that each product and its variants 'exits' the factory at one single price for that product or variant. The SEP is adjusted annually taking into consideration the different criteria as laid out in regulations. The daily administration consumable costs included the cost of a medication administration pack, specific for each antifungal, which included the agreed costs charged to the medical fund for the syringes, needles, alcohol swabs, diluents, infusion fluids and infusion sets required for the daily administration of the antifungal medication. The total daily cost (Table 1), included the sum of the SEP of the antifungal agent and the administration consumable costs multiplied by the prescribed daily dosage.

Table 1. Antifungal medication and consumable costs (ZAR) equivalent to USD 2015 = 13.83; 2016 = 14.71; 2017 = 13.21

		Antifungal costs								
		2015			2016			2017		
Fluconazole	(Dilfucan®)	SEP (Single Exit Price)	Daily administration consumable costs	Total daily cost	SEP (Single Exit Price)	Daily administration consumable costs	Total daily cost	SEP (Single Exit Price)	Daily administration consumable costs	Total daily cost
		197.29	368.52	1131.61	206.74	737.03	1150.51	212.72	737.03	1162.47
Echinocandin	Caspofungin (Cancidas®)	2888.60	396.12	3284.72						
	Anidulafungin (Eraxis®) – loading dose (day 1)	4838.96	390.80	5229.76						
	Anidulafungin (Eraxis®) – maintenance dose	2419.48	387.58	2807.06						
	Micafungin (Mycamine®)	1824.00	435.94	2259.94	1824.00	436.72	2260.72	1960.80	438.34	2399.14

Table 2. Cost of hospital stay and laboratory costs (ZAR) equivalent to USD 2015 = 13.83; 2016 = 14.71; 2017 = 13.21

Hospital rates*					
Date	General	Isolation	High Care (HC)	ICU	Laboratory rates
2015	1932.40	2545.85	5129.80	8614.65	212.25
2016	2224.40	2887.14	5903.92	9785.70	220.85
2017	2329.95	3002.45	6066.65	10362.48	229.75

**Average costs were calculated for each level of care for a particular year based on the individual medical aid tariffs applicable to each patient included in the study.*

Table 3. Haematologist inpatient consultation costs (ZAR) equivalent to USD 2015 = 13.83; 2016 = 14.71; 2017 = 13.21

Haematologist inpatient consultation rates*								
	Initial				Follow up			
	General	Isolation	HC	ICU	General	Isolation	HC	ICU
2015	619.05	619.05	391.58	1305.75	263.89	263.89	391.58	652.87
2016	564.13	564.13	401.29	1343.02	285.44	285.44	401.29	671.5
2017	656.15	656.15	458.09	1527.17	340.21	340.21	458.09	761.85

**Average costs were calculated based on the individual medical aid tariffs applicable to each patient included in the study.*

The hospital ward charges were based on the National Health Network agreed tariffs with the individual medical aids for that specific year, the laboratory costs for a blood culture (Table 2) and the haematologist consultation rates (Table 3) were based on the agreed fees by the hospital with the medical funders for each year of the study.

2.5 Data Analysis

The data analysis consisted of two components, the first entailing an analysis of the data to establish any statistically significant relationships between the variables. The second was a sensitivity analysis that increased and decreased each cost parameter to identify the factor that had the greatest impact on the total cost of treating an IC episode.

Statistical analysis was performed using IBM SPSS Statistics software, for Windows version 25. One-way ANOVA was applied to test the statistical significance of the normally distributed continuous variables between the three groups. Dichotomous variables were tested using Chi squared, with a p-value of < 0.05 being considered significant. For descriptive purposes, patient and cost data are presented as the median and range or the mean and 95% confidence interval (CI), as appropriate.

One-way sensitivity analysis was performed using Microsoft® Excel 2010, by increasing and decreasing each direct cost parameter over a range between 5% and 20%, while keeping the other costs constant, observing the effect of the results and identifying which variable had the greatest impact on the total cost of treating an episode of IC. The following factors were analysed with the one-way sensitivity analysis:

1) Mean ICU ward costs
2) Mean high care ward costs
3) Mean isolation ward costs
4) Mean general ward costs
5) Mean antifungal medication administration costs for the treatment duration
6) Mean laboratory culture costs
7) Mean haematologist consultation costs

3. Results

The final dataset included any patient over the age of 18 years old with an underlying haematology diagnosis and a positive blood culture for Candida. A total of 321 patient admissions were identified that included treatment with fluconazole and/or an echinocandin during the study period from 1 August 2015 to 31 August 2017. Of these, 96 episodes were excluded based on the exclusion criteria regarding age and underlying haematology diagnosis. Of the remaining 225 episodes, only 24 had a positive blood culture for Candida and were therefore eligible to be included in the cost analysis.

3.1 Demographic Data

The median age of the patients was 54 years, 44 years and 38.5 years in the fluconazole, echinocandin and both groups respectively. Of the 24 patients, 33.3% (n = 8) were female, and the most common underlying haematology diagnoses were acute myeloid leukaemia (n = 6), acute lymphoblastic leukaemia (n=4) and multiple myeloma (n = 4) (Table 4). The one-way ANOVA showed no statistically significant difference in baseline characteristics in terms of median age between the three groups. The Chi-Square test showed no statistically significant difference between the groups with regards to gender and haematology diagnosis.

Table 4. Patient characteristics and underlying haematology diagnosis

	Fluconazole, N = 5	Echinocandins, N = 11	Both, N = 8	
	n (%)	n (%)	n (%)	*p* value*
Age (years), median (range)	54 (27-84)	44 (19-71)	38.5 (18-77)	0.476#
Female	3 (60)	3 (27.3)	2 (25)	0.362¥
Haematology diagnosis				
Acute promyelocytic leukaemia	-	-	1 (12.5)	
Acute lymphoblastic leukaemia	1 (20)	3 (27.3)	-	
Acute Myeloid Leukaemia	1 (20)	3 (27.3)	2 (25)	
Burkitt Lymphoma	1 (20)	-	1 (12.5)	
Diffuse large B cell lymphoma	-	-	2 (25)	0.217¥
Haemolytic anaemia	-	1 (9.1)	-	
Hepatosplenic T cell lymphoma	-	1 (9.1)	-	
Hodgkin lymphoma	-	-	2 (25)	
Multiple myeloma	1 (20)	3 (27.3)	-	
Non Hodgkin lymphoma	1 (20)	-	-	

#One way ANOVA ; ¥Chi-Square.

3.2 Statistical Analysis

Patients receiving both fluconazole and an echinocandin had a much longer duration of antifungal treatment as well as overall hospital stay (Table 5). The patients who were treated with fluconazole only had much shorter antifungal treatment duration and an overall hospital stay. The patients receiving an echinocandin had the shortest general ward stay but the longest ICU stay. One way ANOVA showed no statistical significant difference for duration of antifungal treatment or length of hospital stay between the three groups.

Table 5. Duration of antifungal treatment and length of hospital stay

	Fluconazole, N = 5	Echinocandins, N = 11	Both, N = 8	*p* value
Duration of antifungal treatment (days), mean	8.4	18	22.3	0.135
Overall hospital stay (days), mean	23.3	28.45	38.69	0.197
Length of stay – General ward (days), mean	10.3	4.3	10.75	0.179
Length of stay – Isolation ward (days), mean	5	5.9	6.75	0.942
Length of stay – High Care (days), mean	2.7	6.05	10.5	0.243
Length of stay – ICU (days), mean	5.3	12.23	10.69	0.659

The mean overall direct treatment costs per patient were, ZAR130 326 (95% CI: -4 932 – 265 584) for patients treated with fluconazole, ZAR241 165 (95% CI: 159 175 – 323 155) for those receiving an echinocandin and ZAR270 802 (95% CI: 68 277 - 473 327) for patients treated with both (Table 6). There is an excess cost of ZAR110 839 per patient in the echinocandin group and of ZAR140 476 in the group treated with both medications compared to the fluconazole group. The mean direct costs per day were ZAR5 615 (95% CI: 1000 – 10 229) in the fluconazole group vs ZAR8 450 (95% CI: 6 582 – 10 317) in the echinocandin group and ZAR6 717 (95% CI: 4 248 – 9 186) in the group with both medications. Antifungal administration treatment costs contributed 7.5% in the fluconazole group, 17.4% in the echinocandin group and 16.5% in the group treated with both, to the overall direct costs. The mean number of antifungal treatment days in the fluconazole group was 8.4 with a mean daily cost of ZAR1 160 (95% CI: 1153 – 1166), 28.5 days in the echinocandin group with a mean daily cost of

ZAR2 365 (95%CI: 2218 – 2511) and 18 days with a mean daily cost of ZAR2 106 (95% CI: 1546 – 2667, P = < 0.001) in the combined treatment group.

Table 6. Overview of the direct cost distribution among groups

Direct cost parameter (ZAR), mean (95% CI)				
	Fluconazole, N = 5	Echinocandins, N = 11	Both, N = 8	p value*
Ward costs				
General	23 660	9 537	22 526	0.201
	(-9 639 – 56 960)	(2 179 – 16 896)	(6 882 – 38 170)	
Isolation	14 539	17 042	17 630	0.975
	(16 024 – 45 102)	(-1 747– 35 832)	(925 – 34 335)	
High care	16 379	35 832	60 092	0.291
	(-29 098 – 61 858)	(20 704 – 68 959)	(15 250 – 104 935)	
ICU	54 921	119 692	107 756	0.692
	(-93 994 – 203 836)	(43 856 – 195 529)	(-43 781 – 259 295)	
Total ward costs	109 500	182 105	208 006	0.488
	(-10 675 – 229 677)	(116 573 – 247 638)	(34 518 – 381 494)	
Haematologist consultation costs	10 259	15 281	15 953	0.514
	(1 237 – 19 282)	(10 600 – 19 961)	(5 769 – 26 136)	
Antifungal treatment costs	9 742	41 886	44 803	0.032*
	(3 069 – 16 415)	(23 404 – 60 367)	(25 484 – 64 121)	
Blood culture costs	823	1 892	2039	0.134
	(340 – 1 306)	(1 098 – 2 686)	(1 043 – 3 035)	
Total direct costs	130 326	241 165	270 802	0.348
	(-4 932 – 265 584)	(159 175 – 323 155)	(68 277 – 473 327)	
Daily direct costs	5 615	8 450	6 717	0.206
	(1 000 – 10 229)	(6 582 – 10 317)	(4 248 – 9 186)	

***** = *statistically significant.*

3.3 Sensitivity Analysis

One-way sensitivity analysis was performed in Microsoft ®Excel by varying the mean cost of each parameter of the three groups over a range between 5% and 20%. Changes in the mean total direct costs base value (fluconazole = ZAR130 326, echinocandin = ZAR241 165 and both = ZAR270 802) were noted. The one way sensitivity analysis showed that the mean ICU and high care ward costs were considerable cost drivers across all three groups over the 7.5%, 10%, 15% and 20% changes. This is in line with the data that showed that ward costs contributed the most towards the overall cost of treating an episode of IC. Medicine administration costs for the duration of therapy were an important cost driver in the echinocandin only group and the combined treatment group, but not in the fluconazole group (Table 7). This is due to the much higher acquisition costs of the echinocandins compared to fluconazole.

Table 7. One way sensitivity results

MEAN COSTS	% CHANGE IN TOTAL DIRECT COSTS														
	20 %	15 %	10 %	7.5 %	5 %	20 %	15 %	10 %	7.5 %	5 %	20 %	15 %	10 %	7.5 %	5 %
	FLUCONAZOLE					ECHINOCANDIN					BOTH				
ICU	**8.4**	**5.3**	**3.5**	**2.6**	1.8	**9.9**	**6.2**	**4.1**	**3.1**	**2.1**	**8.0**	**6.0**	**4.0**	**3.0**	2.0
High Care	**2.5**	1.6	1.0	0.8	0.5	**3.0**	1.9	1.2	0.9	0.6	**4.4**	**3.3**	**2.2**	1.7	1.1
Isolation	**2.2**	1.4	0.9	0.7	0.5	1.4	0.9	0.6	0.4	0.3	1.3	1.0	0.7	0.5	0.3
General	**3.6**	**2.3**	1.5	1.1	0.8	0.8	0.5	0.3	0.2	0.2	1.7	1.2	0.8	0.6	0.4
Antifungal medication administration	1.5	0.9	0.6	0.5	0.3	**3.5**	**2.2**	1.4	1.1	0.7	**3.3**	**2.5**	1.7	1.2	0.8
Laboratory culture	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.0
Haematologist consultation	1.6	1.0	0.7	0.5	0.3	1.3	0.8	0.5	0.4	0.3	1.2	0.9	0.6	0.4	0.3

4. Discussion

The patient's age, gender and haematology diagnosis was not statistically significant, with no difference being indicated between the three groups (see Table 4).

The results of the study showed that the overall direct cost of treating an episode of IC was much higher in the group that was treated with fluconazole and an echinocandin, either due to treatment failure or a step down approach, and approximately 85% more in the echinocandin group when compared to the fluconazole only group. The study by Heimann et al. (2015) supported this finding; their study showed that the mean overall direct treatment costs per patient treated with an echinocandin to be significantly higher than fluconazole, the main contributor being that the echinocandin treated patients were unwell and had longer ICU stays. This is contrary to the findings from Tagliaferri and Menichetti (2015) who found that the echinocandins reduced the overall in-hospital costs compared to fluconazole, and Reboli et al. (2011) who concluded that anidulafungin versus fluconazole in ICU patients resulted in a reduction in total IC related costs due to the decreased length of stay.

Hospital ward costs contributed 76.8% in the group treated with fluconazole and an echinocandin, 84% in the fluconazole group and 75.5% in the echinocandin group, towards the overall direct treatment cost. This outcome is consistent with the findings from the literature review that length of hospital stay has a substantial impact on the cost of treating an episode of IC. Studies using data spanning many years and in various countries conducted by Wilson et al. (2002), Ha et al. (2012), Ceesay et al. (2015) and Armaganidis et al. (2017) all agreed with the findings of this study. From the study results ICU length of stay was much longer (more than double) in the echinocandin group, possibly indicating that this class of antifungal was used in more clinically unwell patients, particularly when compared to the patients treated with fluconazole. This significantly contributed to the overall direct cost where ICU ward fees were ZAR 119 692, 95% CI (43 856, 195 529) in the echinocandin group compared to only ZAR 54 921, 95% CI (-93 994 – 203 836) in the fluconazole group.

In addition, this study showed that patients in the group treated with both fluconazole and an echinocandin had a much longer mean hospital stay (38.69 days) compared to the fluconazole group (23.3 days) and the echinocandin group (28.45 days). Armaganidis et al. (2017) had a similar result, with patients who switched antifungal treatment having a longer ICU stay, with a mean of 53.8 days.

The second biggest cost contributor, after the hospital wards costs, although much less substantial, were the antifungal treatment costs. The duration of antifungal treatment was the highest in the group treated with both medicines, with a mean of 22.3 days, contributing 16.5% to the overall direct cost. A similar result was seen in the study by Armaganidis et al. (2017), where patients who switched antifungal therapy had a much longer duration of treatment with a mean of 27.3 days. In this study, the echinocandin group was the second longest, with a mean of 18 days, contributing 17.3% of the total cost. The fluconazole treatment group was the shortest stay, with a mean of only 8.4 days and a modest 7.5% toward the overall direct cost. This is reasonably similar to the results of studies

discussed in the literature review, where Ha et al. (2012) concluded that antifungal treatment costs contributed 10% of the total direct cost, Heimann et al. (2015) found the treatment costs to be less than 10% and Wilson et al. (2002) results showed antifungal treatment costs to contribute approximately 17%. Conversely the study conducted by Ananda-Rajah et al. (2011), at an Australian quaternary university-affiliated hospital network, was the only study included in the review that found pharmacy costs to be the main cost contributor, this being attributed to the high acquisition costs of the antifungals that were used as anti-mould prophylaxis and treatment. There was a statistically significant difference in the daily antifungal treatment costs between the groups in this study which was supported by the results of the study by Heimann et al. (2015).

The other two costs factors considered in this study contributed small amounts to the overall treatment cost. The haematologist consultation costs were dependent on the length of hospital stay and the level of care of the patient, as the ICU charge was higher than the general and high care ward consultation costs. The blood culture costs contributed a minor portion towards the overall costs and were independent of the choice of antifungal treatment.

This study had limitations such as a small sample size and only included the private hospital perspective thus the generalizability is questionable.

5. Conclusion

The main cost driver in the overall cost of treating IC was due to the ward costs, which contributed 78.8% on average between the three groups. This was dependent on the level of care of the patients stay, where it can be seen that patients spending longer in the ICU have much higher costs. The antifungal administration costs also contributed a substantial amount to the overall treatment costs, which varied depending on the choice of first line therapy as well as its success, as a change in the treatment resulted in increased treatment costs and extended length of stay. Further studies with larger sample sizes are required to establish whether fluconazole should be used as first line therapy and only changed to an echinocandin where resistance is identified on blood culture.

Ethical Considerations

The protocol received approval from the Biomedical Research Ethics Committee at the University of KwaZulu-Natal in South Africa (reference number BE403/17). As this was a retrospective chart review study, the patient's permission was not required. However, permission was obtained to access the data from the hospital manager. To prevent any bias, no randomization or blinding in the sample selection was introduced.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Psychosocial and Demographic Factors That Compound Alcohol Abuse Amongst Youth: A Case Study of Musina High School

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Abstract

The risk factors that compound alcohol abuse by young people have significant effects of individuals. The sole purpose of social work is to enhance the social functioning of clients and in most cases, clients have impairments as the result of high density of alcohol outlets, affordability of alcohol, which later give birth to psychosocial challenges. The aim of this study is to describe psychosocial and demographic factors compounding alcohol abuse amongst youth. The study employed quantitative approach and descriptive case study design. Data was collected at Musina High School and 96 learners were sampled using stratified sampling to complete the questionnaire. Data was analysed descriptively with the aid of Statistical Package for the Social Science. The study revealed that psychosocial and environmental factors compound to alcohol abuse amongst youth in Musina High School. The study concludes that the context determines the excessive use of alcohol abuse by youth. Young people especially those who reside in rural areas are exposed to high density of alcohol outlets and they are left without guardianship. Due to lack of guardian or parental involvement they end up indulging in excessive use of alcohol.

Keywords: alcohol abuse, accessibility, consumption, peer pressure, youth

1. Introduction

Excessive use of alcohol amongst youth is a major concern globally and South Africa is not an exemption (United Nations Office on Drugs and Crime, 2009). There are numerous factors that compound youth excessive indulgence in alcohol. Robertson, David and Rao (2003) assert that these factors can be classified as internal and external. For example, the excessive usage of alcohol by a young person might be influenced by age or sex (internal factors) and/or learning from peers (external factors). In support of this, Gale, Lenardson, Lambert and Hartley (2012:5), aver that "age and sex are identified with pre-adult alcohol utilise". A young person may indulge in alcohol abuse because his male peers assert that manhood is proven by drinking alcohol or to look sexy to her friends. Mafa et al (2019) aver that the assumption that women do not indulge in heavy drinking may lead to minimization of problem drinking by male drinkers. To that end, this study was aimed at describing psychosocial and demographic factors that compound alcohol abuse amongst youth in Musina High School.

2. Background Information and Problem Formulation

A study by Donovan (2004), demonstrates that drinking regularly starts at extremely young age. In corroboration, Grunbaum, Kann, Kinchen, Ross, Hawkins, Lowry, and Collins (2004) discovered that the debut drinking age is 9 to 10 years, while Substance Abuse and Mental Health Services Administration [SAMHSA] (2003) discovered that debut drinking is at the age of 14. National Institute on Alcohol Abuse and Alcoholism [NIAAA] (2017) and Caron Treatment Centers (2004) have reported that females are more likely to rapidly develop alcohol dependency as compared to their counterparts. The expansion of alcohol abuse among female understudies is particularly disturbing. Caron Treatment Centers (2004) have also noticed and strongly indicate that alcohol abuse amongst female is rapidly increasing than for male.

Several authors, Lambert, Gale and Hartley (2008); Gfroerer, Larson and Colliver, (2007); Lasser, Schmidt, Diep and Huebel (2010), have all discovered that young people in rural areas abuse alcohol more than their counterparts in urban areas. this can be attributed to boredom due to the absence of recreational facilities in rural areas. In support of this, Freeman (1999) indicated that young people drink due to government failure to produce recreational facilities, especially in rural areas. Instead of producing recreational facilities, there are overcrowded

alcohol outlets. Connor, Kypri, Bell and Cousins (2010) aver that high-density of alcohol outlets contribute to alcohol abuse amongst youth. In corroboration, Masemola, van Aardt, and Coetzee (2012) aver that young people find themselves in an environment wherein there is an easy access of alcohol and their friends are using it.

Finlay, Ram, Maggs, and Caldwell (2012) and Patrick, Maggs, and Osgood (2010) have discovered that the affordability of alcohol also makes youth vulnerable to binge drinking. In support of their argument, Ayuka, Barnett and Pearce (2014) discovered that young people are more likely to choose cheaper alcoholic beverages to maximise alcohol intake for the money they use. As such, the increase in alcohol pricing will result in the decrease of alcohol consumption. In support of this, Anderson and Baumberg (2006) discovered that an increase in alcohol prices generally leads to a decrease in alcohol consumption, and a decrease in alcohol prices usually leads to an increase in alcohol consumption. While, Wagenaar, Salois and Komro (2009) avow that the increase of alcohol taxes serves as a strategy to reduce alcohol consumption.

3. Methods

The research type for this study involved empirical data where questionnaires were utilised to describe risk factors that compound youth into alcohol abuse in Musina High School. Quantitative approach was used because of its ability to quantify and measure social phenomena – alcohol abuse (Creswell, 2003). A descriptive case study design was utilised because of its ability to describe, analyse, and interpret psychosocial and demographic factors compounding alcohol abuse amongst youth in Musina High School (Fouché & Schurink, 2011). The population of the study was drawn from learners from Musina High School. Authors selected both male and female alcohol users and non-users between the ages of 18 and 20 years to respond to the questionnaire.

Stratified sampling techniques was employed in this study. It was essential to employ a stratified sampling approach due to its ability to divide the population into several strata that were mutually exclusive (Christensen, Johnson & Turner, 2015). A sampling frame was developed for the youth between the ages of 18-20 years in each geographical area targeted – Musina High School. Musina High School was conveniently included as the study area because it is situated in a border town where alcohol consumption is high. Mafa et al. (2019) reported that high alcohol consumption is found in young people. Authors ensured that a purposeful systematic method was adhered to with a controlled list of specified populations (male and female) in Musina High School. According to Christensen et al. (2015:168) “stratified sampling requires slightly fewer people”. As such, controlled list was developed, wherein a 2nd member from 192 respondents were randomly picked to form a sampling size of 96. Authors used a small number of population to control the administration of questions.

Data was analysed using the Statistical Package for the Social Science (SPSS), which is a comprehensive system for analysing data. It can take data from almost any type of file and use them to generate tabulated reports, charts, plots of distributions and trends, descriptive statistics, and complex statistical analyses (Gilman & Weber, 2007). Since this was descriptive in nature, data was also analysed descriptively and not inferentially.

4. Results

4.1 Demographics of the Respondents

The demographics represents the summary of learners who responded to the questionnaires in this study.

Table 1. Gender of the respondents

Gender	Frequency	Percentages (%)
Female	62	65%
Male	34	35%

The above table shows that a substantial majority (at 65%) of the respondents were females followed by 35% of males.

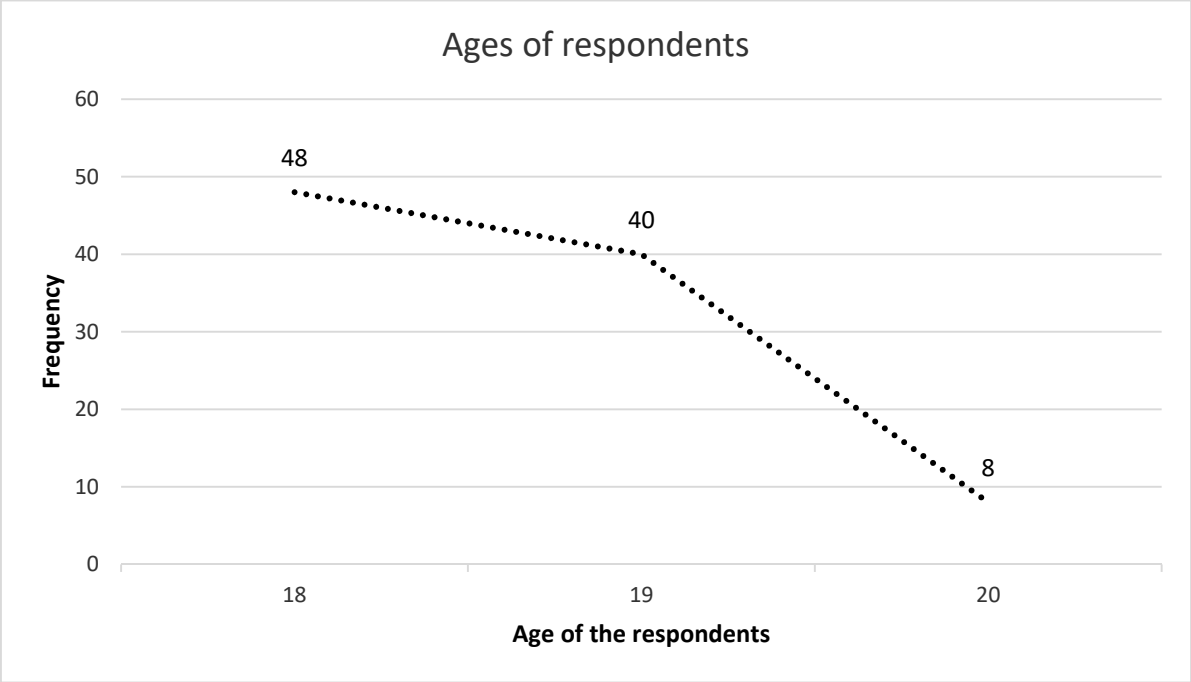
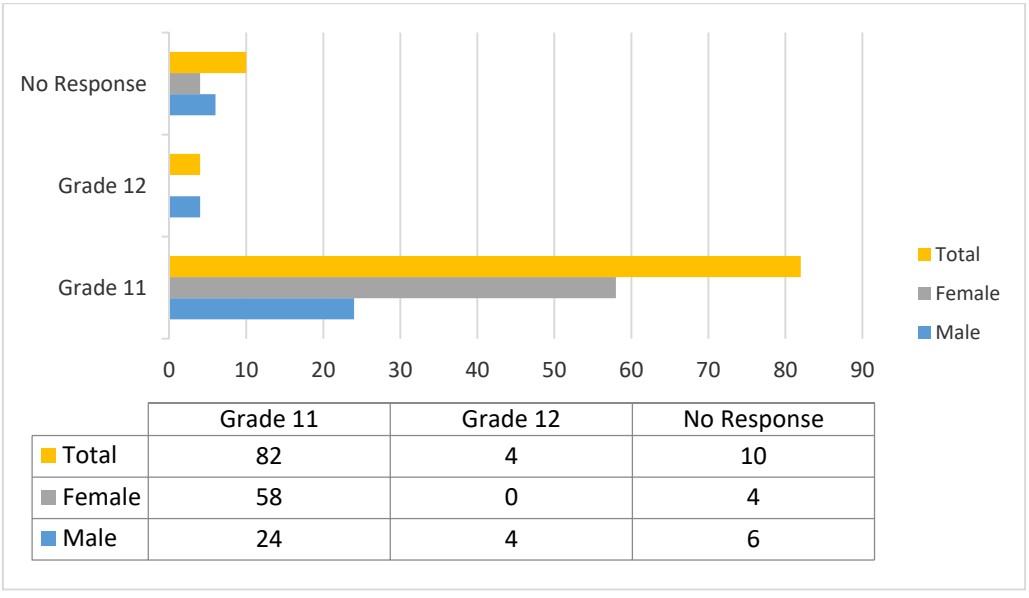


Figure 1. Age of the respondents

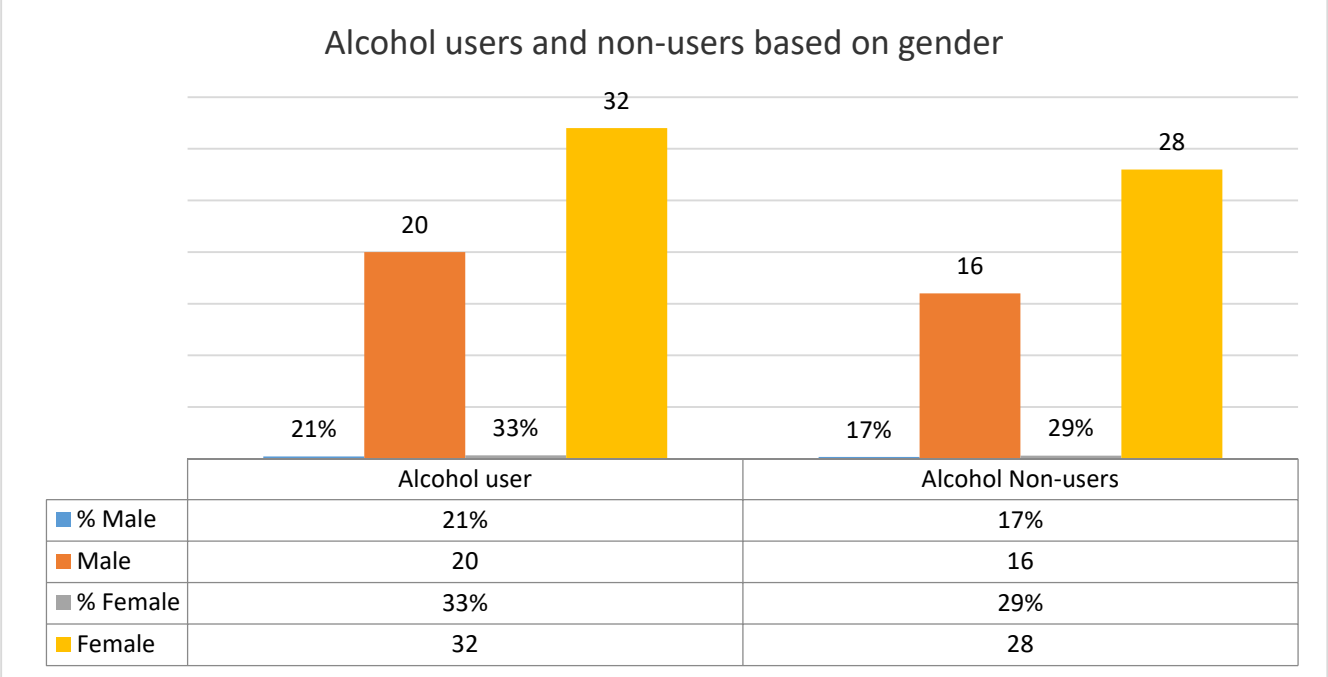
From the above figure, it can be depicted that half (at 50%) of the respondents were aged 18 years, followed by 42% for the age of 19 years and 8% for the age of 20 years. Globally, studies have a different view as when youth start to indulgent into alcohol. Ramsoomar and Morojele (2012) discovered that young people start to indulge in alcohol abuse between the ages of 13 to 19 years. Whilst, Fortune, Watson, Robinson, Fleming, Merry, and Denny (2010) discovered that young people aged 12 to 16 years engage in binge drinking and those who are aged 16 to 21 years engage in hazardous drinking (Wells, Baxter, & Schaaf, 2007). Nonetheless, in South Africa, as in other countries, the alcohol debut age has reduced significantly. Youth starts to indulge in alcohol between the ages of 15 to 24 years (Peltzer, & Ramlagan, 2009). This shows that bar owners, in spite of the Liquor Act 53 of 2003 clearly stipulating age restrictions, sell alcohol to anyone including those who are under the age of 18.



	Grade 11	Grade 12	No Response
Total	82	4	10
Female	58	0	4
Male	24	4	6

Figure 2. Educational status

The study intended to discover the educational status of both alcohol users and no-users distinguishing them by their gender. As such, the above figure depicts that a substantial majority (n=82; at 85%) of the respondents are in Grade 11; n=4, at 4% are in Grade 12 and n=10, at 11% did not respond to the question.



	Alcohol user	Alcohol Non-users
% Male	21%	17%
Male	20	16
% Female	33%	29%
Female	32	28

Figure 3. Number of alcohol users and non-users

The figure above provides information regarding the number of respondents who are currently using and not using alcohol. It could be depicted from the figure that the majority of females (33%) and males (21%) are alcohol users with a representative of 54%. Whilst, female (29%) and male (17%) are non-users with a representative of 46%.

4.2 Factors Compounding to Alcohol Abuse

4.2.1 Accessibility of Alcohol

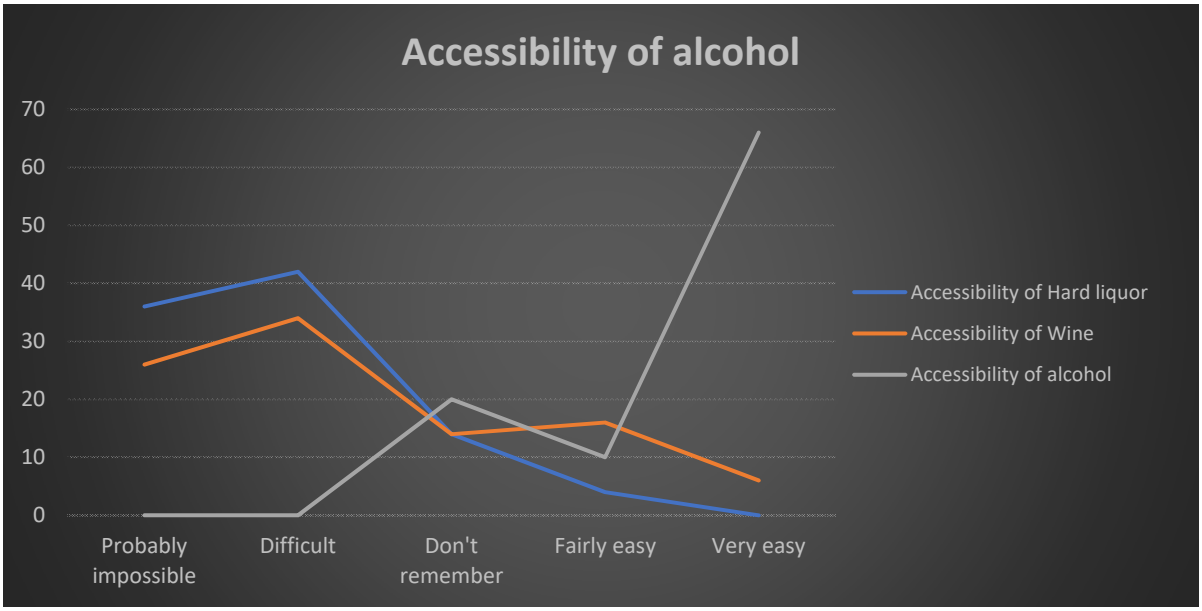


Figure 4. Accessibility of alcohol

The figure above shows that a substantial majority (at 69%) reported to have an easy access to purchase alcohol; 35% reported that it is difficult to purchase wine and 44% reported that it is probably impossible to purchase hard liquor (such as brandy). It is not surprising to see alcohol being accessible as compared to other substance, because in rural areas, there are many alcohol outlets.

4.2.2 Alcohol Consumption

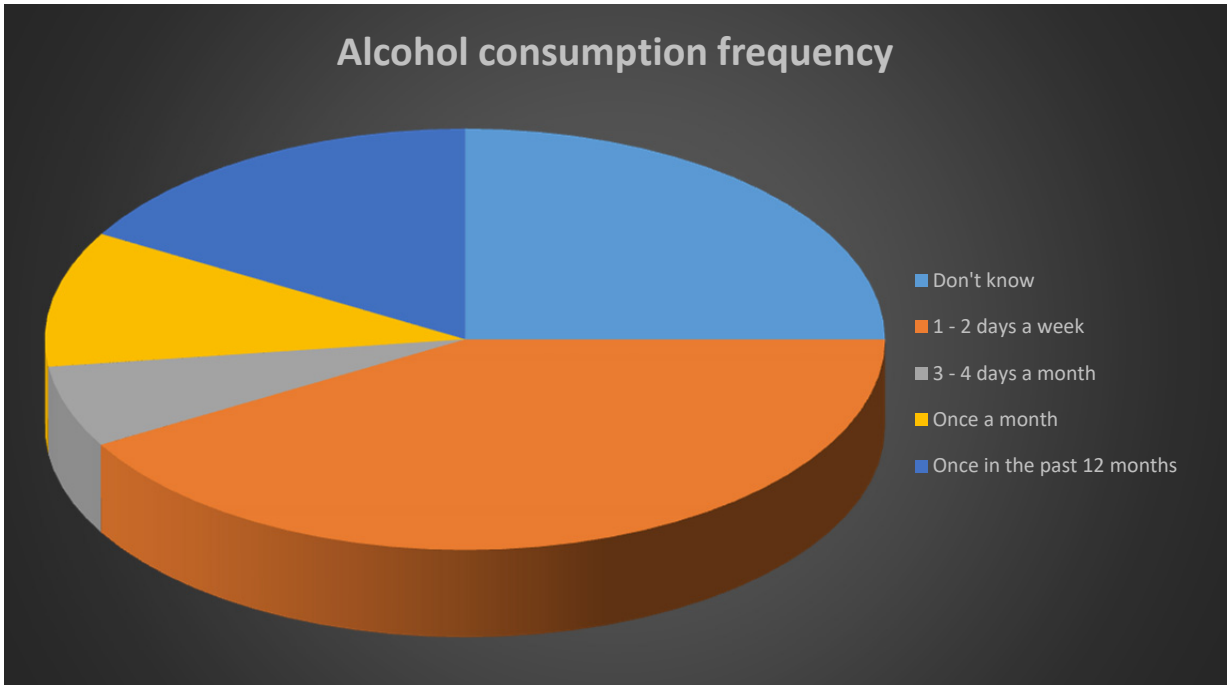


Figure 5. Alcohol consumption frequency

The above chat shows that 42% of the respondents reported that they consume alcohol in 1-2 days a week; 17% once in the past 12 months; 10% once a month, 6% in 3-4 days a month; 25% does not know. Most of the respondents' drink alcohol 1-2 days a week because they are learners and during the week they have no time to drink as they attend classes. Evidently, Finlay et al. (2012) discovered that learners were more likely to indulge in binge drinking on weekends. Whilst, Patrick, Maggs, and Osgood (2010) state that learners indulge in binge drinking when they go out to bars and parties which are more likely to take place on weekends. Hence, it can be deduced that on weekends youth indulge on binge drinking as a way of celebrating and refreshing. During weekends, youth tend to buy cheaper beverages as they have insufficient money to sustain themselves throughout the part or their stay in the bar. In support, Ayuka et al. (2014) discovered that youth tend to choose cheaper alcoholic beverages to maximise alcohol intake for the money they use.

4.2.3 Family Members Who Drink

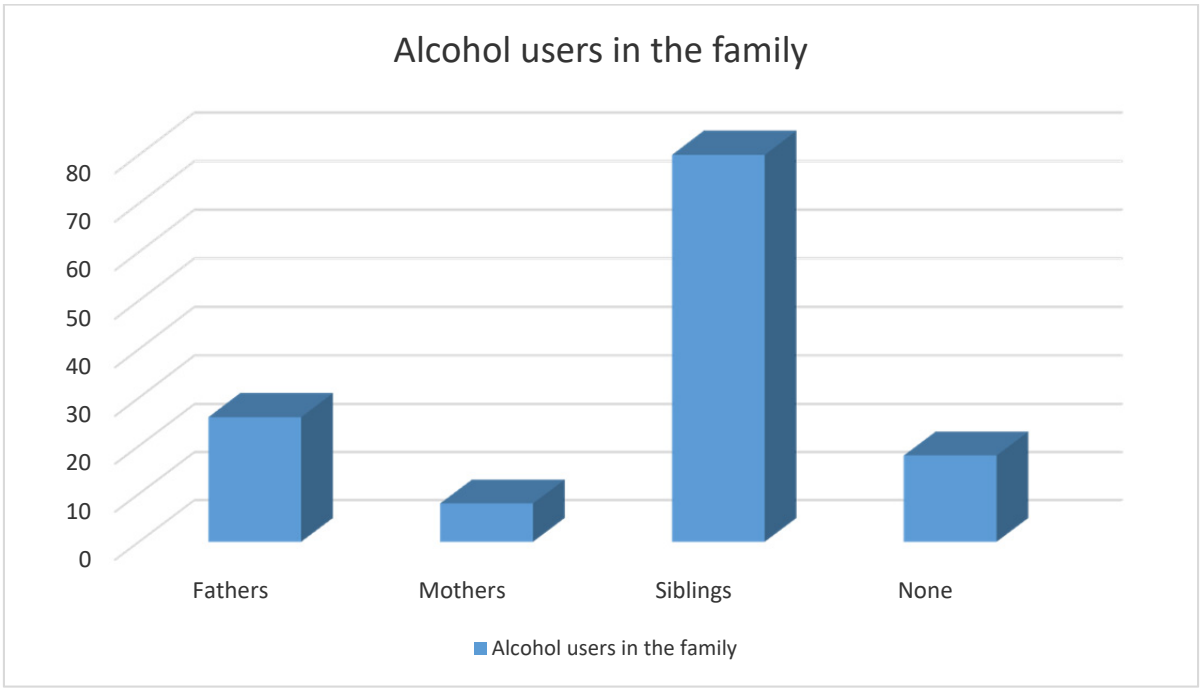


Figure 6. Family members who drink

The table above shows that an absolute majority (at 61%) of the respondents have siblings who consume alcohol; 20% has fathers who consume alcohol, 6% have mothers who consume alcohol; and 13% reside with family members who do not consume alcohol.

4.2.4 Peer Pressure

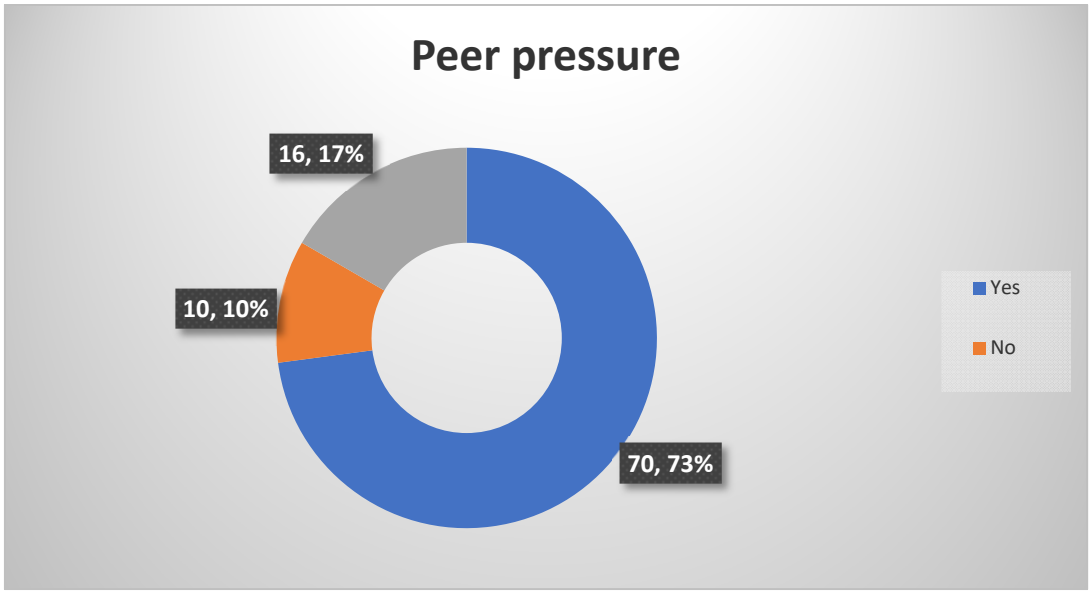


Figure 7. Peer Pressure

The above chat shows that an overwhelming majority (at 73%) of the respondents stated that peer pressure influences youth to indulge in alcohol abuse; 10% did not see peer pressure as the contributing factor; and 17% remained neutral. The results affirmed the view of Gale *et al.* (2012), who stipulated that peer impact is an essential determinant of whether, how frequently, how much, and under what conditions an adolescent will drink. For a young person to indulge in alcohol abuse is because of learned maladaptive behaviour from their peers. If learned

patterns from home are not covered with precise caution from secondary source of socialisation, that is friends, young ones accommodate behaviour from extended sources whether positive or negative into their memory.

This result upheld the views of Atkins, Oman, Vesely, Aspy and McLeroy (2002) who postulated that peer influence has either a protective factor or a risk factor and friends who use alcohol and other drugs are an important determinant of drinking behaviour and another drug use (Branstetter, Low & Furman, 2011). Authors are of the notion that the type of friends that a young person keeps have an impact on his or her bhaviour since they are secondary source of socialisation. For instance, if one associates him or herself with alcohol non-users, he or she will learn positive habits and the opposite is true.

4.2.5 Self-Esteem

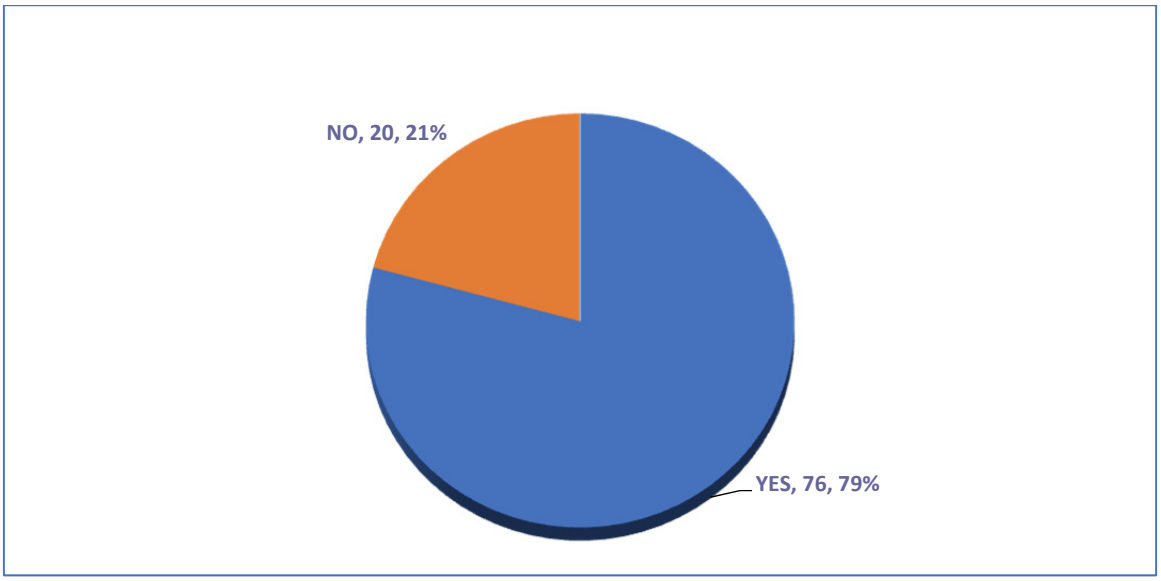


Figure 8. Self-esteem

The chat above showcase that a substantial majority (at 79%) of the respondents stated that youth indulge in alcohol abuse because of low self-esteem whilst 21% are opposing the idea. Young people lack self-esteem and they consume alcohol to so as to develop their self-esteem.

4.3.6 Stress

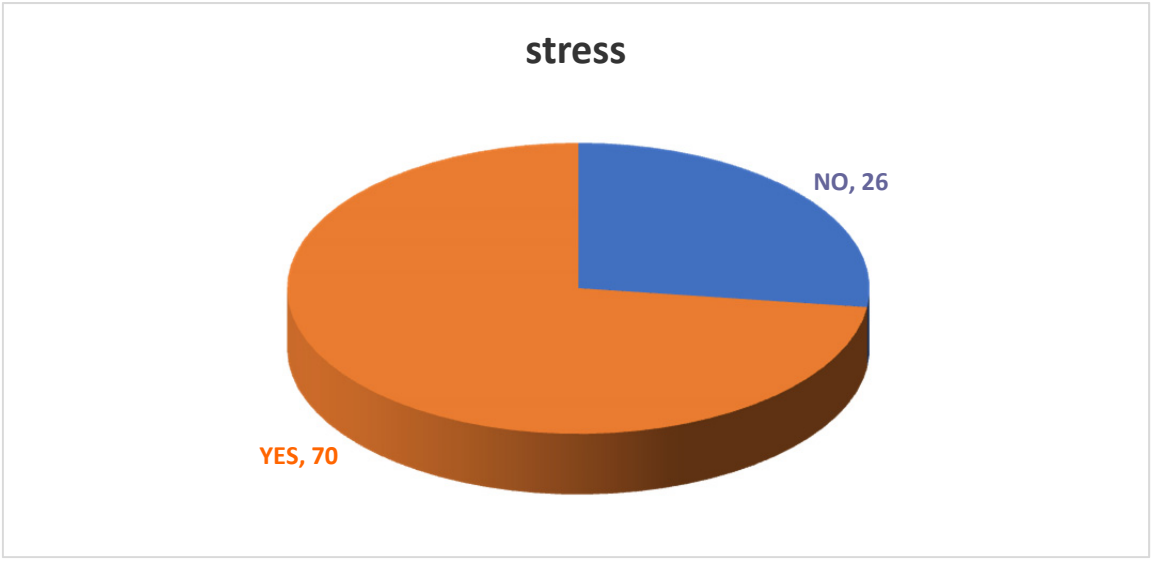


Figure 9. Stress

From the chat above, a substantial majority (at 73%) of respondents stated that youth indulge in alcohol abuse because of stress whilst 27% did not see stress as a risk factor of alcohol abuse. This result substantiates the findings of Jackson, Knight, and Rafferty (2010) who assert that stress is strongly associated with alcohol use amongst the youth. Thobejane and Raselekoane (2017:95) substantiate the view of the latter authors and state that, "youth indulge in alcohol abuse to try and forget about their problems because they believe that alcohol is a depressant that paralyses the brain of a certain moment". In corroboration, Shilakwe (2005) has noticed that youth consistently indulged in alcohol to deal with their psychological problems, which then bears alcohol dependency or abuse.

5. Discussion

Connor, Kypri, Bell and Cousins (2010) discovered that an increase in binge drinking is associated with high-density outlets in a community. Youth, especially in rural areas find themselves in an environment that is populated with alcohol outlets, hence, their receptiveness to alcohol use increases. The accessibility of alcohol in rural areas, varies from friend to media. Giesbrecht, Patra, and Popova (2008) argue that access to alcohol through adverts and promotion on media brings a variety of substances in the disposal of youth. Thobejane and Raselekoane (2017) concur with the above authors and in their study conducted in Musina Town, they discovered that alcohol is being advertised every 5 minutes on television. These adverts evoke an attitude of a young person by association of unconditioned stimulus with a conditioned stimulus. Alcohol advertisements are associated with professionals that young people admire such as musicians and soccer stars. As such, one could conclude that when alcohol is advertised during soccer matches a young person salivates. Hence, *Liquor Amendment Bill* (2016) is calling for the restriction of advertisement of alcoholic beverages, prohibitions of sponsorship and promotion associated with alcoholic beverages. Their argument is based entirely on the fact that young people see alcohol use as socially acceptable and something that is on the agenda.

Youth learn to consume alcohol from their family members. Hayes, Smart, Toumbourou and Sanson (2004), in their study, discovered that that when parents use alcohol frequently, their children have an increased likelihood of being exposed to alcohol and related risk behaviours. If a father or mother, as discipliner or those who enforce discipline, is intoxicated, how then can such a person reprimand the child? Parents need to be wary of their own behaviour in the presence of their children, not only their children but also the children within the community. Elderly people have what is known as streetwise intelligence or wisdom and they cannot transfer their historical norms (specifically, mores) when they are intoxicated. Authors are of the notion that positive conduct from elderly people will result in reduction of binge drinking from youth as primary socialisation is instilled by them. Children assimilate mores learned from their family and accommodate what they learn on street as a way of attempting to broaden their vocabulary in their brains. United Nations Office on Drugs and Crime (2004) reported that young people start experimenting alcohol as part of their search for an identity and, as such, they use substances to define their belonging to a particular group or to relieve feelings of anxiety or stress in this search for the self.

Young people lack self-esteem and they associate themselves with alcohol to develop their self-esteem. This statement is backed by Suvitha, Navaneetha, Nappinai, Sridevy and Premila (2017) who discovered that youth with low self-esteem struggle to find success and happiness. This is mostly because they do not feel themselves worthy of enjoying such things. For that reason, youth indulge in alcohol abuse because it offers them a temporary solution to their problems. Their problems could include making friends in a new school. However, that does not solve the problem because, as much as they temporarily deal with their problems, they also expose themselves to potential alcohol addiction (Suvitha et al., 2017). Suvitha et al., (2017) further allude that alcohol increases self-confidence of alcohol first time users.

Donovan (2004) avows that youth indulge in alcohol abuse as a means of coping with stress, anxiety, or depression. It could be assumed that youth indulge in binge drinking because they attempt to deal with their life challengers, including their school work, not necessarily forget them. This assumption is supported by Keyes, Geier, Grant and Hasin (2009) who discovered that increased alcohol consumption was caused by academic stress. Liu, Keyes, and Li (2014) found that the relationship between academic stress and alcohol use was more likely to be moderated by peer influence. As such, they have encouraged that positive peer influences should be encouraged to delay the onset of alcohol use in adolescents. For example, adolescents with friends who focus on their school work could discourage alcohol abuse and encourage focus on their school work and vice versa. In other words, those youth that experience academic stress and negative peer support are vulnerable to embracing adverse drinking habits.

6. Conclusion

This paper covered array of psychosocial and demographic factors compounding to alcohol abuse amongst youth. Young people especially those who resides in rural areas are exposed to high density of alcohol outlets and they are

left behind by their parents. Due to lack of guardian or parental involvement they end up indulging into excessive use of alcohol. The study recommends that Alcohol Act should be amended and the age restriction to purchase alcohol should be reconstructed from 18 years to 21 years. In addition, universities, research institutes and publishing houses should implore to partner with community members to conduct awareness campaigns as intervention method on alcohol abuse.

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Self-Rated Health and Lifestyle/Food Habits in Japanese Junior High School Students

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Abstract

Adolescence is a crucial period for health status formation. Adolescence is the period during which health-related behaviours, such as nutrition-related behaviours and physical activities, are developed. Self-rated health (SRH) assessment during adolescence is strongly associated with general well-being and psychosomatic symptoms. The current study investigated the relationship between SRH and lifestyle, eating habits and attitudes toward food among junior high school students. A total of 438 students aged 13–15 years and their parents in the Hyogo prefecture of Japan participated in this study. Questionnaires were distributed to the students, who attempted them at home with their parents and returned them via Freepost envelopes. The questionnaires comprised the SRH assessment, lifestyle information, an unidentifiable description of the subject and their guardian's SRH, and 39 parameters regarding food-related habits and attitudes. The χ^2 test or Fisher's exact test were employed to assess any associations between the independent variables and SRH at a 5% level of significance. The differences between the healthy and unhealthy SRH groups were examined for all significant items using a logistic regression analysis after adjusting for sex and age. Of the participants, 188 (42.9%) returned both completed questionnaires. Among the respondents, 53.2% reported feeling very healthy. SRH assessment did not significantly differ with sex, age or school. Eleven parameters were significantly associated with SRH ($P < 0.05$ by χ^2 test). The guardians' SRH had no association with the students' SRH. The excellent SRH group had no headaches [odd's ratio (OR): 1.68; confidence interval (CI): 1.29–2.18], went to bed early [OR: 1.88; CI: 1.17–3.02], liked home-cooked meals to a greater extent [OR: 2.55; CI: 1.54–4.22], and had good exercise habits [OR: 2.98; CI: 1.27–6.99] compared with the very good to poor SRH group. High SRH was strongly associated with going to bed early, not having headaches, liking home-cooked meals, and having good exercise habits among Japanese junior high school students.

Keywords: self-rated health (SRH), junior high school students, cross-sectional study

1. Introduction

Self-rated health (SRH) status instruments are subjective by their nature however recent research studies have shown that they can help predict mortality risk (Finch et al., 2002; Robinson-Cohen et al., 2014). In addition, it has become clear that chronic diseases such as obesity, hypertension, diabetes, chronic kidney diseases and dyslipidaemia significantly increase as SRH decreases (Robinson-Cohen et al., 2014; Yamada et al., 2012). In these earlier studies, a consistent inverse association was observed between broadly perceived health status and mortality (Miilunpalo et al., 1997). In this way, SRH is associated with a varied lifestyle and some types of diseases. Thus, this metric has been extensively consulted in the fields of gerontology and public health (Sargent-Cox et al., 2008).

Among the various stages of life, adolescence is an especially crucial period during which concepts and decisions about healthful living are formed, for example regarding smoking, alcohol consumption, drug use,

nutrition-related behaviours and physical activity (Mechanic & Hansell, 1987; Vingilis et al., 2002; Vingilis et al., 2007). It is well known that the moulding of such views is strongly associated with social factors, including income inequality, family support school environment and peer influence (Viner et al., 2012). Therefore, the ideas and values regarding health that adolescents develop are very important because those will influence their future health, productivity, lifespan and their private as well as public medical costs. Indeed, it is widely acknowledged that adult illnesses are more prevalent and problematic among those who have experienced adverse early life health conditions (Danese et al., 2007; Galobardes et al., 2008).

SRH assessments among adolescents are strongly associated with both the status of a student's general well-being as well as psychosomatic symptoms, while providing a good measure of how well health-related issues are understood. Studies show that SRH status reports by adolescents are general health (Malinauskiene et al., 2011; Sharma et al., 2016). However, the adolescent stage of developments is very complex. For example, an adolescent may feel unhappy and become disengaged or disruptive, lose motivation to learn, and enter a downward spiral (Pietarinen, 2000; Kvalsund & Hargeraves, 2009). In extreme cases students who have been shown to be associated with low self-reported health status may drop out of school entirely (Yadav et al., 2010). Therefore, a better understanding of the SRH status of young children and adolescents is essential because it may influence their future health in many profound ways.

In particular, a recent study has shown that dietary intake is significantly related to eating habits, suggesting that dietary behaviours significantly influence health (Sharif et al., 2016). Our previous study indicated that SRH was strongly associated with the frequency of eating breakfast and liking home-cooked meals, for Japanese high school students aged 16–18 years (Osera et al., 2017). To the best of our knowledge, not many studies have specifically investigated the relationship between SRH and lifestyle as well as food choice habits in junior high school students. Therefore, in this investigation, we studied the relationship between SRH and lifestyle, eating habits and attitudes towards food in junior high school students.

2. Method

2.1 Study Design and Data Collection

This cross-sectional study was conducted from June to September 2017 and involved 438 students aged 13-15 years and their guardians, from both rural and urban areas of the Hyogo Prefecture in Japan. Two distinct questionnaires were sent at each student's residence, one for the student and another for his/her guardian. The questionnaires were completed at home and returned using postage-free envelopes supplied by the study.

The questionnaire comprised SRH, lifestyle (e.g. wake-up time); unidentified complaints (e.g. stomach ache) of the subject, the guardian's SRH, and 37 parameters regarding food-related habits and attitudes. The detailed questionnaire comprised SRH, mother's SRH, three demographic characteristics, six lifestyle characteristics (e.g. wake-up time, bedtime, sleeping habits, and self-reported BMI), five miscellaneous health-related parameters (e.g., tiredness, anorexia, dizziness, irritability, and cephalalgia), five parameters related to Breslow's seven healthy habits excluding alcohol consumption and smoking habits (Breslow & Enstrom, 1980), and 23 parameters related to food-related habits and attitudes (e.g. frequency of eating breakfast, food-related concerns, respect for food, watching TV while eating, and talking about food with family members). The questionnaire parameters were determined on the basis of our previous studies (Osera et al., 2016; Osera et al., 2017). Both 4- and 5-point rating scales were used, with higher scores indicating more positive food habits. For example, questions concerning 'respect for food' utilised a 5-point rating scale (5 = high concern, 4 = moderate concern, 3 = concern, 2 = little concern, and 1 = no concern).

2.2 Self-Rated Heath Status

Various global SRH questions were used, such as 'How would you rate your overall health?' and the responses were graded on a five-point scale (i.e. excellent, very good, good, fair, and poor) (Joffer et al., 2016; Warnoff et al., 2016; Wu et al., 2013). The SRH scores were grouped into two categories: [a] 'very healthy', which included responses of 'excellent' and [b] 'healthy' which group included responses of 'very good', 'good', 'fair', and 'poor'. All responses were put into one of the two categories: 'excellent' (excellent) versus 'other' (very good to poor).

2.3 Statistical Analyses

The χ^2 test and Fisher's exact test were employed to assess the association between the independent variables and SRH. T-tests were used to compare the 'excellent' group with other SRH groups for each variable. P values < 0.05 were considered statistically significant. Spearman's linear correlation analysis was performed to assess the relationship between SRH and student's lifestyle and food habits.

The differences between the healthy and unhealthy SRH groups were examined for all significant items using a logistic regression analysis after adjusting for sex and age. A dichotomy regression analysis was performed using a stepwise method. Variables that were significant in the bivariate analysis were subjected to logistic regression analysis. A binary regression analysis was performed using the stepwise method. A Hosmer–Lemeshow test was applied to determine the model's goodness-of-fit. Data were entered and analysed using SPSS statistical software for Windows, version 23.0 (IBM, New York, NY).

2.4 Ethical Statement

The participants were well-informed about the objectives and methods of this study; they voluntarily provided responses to the questionnaire and were free to withdraw from the study at any time. Individual privacy was strictly protected throughout the investigation. Consent signatures were obtained from the guardians of each student. This study was approved by the Kobe Women's University Ethics Committee Regarding Human Subjects, H29-1.

3. Results

3.1 Sample Characteristics and Item-Specific Responses

Complete responses to the questionnaire parameters and sample characteristics are summarized in Table 1. There were no significant differences between the two groups in terms of age, sex, grade, height, weight, or BMI ($P < 0.05$, Table 1). Of the 438 students and their guardians to whom the two questionnaires, one 'for students' and one 'for guardians', were sent, 188 (42.9%) returned both completed questionnaires. Of these, 48.4% were female and 51.1% were male; 43.1% of students were in the third, 28.2% were in the second, and 28.7% were in the first year of junior high school. The mean participant age was 14.1 years, and there were no significant differences between excellent vs the other status, nor among the types of schools involved.

Table 1. Distribution of the study samples by sex, grade and age, and SRH

	Variables	**Number**	**Percentage (%)**
Sex	Male	91	48.9
	Female	95	51.1
Grade and Age	Grade 1 (13 years old)	54	28.7
	Grade 2 (14 years old)	53	28.2
	Grade 3 (15 years old)	81	43.1
Children's BMI	Lower 18.5	100	50.5
	18.5 – 25.0	93	47.0
	Over 25.0	5	2.5
Children's SRH	Excellent	99	53.2
	Very good	70	37.6
	Good	13	7.0
	Fair	3	1.6
	Poor	1	0.5
Mothers' SRH	Excellent	54	27.1
	Very good	83	41.7
	Good	21	10.6
	Fair	34	17.1
	Poor	7	3.5

Note. SRH, self-rated health.

3.2 Relationship Between SRH and Students' Food Habits/Attitudes

All lifestyle, food habit, and attitude parameters displayed significant relationships with SRH (Table 2). The results suggested that positive lifestyle and food habits resulted in increased SRH. Among the student respondents, 53.2%

reported feeling excellent. Approximately one-third (37.6%, n = 70) of the sample reported feeling very good. The remaining 9.1% reported a 'good' to 'fair' SRH. No students answered 'poor'. Remarkably, the reported SRH value did not significantly differ according to sex, age or school. A considerable variety of factors were significantly associated with SRH ($P < 0.05$, χ^2 tests or Fisher's exact test), including: hours spent sleeping, going shopping for dinner, helping set the table, talking about food, respect for food, food-related concerns, liking home –cooked meals, remembering school lunches during childhood, being irritated, headaches and exercise habits.

Table 2. Bivariate analysis of association between independent variables and SRH

	Self-Rated Health						
	Excellent			Very Good to Poor			*P*-value*
	N	%$^{\$}$	%$^{\#}$	N	%$^{\$}$	%$^{\#}$	
Sleeping time							
After 12 a.m.	4	4.0	20.0	16	18.4	80.0	
10–11 p.m.	50	50.5	54.3	42	48.3	45.7	
9–10 p.m.	36	36.4	59.0	25	28.7	41.0	0.013
8–9 p.m.	7	7.1	63.3	4	4.6	36.4	
Before 8 p.m.	2	2.0	100	0	0.0	0.0	
Go shopping for dinner							
Never	24	24.2	41.4	34	39.1	58.6	
Rarely	42	42.4	60.0	28	32.2	40.0	
Sometimes	7	7.0	50.0	7	8.0	50.0	0.013
Often	18	18.2	50.0	18	20.7	50.0	
Usually	8	8.0	100.0	0	0.0	0.0	
Help set the table							
Never	10	10.1	34.5	19	21.8	65.5	
Rarely	27	27.3	52.9	24	27.6	47.1	
Sometimes	6	6.1	27.3	16	18.4	72.7	0.003
Often	37	37.4	67.3	18	20.7	32.7	
Usually	19	19.2	65.5	10	11.5	34.5	
Talk about food							
Never	4	4.1	33.3	8	9.3	66.7	
Rarely	12	12.2	48.0	13	15.1	52.0	
Sometimes	9	9.2	31.0	20	23.3	69.0	0.004
Often	45	45.9	57.0	34	39.5	43.0	
Usually	28	28.6	71.8	11	12.8	28.2	
Respect for food							
None	1	1.0	100.0	0	0.0	0.0	
Low respect	1	1.0	50.0	1	1.2	50.0	
Medium respect	5	5.1	33.3	10	11.8	66.7	0.000
High respect	24	24.5	41.4	34	40.0	58.6	
Highest respect	67	68.4	62.6	40	47.1	37.4	

Food-related concern							
None	0	0.0	0.0	4	4.7	100.0	
Low Concern	6	6.1	60.0	4	4.7	40.0	
Medium Concern	19	19.4	50.0	19	22.1	50.0	0.002
High Concern	27	27.6	43.5	35	40.7	56.5	
Highest Concern	46	49.6	65.7	24	27.9	34.3	
Liking home-cooked meals							
Dislike	1	1.0	100.0	0	0.0	0.0	
Do not like much	1	1.0	33.3	2	2.3	66.7	
Like moderately	3	3.1	25.0	9	10.5	75.0	0.000
Like a lot	17	17.3	34.7	32	37.2	65.3	
Like very much	76	77.6	63.9	43	50	36.1	
Remembering home-cooked meals during childhood							
Never	5	5.1	62.5	3	3.5	37.5	
Rarely	14	14.3	45.2	17	19.8	54.8	
Sometimes	5	5.1	22.7	17	19.8	77.3	0.015
Often	29	29.6	56.9	22	25.6	43.1	
Usually	45	45.9	62.5	27	31.3	37.5	
Feeling annoyed							
Usually	17	17.2	38.6	27	31.0	61.4	
Often	38	38.4	54.3	32	36.8	45.7	
Sometimes	13	13.1	46.4	15	17.2	53.6	0.041
Rarely	24	24.2	72.7	9	10.3	27.3	
Never	7	7.0	63.6	4	4.6	36.4	
Headache							
Usually	9	9.1	34.6	17	19.5	65.4	
Often	23	23.2	42.6	31	35.6	57.4	
Sometimes	4	4.0	36.4	7	8.0	63.6	0.003
Rarely	34	34.3	60.7	22	25.3	39.3	
Never	29	29.2	74.4	10	11.5	25.6	
Exercise habits							
None	1	1.0	33.3	2	2.5	66.7	
In the future I hope to	14	14.3	37.8	23	28.8	62.2	0.027
Yes, currently	83	84.7	60.1	55	68.8	39.9	

Note. *Significance was assessed using the chi-square test and Fisher's exact test.

$ % in parenthesis represents the percentage of responses to questions in the subgroup of children.

% value represents the percentage of the group 'excellent health' or 'very good to poor health' in children responding to each questions.

3.3 Correlation Between SRH and Students' Food Habits/Attitudes

Table 3 shows the correlation between SRH and students' food habits/attitudes. SRH was significantly positively correlated with lifestyle, food habits, miscellaneous health issues and Breslow's healthy habits for each variable as shown Table 3.

Table 3. Correlation between SRH and students' lifestyle habits

	Variables	SRH	
Lifestyle	Wake-up time	.155	*
	Bedtime	.195	**
	Hours of sleep	.160	*
Food habits	Eat with family in the morning	.162	*
	Help set the table	.241	**
	Talk with family during dinner	.263	**
	Respect for food	.201	**
	Food-related concerns	.158	*
	Like home-cooked meals	.231	**
	Remember home meals during childhood	.167	*
Miscellaneous health issues+	No Anorexia	.147	*
	No Irritation	.187	*
	No Headache	.273	**
Breslow's health issues	Hours of sleep (between 7 and 8 hours)	.159	*
	Exercise habits	.209	**

Note. SRH, self-rated health.

*Spearman's linear correlation analysis; *P < 0.05, **P < 0.01.

+Miscellaneous health issues include no anorexia, no annoy, no headache.

3.4 Multiple Logistic Regression Analysis

The logistic regression analysis results revealed that SRH was significantly and positively associated with headaches, sleeping habits, liking home-cooked meals, and good exercise habits (Table 4). The students' guardians' SRH had no association with their own SRH. These 11 variables from Table 2 were included in the logistic regression analysis. The 'excellent' SRH group had no headaches [OR: 1.68; CI: 1.29–2.18], went to bed early [OR: 1.88; CI: 1.17–3.02], liked home-cooked meals to a greater extent [OR: 2.55; CI: 1.54–4.22], and had good exercise habits [OR: 2.98; CI: 1.27–6.99] compared with the 'very good to poor' SRH group.

Table 4. Means and 95% confidence intervals of food habits by self-rated health in junior high school students after covariate adjustment

	OR	(95% CI)	*P*-value
No headache	1.68	(1.29, 2.18)	0.000
Go to bed early	1.88	(1.17, 3.02)	0.009
Liking home-cooked meals	2.55	(1.54, 4.22)	0.000
Having good exercise habits	2.98	(1.27, 6.99)	0.012

Note. OR, Odds ratio; CI, confidence interval.

The multiple regression analysis used a stepwise method.

Liking home-cooked meals indicates that the students prefer meals at home.

Adjusted for gender and age.

4. Discussion

This study revealed that high SRH status among Japanese junior high school students was strongly associated with going to bed early, not having headaches, liking home-cooked meals and having good exercise habits. Each

concept is discussed in further detail below.

A study on adolescents in Peru revealed that 10.2% adolescents had excellent SRH. In addition, Sharma suggested that SRH differed significantly with age group. A significantly higher SRH proportion of 11–14 age group to 15–19 age group (Sharma et al., 2016). Our study revealed that 53.2% adolescents had excellent SRH. Additionally, 90.8% were included in the 'excellent to good' SRH groups. A previous study involving Japanese high school students showed that 83.3% students had 'excellent to very good' SRH (Osera et al., 2017). The number of Japanese adolescent students with a high SRH than Peru students. Moreover, a study in Greece by Darviri et al. (2011) showed that reporting good SRH (excellent, very good, and good) decreased with age (97.1% in those 15–29 years old, 91.4% in those 30–49 years old, and 74.8% in those older than 50 years). In male Japanese workers aged 38.1 ± 11.7 years, 83.9% reported good SRH (Igarashi & Iijima, 2006). Thus, Japanese SRH may also be very high in the middle-aged individuals.

Tables 2, 3 and 4 suggest that 'going to bed early' was associated with SRH. Our results indicate that sleeping habits were related to SRH in junior high school students (Tables 2, 3, and 4). Previous research has also revealed that SRH is associated with sleeping habits. Good sleep and daily physical activity were identified as significant factors influencing positive SRH among children aged 6–16 years (Holmstrom et al., 2014). Additionally, sleep quality has emerged as an important determinant of SRH for most individuals (Darviri et al., 2011). Some researchers have suggested that these observations indicate that morning habits are associated with the health status of adolescents (Sjoberg et al., 2003). Our previous study indicated that morning habits are a very important factor affecting high school students' SRH (Osera et al., 2017). The current study suggests that students who have good sleeping habits (i.e. going to bed and waking up early) may have enough time to eat breakfast every morning. Most importantly, sleeping habits and attaining 7–8 hours of sleep are very important for young children. Sleeping habits were strongly associated with SRH.

Table 4 shows that liking home-cooked meals was significantly associated with a high SRH score (Tables 2, 3 and 4). During adolescence, the proportion of total nutrition consumed at restaurants, particularly fast-food establishments, significantly increases, whereas the amount of home-cooked meals consumed decreases (Bauer et al., 2009). Several studies have suggested that increasing the proportion of total food consumption obtained from meals prepared at home is essential to enable healthier food choices among overweight/obese adolescents (Watts et al., 2015). According to Watts and colleagues and our previous investigation, as well as the results of the current study, liking towards home-cooked meals is important and may be positively connected with overall health and is consistent with Bowlby's secure base theory (Bowlby, 2008). According to this author, having a secure base is extremely important for a child's healthy emotional and physical development.

In the current study, 85.7% of the enrolled students had dinners prepared by their mothers. In light of the positive connection between this pattern and better health, we suggest that students should primarily consume dinners prepared by their parents. This is because the trait of 'liking home-cooked meals' is good for a student's relationships with their parents, due to the nutrition of the home-cooked meal itself, and also because this may increase the stability of spirit and a sense of security. Additionally, achieving a good start at school was found to be important in reporting a positive SRH in 6-year-old children (Holmstrom et al., 2014). One study suggested that mental equanimity appears to be significantly important in enhancing SRH in male workers (Igarashi & Iijima, 2006). Moreover, good sleep and daily physical activity were also identified as significant factors that resulted in high SRH scores among children aged 6–16 years (Holmstrom et al., 2014).

Our results suggest that 'having good exercise habits' was associated with good SRH (Tables 2, 3, and 4). Poor SRH was associated with less physical activity in 15–29–year–olds (Darviri et al., 2011). Physical activity is related to SRH and is also an important factor for junior high school students. Additionally, Tables 2, 3, and 4 suggest that 'no headaches' was associated with SRH. Another important study revealed that male and female high school students who initiated smoking earlier reported poorer SRH compared with those who initiated smoking later and non-smokers (Piko, 2007). These findings suggest that SRH is a key factor affecting junior high school students' health. These data were similar to the findings of our previous study on high school students, which described five items related to miscellaneous health issues that displayed a significant relationship with SRH (Osera et al., 2017). High SRH was significantly associated with not being irritated and not suffering with headaches (Tables 2 and 3). If a student has a headache, they may feel that they are unhealthy. Lack of sleep and stress related to daily school activities can cause headaches in students (Visudtibhan et al., 2010). The previous paragraph highlighted that sleep and stability of the spirit or sense of security is related to SRH. Sleeping habits and stability of the spirit or sense of security may also be associated with headaches.

In the current study, we assessed the relative importance of students' lifestyles and food habits on their SRH via

multiple regression analyses (Table 4). Our findings suggested that SRH is a key factor in junior high school students' health. Most importantly, lifestyle factors, including going to bed early, not having headaches, liking home-cooked meals and good exercise habits, may be associated with junior high school students' SRH. In conclusion, the results of this study could benefit junior high school students.

This results described here and our previous study's results are slightly different. We found a significant difference between the health status of high school and junior high school students (e.g. age, the amount of study time and their sense of independence). In addition, these two studies differed substantially in the number of questionnaires employed, the number of questions asked and how the surveys were distributed, all of which helped lead to a significant difference in the results obtained. However, both studies revealed that both junior and senior high school students are widely involved in health improvement, and that Japanese adolescents generally have high SRH scores.

Although the questionnaires for the current study were distributed with postage-paid return envelopes, only 42.9% of students attempted and returned them. Therefore the students and their guardians who were ultimately included in this study's results may have had greater concerns about their lifestyle and food habits than those who did not return the questionnaires. However, we were unable to determine the magnitude of this possible bias. To further understand this phenomenon, the interventions and cohort studies must be separately evaluated. In addition, in the next study, we try to not only using self-assessment, but also body composition and muscle strength.

This study presents a self-rated health instrument, which may be able to estimate the level of children's well-being and health status. A high SRH status in Japanese junior high school students was strongly associated with going to bed early, not having headaches, liking home-cooked meals and good exercise habits. These students reported better health than those who did not possess these lifestyle characteristics.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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What Are the Experiences and Needs of Primary Care Nurses in Caring for Patients With Type 2 Diabetes in a Rural Village in South Africa? An Exploratory Study

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Abstract

Since 1994, the emphasis in the provision of health services in South Africa has shifted from hospital-based care to a community-based comprehensive primary health care system, especially important in the management of chronic diseases. However, primary health care professional nurses are not well trained to manage chronic conditions like type 2 diabetes. Therefore, this study aimed to explore the experiences and needs of primary care nurses as a basis for the development of a training programme for professional nurses who care for T2D patients. A qualitative descriptive approach was employed, using individual interviews with primary health care nurses caring for T2D patients in the Ga-Dikgale village clinics. Ethical considerations were observed throughout the study and quality supportive measures were employed. Three main themes emerged from the study findings which address the current practices and knowledge of professional nurses related to care provided to diabetes patients, the challenges experienced by professional nurses during the provision of care to diabetes patients on treatment and their training experiences, gaps and needs. A need for continuing education for professional nurses related to the care of patients with diabetes was identified. The results of this study will be used to develop a training programme to improve the knowledge and skills of professional nurses and to improve the quality of care of patients with type 2 diabetes.

Keywords: non-communicable diseases, T2D, training needs, training programme, primary care nurses

Abbreviations

T2D: Type 2 Diabetes; NCDs: Non-Communicable Diseases; PHC: Primary Health Care; HIV: Human Immunodeficiency Virus; TB: Tuberculosis; TREC: Turfloop Research Ethics Committee; EDL: Essential Drug List.

1. Background

Type 2 diabetes (T2D) is one of the fastest growing chronic non-communicable diseases (NCDs) and has become a global epidemic (Unnikrshnan, Pradeepa, Joshi, & Mohan, 2017). Type 2 diabetes is characterized by impaired insulin secretion and insulin resistance in peripheral tissues, such as adipose and muscle, and the liver. The decrease in insulin secretion is due to the gradual decline in pancreatic beta-cell function (Stumvoll, Goldstein, & van Haeften, 2005). Over the past three decades, the number of people with diabetes mellitus has more than doubled globally, making it one of the most important public health challenges for all nations (Chen, Magliano, & Zimmet, 2011). Diabetes has caused 1.5 million deaths in 2012, an estimated 422 million adults were living with diabetes in 2014 (WHO, 2016). In 2013, about two-thirds of all individuals with diabetes lived in lower-middle-income countries (IDF, 2013). According to Braun and Clarke (2006), an estimated 415 million people have diabetes throughout the world, with the number set to rise beyond 642 million within the next two decades. Over 90% of cases of diabetes mellitus are of T2D a form of diabetes (WHO, 2009).

South Africa, like many other countries, reports an increase in the prevalence of non-communicable diseases such as diabetes mellitus (Malan, Mash, & Murphy, 2015. This burden of disease has led to increased workloads,

overcrowding of health facilities and poor quality of care. Also, it has exerted a tremendous strain on human resources in the healthcare system, especially on those working at Primary Health Care (PHC) level (Tsolekile, Puoane, Schneiden, Levitt, & Steyn, 2014). Professional nurses play an extremely important role in the management of patients with T2D in PHC settings. They are often the first healthcare team members to interact with patients and are called on to apply their knowledge, training, and skills to treat, follow-up, educate and motivate patients with diabetes about self-care and practical ways to achieve their treatment goals (Levich, 2011).

Training of nurses at PHC level is vital to ensure that they can contribute appropriately to the management of non-communicable diseases, including diabetes. Because of their central role in primary healthcare, they are well placed to support early diagnosis in diabetes. It is essential that efforts are made to diagnose diabetes early to prevent the complications and to begin early management interventions of the disease (Ramachandran, 2014). Early control of glycaemia and dyslipidaemia, together with regular examination for macrovascular and microvascular complications, with appropriate and timely interventions, are the only ways to prevent and reduce morbidity and mortality related to diabetes (Amod, Motala, Levitt et al., 2012).

Nurses play a critical role in empowering patients to better manage diabetes through self-care and improving the quality of life of these patients through providing them and their families with the required information and consultations (Vissarion, Malliarou, Theofilou, & Zyga, 2014). Enhancement of the glycemic control and quality of life of those afflicted with diabetes requires the incorporation of education in the treatment modality, aiming to teach diabetics the methods by which they can live with and manage their disease daily (Burke, Sherr, & Lipman, 2014). Previous research has shown that behaviour change counselling integrated into routine primary care is effective in assisting patients to change their risky behaviours (Murphy, Mash, & Malan, 2016).

Lack of knowledge and inconsistent practice pertaining to T2D diagnosis, evaluation and management among professional nurses, long intervals between patient visits and limited consultation time, resulting from overwhelmingly heavy patient loads constitute major impediments to the attainment of diabetes-related goals of (Roumie, Elasy, Wallston, Pratt, Greevy, Liu, Alvarez, Dittus, & Speroff, 2007). Educational programmes for nurses with a focus on reducing the risk factors of diabetes, monitoring and controlling blood sugar levels and diagnosing, preventing, and treating hypo and hyperglycemic states are required (Peimani, Tabatabaei, & Pajouhi, 2010). Nurses should be able to: screen patients for early identification, recognise and initiate corrective measures for inadequate treatment regimes, help patients set and achieve therapeutic goals and assess diabetes-related complications as they arise (Levich, 2011).

Prior research in the Ga-Dikgale area reveals that nurses lack training in chronic disease management. The nurses attended supplementary training programmes on HIV, TB, Child Health but little on diabetes, hypertension, mental health or cardiovascular diseases. This indicates that there is a need for the training of professional nurses who care for patients with diabetes in the Ga-Dikgale village clinics. However, to develop a context-specific training programme for those nurses, their specific knowledge gaps and training needs need to be identified (Maimela, Van Geertruyden, Alberts, Modjadji, Meulemans, Fraeyman, & Bastiaens, 2015).

Therefore, the objectives of the study are to:

- Explore and describe the experiences of professional nurses related to care provided to patients with Type 2 diabetes;
- Identify the training needs of professional nurses regarding Type 2 diabetes.

2. Method

The research reported on in this paper is part of a larger study which aimed at the development of a training programme for primary care nurses on T2D in rural clinics in South Africa. In the first stage, a situational analysis was conducted, employing a mixed method approach, making use of the complementarity of qualitative and quantitative research methods to get insight into the knowledge, experiences and training needs of these nurses (Fetters, Curry & Creswell, 2013). This paper reports on the qualitative part of the research. A descriptive qualitative study approach was adopted to explore and understand the experiences and learning needs of nurses taking care of patients with diabetes in the Ga-Dikgale village from their perspective.

2.1 Study Site

The study was conducted in the rural area of the Ga-Dikgale village in Limpopo Province, South Africa. The Ga-Dikgale village is situated in the Capricorn District, which is approximately 50km northeast of the capital city of Limpopo Province, Polokwane. The study was conducted in the three primary health care clinics: Sebayeng, Seobi and Dikgale which provide comprehensive integrated health care to the community.

2.2 Study Population and Data Collection

The population eligible for this study was primary health care nurses working in the three clinics and having at least two years' clinic experience caring for patients with diabetes. A total population of purposive sampling was used to select the participants because all 27 participants met the selection criteria.

Semi-structured, one-on-one interviews with an interview guide (see Appendix-) were used to explore and describe the knowledge and practices of the professional nurses caring for patients with diabetes in the Ga-Dikgale village clinics. A semi-structured guide was developed by ES (female professional nurse, who had basic training in qualitative research) in collaboration with TM (professional nurse, experienced qualitative researcher) and HB (medical doctor, experienced qualitative researcher). The guide consists of three main questions (Table 1). Interviews were conducted by ES, who is working as a hospital nurse caring for patients with diabetes in another province in South Africa. This meant that she did not know the study participants. In the preparatory phase of the research, ES was in contact with the head nurses of the different clinics. Permission was asked to approach the nurses to invite them to participate in the study and to conduct the interviews during their working hours at the clinic. The individual interviews were voice recorded and field notes were written for the aspects that could not be captured by the voice recorder. Probing questions were asked to clarify issues during the interview sessions. A total of 18 professional nurses who were available during data collection were interviewed. Eight professional nurses were on their rest days and one was on leave during data collection. Sufficiency of the collected data was checked to ensure credibility and the second round of data collection was conducted where a total of 23 professional nurses were interviewed until sufficient data were available for the study. Interviews took between 25 and 40 minutes.

Table 1. Interview guide main questions

What are your experiences with patients with diabetes?
What are the challenges you face in the care for patients with diabetes?
Do you feel the need to learn more about care for patients with diabetes? Please explain how. What would you like to learn?

2.3 Data Analysis

Data were analysed using a thematic method of data analysis, combining both deductive and inductive coding. The main interview questions were used as an initial coding frame. The researcher read and re-read the transcripts several times to be familiar with the entire body of data before continuing with the analysis. After that, descriptive coding was undertaken, labelling relevant pieces of text and producing a list of descriptive codes. Data was put back together in new ways, making connections between codes and grouping similar codes into broader themes and sub-themes. Further grouping of the emerging ideas into sub-themes was carried out using constant comparison. Ideas from additional interviews were added and coded interviews were reread to ensure that they were comprehensive. During the whole coding process, regular discussions were held with the research team (ES; TM; HB) to support trustworthiness (King & Horrocks, 2010).

2.4 Ethical Considerations

Ethical clearance was obtained from the University of Limpopo Research Ethics Committee (TREC). The study ethical clearance reference number is TREC/37/2016: PG. Permission to collect data in the health care institutions was obtained from the Limpopo Province Department of Health Research Ethics Committee. Informed consent was obtained from all participants before the start of each unstructured interview session. The aim and nature of the study were explained to the participants before data collection and they were informed that results would be used for scientific purposes and might be published. The names of the participants were not used and numbers were allocated to each participant to ensure anonymity. Only the researchers have access to the data obtained to maintain confidentiality (Holloway & Galvin, 2016). Interviews were conducted in private rooms away from distractions to ensure privacy.

2.5 Results

In total, 23 nurses were interviewed. Interviews took an average of 25 to 40 minutes. Characteristics of the participants are described in Table 2.

Table 2. The organisation of the participants

Characteristics	Number
Experience	
<5 years	3
5 – 10 years	9
11 - 15 years	5
16 – 19 years	4
≥20 years	2
Level of education	
Diploma	18
Baccalaureate Degree	5

The interview data were grouped in three main themes (Table 3): Current practices and knowledge of professional nurses related to care provided to diabetes patients on treatment, Challenges experienced by professional nurses during provision of care to diabetes patients on treatment, training experiences and gaps and needs.

Table 3. Themes and sub-themes

Main themes	SuSub-themes
1. Current practices and knowledge of professional nurses related to care provided to diabetes patients	Nurses perform diverse tasks and roles
	Nurses' collaboration with other disciplines
	There is a diverse level of knowledge among nurses
2. Challenges experienced by professional nurses during the provision of care to diabetes patients on treatment	**Challenges related to the patient**
	Problems related to denial and misconceptions
	Problems related to patients' continued risky practices and non-adherence to recommended treatment
	Patients' socio-economic context
	Problems related to inadequate knowledge or self-management skills
	Challenges related to the organisation of health care
	Shortage and non-functionality of machines and the shortage of medication
	Shortage of nurses and other services in the clinics
	Shortage of resources like guidelines and training
3. Training experiences, gaps and needs	Lack of attendance and unavailability of diabetes training programmes viewed as problematic in managing the condition
	What topics nurses want training in
	How nurses want the training-

Theme 1: Current Practices and Knowledge of Professional Nurses Related to Care Provided to Diabetes Patients

Experiences with T2D nurses described during the interviews reveal that in practice they **perform several different tasks** in diagnosing, treatment follow up, educating patients, management of complications, referring patients for specialised care and emergency care. The nurse's role during the diagnosis of diabetes includes a thorough assessment of the patients, rapid and laboratory blood glucose tests and urine dipstick tests. If the

diagnosis is confirmed, the patient is offered health education about lifestyle, diet, exercises, and then the patient is referred to a doctor for the initiation of treatment. After this, the patient is referred back to the clinic for follow up treatment and further support and care by the nurses.

"If the patient comes to the clinic for the first time we do an initial assessment of the patient and check the blood sugar and we find that it is high then we tell the patient to come the following day in the morning before eating. Then we do the fasting blood glucose but we start by doing the rapid test to check maybe the blood glucose of yesterday it was triggered by something" [nurse 3].

Minor complications of diabetes and some emergency cases are managed in the clinics and later referred to a hospital if there is a need, the complicated cases are referred to the hospital for specialised care.

"Normally when it is a newly diagnosed because this patient does not have treatment if the blood sugar is 20 and above we normally put a Normal Saline drip to reduce the blood sugar then we call the ambulance for the patient and we refer the patient to the hospital" [nurse 1].

According to participants, patients are referred to the next level of care, based on the signs and symptoms that they present with when consulting the clinic. The signs and symptoms that the patients present with include: high glucose levels, dizziness, dry mouths, blurred vision and others. When referring patients, the referral note should outline the reason for referral. The participants mentioned what should be included in the referral i.e., patient's history, findings from the assessment and tests carried out and medication that the patient received before referral.

"If there is a problem we refer them to the hospital, for example, if a patient says l usually feel dizzy or has blurred vision after taking medication we advise the patient to go to the hospital and see the doctor because we are not sure what it is the cause" [nurse 3].

"Eeh, the contents we talk about what you find to the patient, the history and even my assessment. Whether there is a dry mouth for an example. You indicate everything there also even indicating the blood sugar level and treatment given [nurse 13].

The findings reveal that **multidisciplinary team services** and resources are available at the clinics to support the health services rendered to patients with diabetes. The multidisciplinary teams include the **doctor**, **dietician and the pharmacist.** The services of the multidisciplinary team occur on different dates. They may be weekly, monthly or fortnightly. According to the participants, there are scheduled days for doctors to visit the clinics and see patients with diabetes and also to give support to professional nurses.

"I consult colleagues or send patients to doctors in the hospital. On Thursdays, we are having visiting doctors if we are having problems we refer difficult patients to them. We also consult doctors in the hospital and refer the patients" [nurse 18].

"With those type of patients, the pharmacist come and dispense insulin to them. For the patients that are not in, we take their insulin and store in the fridge" [nurse 4].

"If you see that he comes in the consulting room you ask a question to check if he understands what you have told them in the morning when giving health education and the dietician is there if you find that this patient needs to be referred, we refer him immediately to the dietician to be seen by the dietician" [nurse 2].

The clinics receive support from the **laboratory services** every day, except weekends and holidays and the pharmaceutical services every week. The nurses collect specimens from patients, and the laboratory services come and collect the specimens for testing and bring the results back. The pharmaceutical services from the hospital visit the clinics to dispense medication that is not stored in the clinic. This includes insulin injections and oral medication.

"Yes, National Health Laboratory Services (NHLS) is coming every day from Monday to Friday. Weekends they are not coming. If the patient comes during the weekend we encourage them to come early in the morning Monday" [nurse 3].

The level of knowledge differs among the participating professional nurses: some lack of knowledge while others are knowledgeable about diabetes.

"Normally if the patient is newly diagnosed we refer them to the diabetic nurse so that they should go for training regularly or they need to be health educated by a person who knows this condition [nurse 13].

Theme 2: Challenges Experienced by Professional Nurses During Provision of Care to Diabetes Patients

Several challenges were experienced and described by the participants, linked both to the patient and to the healthcare system.

Challenges related to the patient

The findings reveal that professional nurses experience challenges during the provision of care to patients with diabetes. Some challenges affect the patients' blood glucose levels and lead to complications related to diabetes. The attitudes, behaviours and other personal characteristics of patients contribute to poor treatment outcomes, lack of adherence to treatment and complications related to the disease. These may include: denial and misconceptions, continued risky behaviour/non-adherence to advised treatment and lack of knowledge and self-care skills.

Denial and misconceptions displayed by the patients retard progress and lead to treatment failure. Sometimes patients, after being diagnosed with diabetes, go into denial and think that they have been bewitched. They go to the traditional and faith healers for help and stop following the medical advice and taking their medication.

"Before newly diagnosed patients can accept they start by having denial emotions first because you find that before sending that person to diabetic nurse when they come home or they come back to our facility they still have that high blood sugar until they adjust themselves they just continue with those" [nurse 4].

"In December an old man who was known diabetic came to the clinic limping and said I have consulted traditional healers and have told my children that l was bewitched. In the clinic, we gave the old man antibiotics and dresses the wounds until they are healed. I told him that it is not witchcraft, it is because of the blood sugar. So I teach patients that if they develop some sores or wounds which takes time to heal it is not because they have been bewitched" [nurse 2].

"Some patients deny that they are diabetic and will not stick to the advice about diet. They will continue taking wrong food and abuse alcohol and when you give health education about the lifestyle they will tell you straight that they are not diabetic" [nurse 14].

The participants think that **patients' continued risky behaviour and non-adherence to advised treatment** lead to uncontrolled blood glucose levels and complications related to diabetes. Patients are taught what to eat and what not to eat, when to come for follow up visits and how to take their medication. However, they still adhere to the risky practices of not following the instructions of the health care professionals. This happens especially during **social events and funerals** when some patients with diabetes do not adhere to the medical advice that they have been given. This may lead to patients presenting with uncontrolled symptoms which may lead to complications.

"Some patients do not comply even if you try to teach them and they don't care what they eat and the other thing is that when you tell the patient that when the sugar is not controlled the doctor will change the treatment and prescribe both the insulin and the oral anti-diabetes treatment, you find that the patient does not want to use the injection because they are used to oral and it becomes difficult to manage the client and the sugar and you find that the sugar becomes high all the time" [nurse 10].

"Hmm, my experience is that diabetes is not like hypertension it is difficult to control and most patients they find it difficult to control the sugar level because of the food they eat. Here in the clinic, most patients come with high sugar level when you try to ask about the food they eat you find that there is a problem. They were told what to eat but sometimes they find it difficult to adhere to the diet" [nurse 12].

"When you take history they will tell you that maybe l went to a funeral or something like that and l ate whatever is there. They don't consider their condition, but at home, they can say l am not eating one two three but when they go to funerals or parties you find that they just take whatever is available" [nurse 1].

The findings reveal that the **patients' socio-economic context** may lead to difficulty in adherence to treatment and related medical advice. Lack of money for transport when referred to the hospital for further management by the doctor or other medical teams and lack of support from family members lead to poor adherence to treatment and medical advice.

"If the patient fails to collect her insulin during the collection day maybe on Thursday and he comes to the clinic to report that her insulin is finished you can send her to the hospital is a challenges because you find that she is telling you that l don't have money or l don't have somebody who will accompany me to the hospital" [nurse 2].

"You can give the patient referral and the patient will say l don't have money and then she has to stay home for a while until she got the money" [nurse 5].

"I think it might be the background because most people in this area most of the people are not working they just eat what they come across even if they are restricted according to their condition because it is what is available they just eat" [nurse 13].

Nurses indicated **the importance of knowledge and self-management skills** and the fact that some patients possess knowledge and skills regarding diabetes and others do not. Knowledgeable patients seem to take their medication as prescribed and they follow medical advice and make good progress. Their blood glucose levels on

follow up visits are controlled and they do not show signs of non-adherence and complications of diabetes.

"They must know what is happening in their bodies. Sometimes you will hear a person saying l don't eat sugar or a person will think to say he has diabetes because he ate a lot of sugar. So we tell them that diabetes is not there because they ate a lot of sugar. There is something in the body that is not working well" [nurse 18].

"They know what to eat and what not to eat and even their lifestyle they understand that they are not supposed to maybe in case of shoes they have to put on loose shoes so that they don't have to damage their legs or they don't have to walk barefooted because if they are pricked by something like needle or pin the wound will not heal quickly. They take their treatment the way you have told them" [nurse 1].

Lack of knowledge regarding diabetes is a challenge. Sometimes it is related to the fact that **some patients are old** and are not able to follow the treatment as prescribed.

"Ya, I have been working in the clinic seeing diabetic patients on Thursdays. Most of the patients are old and they are not sure about diabetes. They don't have knowledge that is why they eat like any person. They don't choose what they eat. We teach them what to eat but they don't understand. Some say instead of putting sugar in the tea they put brown sugar because they believe brown sugar does not raise blood sugar. Otherwise, they come to the clinic for treatment" [nurse 2].

Participants observed that some patients lacked knowledge and understanding of diabetes, self-management strategies and treatment and complications. Nurses stress the importance of their role in educating people about diabetes and the fact that they do not always succeed in educating their patients.

"The things that are hindering the treatment of the diabetic patients l can say the clients that do not have insight concerning the condition, they usually do things that they are not supposed to do" [nurse 5].

"I am not sure maybe the patients do not understand when we teach them about diabetes. Maybe we are not giving them enough information I don't know. They forgot what we teach them, some of the patients come high HGT sometimes 19 and above. They claim to be taking the treatment regularly, they don't adhere to the education we give them about diet, sometimes you find that the sugar is either high or low" [nurse 6].

"My experience is that most of the patients are unable to adhere to the treatment especially males. They sometimes forget to take their medication as prescribed; they lack self-management strategies. When you try to find out the reasons for non-adherence you are told that they have forgotten" [nurse 2].

"Some of the patients they don't know how to use pen insulin and they don't want it they refuse it they just want the syringe one" [nurse 2].

Challenges related to the organisation of care

The study findings reveal that there are challenges related to the organisation of health care in Ga-Dikgale village clinics. There is a **shortage of some of the equipment** used for the care of patients with diabetes. This makes it difficult for nurses to function as expected. Some clinics are short of equipment like glucometers, glucostix and blood pressure machines which are necessary for the baseline monitoring of the patients. In some of the clinics, the equipment is available but is non-functional. According to the participants, it takes a long time to replace and repair the broken equipment. The challenges related to the organisation of health care delays the proper assessment and management of patients.

"Sometimes we also don't have the resources to care for the patients. Like for an example, the HGT machine become broken and we don't know what to do or the test strips are not there" [nurse 17].

"The challenges that we come across sometimes the machines are not working and the patient coming to the clinic are not tested for their glucose level that day. You just give the medication but you don't know how blood glucose today. If there is a problem we refer them to the hospital, for example, if a patient says l usually feel dizzy or has blurred vision after taking medication we advise the patient to go to the hospital and see the doctor because we are not sure whether it is hypoglycemia or hyperglycemia" [nurse 3].

The study findings revealed that there is sometimes a **shortage of medication** in the clinics which leads to poor patient outcomes, medication errors and delayed or cancelled care. Sometimes patients are sent home and advised to come for medication on certain dates.

"Ok, we care for diabetic patients every day and sometimes we are experiencing a shortage of diabetic treatment at our facility, for an example Glucophage but we do ask from other facilities" [nurse 9].

"The challenge is that sometimes we don't have medication for diabetes in the clinic. You find that we have got one or two and the other medication is not there. And sometimes the blood glucose machine is not working and it becomes difficult to measure the blood sugar" [nurse 10].

The study findings reveal that there is **a lack of dieticians in some of the clinics**. Patients from the clinics that do not have dieticians are referred to the hospital, or to the other clinics, to be seen by the hospital dietician.

"No, we don't have a dietician in the clinic. If we want to refer the patient to the dietician we just refer to the hospital or clinics with dieticians. But before then the doctors are the one who initiates treatment in the hospital then they have got the chance to send the patient to the dietician. Then the dietician will advise them about the diet" [nurse 4].

"Yes, but those who don't stick to the diet we see by the blood sugar level when they are coming to collect treatment you find that their sugar is recording high. We refer them again to the hospital to be seen by the dietician" [nurse 2].

Some participants confirmed that there is **a lack of diabetes nurses** and that they rely on the doctors to see the patients instead of referring them to diabetes nurses who are well informed in teaching the patients about diabetes.

"There is no one who is trained as a diabetic nurse. We are all the same" [nurse 2].

"I suggest that maybe if we can have a diabetic nurse, somebody who will go for training on diabetes to be a diabetic nurse" [nurse 1].

The clinics have guidelines and protocols that should be followed during the care of the patients but, due to the **shortage of resources,** nurses are unable to adhere to the available guidelines and protocols.

"Yes, we do have guideline but we don't have the equipment to monitor patients like blood pressure machine and glucometers. We tell patients to come back the following month for follow up and monitoring" [nurse 17].

Availability of **teaching aids** would assist patients to understand their condition better. One participant confirmed that the use of teaching aids when offering health education to patients makes them understand and take an interest in knowing more. Looking at teaching aids enables them to ask questions.

"There was a day when l was teaching patients about diabetes and l saw them looking at me. I was using something like a book which l found from one of the doctors. I showed the patient a poster from the book and they were anxiously looking at the posters to show that they want to know more about diabetes. I showed them the pancreas and l told them that the organ l am showing you is found in your body. I wish to have posters so that l can use to show them where sugar comes from or a doll to use in the morning when we give health education to use and demonstrate with it. Like if you have posters you will be able to show them the organ that leads to diabetes. You will show them and touch the part that is sick in the body that makes a person to be diagnosed as having diabetes. If possible show them the pancreas and tell them how does this lead to diabetes" [nurse 2].

Theme 3: Training Experiences, Gaps and Needs

The study findings reveal that most participants had not received training about diabetes other than during their basic training to be professional nurses. In the three clinics, only one professional nurse had attended diabetes training. The training was arranged by a private services provider. Participants think that the scarcity of diabetes training programmes leads to mismanagement of patients. The participants do not have confidence in what they are doing when they take care of patients.

"I'm still applying the skill that I obtained at college when l was training as a professional nurse. I learned about diabetes when l was in college as a student nurse" [nurse 3].

"All along we have been mismanaging patients because of unavailability of training regarding diabetes and l guess the majority of professional nurses who are not informative enough the trend continue of mismanaging or mishandling patients" [nurse 6].

"At the clinic, we are not taught to prescribe diabetic treatment we rely on the doctors from the hospital. So we issue treatment that has been prescribed by the doctors" [nurse 16].

"If the patient is the first time attending the clinic then diagnosed with high blood sugar that is where we not sure whether is Type 1 or Type 2 unless the doctor diagnoses that patient. That is where we find that it is difficult" [nurse 17].

One participant confirmed receiving training in the form of a workshop on two occasions while employed as a professional nurse. According to the participant, the knowledge gained during the basic training courses helped understand the condition and manage the patients effectively. She is now able to feel for the patients because in the training they were made to act like a patient with diabetes. According to the participants, it is important to attend diabetes training courses to improve patient care.

"Yes, I attended a three-day course where we training to live like a diabetic. The whole of three days we were given Placebos in the form of sweets being tablets for us. And then we were supposed to eat like a diabetic, exercise like

a diabetic, inject ourselves with insulin, take medication after having those meals. In the morning take the fasting blood glucose, eat then after eating, test blood glucose again and then after that take medicines. And then we have witnessed that it is difficult to live like a diabetic patient because the majority of the class we did not manage to have the doses correctly at the prescribed scheduled times, the other one was about us how to screen, prescribe and take care of the patients with diabetes at the Primary Health Care level" [nurse 17].

*"I liked the courses on diabetes because they improved my work performance and patient care. The first training taught us how to feel for a patient and the second one was teaching us on how to manage a patient with diabetes in the Primary Health Care setting" [nurse 17]***.**

Since they had started practising as professional nurses, they had not attended any workshop except for the sessions where they reminded each other of what they had learnt.

"Hmm, I think we are having more information that we received during the basic training about diabetes but we just want to be reminded and most of the time we are busy we don't provide the proper care but the information we have" [nurse 18].

"I'm still applying the skill that I obtained at college when l was training as a professional nurse. I learned about diabetes when l was in college as a student nurse" [nurse 2].

Training Needs

The participants confirmed the **need to receive training** about diabetes. Also, they mentioned other topics that they wanted to receive training on. According to the participants, training would build their confidence when providing care to patients. Currently, they rely on the Essential Drug List (EDL) provided by the Department of Health and are not conversant with changes and new treatment protocols.

"Yes, l feel there is a need to learn more about diabetes because we rely on EDL only. Since things are developing and we find that we still use the old regimen and not the recent treatment protocols" [nurse 10].

"Yes, I think there is a need. Because now we are using the information that we got from training and things are changing, they must keep us updated with the new developments about diabetes" [nurse 15].

Participants listed the **different topics they needed to be trained on**. The listed topics include anatomy and physiology of diabetes, identification and management of complications related to diabetes, assessment, how to assist patients to self-manage the disease, coping strategies, diet, exercise and treatment adherence.

"I want to know the management of the different types of diabetes and the type of people who are at risk of being diabetic; how to prevent diabetes; we need maybe more information about diabetic" [nurse 3].

"We want to know how to teach patients about diabetes, about diet and self-management of diabetes and how to self-inject insulin" [nurse 8].

"I would like to learn more about ehh, foot care in the diabetic patient, how to manage complications of diabetic patients especially the hypoglycaemic patients and others we need to learn more" [nurse15].

"Yes isn't when you teach you must start with the introduction and tell us what diabetes is, give the background and everything. You have to start with everything. Like the anatomically part of it, coming to lifestyle and treatment" [nurse 5].

Participants gave different opinions about **what form their training should take.** Some participants would prefer in-service training, while others would prefer the training to be in the form of a workshop. Further, the participants indicated that other categories of nurses should be trained about diabetes because patients are first seen by them when checking vital signs before they are seen by professional nurses or doctors.

"I prefer the training to be in the form of an in-service because it can be done at any time. Whoever is at work can be in-service and can in-service other staff" [nurse 9].

"The training should be in the form of a workshop and should be conducted in a central place and not in the clinics because in the clinics there is no space" [nurse 4].

"Yes, I was suggesting that when you conduct the training you much teach all the categories because when the patient initiates at the clinic they are seen by the nursing assistant and they must know what the patient is expecting so that is why I'm suggesting that all categories must be included" [nurse 7].

3. Discussion

Diabetes is one of the four priority non-communicable health problems and a leading cause of morbidity and mortality worldwide (Kakkar, 2016). In South Africa, nurses are regarded as the backbone of primary health care services where patients with all types of diseases and health problems, including diabetes, are seen before they go

to the next level of care (Swart, Pretorius, & Klopper, 2015). This article aims to present the findings of a qualitative study of the experiences and training needs of primary care nurses in caring for patients with diabetes and to indicate how these needs will inform the development of a training programme. The findings correspond with previous studies which find that, although professional nurses at Ga-Dikgale clinics are at the forefront in the care of patients with diabetes, they lack the knowledge and are poorly trained in the management of chronic diseases, including the management of diabetes (Maimela et al., 2015).

This study highlights the great need for training in diabetes management and the care of patients with diabetes. Study participants indicated that as the front-line health professionals they have a vital role to play in the initial management of patients with diabetes in primary health care settings. They are responsible for the administration of medication, giving care to patients with diabetes, educating patients about the diabetic treatment regimen and lifestyle changes and this is in line with previous research conducted by Uğur, Demir, & Akbal, (2015). The study findings indicate that there is a need to improve the knowledge and practice of professional nurses, particularly in the care of patients with diabetes, through continuous training.

In South Africa, the basic nurse training curriculum includes training about non-communicable diseases including diabetes and hypertension. According to the Nursing Act (2005), nursing education and training across South Africa are responding to changing needs, developments, priorities and expectations in health and healthcare. Nurses need to be equipped with the knowledge and skills to improve the health and wellbeing of patients and their families.

The study findings indicate that inadequate knowledge and practices related to the care and treatment of patients with diabetes give rise to poor patient outcomes. Despite the increased number of patients with diabetes in Ga-Dikgale, the training of nurses on the care of these patients is not been considered effective. The majority of participants revealed that they only received training about diabetes while they were training to be professional nurses and, since their being employed as professional nurses, they have not attended any workshop or course on diabetes. The study conducted in the Ga-Dikgale village clinics by Maimela et al., (2015) reveals that nurses attended training on HIV, TB, Child Health but little on diabetes, hypertension, mental health or cardiovascular diseases. In the clinics, the visiting doctor's support and initiate treatment of the newly diagnosed patients and nurses refer all newly diagnosed patients to the doctor for the initiation of treatment because of their lack of knowledge on how to initiate treatment.

In South Africa, the structure of the healthcare system comprises different levels, from the most basic services at Primary Health Care (PHC) level to the most sophisticated at tertiary levels of care. A holistic approach in caring for patients with diabetes, including collaboration with other health care professionals, is needed (Ofori & Unachukwu, 2014). The studies reveal that when there is a need, patients have to be referred to other health care professionals and other levels of care for further management. Patients are usually referred to using a letter which states the reasons for referral. This referral letter acts as a permission slip to allow the patient easy access to treatment by a specialist at the hospital level. As soon as the problem for which a patient was referred to is solved or under control, the patient moves back to the clinics.

Nurses at the primary level of care should know how to refer to the next level of care and what and how to write the referral note. Participants also mentioned that, as they lack knowledge of how to manage complications related to diabetes, they refer patients with complications to the hospital to be seen by the doctor. The participants feel that it is good for patients to be referred for major complications that cannot be handled at the clinic level but that in minor cases, the nurses should be empowered to handle those cases at the clinic level.

This study has highlighted that there are several misconceptions about diabetes. Even when patients do know and understand the biomedical origin of diabetes, some patients still attribute the cause of the disease to supernatural forces like witchcraft. This is in line with the study conducted by Hjelm & Nambozi, (2008) and Rutebemberwa, Katureebe, Gitta, Mwaka and Atuyambe, (2013). The common belief that the disease is attributed to witchcraft often lead to poor adherence to prescription, increases the risk of relapse, poor therapeutic outcomes and needless mortalities (Mattke, Haims, Ayivi-Guedehoussou, Gillen, Hunter, Klautzer et al., 2011).

The study further reveals that nurses have the primary role of empowering patients to better manage diabetes through self-care, adherence to treatment and the prevention of complications. This corresponds to the findings of other studies (Tol, Alhani, Shojaeazadeh, Sharifirad, & Moazam, 2015). According to Taruna, Juhi, Dhasmana, Harish, (2014); Brown & Bussell, (2011) poor medication adherence seems to be a significant barrier to the attainment of positive clinical outcomes among diabetes patients. Patient non-compliance is not only limited to the failure to take medication, but also to the failure to make lifestyle changes, undergo tests or keep appointments with physicians (WHO, 2016).

The majority of the participants feel that training would empower them to form patient support groups where the

patients would support, encourage and teach each other self-care skills, the eating of correct food, exercising, coming for follow up treatment and taking their medication as prescribed. According to WHO, (2009) empowering patients with diabetes to be active participants in their care, requires skill and knowledge on the part of the primary health care nurses. Professional nurses have a responsibility to teach patients about adapting to a balanced diet, weight control mechanisms, the symptoms of hypoglycemia and hyperglycemia and their approach, providing a balance between the food intake and the amount of daily medication and activity, daily examination of the feet for possible ulcers, controlling blood pressure and cholesterol, visiting a physician on a regular basis for eye examinations and renal function testing.

4. Implications for Practice

The study findings imply that the only way for the patients to receive quality comprehensive care is to empower nurses through training to update their knowledge and practice related to diabetes. The Department of Health should acknowledge and support the need for continuous training of nurses in the PHC sector as the priority to enhance the knowledge and skills of the nurses. Training may be in the form of workshops and in-service training, formal or informal. Options for incorporating other categories of nurses into the training should be explored as they have a key responsibility to teach patients about the disease.

Trends in diabetes management are constantly changing and so nurses should be trained to acquire new information and new ways of caring for the patients with the disease. New guidelines and protocols to support knowledge and practice should be made available and their implementation should be monitored by the Department of Health. Continuous follow-ups and evaluation of the services provided by professional nurses should be conducted. Availability of essential functional medical equipment for patient care in the PHC clinics should be ensured. Lack of knowledge and non-functional equipment in the PHC facilities leads to compromised nursing care of patients with diabetes. On the positive side, nurses indicated that they consult colleagues and the doctors in the hospital if they encounter problems related to patient care. They also use EDL. The clinical guideline is available in the clinics for reference during the management of patients with diabetes. However, this also illustrates the lack of (‘ready to use’) knowledge, although it does indicate a relevant coping strategy to increase knowledge.

4.1 Strengths and Limitations

Total purposive population sampling was performed the researchers were able to gain insight into practices and needs from all but one nurse from the three clinics. This gives a good basis to tailor the training to specific needs.

At the same time, the limitation of the study to the three clinics of the Ga-Dikgale village is a weakness. However, a thick description of the study context and the explicit quotes support other researchers in judging the transferability of the results. It was difficult to recruit the participants for the interviews because of their workload in the clinics, and some managers were not willing to release the participants. Some of the interviews were short and the researcher had to conduct a second-round data collection session to reach sufficiency.

5. Conclusion

In conclusion, the study reveals that the professional nurses who participated in this study had diverse responsibilities related to patient care at the primary health care level. They have a certain level of knowledge of diabetes, however, some areas still need to be improved to enhance the quality of their care. As a result, continuous training to strengthen skills and knowledge in those domains is necessary. Training in the form of workshops, in-service training and refresher courses should be provided for all categories of nurses to prevent mortalities related to the disease. Nurses should be trained in managing newly diagnosed patients by initiating treatment, educating them on self-care, the importance of adherence to treatment, diet, lifestyle and coping strategies for people living with the disease.

Also, improved collaboration with other health professionals and the provision of functional equipment for use in the care of patients is important to improve the standard of care. A multidisciplinary team approach to care improves patient clinical outcomes through the development of an agreed treatment plan. Furthermore, it shortens the timeframes from diagnosis to treatment.

Lack of knowledge and non-functional equipment not only lead to poor health outcomes but also cause frustration in nurses. There is a need to support professional nurses in the primary health care setting by providing functional medical equipment and making sure that medication is always available.

Ethics Approval and Consent to Participate

This study was approved by the University of Limpopo Ethics Committee (Turfloop Ethics Research Committee). Permission to access the clinics was obtained from the Limpopo Provincial Research Committee.

Availability of Data and Material

Not applicable.

Authors' Contributions

ES developed the study, collected and analysed the data and drafted the manuscript. HB and TM co-developed the study, assisted in data collection, participated in data analysis and contributed to the writing of the paper. All authors approved the final manuscript.

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Competing Interests Statement

The authors declare that they have no competing interests.

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Cultural and Religious Beliefs and Practices Abusive to Children With Disabilities in Zimbabwe

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Abstract

This study sought to explore religious practices and beliefs that violate the rights of children with disabilities in Zimbabwe. The authors employed a qualitative approach in exploring cultural and religious beliefs and practices abusive to children with disabilities. Authors used exploratory-descriptive case study design and purposive sampling in selecting participants. Data collection took place in Dzivarasekwa, a high-density suburb in Harare among children who were receiving rehabilitation services at Harare Hospital and their caregivers. The study established that children with disabilities who come from some apostolic families are disadvantaged, as their parents believe that demonic spirits causes disability. This then leads to heightened levels of discrimination. The study also found out that there are remedial but harmful cultural and religious practices. The study recommends that rigorous awareness raising is needed for communities to support people with disabilities, formation of support groups amongst people with disabilities themselves, introducing holistic interventions that address issues of cultural and religious beliefs and continuous training for frontline workers to keep in touch with current best practices, policies and laws around disabilities.

Keywords: children, disability, caregiver, psychosocial challenges, religious, cultural, traditional

1. Introduction

There are many misconceptions and myths attached to disability in Zimbabwe. These are mainly expounded through religious and cultural lenses. An observation by Miles (2001) attests that disability in the Holy Bible, particularly in the book of Exodus is attributed to the sins of parents. In Africa, disability is generally attributed to witchcraft and such cultural and religious interpretations have a bearing on how children with disabilities are treated (Mukushi, 2018). The caregivers of children with disabilities bear much of the burden that children with disabilities face and as such, they are left with a plethora of challenges. In some cases, the parents violate the rights of children in trying to correct the disability using cultural or religious means. Given this situation in Zimbabwe, this paper aims on assessing the challenges that children with disabilities and their caregivers face in line with the cultural and religious beliefs surrounding disability.

1.1 Literature Review

Various schools of thought try to explain causes, management and other issues relating to disability. These different hypotheses known as approaches or models to disability, amongst them include the traditional/religious model, the social model, the charity model and the medical model, to mention the few (Mugumbate and Mtetwa, 2014). This paper focuses more on the traditional approach also referred to as the religious model of disability. This model views disability with religious or traditional lenses (Oliver, 1996). Similarly, explanations on the causes of disability are linked to traditional beliefs and religion, that is, the gods, ancestors, God or evil spirits (Mugumbate & Mtetwa, 2014). Resultantly, this view influences the attitudes and treatment directed towards people with disabilities (Miles, 2006).

Indigenous knowledge systems and beliefs on the causes of disability are key in determining the attitudes of the society towards people with disabilities and disability in general (Miles, 2006). Most traditional beliefs consider disability to be a result of supernatural forces or incongruous deeds like incest (Haihambo and Lightfoot, 2010). Various scholars including Haihambo and Lightfoot (2010) and Mupedziswa (2005) reported that a majority of people in Africa believe that witchcraft, punishment from God, avenging spirits, or promiscuity on the part of one

or both parents can cause disability. It is important to note that these traditional beliefs play a role on how communities support and respond to the needs of people with disabilities. In most families, disability leads to family schisms and division as family members level accusations of witchcraft or wrongdoing among each other (Finkenflugel, Maannen, & Schut, 2016). Lack of acceptance for the condition of the child might also trigger stress related emotions, resultantly affecting the psychological state and social interactions of parents and this consequently affects the child (Finkenflugel et al., 2016).

Zimbabwe has two main belief systems: the indigenous African Traditional Religion (ATR) and other religious beliefs, which came due to colonisation like Christianity and Islam. In ATR, there is belief that there is God who is the creator and has the ultimate powers to life. There is also a belief that deceased family members create an invisible family (ancestors), who have an impact on the lives of the living (Moyo, 1988). Apart from believing that the dead have influence on the living, there is also a belief that there are other spirits like n*gozi* (avenging spirits) which wizards can converse with (Moyo, 1988). Likewise traditional healers (*n`anga*s) can converse with ancestors. Christianity which was brought in the country by European missionaries is the other biggest religious belief in the country, it constitute about 80% of the country`s population (Sosusa, 2018). It is however important to note that majority of Christians are still influenced and practice in part or in full ATR, for example most Christians believe avenging spirits are real.

Documentation and information regarding ATR in Zimbabwe and its influence on disability is very limited but the belief system associates misfortunes as a sign of angry ancestors, avenging spirits or attacks by either evil spirits or wizards (Moyo, 1988). It is in this regard that traditional societies in Zimbabwe view disability negatively. This negative interpretation of disability in African societies translate to the horrendous treatment given to people with disabilities by their communities. It also translate to harmful practices adopted by caregivers and families in trying to "correct" the situation.

For Christians who constitute the main religious group in Zimbabwe (Sosusa, 2018), there are mixed attitudes and perceptions towards disability (Mukushi, 2018). Miles (2006) speculates that Jesus, in the New Testament, said that disability is not punishment from God, but rather, an opportunity for God to demonstrate his power. However, Miles (2001) also notes that the same Bible in Exodus seems to present children with disabilities as suffering because of the wrong deeds of their parents. Leviticus 21 verse 16 to 23 also discriminate against people with disabilities. This creates divided perceptions towards people with disabilities and their families in the Christian community.

Miles (2006) argues that Christianity, Judaism and Islam do not seem to offer enough support for people with disabilities in as far as their day-to-day lives and real needs are concerned. These religions influence perceptions, attitudes and remedial and coping practices towards disability by both caregivers and the community members. Disability is considered as punishment from God and in some cases, the Bible discriminates people with disabilities as shown in Leviticus 21 verses 16 to 23, which clearly discriminate against people with disabilities (Finkenflugel et al., 2016). In line with the above-mentioned verses, disability is seen as a curse, and "believers" avoid associating and interacting with people with disabilities and their families. This, consequently, has huge implications to people with disabilities in general and to children in particular (Miles, 2006).

1.2 The Rights of People with Disabilities in Zimbabwe

Disability is a human rights reality and this has been the case for the past several decades as nations began to see that people with disabilities continue to be sidelined by society (Chambers and Chambers, 2016). The Second World War unequivocally inspired the realisation of disability as a human rights issue after a multitude of soldiers and civilians became disabled during the course of the war. As such, nations began to recognise the disabled as people who needed adequate care. It is however important to note that people with disabilities have for a long time been excluded, socially, economically and emotionally. According to Chambers and Chambers (2016), with the advent of the disability movement, there has been the development of disability policies and legislations for disability rights promotion.

Zimbabwe was one of the first countries to adopt disability related legislation through the promulgation of the Disabled Persons Act (DPA) of 1992 (Manatsa, 2015). This was a progressive development considering that for many years, people with disabilities were burdened by the absence of such pieces of legislation. The enactment of the DPA in 1992 widened the vistas of disability rights activism in Zimbabwe, with disability organizations advocating for equal opportunities for people with disabilities (PWDs) with their non-impaired counterparts (Chimedza & Peters, 1999). The DPA is the major law that addresses disability in Zimbabwe and as noted by (Mwalimu, 2003) it prohibits discrimination against PWDs namely access to public premises, services, amenities and employment. The Act has, however, no formal policies, strategies and agreed standards to monitor its

implementation (Manatsa, 2015). Another weakness is its silence in improving the general perceptions for communities towards people with disabilities.

In 2013, within the latest constitution in Zimbabwe (Constitution of Zimbabwe, Amendment No 20 Act of 2013), the government adopted a human rights approach to disability as for instance, discrimination against people with disabilities in now unconstitutional (Mandipa, 2013). Thus a strong foundation for safeguarding the rights of PWDs although it is a fact that these rights and traditional cultural perspectives exist side by side.

Zimbabwe ratified the United Nations Convection of the Rights of people with Disabilities in 2013. The government, in response to the Convention has put in place a number of provisions for PWDs and a lot of strides have been taken by civil society actors (Mukushi, 2018). Nevertheless, children with disabilities still find themselves deprived several unpardonable rights like the right to education, health, justice amongst others. In the latest constitution of Zimbabwe, (Constitution of Zimbabwe, Amendment No 20 Act of 2013), everyone has a right to education and this enables them to take part effectively in a free society. The Education Act and the Disabled Persons Act also put education as a right for everyone. However, without deliberate measures taken for proper implementation, the pieces of law will not result in children with disabilities accessing relevant services as provided for in these legislations (Manatsa, 2015). Despite the legislations in place, the physical environment in some schools is not disability-friendly; children with wheelchairs cannot access classrooms. Mukushi (2018) argues there is a pronounced shortage of specialised teachers at schools and the caregivers of children, many at times have to bear the burden of huge educational expenses towards the education of the children despite that majority of them come from economically deprived families.

1.3 Discrimination

As highlighted above, most communities attribute disability to witchcraft, avenging spirits, punishment from God and ancestors and or an evil force. According to James and Fleischer (2001), communities that believe there is someone to blame within the family of a child with a disability do not wish to associate themselves with the family, they believe they will end up being contaminated. Children with disabilities are discriminated against right from birth. In a study conducted by Nimbalkar, Raithatha, Shah and Panchal (2014) in India, parents of children with disabilities testified that kinsfolks made many disparaging remarks about their disabled children and they found this to be very disturbing. This, as argued by Nimbalkar et al. (2014), is a form of emotional abuse to both the children and caregivers. At times, they felt that very few people supported them and that society as a whole was against them. They narrated experiences in which they experienced neglect from society due to the attitudes and beliefs that society holds on disability.

It is important however to note that discrimination happens at different levels. As observed by Willacy (2012), disability is a family experience and this means that the family is the first and primary support system for both the child and the caregiver who is usually the mother or the grandmother of the child. However, at family level discrimination starts (Nimbalkar et al., 2014). Discrimination also takes place at community level whereby community members disassociates themselves with the immediate family of a child with a disability. It can also happens at institutional level. Yeo (2011) argues that discrimination starts at birth throughout the life of a person with a disability. Some public institutions are not disability friendly (Mukushi, 2018). The personnel manning the institutions are not capacitated enough to accommodate PWD in most cases.

2. Methodological Approach

A qualitative approach was used and the researchers opted for a case study design. A qualitative approach was chosen because of its ability to explore, in depth, the cultural and religious practices harmful to children with disabilities. The authors felt that the challenges that are experienced by children with disabilities due to culture and religion warrant a thorough investigation, hence the need for an in-depth understanding of those cultural and religious practices. The research had two main subject groups, children with disabilities and their caregivers. Children chosen ranged from ten to seventeen years of age. In selecting a sample, the researchers used purposive sampling, which is a non-probability sampling technique. Selected were fifteen children with disabilities together with 10 caregivers. Even though this frequently applies to quantitative research, the researchers made use of the rule in order to have a sample that ensures trustworthiness of the data. The participants were drawn from clients of Rehabilitation Unit (Harare Hospital) who resided in Dzivarasekwa, a high-density suburb in Harare.

The researchers used interview guides and focus group discussion guides to collect data. According to Yates (2004), in-depth interviews are subjective dialogues between the researchers and the participants for the sole reason of acquiring information from the latter. A focus group discussion was used to collect data, Walliman and Appleton (2009) describe focus group discussions (FGD) as sets of people who discuss particular topics in

research with the guidance of the researchers. A FGD was used because it stimulates richer responses as participants motivate others to open up. Researchers sensitised the participants of the research and of all ethical issues involved. Both the interviews and FGD were not voice recorded; information recorded by way of writing notes.

The researchers used thematic content analysis to analyse the data. According to Bhattacherjee (2012) and Punch (2005), data analysis is about working with data, grouping it, breaking it into manageable units, searching for patterns, discovering what is important and what is to be learned, and deciding what needs to be revealed to others. The Interview transcripts and field notes were systematically arranged into themes for interpretation and analysis. Data from both interviews and FGD were grouped according to themes.

2.1 The Limitations of the Study

This section discusses characteristics of the methodologies that affected and influenced interpretation of findings. It discusses issues that constraints generalizability of the study. The study was conducted in one high-density suburb and therefore it may be difficult to generalise the findings to other areas. There is also a critical shortage of recent and relevant literature on disability in general and disability and religion in Zimbabwe. The sample size might also be too small to generalise for the whole of Zimbabwe especially considering that participants were drawn from a single high-density suburb.

3. Findings and Discussion

3.1 Religious Beliefs of Caregivers

3.1.1 Apostolic Churches

Most apostolic churches in Zimbabwe are African initiated Christian churches. They have different names and leaders but the belief system is almost the same. In as much as they believe in the Bible they also borrow from the African Traditional Religion. As a result, participants who were Apostolic almost shared the same beliefs with those who believed in ATR. Seven out of the ten caregivers were members of apostolic churches.

There are a number of remedial practices caregivers highlighted in response to children`s condition. Every apostolic member believed in the prophet praying for water, which the child with a disability can drink, bath with or used to spray in the homestead to get rid of evil spirits, which cause disability. One caregiver said.

"*The prophet prays for small stones and water, which we can use on the child either to drink as medicine or bath with. Sometimes we spray the water in our house and compound to get rid of the evil spirits, which cause mental problems on the child."*

The above narrative from one caregiver seem to concur with Haihambo and Lightfoot (2010) who argue that disability in most cases is seen as caused by avenging spirits or evil spirits. It is this belief then, which guides caregivers to put much of their focus on finding a spiritually related solution. In stressing this point, another caregiver said:

"*Because we know that disability do not just come unless there is foul play we try to fight with prayers and help from prophets. The strings we tie on children`s hands are meant to protect them against evil spirits, they are spiritual protection".*

3.1.2 Mainstream and Pentecostal Churches

Mainstream and Pentecostal churches are those Christian gatherings that were introduced to Zimbabwe through European missionaries who came to the country. They can be traced from the holiness movement of the Methodist church to now the modern Christianity they have become (Makamure, n.d.). Pentecostal life emphasizes accepting Jesus as the Lord and personal saviour as well as gifts such as speaking in tongues as well as divine healing. Ideally, the beliefs of these churches are not influenced by African traditional culture. However, participants from these churches were found to believe in some aspects found in the African Traditional Religion, for example, avenging spirits' ability to cause misfortunes to people. Like the Apostolic churches, Pentecostal churches also believe in faith healing. One caregiver had this to say:

"Pastor usually says even if you are prayed for without the right mental attitude nothing will come but if you are prayed for with the right mental attitude even disability can be healed because everything is possible with Jesus"

Similar to the apostolic beliefs of the prophet praying for water, pastors in Pentecostal churches pray for oil, which is often called anointed oil and is, used for the same purposes as water in apostolic churches. One child said.

"*Every time my grandmother goes to church, she buy anointing oil that she then use to apply on my legs saying it casts out evil spirits but it is not helping me at all"*

3.2 African Traditional Religion

African Traditional Religion is the indigenous traditional religion in Zimbabwe. No participant were affiliated hundred percent to the religion but all of the participants highlighted that although they are Christians it is difficult to completely disassociate themselves with ATR. Majority even highlighted that when family problems arise they visit traditional healers despite being Christian. It is therefore safe to argue that ATR is like the shadow of Zimbabwean people, despite believing Christianity, some aspects of the traditional religion still influence their day-to-day living.

3.3 Beliefs on the Causes of Disability

As established already there are two main belief systems in Zimbabwe, namely the ATR and Christianity. From both the indigenous traditional belief and Christianity, there is agreement on the causes of disability. All caregivers believed that there are certainly certain types of disabilities that are caused by supernatural forces. Widely held views were that disability might be caused by avenging spirits, witchcraft and or punishment from either God or the ancestors. Caregivers also had a widely held perception that discrimination of people with disabilities in general emanates from the perceived causes, as propounded by (Miles, 2006), as people do not want to associate with witchcraft, avenging spirits or punishment from God or ancestors.

The religious perspective holds disability as something that is a result of punishment from God for sins one committed together with witchcraft and evil forces. Majority of participants simply said, "It is the will of God". It is important to note however that these beliefs about the causes of disability are the basis of how communities treats people with disabilities together with their families (Miles, 2006). Caregivers who said it is the will of God were a bit reluctant to seek medical and rehabilitation services for their children, instead they sought faith healing.

It is however important to note that a minority of the participants highlighted that disability may be caused by accidents; prenatal health issues on the mother as well as genetic factors. Whilst they had this view, they also believed that supernatural forces still cause some types of disabilities. Needless to emphasize therefore, is the strongly held belief about the relationship between disability and supernatural forces. The country`s traditional and religious belief system associate disability with supernatural forces.

3.4 Discrimination at Family and Community Level

Similar to Nimbalkar et al (2014) `s observation participants highlighted that some people s avoid close interaction with the immediate family members of children with disabilities. Caregivers reported that they were not invited to most social gatherings and in those few incidences they are invited, the treatment they received clearly showed that they are not appreciated. One caregiver said:

"People think if they come near disabled children, they will be infected. Disability in is considered as punishment from God or from the ancestors, so people do not want to show sympathy, as they believe the disability is well-deserved…"

The caregivers highlighted that of all the challenges they are facing, discrimination was the most grievous challenge. This discrimination triggers a lot of emotional suffering for the caregivers and children, as it is a constant reminder of their burden. One caregiver said the following as she was becoming emotional:

"When you are carrying a child with disability even people who know you and the child keep staring at you like they do not know you, like you are carrying faeces…"

From the above account, it is noteworthy that caregivers of children with disabilities feel inferior and ashamed in their communities mainly because of the treatment they receive. This limits caregivers` participation in social events and it affects the quality of care the child resultantly gets.

3.5 Discrimination at Institutional Level

Caregivers were in consensus that even medical staff like nurses started treating them differently the moment they realised the 'abnormality" of the child. They attributed this to the general community perception on disability. Caregivers went on to say that when they compare the friendliness before the delivery of the child and after, and comparing how nurses related to them and to other mothers of children with disabilities, they could see the harsh reality of discrimination against people with disabilities. This is similar to the observations made by Yeo (2001) that children with disabilities are discriminated against from birth, and this goes on for a lifetime. One caregiver said:

"When I went to labour, nurses were very friendly to me because I was young and smartly dressed. When I gave birth, they started distancing themselves from me because from birth my child resembled signs of disability. His

head was too big"

Apart from discrimination at medical facilities, discrimination also comes from institutions like schools. Caregivers highlighted that children are often denied entry and access to schools, with authorities citing that their schools do not have facilities suitable for children with cerebral palsy, for instance. This is contrary to the government policy of inclusive education as argued by Mukushi, (2018). In explaining how discrimination at institutional level happens, one caregiver said:

"I once visited the school where my other children are learning with the intention of enrolling my child with cerebral palsy at that school. The headmaster said they could not enrol my child because this school has no facilities for children like these"

Whilst the above account is pointing out that government officials, seem to deny children with disabilities services enshrined in the constitution as their rights it is important to note that indeed the facilities do not cater for some disabilities. For instance, as noted by Mukushi, (2018) most government institutions (schools, district offices, etc.) are not disability friendly, they do not have ramps for wheel chairs and the toilets are not built to disability specifications. A combination of these system shortfalls and the traditional and religious perceptions influencing officials operating in institutions, children with disabilities often find themselves continuously struggling to access services.

3.6 Harmful Cultural Practices

Participants highlighted that there are some traditional remedies meant to end the disability. This is similar to an observation by Haihambo and Lightfoot (2010) that disabilities in most instances are interpreted culturally and likewise the solutions are found within the cultural spectrum. It is important however to note that even if the idea behind the traditional remedy is done with goodwill, it is a risk to the child`s health considering hygienic issues and complications that may results from taking the remedy in its concentrated form.

The traditional ways of therapy include dipping the child in cold water or in a water source for some time, applying traditional medicines and consulting traditional healers. While participants claimed in some instances it had worked, it is important not to ignore the risk and dangers it poses to children. Children are at risk of waterborne diseases and drowning, overdose of traditional medicines and infections. This however is testimony to the fact that traditional and cultural beliefs pose a risk to children with disabilities, mainly because they cannot make their own choices regarding how they want to seek help and services, instead the community and parental beliefs are key.

3.7 Support Systems

Support systems are individuals and entities that offer emotional, physical, mental and spiritual support to caregivers and children with disabilities. Societies and communities have systems that support caregivers. These support systems come in many forms like non-formal, for example, family and friends and formal for example, professional rehabilitation programs by government and its partners.

As highlighted above, many caregivers agreed that the most important source of support comes from the immediate family of the child with a disability and the children themselves admitted this. Close relatives and friends distance themselves the moment they realise that there is a child with a disability in the family. In narrating how the family is the strongest support system, one caregiver said:

"It is difficult to have a child with disability. This is especially so when relatives clearly show they do not want anything to do with the child. Most of the times I get comfort from my immediate family. I can cry to my immediate family and they give me the strength to keep going…"

The caregivers highlighted that they receive donations, stipends and handouts, advice and social support from other members of society and various organisations. The church also emerged as another source of support for caregivers of children with disabilities. However, caregivers seemed to have divided notions towards how helpful the social support that comes from churches really is to them. Psychologically, they all believed the church is instrumental in that part especially from teachings and counselling from pastors and elders. Socially, the case was not the same. Caregivers highlighted that the same people who segregate against them in communities are the same people who come in church uniforms.

3.8 Coping Strategies

Caregivers have employed different coping mechanisms in an effort to curb the challenges they are facing. It is however, important to note that religious and cultural belief systems of the caregiver influence the coping mechanisms as propounded by (Miles, 2006).

3.9 Counselling

Counselling give caregivers a different view of disability as well as acceptance to having a child with a disability. A young caregiver said:

"*When I first noticed my child had cerebral palsy I couldn't accept it and thoughts of running away abandoning the child were frequent. When I started receiving counselling this quickly changed, now I accept that I have a child with a disability and whenever I feel troubled about the situation I seek counselling"*

3.10 Avoiding Intimidating Environments

Caregivers have resolved to avoid intimidating environments. Respondents agreed that they avoid areas and places where they receive silly comments from strangers and members of extended families. A mother caregiver said:

"When I realised that my husband`s relatives were not comfortable around my child, I stopped visiting them at al."

Another caregiver also indicated that she has stopped going to places where there is intimidation. She said:

"I realised that when there is a gathering that is where people begin to talk from your back. I usually fetch water from the borehole when there are not many people there. I do not like family gatherings because the treatment I get is different from the one my age mates receive"

Caregivers agreed that they had to stop visiting members of the extended family, avoid going to public places during busy days, and generally cut themselves out of the entire social life of the community. However, avoiding emotional suffering by avoiding provocative comments also affects children with disabilities, as they grow up lonely and being "the cause" of family shame. This supports Chitereka's (2010) observation that disability in general is associated with shame and sin.

3.11 Seeking Faith Healing

The majority of caregivers believe that their children are in the condition they are because of witchcraft and supernatural forces as highlighted before. Because of this belief, caregivers have joined the apostolic sect or Pentecostal churches, hoping to use the prophetic power to cure their children. This supports the observation by Chitereka (2010) that disability generally is religiously interpreted. Whilst this interpretation has its own effects (Miles, 2006), joining the apostolic sect in search of cure is also dangerous to the child. Some caregivers confidently said that they do not adhere to prescriptions and advice from medical staff because of their apostolic beliefs. This endangers the child as withdrawal from daily routines that are medically proven may worsen the disability. A grandmother caregiver said:

"Some of the times what we are told at CRU is different from what we would have been told by God`s Messenger."

Another caregiver (a young mother) also indicated that she went to the apostolic sector because of the child. She said:

"*I grew up going to the Roman Catholic Church. When I gave birth, people were advising me to go to the apostolic sect; I ended up being a full time member of the sect. Most of the times we are given holy stones for protection and this really helps us…"*

3.12 Locking up Children in Houses

Caregivers highlighted that the financial statuses of families of children with disabilities act a major barrier to quality caregiving for their children. It is, however, disheartening to note that in trying to curb this challenge, caregivers have, in a number of ways, abused their children and exposed them to serious emotional and behavioural threats. Children with disabilities have many limitations that can result in requirements for long-term care that far exceed the usual needs of children without disabilities (Nimbalkaret al., 2011). This observation is correct because the findings of this study suggest that one of the care requirements of children with disability is constant watch. However, caregivers are not able to provide this much-needed constant watch to their children. Every caregiver has other economic activities that they engage in so that they can feed the child. One caregiver said:

"*I realised that when I am selling at my small market people would stop buying from me when they see a child with a disability. I then resorted to locking the child home so that I can sell"*

Similar to the above narrative another caregiver said:

"*I have a small vegetable market. During my first days, I would leave my child with my next-door neighbour. I would find my child unclean. Even when he soiled himself, I would find him like that, and all the time, I would find him lying down uncomfortably. I then realised that it was better to leave him home since he was not getting any*

help from the neighbours"

3.13 Abandoning Family

Disability is associated with negativity in many societies as already established. As a result, some caregivers resort to running away, abandoning their families altogether. Willacy (2012) argues that disability is a family experience. Some family members who cannot cope with the pressure resort to running away. The participants highlighted that either husbands abandoned them, or they experienced marital problems because of criticisms from family members as well as the financial needs required for children to survive. All the grandmother caregivers who participated indicated that the biological mothers of the children had abandoned them, leaving them in their care. A mother caregiver said:

"My husband abandoned me when he realised I gave birth to a child with disabilities. Even myself I once attempted to leave the child with her father`s parents and run to South Africa. This, however, changed when I received counselling from CRU…"

The same view was also emphasised by a grandmother caregiver who said that she is taking care of the child because the biological mother ran away. She said:

"I am staying with my grandchild because the mother ran away; I do not even know where she is right now. At least she did not kill the baby. However, I take care of every need of this child without the help of the mother. She feared the disability and ran away..."

4. Conclusions

The research concludes that one of the major challenges caregivers of children with disabilities are facing is discrimination. Lack of acceptance of disability as an inevitable and natural occurrence by community members cause discrimination. Evidence suggests that the religious and cultural beliefs on the causes of disability influence discrimination. Disability is associated with spiritual or supernatural forces hence the treatment of people with disabilities in general is also guided by religion and traditional beliefs. Their religious and traditional understanding of disability also influences coping mechanisms caregivers of children with disabilities employ.

5. Recommendations

To lessen the effects of different religious and cultural practices and beliefs there should be efforts from the government, NGOs, the churches and communities in redefining disability and in adopting the medical model of disability. There is need to conduct awareness raising campaigns in communities on disability. The aim should be on making the community appreciate different pre-natal, natal and post-natal causes of disabilities. It is also important to raise awareness on available services at government institutions like health institutions and social welfare organisations. A deep understanding of different disabilities and how they are managed will go a long way in shifting perceptions and beliefs towards disability and hence improve the manner in which children with disabilities are treated. It has been observed that current programmes are mainly concerned with the rehabilitation of the child. The caregivers and families are left out in these. However, the wellbeing of the caregiver is directly related to the quality of support they provide to children. Strategies like organizing counselling sessions for the caregivers and parents, and capacity building workshops on disability for caregivers could be useful. It is also necessary to create a system that allows and encourages continuous professional development for the frontline service providers so that they keep up to date with new policies and new practices and that they continually develop and sharpen their expertise, thus improving the provision of care for children with disabilities.

5.1 Areas for Further Research

The research observed that there is pintsized literature regarding disability in Zimbabwe. Most conducted studies are on an international scale. This research therefore recommends that there be research initiatives that look into disability issues in Zimbabwe, particularly on improving welfare of people with disabilities. The Link between indigenous understanding of disability and the medical model is also a key study area in improving disability response in Zimbabwe.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Sexual Education of Palestinian University Students: Between Perceptions and Cultural Barriers

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Abstract

This study explored the sexual education perceptions in the Palestinian society, as perceived by Al-Quds University students. Perceptions regarding sexual education were evaluated using an index with 50 items, which was developed by the researchers. It was administrated to 369 undergraduate students who were selected using the stratified method. The findings show that students at Al-Quds University were moderately knowledgeable of sexual education; females had fewer knowledge of sexual education than males. The statistics show that gender, school, academic year and religious commitment are significant predictors of students' perceptions of sexual education. Sexual education is a sensitive and sometimes taboo concept in the conservative Palestinian society that adheres to its religious, cultural and moral values.

Keywords: sexual education, sexual socialization, patriarchal society, taboo

1. Introduction

Sexual education for youth is one of the most hotly debated issues in the social sciences and among policy makers, program planners and educators. Sexual education refers to life-conscious processes throughout life, where people learn about gender, biological, psychological and socio-cultural perspectives (Goldfarb & Constantine, 2011).

Education regarding sexual and reproductive health has been identified by the United Nations Secretary-General as a key priority in the development of a System Wide Action Plan on Youth (UN, 2012). According to UNESCO (2009), the preparation of children and youth has always been a major challenge for humanity, in terms of gender sexual education and in a world with AIDS.

Historically, young people in many cultures are not informed about sexual relationships, and the discussion of these issues is considered taboo on sociological terms. Today, there is a strong international commitment to promoting comprehensive sexual education, especially from the perspectives on strengthening human rights, health and youth (UNESCO, 2009).

Recently, the WHO (2010) underlines the importance of sexual health in laws, politics and human rights, education, society, culture, economy and health. The call was supported by the various sectors' legal approach, based on the programs described, as well as key entry points that promote sexual health. This must be done by providing information and assistance to the broad and concrete subject of educational initiatives.

2. Background and Literature Review

According to the WHO (2010), sexual health is the physical and emotional health and well-being of the people, couples and families, and to the social and economic development of communities. Sexuality lives in all cultures and societies. Sexual socialization is described as a process by which young people acquire sexual knowledge and norms (Ward, 2003). Historically, the sexual socialization of the youth created at the house and has traditionally been performed by the respected elders in the extended family, rather than by the child's parents. However, parents provide and shape their values, including sexuality, which is often postponed to child marriage. Nevertheless, many parents do not provide enough sexual education for their children and what they provide are rare and low quality as perceived by the children (Huong, 2010).

The main goal of sexual education is to promote sexual health (National Guidelines Task Force (NGTF, 1996). Sexual health is a state of well-being and physical, emotional, mental and social safety in relation to sexuality; and not just the absence of illness, dysfunction or disability. Therefore, the concept of sexual health should be the objective of life and personal relationships, and not only improve the relationship between counseling and sexually transmitted diseases and prosecution (WHO, 1975).

According to Goldfarb & Constantine (2011), sexual education for adolescents occurs in the context of the biological, cognitive and social-emotional developmental progressions and issues of adolescence. However, the progressive education movement of the late 19th century led to the introduction of social hygiene in North American school curricula and the advent of school-based formal sex education as part of the curriculum in junior high school or high school (Connell, 1993, 1996; Thorne, 1993; Elia, 2009).

From the 1960s onwards, support for sexual education in schools gained widespread support. Yet, schools and parents do little to help youth make sense of their sexuality. However, the literature that was reviewed indicates that college students have a positive attitude towards implementing sexual education at school level (Yesudas et al., 2008). In the same time, sexual education may be taught informally, such as when someone receives information from a friend, religious leader, on the internet, or from a culture's various other media that may leads to a range of conflicting and confusing messages about sexuality and gender (Goldfarb & Constantine, 2011).

Therefore, a thorough high-quality curriculum-based sexual education program would help children and young people to navigate these messages; develop positive norms about themselves, about relationships, about their health and about responsible citizenship (UNESCO, 2009).

The outbreak of AIDS has resulted in a new sense of urgency in terms of sexual education, which is seen by most scientists as a vital public health strategy (UNESCO, 2009; WHO, 2010).

The international agreements include: the International Conference on Population and Development (ICPD) in 1994; the Fourth World Conference on Women in 1995; and the World Summit on Children in 2002 affirming the right of all children and adolescents to receive sexual and reproductive health (SRH) information, education and services in accordance with their specific needs (UNESCO, 2009).

A substantial body of research has examined sexual education in various ways. A recent study performed by Song (2015) indicated that participants do not have formal sexual education; neither schools nor parents were the main providers of sexual education. Graf & Patrick (2015) concluded that, friends were the most common sources of sexual matters during their lives.

The study done by Chi et al. (2015) found a significant impact of a sexual education program on sexual health knowledge for university students in Southwest China. Meanwhile, Goldfarb & Constantine (2011) concluded that there is a demand for sexual education among traditionally underserved youth, including sexual minorities, youth with disabilities, and those in foster care. Huong (2010) indicated that sexual values within families and the influence of culture need to be considered as a channel to convey sexual values to children. According to Bleakley et al. (2009), the most often reported sources of sexual information were the media, friends, teachers and mothers.

In the Arab world, the Arab Human Development Report (2009) indicated that sexual education is a taboo in the male-oriented culture of denial. Women are victims of cultural and social practices that cause material harm to women, such as female genital mutilation (FGM), child marriage and murder or the so-called 'honor crimes'.

In short, despite the widely recognized importance of sexual education, it remains a sensitive and sometimes taboo issue in many cultures around the world, and in the Palestinian Arab culture in particular. Additionally, empirical testing of these assumptions in the Palestinian family is recommended.

3. Purpose and Scope

This study addressed the sexual education socialization in the Palestinian society, as perceived by students at Al-Quds University. The objectives of the study were threefold, i.e.: to examine the perceptions of sexual education of students at Al-Quds University; to assess their knowledge of sexuality; to identify the sources of information from which students learn about sexual education; and to explore how socio-demographic factors influence their knowledge of sexual education.

The study is considered the first of its kind, according to the best knowledge of the authors. It is a leading study that deals with a taboo and sensitive topic in the conservative Palestinian society.

4. Hypotheses

The study proposed the following hypotheses:

4.1 There are no statistical significant differences at $\alpha \leq 0.05$ in the perceptions of sexual education of students at Al-Quds University in terms of place of residence, gender, school, college, and academic year.

4.2 There are no statistical significant correlation at $\alpha \leq 0.05$ between religious commitment, academic achievement and the perceptions regarding sexual education of students at Al-Quds University.

5. Methodology

5.1 Approach

The study was a descriptive research study that used a mixed approach of quantitative and qualitative design, and a questionnaire. This was considered appropriate to the research, which was exploratory research, and it was considered that this approach would provide more meaningful in-depth data.

5.2 Population and Sampling

The population of the study consisted of students at Al-Quds University at the main campus - Abu Dies - during the academic year 2017/2018. The total complement was 9464 (4421 males to 5043 females) (Al-Quds University, 2017).

The sample comprised 369 students (173 males and 196 females), all full-time undergraduate students at Al-Quds University, who were selected based on gender and academic year using a stratified approach. The sample size was calculated using the sampling web http://www.surveysystem.com/sscalc.htm sample size calculator, with a margin error of 0.05.

5.3 Instrumentation

Students' perceptions of sexual education were evaluated using an index with 50 items, which was developed by the researchers. A 5-point Likert scale was used to measure responses, with available responses ranging from strongly agree to strongly disagree. Participants at the Al-Quds University main campus - Abu Dies - were asked to complete the questionnaire. The survey instrument sought to obtain background information from the students, such as the gender, college, school, place of residence, religious commitment, academic year, and academic achievement.

5.3.1 Instrument Validity

Validation of the instrument was done in two distinct phases. The first involved a focus group session (N=18); while the second phase involved implementation of a pilot study (N = 70), which was done to validate the survey using exploratory factor analysis. Factor loading for all items exceeded 0.65 (0.67 to 0.89), which means that the items are considered suitable for measuring every item regarding the perception of sexual education among students at Al-Quds University.

5.3.2 Instrument Reliability

Reliability was tested using Cronbach's Alpha and the Split-half Coefficient to determine the reliability and consistency of the survey. The scores for the survey instrument for Cronbach's Alpha and the Split-half Coefficient were 0.87 and 0.85, respectively. This indicates very good reliability and consistency.

5.4 Sample Socio-demographic Characteristics

The demographic breakdown of the participants was gender, place of residence, college, school, academic year, religious commitment and academic achievement. In total, 369 students were included and four focus groups were conducted. The GPA of respondents was recorded at between 60 and 95 points (M 78.16; SD 6.87). Females represented 53.1% of the participants, while the remaining 46.9% were males. Students were drawn from fourteen faculties: arts - 53.9%; sciences - 46.1%. The majority (78.9%) were from public schools. Half (56.4%) of the participants were from rural areas, 33.1% were from urban areas, and the remaining 10.6% were from refugee camps. The largest group in terms of university year were students in the senior year (34.4%), while: 27.6% of the participants were in their sophomore year, 20.3% were in their junior year and 17.6% were freshmen. Most 66.1%) of the students were religiously committed.

5.5 Data Analysis

The questionnaire items were rated on a Likert scale of 1–5 (1 = strongly disagree to 5 = strongly agree). The highest score indicated a higher perception of sexual education. Descriptive statistics gauged the perceptions of the sampled population regarding sexual education. The following statistical techniques were measured: Regression, T-test; One-way analysis of variance; Tukey test; Cronbach's Alpha; Split-half Coefficient; Factor Analysis using SPSS.

6. Findings

The mean score of the perceptions regarding sexual education, as reported by the sample of 369 participants, was moderate (M 3.30; SD 0.37). The total score showed that 66% of the students were moderately knowledgeable of sexual education. Furthermore, the main indicators of sexual education knowledge, as perceived by students and ranked in descending order, are as follows: it is necessary for students to define the topic of sexual education (M 3.95; SD 1.00); human sexual motive deserves attention, as do other motives (M 3.93; SD 0.95); sexual education is an important educational goal (M 3.89; SD 1.31); sexual education protects youth from deviation (M 3.82; SD 1.11); sexual education limits sexual deviation (M 3.79; SD 1.09). Participants also indicated that: sexual education is an intruder topic in Palestinian culture (M 3.70; SD 1.06); even though it does not violate heavenly religions (M 3.68; SD 0.94); but dealing with sexual education should be approached carefully (M 3.66; SD 1.04); some students behave illogically when sexual education is addressed (M 3.65; SD 1.00); students prefer that sexual education be provided to males and females separately (M 3.63; SD 0.98).

The results also showed that friends were the most frequently reported source of sexual information (M 3.79; SD 1.16), followed by; the internet (M 3.77; SD 1.18); and religion (M 3.39; SD 1.20). Participants indicated that the issue of sexual education is the responsibility of the family (M 4.13; SD 0.94), as well as: the school (M 3.85; SD 1.00); the university (M 3.75; SD 1.07).

The study investigated student demographics in terms of perceptions regarding sexual education, with the aim of identifying differences. The findings show that college, place of residency and academic achievement do not indicate any significant differences. However, it was found that academic year, gender, school and religious commitment are significant variables. In relation to gender, the differences were in favor of males (M 3.37; SD 0.35) compared to (M 3.24; SD 0.38) for female participants, where the T.test value was (3.329, P = 0.001). With school, the differences favored students from private schools (M 3.44; SD 0.54) compared to public school participants (M 3.26; SD 0.30), where the T.test value was (-2.771, P = 0.007).

Differences were found in terms of students' academic year level, i.e. in favor of senior students (M 3.44; SD 0.27) compared to freshman participants (M 2.87; SD 0.32), where the F-value was (48.823, P = 0.000). Finally, the findings indicated that there is a statistically significant negative correlation between religious commitment and the average score of perceptions regarding sexual education of students at Al-Quds University: the Beta-value was (-0.218, P = 0.000).

7. Discussion

The findings of the study show that: students at Al-Quds University were moderately knowledgeable of sexual education; females had a lower knowledge of sexual education than males. In fact, sex is a sensitive topic in the conservative Palestinian society, which adheres to its religious and moral values. In the Palestinian Arab society, the family is characterized by being patriarchal in relation to the gender differentiation between males and females. Gender separation starts at a very early age in the individual's life. Males are raised in the men's world, while females are raised in the women's world, according to several educational, moral, aesthetic, intellectual, philosophical and even practical approaches. The Palestinian culture seeks to direct males towards an affirmation of masculine qualities like manhood, chivalry, bravery, gallantry, daring and stamina. On the other hand, it stresses directing females towards feminism, decency, decorum, virginity, love of children, home economics and stability (Barakat, 1993; Muhawi & Kana'na, 2001; Banat & Rimawi, 2014; Banat, 2010, 2014a, 2015). It follows that there is a lack of sexual education and that the family does not provide sufficient sexual education for their children. Additionally, what they do provide is perceived by children as infrequent and of poor quality. In this context, one of the students said: "I feel embarrassed to ask about the sexual education topic; but sometimes certain things in sexual education happen that make me feel lost". The student continued: "I strongly support answering students' questions about sexual education, and I am ready to participate in academic sexual workshops".

Since its establishment in 1984, Al-Quds University has been considered one of the leading educational institutions in Palestinian society. It offers a vibrant learning environment by encouraging an exchange of ideas and freedom of expression, as well as leading innovative research. It also helps students to develop their personality and to adapt to the study environment and overcome all the problems they face with choosing a major subject, managing their time and adjusting effectively to the study and social environment (Banat & Rimawi, 2014, 2017). However, in the past, the university did not offer a course that addresses sexual education, because of the sensitivity of the topic in the conservative Palestinian society. However, Al-Quds University provides information on sexual education for the students through various courses that can be undertaken during their university studies. In this regard, one of the participants said: "Sexual education is a vague topic in students' minds". The student continued, "As a university student, it is important to know about sexual education; and I think that sexual

education should be taught at the university". Another student said: "I feel my sexual knowledge today is different from yesterday; and I think that the university role completes the family and school roles in providing sexual information".

The study findings show that students from private schools had better sexual education knowledge. This result suggests the sub-cultural differences in education in Palestinian society. Private schools are co-educational schools that seek to preserve their existence and raise their members in an open social manner that supports qualities such as independence, freedom, development of skills and abilities, and access to and interaction with the world. In co-education schools, girls and boys work collaboratively, exchange ideas and debate issues, and the presence of both genders shows a good return in building a sound platform for personal growth, peer connectedness, and healthy sexual education. In this context, one of the participants from a private school said: "I have a clear picture on the sexual education topic. I feel relaxed talking about sexual education topics, and it's easy for me to participate in sexual education discussions". On the contrary, one of the single-sex school students said: "I wish to participate more on the sexual education topic if it is not complicated like this in Palestinian society".

The study findings furthermore reveal that senior students scored higher on sexual education knowledge. The familiarity is considered one of the key psychological processes that link people together in an environment. Senior students spend a long time at the university during their undergraduate course, when the formation and development of one's personality, the fulfillment of aspirations, social interaction with peers (the most frequently reported source of sexual information) and the other gender, contributes to the development of a healthy sexual education. According to Blanton (2014), the period of time spent studying at college is often used as a time of exploration for the students to experience living as young adults without the parental supervision associated with living at home. Students are allowed the freedom to act independently and pursue personal goals and agendas without parental regulation, which affects their sexual education knowledge positively. Taking into consideration the qualitative data, one of the senior students argued that: "Students' fear of the sexual education topic is exaggerated; and it's better to leave the freshman students to discover facts about sexuality by themselves".

Finally, the findings revealed that religious commitment correlated negatively with sexual education perceptions: deeply religious students reported less sexual education perceptions and had a more conservative attitude towards sexuality. Religious commitment in the Palestinian family occupies a large space in its social, intellectual and emotional life. It is natural that the religious creed is respected by all members of Palestinian society, due to the concentrated effort that the parents exert in bringing up their children. The process of socialization in Palestinian society is based on religious education and the teachings of Islam. The majority of the Palestinian population is Muslim, and the teachings of Islam influence their daily, social and cultural life (Banat, 2010).

Moreover, the values of marriage, family and familial duty are still emphasized by many aspects of Palestinian society. Marriage is the only culturally and legally acceptable way to regulate a family in Palestinian society. The teachings of Islam call for legal Sharia marriage within the framework of wedlock, in order to prevent mixing of lineage; and any sexual relationships outside of marriage are considered taboo and a great sin, which leads to legal punishment. "An approach not adultery, undoubtedly that is immodesty and a very vile path" (Isra: 32).

Additionally, the Palestinian conservative culture and background affect how individuals receive and interpret messages about sexuality. In a Palestinian Muslim society, Islam calls for sexual education of children in a way that is appropriate to their age, by both the family and the school and within the context of Islamic teaching. However, despite the low rate of child abandonment in Palestinian society, and the under-reporting of offences, especially of incest cases that are considered risk factors that reflect the lack of sexual education and the confusing messages about sexuality and gender, young people receive in the Islamic patriarchal Palestinian society (Banat, 2014b). In this regard, one of the deeply-religious students indicated: "Talking about sexual education is taboo in the Palestinian society, and crosses the values and norms of Palestinian society". The student continued by saying: "Sexual education is an intruder notion in Palestinian culture, and it's better to leave the "sexual education" facts to the family, based on the teaching of Islam, which is very clear".

8. Conclusion and Recommendations

Sexual education is a sensitive and sometimes taboo concept in the conservative Palestinian society that adheres to its religious, cultural and moral values. The findings of the study have several implications in terms of sexual education for parents, schools, universities, religious leaders, policy makers and social workers. Importantly, there are still a lot of needs that must be addressed in the area of healthy sexual education in Palestinian society.

Given the findings and conclusion of this study, the following recommendations are made:

1. It is necessary for children's questions on sexual education to be answered by parents in a healthy

atmosphere.

2. Sexual education should be addressed in the Palestinian formal curriculum and at universities as well.
3. Further studies should be conduct to ensure better understanding of sexual education among youth in Palestinian schools.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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The Health Promotion Model of Public Health Program for Elderly

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Abstract

Objective: The society health care of elderly is integral part of service health by comprehensive through promotion, preventive, curative and rehabilitative, and resocialitative efforts. The aim of society health care is to improve the ability of society to live healthy until an optimal degree of health is achieved.

Method: This research was cross sectional research by using survey method. Sample of this research was 200 elderly that was divided into 25 clinics in Sleman regency of *Special Region Yogyakarta*. This research was done on March up to August 2018. The data was collected then processed by using PLS SEM program.

Resutls: The results of research show there is an influence between the health promotion and the health education with estimates = 0,753. The health education posses the elderly health behavior with value p = 0,00. The health behavior (p = 0,00), public policy (p = 0,07), the care function of elderly (p = 0,00), and elderly behavior (p = 0,020) posse the independence of elderly. The elderly independence possess the elderly health quality with estimates as big as 0, 312.

Conclusion: Based on the finding of the study, elderly health quality can be improved by increasing the elderly independence through the health education effort which takes effect to the health behavior and improving the facilities and infrastructure related to the health public policy, and improving the health care of society.

Keywords: care function, policy, health education, health behavior, elderly

1. Introduction

Elderly is age group of 60 years which goes into the end step on life cycle (WHO, 2015). This phase will be gotten by everyone so it cannot be avoided. Elderly will experience the aging process biologically and it is marked by emergence of many changes in cognitive, physic, and psychology (Abidin, Nurdiana, Ahmad, & Munir Rabin, 2016). Commonly, the psychological changes happened is a decrease in the ability and social functions possessed. The physic change is normal process but it often becomes threatening integrity for all of elderly like hair to be white, wrinkles appear on the skin, decreased body immunity, and decreased sensory function (Erawati, 2012).

The elderly population number in the world is 11,7% of the total population and it is estimated that this number will increase with increasing life expectancy (WHO, 2015). The total population of elderly in 2009 about 7,49% and in 2011 increase to be 7,69%. In 2000, the age of life expectancy in the world is 66 years then it increases to 70 years (in 2012), and 71 years (in 2013). The elderly health quality will increase when family member working together to do family function in health field. Some functions of family that is meant those are effective, social, reproduction, economic, and health care functions (Kemenkes, 2018). There are five main tasks of family to do the family function which posses to the health care, they are (a) identify health problems, (b) make decisions for elderly people who have health problems, (c) care for elderly people who are sick, (d) create a home environment that has an impact on health family, (e) use the health facilities closest to where you live (Friedman, 2010).

Public health care is an effort to provide nursing services that are an integral part of health services carried out by nurses by involving other health teams and communities to obtain higher levels of health from individuals, families and groups (Choi Young, 2016; Ding et al., 2015). Public health care for the elderly is a special field of nursing which is a combination of nursing, public health and social sciences which are an integral part of health services provided to individuals, families, special groups of elderly people and communities both healthy and sick (having comprehensive health / nursing issues through promotive, preventive, curative, rehabilitative, and resocialitative efforts aimed at the elderly by involving the active role of the community in an organized manner, such as the

integrated-health-post for the elderly (Chang, 2014).

This research aims to analyze the influence between health promotion, elderly public policy, elderly care function, health education, and elderly behavior towards elderly independence and life quality to formulate the health promotion in public health nursing as a means to improve elderly health quality through elderly health nursing program in Sleman Regency, Special Region Yogyakarta by identifying health issues and nursing which is faced, decide the health problems or nursing and problem priority, specifically namely identifying health and nursing problems faced, establishing health or nursing problems and prioritizing problems, formulate the various alternative solutions to nursing problems that they face, assessment of health outcomes in solving health / nursing problems, encourage and increase community participation in health/nursing services, improve ability to maintain health independently (selfcare), instil healthy behavior through health education efforts, handling high risk groups which are prone to health problems, high risk groups including the elderly (Notoatmodjo, 2013).

The goals of public health care are individuals, families, groups and communities that have health problems due to factors of ignorance, unwillingness and inability to resolve health problems. Individual is a part of family member. If the individual has a health/nursing problem because of the inability to care for himself by something, it will affect other family members physically, mentally and socially (Friedman, 2010).

As a health effort in increasing the independence of the elderly can be seen from the health quality. The health efforts include the health promotion through health education which aims to change behavior which includes knowledge, attitudes, and practices (Orem, 2011; Kemenkes, 2015).

2. Research Method

This research used cross sectional design because data retrieval was done in same time (Sugiyono, 2014). There are 103,686 elderly aged 60–74 years old who live in 25 Health Center in Sleman Regency (Dinas Kesehatan Sleman Regency, 2016) (Badan Pusat Statistik DIY, 2015). This research sample is 225 elderly. This research aims to analyze the influence between health promotion, elderly public policy, elderly care function, health education, and elderly behavior towards elderly independence and life quality to formulate the health promotion in public health nursing as a means to improve elderly health quality through elderly health nursing program in Sleman Regency, Special Region Yogyakarta. The variables used for this research are health promotion (X1), good public policy (X2), function of elderly health nursing (X3), health education (Y1), elderly health behavior (Y2), elderly independence (Y3), and elderly health quality (Y4). The questionnaire used to identify the health quality (HTQL) is a questionnaire that is taken from sf-36 from WHO. The function of health nursing program uses standard questionnaire from Friedmann. Index Katz is a standard instrument used to measure the independence while validity and reliability test are used to measure the healthy public policy, community empowerment and health education. PLS SEM is used to analyze by modelling dependent variable (X) and independent variable (Y).

3. Result

The table of summary results directly from latent variables

Table 1. Summary of results directly from latent variables

Direction of influence	Estimates	p-value	Conclusion
The health promotion program → The health education	.753	2.33×10^{-42}	Significant
The health education → The health behavior	-.226	.000	Significant
Public policy of elderly → Elderly independence	.184	.007	Significant
The nursing function of elderly → Elderly independence	-.228	.000	Significant
The health education → Elderly independence	.200	.002	Significant
Elderly behavior → Elderly independence	.164	.020	Significant
Public policy of elderly → Elderly health quality	-.036	.587	Non-significant
The nursing function of elderly → Elderly health quality	.121	.067	Non-significant
The health education → Elderly health quality	.061	.366	Non-significant
Elderly independence → Elderly health quality	.312	7.67×10^{-6}	Significant

The estimated coefficients on the path analysis at the 5% real level of the bootstrapping resampling result show a

significant effect for several variables. The relationship between latent variables that have a p-value of more than 0.05 indicates a non-significant relationship.

Based on the table above, it can be done the hypothesis testing. The testing is done on ten (10) hypotheses. T-Statistics value which is more big than 1.96 or p-value smaller than 0.05, it marks that there is significant influence between latent variable. The original sample values same as estimated value relation between latent variable. If the positive original sample value indicates that the relationship between the latent variables is positive and vice versa.

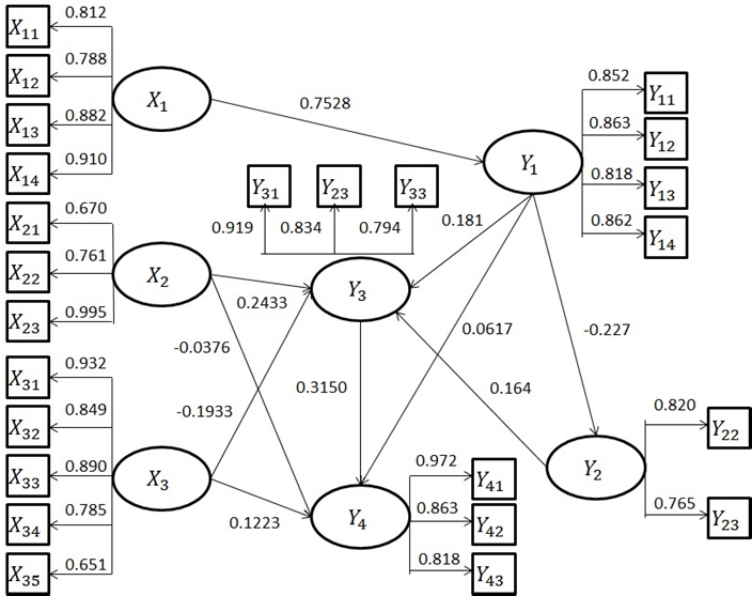

Figure 1. The value of loading factor for each indicator

3.2 Model Evaluation

The structural model describes the relation between latent variable. The goodness of the structural model is seen based on the coefficient of determination $(R-square)$, *predictive relevance* $(Q-square)$, *goodness of fit* (GoF), and testing statistic t through *resembling bootstrapping*.

3.2.1 Coefficient of Determination $(\mathrm{R}-\mathrm{Square})$

The latent variable of health education has a value $R-\mathrm{square}$ as big as 0.5666 so the latent diversity of health education variables can be explained by health promotion programs as big as 56.66% and the rest as big as 43.34% can be explained by other factors out of the research. The variable of elderly behavior has a value $R-square$ as big as 0.0513, it means that the diversity of elderly behavior can be explained by health education as big as 5.13%, and the rest 94.27% can be explained by other factors out of research. The value $R-square$ for the variable of elderly behavior is very low. The variable of elderly independence has a value $R-square$ as big as 0.1418, it means that the diversity of elderly behavior can be explained by public policy, nursing function of the elderly that means the diversity of elderly independence can be explained by public policy, nursing function of the elderly, health education and elderly behavior as big as 14.18% and the rest 85.82%, it is explained by other factors out of the research. The last, the variable of elderly health quality has a value $R-square$ as big as 0.1009 which means that the diversity of elderly health quality can be explained by the public policy of elderly, nursing function of the elderly, elderly education, and elderly independence as big as 10.09% and the rest 89.91 can be explained by other factors out of the research. The value $R-square$ as big as 0.26 is classified strong, 0.13 medium, and 0.03 low (Akter, Samad, & Zaman, 2013; Götz, 2010).

3.2.2 Predictive Relevance $(\mathrm{Q}-\mathrm{square})$

The value $Q-square$ that is gotten is as big as 0.6827. The value $Q-square$ that it is bigger than 0 marks that latent variable already could predict the good model. The output of program R version 3.4.2 does not output the value $Q-\mathrm{square}$, so the value $Q-\mathrm{square}$ can be counted manually as below.

$$Q - square = 1 - [(1 - R_1)(1 - R_2)(1 - R_3)(1 - R_4)]$$
$$= 1 - [(1 - 0.5666)(1 - 0.0513)(1 - 0.1418)(1 - 0.1009)]$$
$$= 0.6827$$

Goodness of $(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos\frac{n\pi x}{L} + b_n \sin\frac{n\pi x}{L}\right)$ Fit (GoF)

The value of *GoF* is between 0 up to 1. As high as the value *GoF* states that the model is better. The value of *GoF* which is gotten from this model is 0.3803. *GoF* as big as 0.38 includes into high category so this model has the good performance and validate the overall model (Akter, Samad, & Zaman, 2013; Husein, 2013; Henderson, Willis, Xiao, & Toffoli, 2016).

4. Discussion

4.1 The Effect of the Health Promotion Programs to Health Education

The health promotion programs is the effort which is done by community although they want to and able to keep and increase their health together with the aim of health education that is increase the willingness or ability of society in health behavior, so it is relevant as this research that the health promotion programs relate with the health education. In addition to education as a media for health promotion programs, health education is also the target of health promotion programs to increase public knowledge through health education.

The health promotion gives the influence to give influence towards skills, knowledge, social relations with other people, the potential of individuals, and communities, especially the elderly. This approach to health promotion programs is an ideal opportunity for both government-owned and private health care facilities to respond the challenges which are faced by the elderly. Although many factors influence each other but also show the potential elderly can measure health status with the frequency of these elderly people attending health education (Henderson, Willis, Xiao, & Toffoli, 2016; Ding et al., 2015).

The goals of health education are mentioned namely individuals, families, groups and communities. Elderly as an input in the process of health education is very much influenced by many factors, their own age, illness, environment, family support etc (WHO, 2015). Based on Skinner in the process of health education there is a process that is "learning", it is individuals who do not know to know (Skinner, 1938). Learning domains have three components, namely cognitive, affective and psychomotor. These three components greatly influence the outcome of learning. While the factors that influence learning include external factors such as light, sound, air humidity and temperature, while internal factors such as physiology, psychological (Notoatmodjo, 2013).

4.2 The Effect of Health Education on Elderly Health Behavior

The health education is provided to the elderly, especially those who are vulnerable to the risk of falling or vulnerable to an illness. Health education provided to the elderly must also pay attention to various factors including age, gender, occupation, and lifestyle (Notoatmodjo, 2013). Elderly people who live in the area of *Sleman* Regency mostly live in rural areas with jobs as farmers.

Geographically, the elderly who live in *Sleman* Regency tend to have a simple lifestyle, "*nrimo*" (receive) although the health education that is given appropriate by habitual action which is done by elderly. Health education influence towards health behavior to the resident in China about uncontagious disease (Ding, Shen, Zhang, Qi, & Jiao, 2015). The residents who live in the rural area of Australia concerns more to the simple life factor than in the city. Primary health education or effective intervention program is given to improve knowledge towards the rural women about the risk of heart disease and the life style change (Crouch, 2011).

4.3 The Effect of Public Policy on the Independence of the Elderly

Respondents of this study namely the elderly said that public policies such as referrals to health facilities, treatment, home care, social security cards, old age social assistance, health information systems, which are in the *health center* working area of *Sleman* Yogyakarta Regency run and are in a good category. This research was supported by a previous journal which stated that one of the health policies of the government was the National Health Insurance (*Jaminan Kesehatan Nasional*/JKN). This policy aims to enable all communities to receive equitable and equitable health services by using a premium system such as health insurance in general (Kemenkes, 2018).

The research conudcted in Health Center of Sleman Regency shows that public policy influences towards elderly autonomy, such as health insurance factor - BPJS. Elderly can use the health service facilities in health center for free. Hence, elderly can do the promotive and preventive efforts to improve their independence.

The issue of public policy is based on the needs of problem solving that occurs in the society. Public policy is set by

stakeholders, especially government that is oriented to the fulfillment of society needs and interest.

The public policy related to medical care service towards elderly is related to the elderly independence. The public policy about Japanese health insurance system has been used since 1961 and long-term care covers well-being service that is separated from medical care insurance scheme in 2,000 when Japan had been admitted as aging society. This policy aims to build comprehensive support service until the end of time of elderly in every community (Liu, C. Wang, Hu, & W. Wang, 2018).

4.4 The Effect of Nursing Function on Independence

Family nursing care as a primary nursing function is expected to increase family independence in preventing and overcoming various family health problems (Kemenkes, 2018). Family care that functions as a basic essential function in the family have full responsibility to maintain the health status of the family members. Based on the results of the research, nursing functions affect the independence of the elderly by 52%. Factors that can influence the implementation of health care functions in the family include lifestyle, healthy environment and preventive health assessment to provide information that supports and identifies risk factors in order to develop a health care plan (Friedman, 2010). Family nursing care that is carried out effectively can increase family independence (Agrina & Zufitri, 2012). Family members who are able to provide care to sick elderly people can play an important role in the health and well-being of the elderly to implement a comprehensive approach (Parmar, Jacqueline, Suzette, & Lesley, 2018). Efforts to guide and guide the family greatly influence the achievement of the independence of family members including the elderly in overcoming various health problems in the family. This is because family nursing care is a series of activities to transfer knowledge and the ability of the family to overcome existing health problems by using various strategies to change behavior towards a better direction (Rina, Jumita, Azrimaidaliza, & Rizanda, 2012). The strategies or methods used include health education using verbal, psychomotor (practice) and affective to see the extent to which family compliance with activities that address health problems in the family (Basuki, Agus Tri, & Prawoto, 2016).

4.5 The Effect of Health Education on Independence

A person's cognitive functions are very important in memory and most will affect daily activities (Muszalik, 2012). Education is the basis of intellectual knowledge possessed by someone, the higher the education will be the greater the ability to absorb and receive information. Extensive knowledge and insight is one of the factors behind the actions that will affect a person's behavior. The results of this study indicate the influence of health education on the independence of the elderly. Elderly people in Sleman Regency who often participate in *integrated-health-post* activities or who often visit health care facilities and get health education show independence, especially in terms of daily activities (activity daily living). In Iran, health education given to the elderly, especially those who suffer from diabetes, has an influence on the independence of the elderly in self-care. Independence in the elderly will have an impact on quality of life related to health (Ghasemi, 2019). This activity can be useful for maintaining joint function (physical health), so that it can improve fitness and improve feelings of well-being and support independence.

4.6 The Effect of Health Behavior on Independence

The results of this study indicate the influence of health behavior on the independence of the elderly. The elderly in this study were on average able to carry out daily activities and were active in integrated-health-post activities so that they were involved in direct socialization with the surrounding environment including with health workers. The social involvement of the elderly in the community can improve the physical health and mental health of the elderly by changing their health behavior and facilitating access to health care facilities and meeting with health workers so as to increase their independence. In China it shows that relatives, friends or neighbors are a source of social support and can monitor a person's health behavior, the researchers get significant and consistent results that social networks can regulate health behavior (Wu et al., 2017). The tendency of the elderly to carry out this healthy behavior will have an impact on independence which is not easy to depend on others. The social involvement of the elderly in the community can improve the physical health and mental health of the elderly by changing their health behavior and facilitating access to health care facilities and meeting with health workers so as to increase their independence (Vorst et al., 2017).

4.7 The Effect of Public Policy on Health Quality

There is no significant influence between public policy and the quality of health of the elderly. It can be shown that the elderly who do or enjoy health care facilities at the health care still have elderly people whose health status and quality of health are not good. The health quality of the elderly consists of physical health, mental health and health transition. Healthy public policy for the elderly in Indonesia has not all benefited the elderly, in Sleman regency

there are only 9 elderly health clinics from 25 health centers, but the remaining 14 health centers have run elderly health programs, this is evidenced by the ease of access in each health center, but not all elderly people can use this well. Many influencing factors include knowledge of the elderly about the facilities in the health center, information that is not obtained by the elderly, family members who do not deliver to the health center so that the elderly are reluctant to visit the health center.

4.8 The Effect of Function Care on Quality of Health

There is no influence between the health care function and the quality of health of the elderly. Based on the data obtained by researchers the factors that influence this include chronic conditions in the elderly, decision-making styles and discharge planning when the elderly are in hospital care. The researcher concluded that the care function of the elderly in the less category and the quality of health of the elderly in sufficient categories so that the effect was less meaningful, this happened because of several factors that influenced the functioning of the health care program from each family who had an elderly live alone at home. Elderly people who live with many families who feel lonely because they are left behind by children who have worked and grandchildren who go to school, so they feel that no one is paying attention or recognizing problems related to the health of the elderly. Factors that affect the quality of health of the elderly, namely age, sex, education, employment, income, marital status and social activities also affect the condition of the elderly, this condition greatly affects both the elderly who live with family or live alone. Researchers and policy makers must explore the potential benefits of providing support and receiving support.

4.9 Effect of Health Education on Health Quality

There is no influence between health education and the quality of health of the elderly. The researcher explained that there are factors that make the obstacle that health education does not affect the quality of health. These factors include gender, lifestyle and marital status (Mofrad, 2015), other factors that can influence are problems related to the elderly, abilities and potential of the elderly and the level of health of the elderly (Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan RI, 2015). Elderly people slowly began to withdraw both physically, psychologically and socially. The most noticeable decrease is limitations in physical activity, especially in stamina and health. As the physical condition decreases, the elderly need a variety of public facilities so that the elderly will tend to withdraw from their environment. Indirectly this decrease in stamina will affect psychological conditions because they feel unable to live as before and encourage clans to withdraw and focus in their own lives. It has resulted in the failure of health education given to the elderly so that it does not affect the quality of life of the elderly (Friedman, 2010; 2012).

4.10 The Effect of Independence on Health Quality

There is an influence between independence and the quality of health of the elderly. According to researchers, reactivating the elderly can affect quality of life or living arrangements with up to 12 months. Elderly people who use health care facilities are less likely to get higher individual care facilities than people who receive care in ordinary health care facilities for 24 months. Although there may be a reduction in the total cost of nursing home care and health care programs for 24 months (reablement: AUD 19,888; usual care: AUD 22,757; 1 trial with 750 elderly), researchers have not found significant results between the size and importance of the effects of this study because the results proved to be very low quality of life. Independence in terms of daily activities is also considered an important indicator in terms of the health of the elderly, whereas dependence on daily activities correlates with an increase in the risk of death and poor quality of life for the elderly (Henderson, Willis, Xiao, & Toffoli, 2016). It is recommended for the elderly to continue to carry out daily activities independently at home even though there are physical weaknesses. To support or improve health, effective interventions need to be developed through health promotion programs (Halcomb, Stephens, Bryce, Foley, & Ashley, 2016).

4.11 Community Nursing Health Promotion Model for the Elderly Through the Health Care Function Model

4.11.1 Step of Input

The health quality of the elderly starts from health promotion efforts. Health promotion includes health human resources, program funds, media health promotion programs and the intensity of health promotion programs that are carried out continuously so that they can improve the quality of health of the elderly well. In addition, the existence of public policies related to the health of the elderly will further increase the independence of the elderly who will have an impact on the quality of the health of the elderly.

4.11.2 Step of Process

Health education as part of a health promotion program in the form of intervention, health promotion is born from

health education. Health education that aims to change the behavior of individuals, groups and society is not enough to improve health status because there are still many factors or determinants that affect health and are outside the health area. Health promotion is a process of changing behavior or a planned learning process in individuals, groups or communities in improving their abilities (knowledge of attitudes and practices) to achieve optimal levels of healthy living. The process of health promotion includes schedules, the appearance of organizing officers and the environment into a unity that cannot be separated.

4.11.3 Output Stage

The results obtained from health education which is part of a health promotion program are knowledge, attitudes and practices related to health in the elderly. These goals: a) Make health as a value in society, b) Help individuals and families to be able to be independent or in groups to hold activities to achieve healthy life goals c) Encourage developing and using the appropriate health service facilities.

4.11.4 Out Come Stage

Individuals continue to learn to be independent in dealing with various circumstances in the environment so they are able to think and act on their own. The independence of individuals can support and choose a way of life to develop for the better. The level of independence of the elderly can be seen from the quality of life they have. The quality of life of the elderly can be assessed from the ability to carry out daily activities or activity of daily living.

4.11.5 Impact

Quality of life is a condition that describes the elderly to enjoy well-being including feeling all the events that occur in life. Elderly people who can achieve high quality of life can be interpreted that the life of the individual leads to a state of well-being but if the elderly have a low quality of life then the life of that individual is in a state of ill-being. Welfare is one of the parameters of the high and low quality of life of the elderly to enjoy old life. Improving the quality of life of the elderly aims to provide opportunities for the elderly who have the potential, empower the productive elderly and improve and strengthen the faith and piety of the elderly towards the Almighty God according to his beliefs

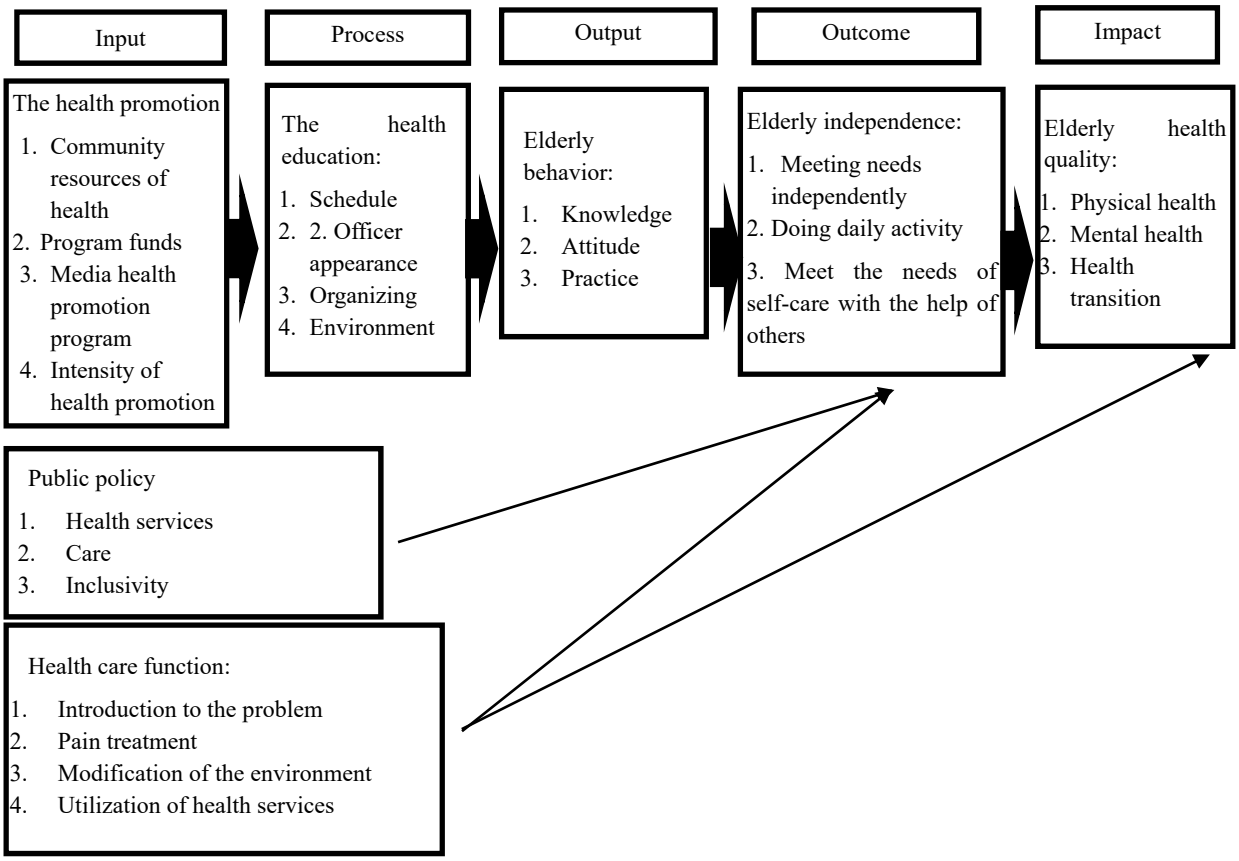

Figure 2. Health promotion model in the elderly health care program

5. Conclusion

The model of the influence of health promotion programs, health behavior and independence of the elderly on the quality of health of the elderly proved to be fit with the data. The health quality of the elderly can be improved by increasing the independence of the elderly through health education efforts that affect health behavior and improving facilities and infrastructure related to public health policy and improving the function of public health care.

This research also explores the factors of local government support in making policies. The Regency Government of *Sleman* in improving the quality of elderly health and independence in the health of the elderly, among others by providing a budget for special care programs for elderly health through the launching of the Elderly Community Health Centres to appoint nurses to carry out public health care and provide facilities in government health facilities and governmental organization that provides easy access for the elderly (inclusiveness). This is the value of increasing the quality of elderly health in *Sleman* Regency. So, life expectancy in Sleman Regency occupies the highest ranking in the *Yogyakarta* Special Region and National level.

The low quality of life according to researchers is not necessarily significant whether reactivating the elderly can affect quality of life or living arrangements with up to 12 months. The change of elderly behavior is a function of the efforts of focused and integrated health education, both in terms of activity schedules, appearance of health workers, organization of neat health education and a conducive community environment. Therefore, in developing health promotion programs in *Sleman*, the availability and quality of human resources, the policy of providing budgets / funds from local governments, the use of information technology-based media and the frequency of health promotion for the elderly will have an impact on the better life quality of the elderly.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Development and Validation of the Spiritual Impact Rating Scale for Women (SIRSW): A Tool for Assessing College Women's Spirituality

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Abstract

Spirituality impacts college student outcomes in the United States such as mental health, physical health, academic success, and healthy behaviors. Numerous studies consistently show gender differences on spirituality measures. The wealth of empirical evidence demonstrating gender differences in spirituality warranted the development of a tool for measuring college women's spirituality. The purpose of this study was to develop and examine the psychometric properties of the SIRSW, including its content validity, factorial structure, and internal consistency using a college women sample. A sample of 667 undergraduates (ages 18-26) at an all-women's Catholic University in the upper Midwest completed the spirituality survey in Spring 2018. Demographic characteristics were analyzed using descriptive statistics. Demographic differences in spirituality score were assessed using t-test and one-way ANOVA. Psychometric characteristics of the SIRSW were assessed by evaluating variability, internal consistency reliability, and overall scale structure. There were no significant demographic differences in total spirituality score. Internal consistency was high (Cronbach alpha = 0.97). Item-scale coefficients were above the minimum criteria. Factor analysis revealed that the 16-items measuring spirituality fell under the one-factor component and accounted for 82% of the variance. The SIRSW was found to be a valid and reliable tool for assessing the spiritual well-being of college women. Understanding college women's spirituality can inform the development of a spiritually oriented intervention that is consistent with their values enhancing their psychological, mental, and physical well-being.

Keywords: spiritual, impact, validation, rating scale, women

1. Introduction

1.1 Background

Spirituality is the process of striving for greater connectedness to self, others, and/or a higher power or nature; from which one derives a sense of meaning in life; and transcendence beyond self, everyday living, and suffering (Weathers, McCarthy, & Coffey, 2016). Spirituality provides one with personal meaning, social and inner resources they can call on in adverse situations (Pargament, 2001). Spirituality may help sustain valued health behavior and influence one's self-esteem and sense of belonging (Musgrave, C. E. Allen, & G. J. Allen, 2002). Research shows that students come to college in the U.S. not only with a desire to study and explore potential job and career opportunities but to find a sense of direction by addressing questions of meaning and purpose in life (Shin & Steger, 2016). Increasing numbers of college students not only consider themselves spiritual but seek out opportunities to help them grow spiritually (Kuh & Gonyea, 2006; Astin et al., 2004). Spirituality impacts student outcomes such as mental health (Dhama et al., 2017; Deb, McGirr, & Sun, 2016), academic resilience, (Ekwonye & DeLauer, 2019), and healthy behaviors (Hooker, Masters, & Carey, 2014; Mehri, Solhi, Garmaroudi, Nadrian, & Sighaldeh, 2016). A review of 20 research studies found a positive association between relational spirituality and quality of life across different age groups, including young adults (Counted, Possamai, & Meade, 2018). Spirituality can hold different meanings to different individuals. For some, spirituality is a part of organized religion such as going to church, temple, or mosque (Hooker, Masters, & Carey 2014). Others consider it very

personal (Reed, 1987), and some become attached to their spiritual side through prayer, meditation, silence, yoga, nature walk, etc. (Puchalski & Romer 2000). Gender-identity appears to influence the way that an individual perceives and expresses spirituality (Agha, Maqbool, & Javed, 2016).

1.2 Gender-Based Differences in Spirituality

The notion of gender differences has been reported on different aspects of human development implicitly or explicitly, whether it be in terms of women's distinctive forms of moral reasoning (Gatens-Robinson, 1986; Ryan, David, & Reynolds, 2004; Ward & King, 2018), ways of knowing (Belenky et al., 1986), emotionality (Miller, 1976), styles of relational attachment or identity formation (Josselson, 1987), and religiosity (Bryant, 2007; Johnson & Reynolds, 2018). Differences in all of these facets of human development lead to the beliefs that gender differences in spirituality may exist as well. It has been suggested that college women experience to a greater extent a strong relational spirituality in terms of daily connection with God through prayer, seek spiritual direction when handling personal problems, and feel assured that God is present and active in their lives. College women tend to derive comfort and security from faith and express feelings of devotion to and reverence for God compared to their male counterparts (Buchko, 2004). While some studies found that men benefit from public religious activity in comparison to women within some religious denominations, having spiritual experiences is important to women (Hammermeister et al., 2005). Over the past 20 years, there have been a number of spirituality assessment studies where female students scored higher than males in spiritual well-being (Bryant, 2007; Jafari et al., 2010). Gender differences in spirituality were found in a study of 60 college students. Using the Expressions of Spirituality Inventory, the authors found that males scored higher in the cognitive domain, whereas females scored higher in the experiential domain (Agha, Maqbool, & Javed, 2016). The authors argued that men and women do not differ in their levels of spirituality, but in the ways they conceive and express it.

Gender differences in spirituality have been linked to the concept of connected and separate ways of knowing (Belenky et al., 1986; Aldegether, 2017). According to the authors, connected knowers focus on relationships, feelings, and understanding others, while separated knowers favor moral objectivity restricting their personal feelings. Belenky et al. (1986) claimed that women are more likely to use connected knowing, while men are more likely to use separate knowing. Scholars of women spirituality have often depicted the connections between women's spirituality and their relationships with others (Ochs, 1983; Shukla et al., 2016). The notion of "being in relationship" as fundamental to women's spirituality was recognized by Bergin (1988) who also acknowledged that men form relationships with others. However, the difference lies in their style of being in a relationship (Al-Natour, 2017). While women focus on the personal connections formed with a loving God and with members of their religious communities, men feel drawn to God's power and judgment and on practicing spiritual discipline (Ozorak, 1996; Nadeem, 2015). Since evidence indicates that women's spirituality centers on "being in relationships" compared to men, one can argue that an exclusive instrument is required to gauge women's spirituality effectively. The Spiritual Impact Rating Scale for Women (SIRSW) satisfies that need as it was designed to measure perceived relational nature of women's spirituality, i.e., the extent to which women derive inner strength, support, meaning, and purpose in life through their relationships with self, others, and a Higher Power.

1.3 Existing Measures of Spirituality

Several instruments that measure spirituality have been used in both male and female populations without considering that males and females express and conceive their spirituality differently. One instrument is the Spiritual Well-Being Scale (SWBS) which is the most commonly used measure of spirituality (Paloutzian & Ellison 1982) and is based on monotheistic traditions such as tenets of Judeo-Christian religion, which excludes individuals from other spiritual traditions. For instance, an item from the SWBS: "I believe that God is concerned about my problems," implies membership in a Judeo-Christian belief system. The new measure (SIRSW) addresses this limitation by measuring spirituality as an experience of connection with a Higher Power, and as such could appeal to women from different spiritual backgrounds regardless of religious affiliation. Bufford, Paloutzian, and Ellison (1991) noted that the SWBS has ceiling effects that skew data, particularly in religious populations, while Genia (2001) calls into question its validity among groups other than those from the Judeo-Christian background. Beside the SWBS, other spirituality instruments such as the Spiritual Assessment Inventory (SAI) (Hall & Edwards 1996), Index of Core Spiritual Experiences (INSPIRIT) (Kass et al., 1991) are also based only on the Judeo-Christian religion. While other spirituality instruments appear to measure spirituality in young adults including college students, they did not recognize the existence of gender differences in spirituality (Hodge, 2003; Jagers & Smith, 1996; MacMillan & Luna, 2016). In light of increasing evidence in recent times supporting gender differences in spiritual well-being and women's tendency towards a relational form of spirituality (Desrosiers &

Miller, 2007; Bryant, 2007; Buchko, 2004; Hammermeister et al., 2005; Jafari et al., 2010), no tool has been exclusively developed to truly assess college women's relational spirituality.

1.4 Is a Separate Tool Needed to Assess Women's Spirituality?

The question of whether or not separate tools are needed to measure spirituality in males and females is currently unresolved. In some samples, there was no relationship between spirituality scores and gender (Agha, Maqbool, & Javed, 2016; Bufford, 1984). In other instances, gender differences were observed (e.g., Hammermeister et al., 2005; Jafari et al., 2010). On whether items on the most popular tool – the SWBS show differential item functioning (DIF) between gender groups, Kellums (1995) found that mean scores for the older adult population in graduate school were almost identical for males and females thus showing no gender differences for total SWBS score. However, in the younger adult population, females' mean scores were almost five points higher than the males on the SWBS. Although Bufford, Paloutzian, and Ellison (1991) acknowledged the existence of gender differences in spirituality but argued that it was not necessary to provide separate norms for males and females due to limited empirical information comparing men and women's spirituality in the '80s and 90's. More recently, an increasing number of research studies are strongly and consistently showing that gender differences in spirituality exist with women tending to a relational spirituality (Desrosiers & Miller, 2007; Sandage, 2017), thus necessitating the need to develop a separate tool to measure spirituality in college women. The new measure called the 'Spiritual Impact Rating Scale for Women' (SIRSW) was designed to assess college women's spirituality. The purpose of this study was to develop and examine the psychometric properties of the Spiritual Impact Rating Scale for Women (SIRSW) including its content validity, factorial structure, and internal consistency using a college women sample.

2. Methods

2.1 Development of the Spiritual Impact Rating Scale for Women (SIRSW)

The creation of the SIRSW and content validation was carried out in phases. The purpose of the first phase was to generate a pool of items for the questionnaire. Items were created after an extensive review of the literature and a cursory inspection of existing spirituality instruments including the comprehensive list of measures of religiosity (Hill & Hood, 1999). While the existing instruments contain some useful and meaningful items, no single tool appeared to be completely suited for measuring the relational nature of women' spirituality. This initial review led to the creation of a total of 22 items relevant to college women's spirituality.

2.2 Content Validation

In the second phase, the 22 items were reviewed for content validity by the University Chaplain, one Catholic nun, three graduate and two undergraduate students, a panel from the University's Office of Institutional Research, Student Support and Retention, and Academic Advising. Items were evaluated individually for simplicity, clarity, and relevance for women population. Ambiguous terms were either removed or reworded. For instance, one item was rephrased, and three items that were considered irrelevant for use in the female population were removed. In the end, 19 items were deemed valid for measuring the influence of spirituality in college women population.

2.3 Sample and Setting

The study was conducted at an all-women's college in the upper Midwest. The University has three colleges: Graduate College, College for Women, and College for Adults. The Graduate College and the College for Adults are coeducational. The 19 Spiritual Impact Rating Scale for Women (SIRSW) items were added to the institutional Mapworks survey. Students in the College for Women are highly encouraged by the institution to fill out the Mapworks online survey administered twice a year. The Mapworks online survey is designed to gather information about college students experience so that necessary support services can be provided primarily to at-risk students. The Mapworks survey contained institution-specific questions and SIRSW items. All 2,361 students enrolled in the college for women were eligible to participate in the study. A total of 672 students completed the survey yielding a response rate of 28.46%. This sample size was adequate for exploratory factor analysis (Comrey & Lee, 2013). This setting was selected due to the presumption that women attending the University have knowledge of spirituality and are aware that they are a part of a spiritual community.

2.4 Inclusion/Exclusion

To be eligible to participate in the study, the student must be currently enrolled in the College for Women in Spring 2018. Students were excluded if they were not actively enrolled in that semester.

2.5 Procedure

After the Institutional Review Board (IRB) approval, a total of 2,361 students in the College for Women were invited to complete the University Mapworks online survey through the Office for Student Support and Outreach.

Participants completed the consent form which contained information about the purpose of the study, risks and benefits, and the rights to withdraw from the study at any time without penalty. Data collection occurred for two weeks. Academic Advisors were emailed and asked to promote survey participation among their students verbally or through their emails. About 3-4 email reminders were automatically generated and sent to students through the Mapworks web server. To increase the response rate, participants were offered incentives for participation (e.g. reserved parking spot on the campus for spring term, creative cooking class, framed diploma for graduating seniors, early room residence hall sign up, dessert or hot beverage tickets, and $50 gas card). Completion of the survey took approximately 15 minutes. Survey data downloaded from Mapworks were stored on secured drives on password-protected computers. To ensure confidentiality, student data were aggregated and de-identified before analysis.

2.6 Data Collection

The SIRSW contains 19 items intended to reflect on the notion of "being in relationship." Some examples of items include 1) "To what degree does your spirituality define your relationships?" 2) "To what extent do you feel a sense of connection with Higher Power that transcends your personal self?" 3) "To what degree do your spiritual beliefs provide you with support and guidance?" 4) "To what degree does your spirituality give meaning and purpose to your life?" These items are intended to reflect a sense of relatedness to oneself, to others, to nature or the world, and to a Higher Power. Items are rated and scored on a 7-point scale. Responses range from 1 (Not at all), 4 (Moderately) to 7 (Extremely). The advantage of using a 7-point rating scale instead of a 5-point is the higher potential for differentiation in judgments made (Krosnick, 2018). Also, having verbal labels (not at all, moderately, extremely) may be beneficial, because they may clarify the meanings of the scale points and at the same time reduce respondent burden by removing a step from the cognitive processes involved in answering the question (Krosnick, 2018). The scores are summed up to provide total scores ranging from 16 to 112, with higher scores indicating higher spirituality.

2.7 Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 24.0. Before analysis, data were checked for missing values and outliers. Descriptive statistics were used to analyze the demographic characteristics of the sample. Demographic differences in spirituality were tested using t-test and a one-way ANOVA. Psychometric characteristics of the SIRSW were assessed by evaluating variability, internal consistency reliability, and overall scale structure. Normality of the distribution was assessed by observing the range of scores, evaluating the frequency distributions and symmetry. Scores that are distributed across the full range of values indicate that a tool has good variability within the specified group of individuals. In a normally distributed sample, the mean, median, and mode should be similar. Symmetry was assessed by calculating the skewness and kurtosis statistics. Skewness evaluates the extent to which a distribution of values deviates from symmetry around the mean. Kurtosis examines the extent to which distribution is peaked or flat relative to a normal distribution and is another indicator of variability. Skewness and kurtosis values of +/-1 to +/-2 are acceptable for psychometric purposes and represent a more normal distribution. Internal consistency reliability estimates the extent to which individual items within a scale are correlated with the other scale items in a given sample. Reliability of the SIRSW was interpreted by calculating a Cronbach alpha coefficient. A Cronbach's alpha of 0.70 and above are considered an acceptable criterion of internal reliability. A high value of alpha is evidence that the items measure the underlying construct (Portney & Watkins, 2009). Item-scale correlations assess the homogeneity of the tool and how well the items represent the construct of interest. A corrected item-scale correlation greater than .30 is commonly used (Portney &Watkins, 2009).

The SIRSW was evaluated for its factor structure with exploratory factor analysis (principal component analysis). Before performing the principal component analysis, the adequacy of data for factor analysis was assessed using Kaiser-Meyer-Olkin (KMO) test, a test for sampling adequacy and Bartlett's Test of Sphericity, a test of the suitability of the correlation matrix for factor analysis (Stevens, 2012). For factor analysis, the cut-off for item values of communality was 0.50. The criterion for factor extraction was an eigenvalue >1 and factor loading of > 0.70. The number of factors extracted was confirmed by visually examining the scree plot (Yong & Pearce, 2013).

3. Results

3.1 Demographics

The SIRSW was tested in an all-female sample. A total of 672 college women completed the survey. Five students were dropped from the analysis because they completed only one survey item giving a final sample size of 667. Demographic characteristics of participants are displayed in Table 1. One-way analysis of variance did not reveal

significant differences in total spirituality score among the four educational levels, age groups, ethnic groups, religious affiliation, and type of major. T-test analysis did not show significant differences in total spirituality score between on-campus and off-campus students.

Table 1. Demographic characteristics of participants

Characteristics	Frequency (%)	Mean	SD	p-value
Class Rank				0.27
1st Year/Freshman	88 (13.2)	59.42	32.61	
Sophomore	201 (30.1)	64.57	30.43	
Junior	180 (27.0)	63.49	31.82	
Senior	198 (29.7)	66.32	28.57	
Age				0.81
18-19 years	116 (17.4)	62.20	29.87	
20-21 years	308 (46.2)	63.72	31.55	
22-23 years	182 (27.3)	65.00	30.16	
24-25 years	29 (4.3)	66.66	27.62	
26+ years	32 (4.8)	67.59	29.78	
Race				0.45
White	420 (63.0)	62.96	30.33	
Black or African American	49 (7.3)	69.02	28.55	
Asian	83 (12.4)	65.04	30.44	
Hispanic or Latino	57 (8.5)	68.16	30.47	
Two or more races	32 (4.8)	60.66	34.63	
Nonresident Alien	8 (1.2)	81.25	22.95	
American Indian/Alaska Native	2 (.3)	57.00	57.98	
Unknown	16 (2.4)	59.63	36.53	
[a]Religion				0.28
Catholic	110 (16.5)	61.44	30.63	
Protestant	149 (22.3)	61.44	30.72	
Muslims	14 (2.1)	55.21	32.43	
Hindu	3 (.4)	46.00	37.47	
Buddhist	10 (1.5)	64.00	32.75	
Agnostic	29 (4.3)	57.72	34.74	
Jewish	3 (.4)	90.67	12.89	
No religious affiliation	119 (26)	66.82	30.90	
[a]Major				0.06
SHAS	225 (33.7)	60.99	30.72	
HSSH	311 (46.6)	64.44	29.70	
SBPS	112 (16.8)	69.46	31.21	
Type of Residence				0.60
Off-campus	347 (52.0)	64.59	30.43	
On campus	320 (48.0)	63.61	30.78	

[a]Missing data: participants left the item blank.

SHAS (School of Humanities, Arts, and Sciences), HSSH (Henrietta Schmoll School of Health), SBPS (School of Business and Professional Studies).

3.2 Variability

Cases that had a missing value in at least one of the items were dropped. The analysis was run on cases which had a complete set of data (n = 554). Psychometric properties of the SIRSW are shown in Table 2. The mean and standard deviation of the SIRSW total score (sum of the 16 items) of the whole sample was 64.12 (30.58). Participants used the full range of possible responses providing reasonable evidence of variability. The distribution is approximately symmetric with a slight negative skew, indicating that participants responded more toward the higher end of the scale.

Table 2. Spiritual Impact Rating Scale for Women (SIRSW) Descriptive Statistics and Reliability

Scale Statistics	
Number of items	16
Missing items	0%
Mean (SD)	64.12 (30.58)
Median	66.00
Skewness	-0.19
Kurtosis	-1.19
Possible range	1-7
Observed range	1-7
Internal consistency reliability	0.97
Range of corrected item-total correlations	0.82 - 0.93

The mean scores of the individual items ranged from 3.49 to 4.54 (Table 3). The item “I feel connected to others in my spiritual community” was the item with the lowest mean score, while “My spiritual beliefs are one of the most important things in my life” was the item with the highest mean score.

Table 3. Spiritual Impact Rating Scale for Women (SIRSW) Item Means and Standard Deviations

SIRSW Item Means and Standard Deviations	Mean	SD
Q1. My spiritual beliefs are one of the most important things in my life	4.54	2.14
Q2. Integrating spirituality into my life is personally important to me	4.25	2.17
Q3. I seek out opportunities to grow spiritually	4.03	2.07
Q4. My spirituality gives meaning and purpose to my life	4.37	2.15
Q5. My spiritual beliefs help me to find meaning in times of hardship	4.44	2.24
Q6. My spirituality helps define the goals I set for myself	3.95	2.15
Q7. My spirituality has helped me develop my identity	4.15	2.14
Q8. My spiritual beliefs define my relationships	3.70	2.06
Q9. My spirituality informs my ethical behavior	4.42	2.16
Q10. My spiritual beliefs provide me with support and guidance	4.25	2.16
Q11. My spirituality lies behind my whole approach to life	4.14	2.12
Q12. I have an interest in spirituality	3.93	2.04
Q13. I feel a sense of connection with Higher Power that transcends my personal self	3.92	2.21
Q14. I feel connected to others in my spiritual community	3.49	2.04
Q15. I experience spiritual strength by trusting in a Higher Power	3.98	2.20
Q16. I experience deep inner peace through meditation, prayer, or some other spiritual practices	3.91	2.10

Responses: Not at all			Moderately			Extremely
1	2	3	4	5	6	7

3.3 Factor Structure

The number of valid cases (those free of missing data) for exploratory factor analysis was 554. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were used to examine the appropriateness of Factor Analysis. The KMO statistic of 0.976 was large (higher than 0.50). Bartlett's Test of Sphericity was significant with a p-value of <0.0001 (χ^2 = 13798.6, *df* = 136) Therefore, factor analysis is considered an appropriate technique for further analysis of the data. An exploratory principal component analysis was performed to examine the dimensionality of the SIRSW. Only one component was extracted, so the solution was not rotated. Nearly all items loaded highly on the first factor with an eigenvalue of 14.38, explaining 75.7% of the variance. Item loadings ranged from 0.62- 0.89. Three items: 1) "My spirituality helps me to attain inner peace," "I feel good about the direction in which my life is headed," and "It is important that this institution encourages personal expression of spirituality" had loadings of 0.63, 0.62, and 0.69 respectively. These items did not also achieve the cut-off of 0.50 for item values of communality and were dropped from the analysis (table not shown). A second-factor analysis was conducted for the final 16-item one-factor solution, and loadings ranged from 0.84 to 0.94 (Table 4). An eigenvalue of 13.1 was obtained accounting for 82.0% of the variance. An examination of the scree plot supported the unidimensionality of the SIRSW.

Table 4. Principal components analysis factor loadings for the SIRSW items

Item	Factor 1	Communalities
Q1. My spiritual beliefs are one of the most important things in my life	0.91	0.84
Q2. Integrating spirituality into my life is personally important to me	0.91	0.84
Q3. I seek out opportunities to grow spiritually	0.87	0.77
Q4. My spirituality gives meaning and purpose to my life	0.94	0.89
Q5. My spiritual beliefs help me to find meaning in times of hardship	0.93	0.87
Q6. My spirituality helps define the goals I set for myself	0.92	0.86
Q7. My spirituality has helped me develop my identity	0.92	0.85
Q8. My spiritual beliefs define my relationships	0.89	0.79
Q9. My spirituality informs my ethical behavior	0.87	0.76
Q10. My spiritual beliefs provide me with support and guidance	0.94	0.88
Q11. My spirituality lies behind my whole approach to life	0.93	0.86
Q12. I have an interest in spirituality	0.89	0.79
Q13. I feel a sense of connection with Higher Power that transcends my personal self	0.92	0.84
Q14. I feel connected to others in my spiritual community	0.84	0.72
Q15. I experience spiritual strength by trusting in a Higher Power	0.90	0.82
Q16. I experience deep inner peace through meditation, prayer, or some other spiritual practices	0.84	0.71

N= 554; *Note.* Only one component was extracted. The solution was not rotated.

3.4 Scale Reliability

The internal consistency reliability estimates with Cronbach's alpha was very high, 0.97 for the 16-item scale. The inter-item correlation was used to determine how well individual items fit in the overall scale. All item-pairs had correlations above 0.60. All corrected item-total correlations were positive, with corrected item-total correlations between 0.82 and 0.93 (Table 2).

4. Discussion

The present study did not find significant differences in total spirituality scores among educational levels, age groups, ethnic groups, religious/spiritual background, type of major, and residence. Additionally, these demographic variables did not significantly predict SIRSW scores. On whether to develop separate norms for measuring spirituality in men and women, Bufford, Paloutzian, and Ellison (1991) doubted the need due to limited studies in this area at the time. In recent years, numerous studies are consistently showing that men and women score differently on spirituality measures, with college women not only having higher scores in spirituality (Buchko, 2004; Hammermeister et al., 2005; Jafari et al. 2010), but indicated interest in integrating spirituality into their lives and seeking spiritual virtues in life (Bryant, 2007) consistent with the findings of the present study. The wealth of empirical evidence demonstrating that men and women are simply different in the way they experience and express their spirituality warranted the development of the new measure, the Spiritual Impact Rating Scale for Women (SIRSW). The SIRSW was designed to capture the perceived relational nature of college women's spirituality by using a case study in which women are implicitly or explicitly connected to spirituality. This study explores the psychometric properties of SIRSW in a sample of female college students. Study results provide evidence of the reliability and validity of the SIRSW items in measuring spirituality college women population. Internal consistency was high in this sample of female college students; it could not be compared with findings from other studies since there are no current instruments that exclusively tap college women's spirituality. Item-scale coefficients were above the minimum criteria, demonstrating the homogeneity of the scale items in measuring the construct of spirituality. Overall, the results suggest that the SIRSW exhibits good evidence of internal consistency reliability. Factor analysis revealed that the 16-items measuring spirituality fell under the one-factor component and accounted for 82% of the variance. The items on the scale reflect relational connectedness which is central to college women's spirituality (Bryant, 2007; Buchko, 2004). Thus, items in the SIRSW captures college women's relational spirituality as the extent to which they derive inner strength, support, meaning, and purpose in life through their relationships with self, others, and their Higher Power.

The role spirituality plays in helping women find solace and comfort, meaning and purpose in their lives, positive birth, and mothering experiences, and dealing with personal and work-related challenges has been fairly well established (Blakey, 2016; Moloney & Gair, 2015; Reid, Roumpi, & O'Leary-Kelly, 2015; Dailey & Stewart, 2007). Since college women are increasingly committed to integrating spirituality into their lives, healthcare practitioners on or off campus may wish to use the SIRSW to conduct a spiritual assessment of their young female client. Results of such evaluation may provide insight as to the inner resources available to the young college woman. Such internal assets can be drawn upon to help them deal with stressful life events. The tool may also be used to understand the importance of spirituality in the lives of young women since young women who are highly committed to their spiritual beliefs and practices may be open to receiving a spiritually oriented intervention that is consistent with their values. This study was conducted in an all-female college sample and may inform our understanding of the spirituality of college-aged women and how healthcare professionals on college campuses can better work with them to support their spiritual growth. The study obtained a moderate to high spirituality scores and thus may suggest to college administrators the need to endorse the role of spirituality in the lives of their female college students. To further support the spiritual well-being of women on college campuses, college administrators may create space and opportunities that promote spiritual practices on college campuses. Since college women's spirituality is centered on being in a relationship, college administrators can encourage and promote the development and implementation of a spiritual mentorship program or community support network as suggested by Parks (2011) for students to feel safe in exploring the questions of meaning and purpose in life. College administrators can also track the level of spirituality of their female students using the SIRSW and monitor how it relates to retention, commitment, and completion.

This study has some limitations which provide opportunities for future research. First, utilizing a convenience sample limits the generalizability of the findings. Second, the use of cross-sectional design did not permit the assessment of the temporal relation of the variables. Third, participants may have given socially desirable responses that may not be reflective of their true feelings. Fourth, is the use of female college sample, whose characteristics may not reflect typical women community samples, but understanding that population in and of itself is crucial. Further research could validate the scale in a diverse college women sample.

5. Conclusion

This study assessed the relational nature of college women's spirituality using a newly developed tool, the SIRWS. The SIRSW was validated using a sample of female college students. The focus of this scale on relational spirituality allows this scale to be used with college women from a wide range of backgrounds similar to the

sample study. Further research could investigate the validity and usefulness of the scale among women in other college campuses. Future research could also test the scale with a wide range of student outcomes including lifestyle factors, academic behaviors and ethics, retention, and completion. The present study supports the concept of connected knowing which is fundamental to women's spirituality. Overall, the SIRSW scale was found to be a valid and reliable instrument for assessing perceived relational spirituality in college women.

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Competing Interests Statement

There was no potential conflict of interest.

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Stages of Change for Increasing Fruit and Vegetable Intake in a Japanese Population

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Abstract

Objective: Thhis study aimed to investigate the reason why people choose to consume less vegetable and fruit through examining how the stage of change and psycho-social parameters relate to vegetable and fruit intake.

Methods: We carried out a cross-sectional study in 4 regions of Japan in which 2308 individuals (1012 men and 1296 women) aged 18 years or older who completed the questionnaires were included in the study.

Results: The results showed 56% of the participants were in the precontemplation stage **(**not thinking about consuming recommended amount of fruit and vegetable) and their average amounts of vegetable and fruit intake were far below the level of current recommendations, and subjects in the precontemplation stage showed lower scores of attitude and self efficacy. Men were more likely to be in precontemplation (67.7%) and less likely to be in action/maintenance stage (7.9%) than women (46.9%, 12.1%, respectively) ($p < 0.001$). We also observed the scores of attitude ($p = 0.06$) and self-efficacy ($p < 0.01$) rose as the stage went up from the precontemplation to action/maintenance for increasing vegetable and fruit intake. Moreover, a linear trend was found toward higher vegetable ($p < 0.05$) and fruit ($p = 0.121$) intake from precontemplation to action/maintenance stage.

Conclusion: The present evidence suggests more attention should be focused on strategy for perceptions of personal need for recommended amount of vegetable and fruit intake for those who are in the precontemplation stage. Moreover, effective programs on enhancement of self-efficacy and attitude toward vegetable and fruit consumption are needed for increasing the vegetable and fruit intake.

Keywords: vegetable and fruit intake, stages of behavior change, knowledge, attitude, self-efficacy

1. Introduction

Adequate fruit and vegetable (F&V) intake have been reported to decrease the risk for many chronic diseases (Boeing et al., 2012) including ischemic stroke (Joshipura et al., 1999), cardiovascular disease (Bazzano, Serdula, & Liu, 2003; Hartley et al., 2013), hip fracture (Byberg, Bellavia, Orsini, Wolk, & Michaëlsson, 2015), and cancer (Block, Patterson, & Subar, 1992; Van't Veer, Jansen, Klerk, & Kok, 2000; Wakai et al., 2015). In Japan, the daily recommended amounts of fruit and vegetable are 200 g or more and 350 g or more, respectively (Ministry of

Health, 2000; Ministry of Agriculture, 2005); however, the average daily F&V intakes remained low, 110.3 g and 277.4 g in 2011 and 107.6 g and 293.6 g in 2015, respectively (National Institute of Health and Nutrition, 2011; National Institute of Health and Nutrition, 2015). Therefore, understanding the real reasons why people do not consume more F&V is crucial to the development of effective nutritional intervention programs.

Many studies have shown the psychological factors and the stages of readiness to change are related to F&V intakes (Havas et al., 1998; Watters, Satia, & Galanko, 2007; Shaikh, Yaroch, Nebeling, Yeh, & Resnicow, 2008). A few studies in Japan have demonstrated that positive attitudes, self-efficacy, social support, and perceived barrier were associated with daily F&V intakes (Kobayashi, Asakura, Suga, & Sasaki, 2015; Okamoto, Nakao, & Muto, 2015; Kato, 2011; Kato, Watanabe, Haga, Imada, & Osada, 2014; Wang et al., 2016). However, there is limited evidence from Japan that addresses the association of the stage of behavioral change with daily F&V intake as well as with psycho-social factors among general population. The present study aimed to understand why people choose to consume less F&V through examining the stage of behavior change and psycho-social parameters of the subjects.

2. Method

2.1 Study Design and Setting

This study was a cross-sectional survey performed from October 2011 to June 2013. We collected the subjects conventionally from classes for college/university students, places of employment, and personal network in 4 regions of Japan (Chugoku region, Kinki region, Kyushu region, and Kanto region) (Wang et al., 2016).

2.2 Participant Characteristics

Three thousand one hundred and seventy-nine individuals aged 18 years or older were recruited, in which 1012 men (43.8%) and 1296 women (56.2%) who completed the questionnaires were included in the study.

Information on demographic characteristics, daily F&V intake (instruction and examples were presented in the questionnaire), how the subject thinking about eating or planning to eat the recommended amount of F&V, psycho-social parameters related to F&V intake were collected through a self-administered questionnaire (Wang et al., 2016). The study design was approved by the Ethics Committee of Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences (EKI 529). Written informed consent was obtained from all participants in accordance with the principles stated in the Declaration of Helsinki.

2.3 Measures

2.3.1 Vegetable and Fruit Intakes

Vegetable and fruit intakes were assessed with food frequency questionnaire by asking whether they consumed the 38 items of fruits, vegetable, and juice (including fresh, cooked, frozen, canned and dried F&V) on the day prior to the day of investigation, if the answer is “Yes”, then asking “How many times yesterday” and “the serving size (small, medium, large)”. The standard serving size with gram and volume was indicated in the questionnaire. General instructions about definition for fruit, vegetable, juice, and standard serving size (medium size) and examples were provided in the questionnaire. A sample of the questionnaire was kindly provided by Dr. Havas (Havas et al., 1998) and modified and tested for use in the Japanese population (Wang et al., 2016).

2.3.2 Psycho-Socail Parameters

Individual’s psycho-social parameters (including nutritional knowledge, attitudes, responsibility, social support, self-efficacy, and perceived barriers) related to F&V intake were measured by a questionnaire originally developed by Havas et al. (1998), and translated into Japanese and examined with a pilot study (Wang et al., 2016).

Nutritional knowledge of the participants regarding F&V intake was measured with 5 items. Attitudes toward F&V intake were assessed with a five-point Likert scale. Responsibility for food shopping and preparation was evaluated by 3 items and assessed with a three-point Likert scale. Social support was measured with 3 items.

Self-efficacy was measured with 10 items and assessed by a three-point Likert scales. Perceived barriers, including economic/distribution factors, family- and self-preference, availability when eat away from home, personal judgement and comprehension, personal habits, were measured with 18 items and each item was scored on a five-point Likert scale. Further details are described elsewhere (Wang et al., 2016).

2.3.3 Stage of Change

Stage of change behaviors related to increasing F&V intake was measured for 5 eating behaviors by asking questions including “Eating 350g or more vegetables and 200g or more fruits a day most day”; “Having 100% juice or fruit in the morning most days”; “Eating a green salad or another vegetable for lunch most days”; “Eating

2 or more servings of vegetable for dinner most days"; "Eating more fruits and vegetables" with a four-choice response format. Based on the transtheoretical model (TTM) of behavior change (Prochaska & DiClemente, 1983), the answers were converted to the following 4 stages: precontemplation stage (not thinking about doing it), contemplation stage (thinking about starting to do it in the next 6 months), preparation stage (definitely planning to start doing it in the next months), and action/maintenance stage (already doing it).

2.4 Data Analysis

We compared the proportions of subjects among the stages of change for the habits of F&V intakes using Chi-square test. A trend analysis (based on linear-contrast one-way analysis of variance) was also performed to examine the relation of psycho-social factor scores, F&V intake with the stages of change. All statistical analyses were performed using IBM-SPSS for Windows (SPSS Inc., Chicago, IL, USA).

3. Results

Table 1 illustrates the participants' profiles. A total of 1012 men (43.8%) and 1296 women (56.2%) who completed the questionnaires were analyzed in the study. More than half of the participants were aged less than 30 years old, and 76.1% were college educated or higher. Half of the participants (54.2%) reported currently working and 33.2% worked full-time (Wang et al., 2016).

Table 1. Participants' characteristics

		n (%)
Gender	Men	1012 (43.8)
	Women	1296 (56.2)
Age	< 30	1335 (57.8)
	30-59	776 (33.6)
	≧60	190 (8.2)
	Non-response	7 (0.3)
School education	< College/University	531 (23.0)
	≧ College/University	1757 (76.1)
	Non-response	20 (0.9)

Distribution in stage of change for increasing F&V intake across gender was shown in Table 2. For response to the question "Eating 350g or more vegetables and 200g or more fruits a day most day", there was a significant difference in proportion of participants among 4 stages of change ($p < 0.001$). The largest proportion of the participants (56.0%) answered "not thinking about doing it" (in the precontemplation stage) and 29.8% answered "thinking about starting to do it in the next 6 months" (in the contemplation stage), and men were more likely to be in precontemplation (67.7%) and less likely to be in action/maintenance stage (7.9%) than women (46.9, 12.1%, respectively) ($p < 0.001$). The least men (3.7%) and women (4.3%) were in the preparation stage.

Regarding the question "Having 100% juice or fruit in the morning most days", there was a significant difference in proportion of participants among 4 stages of change ($p < 0.001$) (Table 2). About 46.8% of the participants were in the precontemplation and 25.9% in the contemplation stages. More than half of men were in precontemplation stage (55.3%) and the proportions of men were smaller in the contemplation, preparation, and action/maintenance stages compared that of women, respectively ($p < 0.001$).

Regarding the question "Eating a green salad or another vegetable for lunch most days", there was a significant difference in proportion of participants among 4 stages of change ($p < 0.001$). Nearly half of the men (49.9%) and one-third of the women (30.8%) were in the precontemplation stage, and relatively small proportions of men and women were in preparation stage (5.4%, 5.0%, respectively) ($p < 0.001$) (Table 2).

To the question "Eating 2 or more servings of vegetable for dinner most days", there was a significant difference in proportion of participants among 4 stages of change ($p < 0.001$). The proportion of men (48.3%) in the precontemplation stage was two times higher than that of woman (24.3%). The least men (5.7%) and women (5.8%) were in the preparation stage ($p < 0.001$) (Table 2).

To the question "Eating more fruits and vegetables", there was a significant difference in proportion of participants

among 4 stages of change ($p < 0.001$). Both men (36.1%) and women (45.0%) were more likely to be in the contemplation stage; and higher proportion of women (26.1%) was in the action/maintenance stages compared with that of men (18.2%) ($p < 0.001$) (Table 2).

Table 2. Distribution in stage of change for fruit and vegetable intake across gender

	Stage of Change				Difference among stage (Chi-square test)
	Precontemplation	Contemplation	Preparation	Action/Maintenance	
1. Eating 350g or more vegetables and 200g or more fruits a day most day #, ***					
Total (n = 2292)	1283 (56.0)	682 (29.8)	92 (4.0)	235 (10.3)	
Men (n = 1005)	680 (67.7)	209 (20.8)	37 (3.7)	79 (7.9)	$p < 0.001$
Women (n = 1287)	603 (46.9)	473 (36.8)	55 (4.3)	156 (12.1)	
2. Having 100% juice or fruit in the morning most days***					
Total (n = 2291)	1073 (46.8)	594 (25.9)	132 (5.8)	492 (21.5)	
Men (n = 1006)	556 (55.3)	224 (22.3)	52 (5.2)	174 (17.3)	$p < 0.001$
Women (n = 1285)	517 (40.2)	370 (28.8)	80 (6.2)	318 (24.7)	
3. Eating a green salad or another vegetable for lunch most days***					
Total (n = 2290)	897 (39.2)	652 (28.5)	118 (5.21)	623 (27.2)	
Men (n = 1006)	502 (49.9)	228 (22.7)	54 (5.4)	222 (22.1)	$p < 0.001$
Women (n = 1284)	395 (30.8)	424 (33.0)	64 (5.0)	401 (31.2)	
4. Eating 2 or more servings of vegetable for dinner most days***					
Total (n = 2298)	801 (34.9)	612 (26.6)	132 (5.7)	753 (32.8)	
Men (n = 1008)	487 (48.3)	216 (21.4)	57 (5.7)	248 (24.6)	$p < 0.001$
Women (n = 1290)	314 (24.3)	396 (30.7)	75 (5.8)	505 (39.1)	
5. Eating more fruits and vegetables***					
Total (n = 2291)	545 (23.8)	941 (41.1)	287 (12.5)	518 (22.6)	
Men (n = 1006)	353 (35.1)	363 (36.1)	107 (10.6)	183 (18.2)	$p < 0.001$
Women (n = 1285)	192 (14.9)	578 (45.0)	180 (14.0)	335 (26.1)	

Note. # Recommendation level of daily vegetable and fruit intake in Japan.

*** $p < 0.001$ (Men vs. women by Chi-square test). Values in the parenthesis denote percentage.

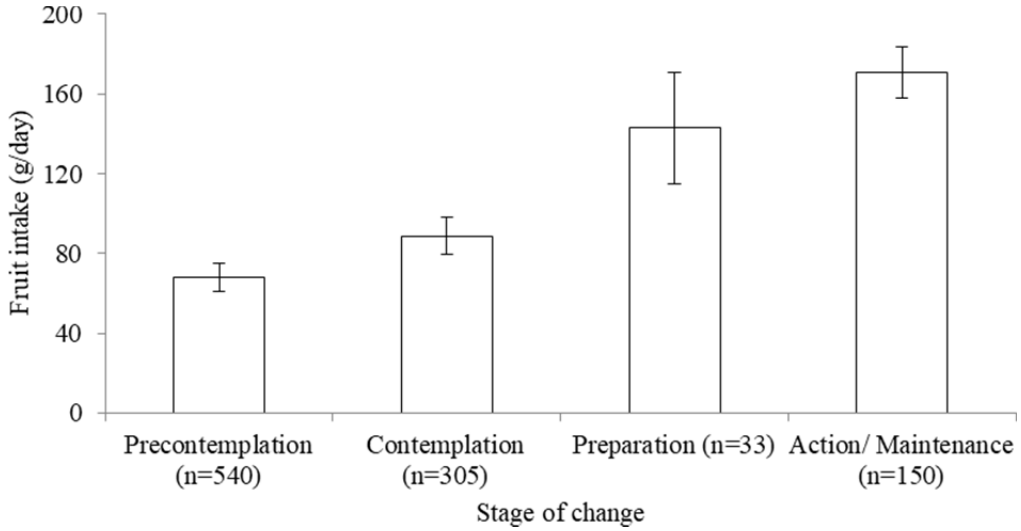
The highest proportions of the subjects answered not thinking about consuming recommended amount of fruit and vegetable (in the precontemplation stage) and the subjects in this stage consumed the least amount of fruit (Figure 1A) and vegetable (Figure 1B) daily. We also found there were linear trends toward higher fruit ($p = 0.121$) and vegetable ($p < 0.05$) intakes from precontemplation to action/maintenance stage (Figure 1).

Subjects in the precontemplation stage showed lower scores of attitude and self-efficacy than in the stages of contemplation, preparation, and action/maintenance stage (Table 3). We also observed the scores of attitude ($p = 0.06$), self-efficacy ($p = 0.005$) increased and the scores of responsibility decreased ($p = 0.003$) as the stage went up from the precontemplation to action/maintenance stages (Table 3). The average score of perceived barriers to increasing fruit and vegetable intakes tended to decrease as the stage went up although it was not statistically significant.

In the previous work, we found a 7-factor structure (2 self-efficacy factors and 5 barrier factors corresponding to loading values > 0.45) was a best-fitting model for deter-mining the major factors of self-efficacy and barriers that might influence F&V intake of the subjects (Wang et al., 2016). Table 4 demonstrates that as the stage went up from the precontemplation to action/maintenance stages, the subjects perceived more "willingness to consuming fruit and vegetable anytime" and "ability to designing meal", and had less barriers related to

"economic/distribution factors", "personal habits ".

A.



B.

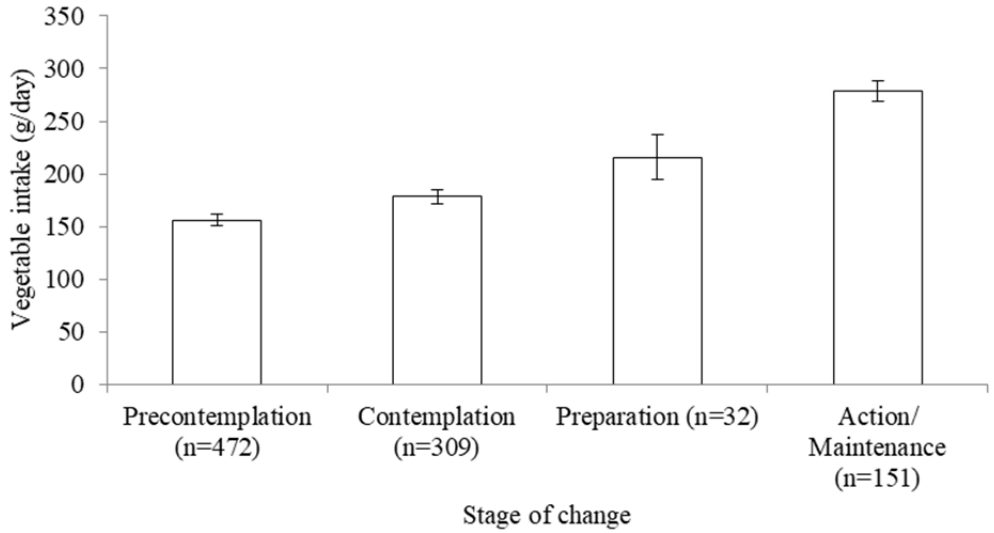


Figure 1. Self-reported daily fruit (A) and vegetable (B) intakes across the stages of change. Subjects in the precontemplation stage consumed the least amount of fruit (A) and vegetable (B) daily. After adjustment for gender, there were linear trends toward higher fruit ($p_{Trend} = 0.121$) and vegetable ($p_{Trend} < 0.05$) intakes from precontemplation to action/maintenance stage

Table 3. Mean scores of psycho-social deterninants for fruit and vegetable intakes across the stages of change

	Stage of Change				
	Precontemplation (n=1196)	Contemplation (n=640)	Preparation (n=83)	Action/Maintenance (n=211)	p_{Trend} ‡
Knowledge	3.0 ± 1.0	3.2 ± 0.9	3.0 ± 0.9	3.3 ± 0.9	0.089
Attitude	18.2 ± 4.6	20.3 ± 3.7	20.9 ± 3.4	21.5 ± 3.3	0.060
Responsibility	6.1 ± 2.3	5.6 ± 2.2	6.1 ± 2.2	5.1 ± 2.3	0.003
Social support	1.1 ± 1.2	1.4 ± 1.2	1.5 ± 1.3	1.3 ± 1.3	0.661
Self efficacy	17.4 ± 4.6	19.1 ± 4.0	21.5 ± 4.5	22.6 ± 4.2	0.005
Perceived barriers	45.6 ± 11.4	44.0 ± 10.5	41.2 ± 10.8	39.2 ± 11.1	0.191

Note. Values are mean ± standard deviation.

‡: Trend analysis adjusted for gender.

Table 4. Tendency of self-efficacy and perceived barriers across the stages

	Stage of change for increasing fruit and vegetable intakes				
	PC (n = 1283)	C (n = 682)	PR (n = 92)	A/M (n = 235)	p_{Trend} ‡
Self-efficacy					
Willingness to consuming V&F anytime	1.8±0.5	1.9±0.4	2.1±0.5	2.3±0.4	< 0.001
Ability to designing meal	1.6±0.7	1.8±0.6	2.1±0.7	2.1±0.7	0.008
Perceived barrier					
Economic/distribution factors	3.5±1.2	3.4±1.1	3.1±1.1	2.7±1.2	0.021
Family and self preference	1.6±0.8	1.5±0.7	1.5±0.8	1.4±0.6	0.106
Availability when eat away from home	2.9±1.3	3.0±1.3	2.7±1.1	2.5±1.4	0.454
Personal judgement and comprehension	2.5±1.0	2.2±0.9	2.1±0.9	2.4±1.0	0.63
Personal habits	2.7±1.0	2.5±1.0	2.4±1.0	2.2±1.1	0.026

Note. PC: Precontemplation, C: Contemplation, PR: Preparation, A/M: Action/Maintenance. V&F: Vegetable and fruit.

‡: Trend analysis adjusted for gender.

4. Discussion

The TTM of behavior change is a useful framework for research on understanding multiple behaviors in the general population (Prochaska & DiClemente, 1983; Marshall & Biddle, 2001). The results on the stage of change showed that more than half of the subjects were in the precontemplation stages of readiness to change for increasing F&V intake, among them the daily F&V intakes were much less than the recommended amount. Such a big proportion in the precontemplation can partially be ascribed to unawareness of the current recommended levels of F&V intake and its health implication as approximately 75% and 87% were unaware of the recommendations for daily F&V intakes, respectively, particularly in men (Wang et al., 2016). The study by Stables et al. (Stables et al., 2002) showed a significant improvement in population's F&V intake when the strategies focused on enhancing public awareness of guideline and health implication for F&V. Lower scores of knowledge and attitude to F&V intake in the precontemplation stage imply that increasing the public awareness of the current recommendations and health benefits of F&V might promote the stage transition from the precontemplation to the higher stages for F&V intake.

We also found that people in the precontemplation stage were those who had lower scores of self-efficacy. Many studies have indicated that self-efficacy strongly predict health behavior change and maintenance (Lawrance & Rubinson, 1986; Strecher, DeVellis, Becker, & Rosenstock, 1986; Velicer, Diclemente, Rossi, & Prochaska, 1990).

According to social-cognitive theory (Bandura, 1986; Bandura, 1997), people with low self-efficacy always think that they cannot perform well and avoid of challenging new things, therefore increase of opportunities for shopping, designing, and preparing meals at household level may make them feel competent to purchase/prepare/plan meal with F&V.

In addition, people in the precontemplation and contemplation stages were those who had higher scores of perceived barriers to F&V intake. The most subjects also perceived higher barriers to F&V intake as those of "economic/distribution factors" and "availability when eat away from home", implying a necessity of approaching to the food service industry and workplace environment to create or popularize high F&V ingredients menu at the dining room of the workplace, schools, and as well to increase availability of such as low price salad bar and takeout salad box in the market.

Consistent with previous research (Ozawa et al., 2013), our study observed there was a positive movement relating F&V intake while the stage of behavior going up (from precontemplation to action/maintenance); we also found from the precontemplation to preparation stages the social support increased as the stage went up. Social support is considered as a potential moderator of the associations between motivation and F&V intake (McSpadden, 2016). A multicenter cross-sectional study in Japan (Kobayashi, Asakura, Suga, & Sasaki, 2015) also demonstrated perceived family support positively associated with F&V intake. Thus, promoting social support from family members and friends might be one of the effective strategies of forward stage transition for F&V intake.

We found the subjects in the early stage of behavior change (precontemplation stage) showed a negative attitude towards F&V consumption and low knowledge score, and the scores of attitude increased as the stage went up from the precontemplation to action/maintenance stages. It is noting only 11.8% of the participants thought that 'Having a green salad or another vegetable for lunch is very important to me, and 10.9% thought "Having two or more dishes of vegetables for dinner is very important to me", implying the importance of incorporating the participants' awareness of their low F&V consumption into health benefit.

To our knowledge, this study is the first published work addressing the stage of readiness to change for F&V consumption and its relation with psycho-social determinants of F&V intake in varying regions of Japan. Although the current findings will be useful for the development of effective nutritional intervention programs in Japan, there are also limitations. First, it was a cross-sectional study and it limited to a number of participants in 4 regions of Japan by a conventional recruitment process, the findings may be affected by selection bias. Future study with sample groups from the other regions of Japan is needed. Second, self-reported measure on F&V intake might introduce some reporting bias although the average daily F&V intakes reported by our participants were consistent with the latest results of the National Health and Nutrition Survey in Japan (National Institute of Health and Nutrition, 2011; National Institute of Health and Nutrition, 2015). Third, since data on household income of the participants were not available, we could not exclude the possibility of a potential confounding by socio-economic status.

In conclusion, our findings provide the evidence that majority of the subjects was in the precontemplation stage, and among them the scores of knowledge, attitude, and self-efficacy were relatively low in comparition with those in the other stages. The identified differences in stage of change and psycho-social characteristics of F&V intake-related behaviors in this study may serve as a reference for tailoring future intervention programs, in which gender-specific approach should be considered.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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The Suspected Child Abuse and Neglect (SCAN) Programme in Malaysia: From Inception to Present

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Abstract

Issues on child abuse are very critical considering the many incidents of abuse and violence against children. Experiencing abuse in childhood has lifelong impacts on the health and well-being of children, their families and communities. Suspected Child Abuse and Neglect (SCAN) service is centralised, multidisciplinary team management in the government hospital and serve as a supportive service or programme to children, families and hospital staff. This paper outlines the history and the SCAN service available in Malaysia.

Keywords: child abuse, child neglect, child maltreatment

1. Introduction

Child abuse and neglect is a societal and global phenomenon for centuries (Alrimawi, Rajeh Saifan, & Abu Ruz, 2014) and a great public health concern. Reports of infanticide, mutilation, abandonment and other forms of violence against children date back to ancient civilizations (Arruabarrena, 2014). Child abuse and neglect occurs in a variety of forms and is deeply rooted in cultural, economic and social practices. Different standards and expectations for parenting behaviour in the range of cultures around the world helps define the generally accepted principles of child-rearing and care of children (Bornstein, 2012). There is general agreement across many cultures that child abuse should not be allowed, and virtual unanimity in this respect where very harsh disciplinary practices and sexual abuse are concerned (Butchart & Mikton, 2014; WHO, 2014). Almost all nations (196 countries) ratified the 1989 United Nations (UN) Convention on the Rights of the Child, which recognizes freedom from violence as a fundamental human right of children (Assembly, 1989). According to World Health Organization (WHO), child maltreatment sometimes referred to as child abuse and neglect, by definition includes all forms of physical and/ or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power (Butchart, Phinney Harvey, Mian, & Furniss, 2006). Based on the WHO Consultation on Child Abuse Prevention, there are four types of child maltreatment (child abuse and neglect): physical abuse, sexual abuse, emotional and psychological abuse, and neglect (Butchart, Phinney Harvey, Mian, & Furniss, 2006; Butchart, Mikton, Krug, Hogan, Laych, & Upton, 2014). The WHO 2002, estimated that worldwide around 875,000 children under the age of 18 years died as the result of an injury [WHO, 2005]. Shockingly, over the past decades, the WHO in 2016, the WHO estimated globally that up to 1 billion children under 18 years, have experienced injury in the past year, or half the children in the world (WHO, Fact Sheet 2018; Hillis, Mercy, Amobi, & Kress, 2016). United Nations (UN) has launched sustainable development goals (SDGs) to end all forms of violence against children (United Nations General Assembly, 2015). Global status report on violence prevention 2014 by WHO reported over half of the 133 reporting countries have child protection services (Butchart & Mikton, 2014). The National Health and Morbidity Survey (NHMS) conducted in 2016 revealed the prevalence of injury among children aged 12 to 59 months in the past one year was 3.8% (95% CI: 2.80, 5.22), which is proportionate to approximately 77,000 children in Malaysia (Institute for Public Health. National Health and Morbidity Survey, 2016).

1.1 Objective

This paper aims to describe the outlines the suspected child and neglect (SCAN) service/ programme in the public hospitals under the Ministry of Health (MOH), Malaysia.

2. History of SCAN

SCAN programme is an initiative undertaken by the Hospital Kuala Lumpur (HKL), Ministry of Health (MOH), Malaysia over the past 33 years (Ahmad, Denise, Arunachalam, & Niner, 2015). It is one of the major programme or initiative provided by the government facilities in dealing with child abuse cases in Malaysia. Apart from SCAN service, other services provided by government agencies include; the Child Protection Team (CPT), overseen by the Department of Social Welfare under Ministry of Women, Family and Community Development Malaysia, and (2) the Child Protection Unit (CPU) carried out by the Royal Malaysian Police. Each of the three programmes has a specific approach to the child abuse problem and different operational objectives, largely driven by the different roles, profiles and characteristics of the agencies themselves (Ahmad, Denise, Arunachalam, & Niner, 2015).

As early as 1974, Hwang et al stated many issues on child abuse in Malaysian hospitals (Hwang, Leng, & Chin, 1974). Child abuse is an important issue but often been neglected by healthcare providers, policy health makers and community, due to its sensitive information and social taboo (Hwang, Leng, & Chin, 1974). SCAN team was established in 1985 in view of the number of children maltreatment cases seen in Paediatrics wards at the HKL suffering from injuries deliberately inflicted by those taking care of them (Schwartz-Kenney, McCauley, & Epstein, 2001). The first SCAN team formed in 1985 was a prototype of the SCAN team available in Australia (Tomison & Tomison, 2002). It was a multi-disciplinary team comprised of medical doctors, medical social workers and police officers. The SCAN team managed any child abuse cases that were brought to the hospital as a team and followed up those cases. The SCAN team became the media focus in 1990 following the tragic death of a 26-month-old severed abused child. The SCAN team was the only organisation in Malaysia dealing with child abuse and used its advocacy role to lobby the Malaysian government for changes in protecting the child. The SCAN team involved with other agencies in preparing the Child Protection Act 1991, and later in year the 1998 received international recognition by the United Nations ‘for protecting the lives of children’. Later, the Child Act 2001 was passed by the government of Malaysia to provide provisions to protect abused children or children in need of care and protection (Child Act, 2001). A set of guidelines was published in February 2009 by specialists working group comprises of Paediatricians, Gynaecologist, Emergency Physician and Mental Health Disciplines, and then formalised by Working Committee and accepted by Head of Paediatrics Departments Meeting in 2007 to complement the guidelines for the management of child abuse at the level of public health staff (Guidelines for the Hospital Management of Child Abuse and Neglect Malaysia: Ministry of Health Malaysia, 2009).

2.1 Objectives of SCAN

The objectives of the SCAN team are as follows: (1) to define hospitals’ responsibilities regarding management of SCAN cases; (2) to provide a guide to the development of hospital protocols and procedures; and (3) to define organisational structure and role of SCAN team and members, at various levels of hospital care (Guidelines for the Hospital Management of Child Abuse and Neglect Malaysia: Ministry of Health Malaysia, 2009).

3. SCAN Team Composition

SCAN team is a centralised, multi-disciplinary and multi-agencies communications, management, database and supportive services to the suspected child abuse and neglect, adolescents and families. The goal of SCAN team is to reduce trauma to the child, by the professionals to communicate from the earliest opportunity, limit repeat interviews by different agencies and multiple interviewers, and continue to share information throughout the pendency of the case, improve coordination of service delivery, ensure forensic defensibility of services, and enhance the courts' ability to protect families (Guidelines for the Hospital Management of Child Abuse and Neglect Malaysia: Ministry of Health Malaysia, 2009). The SCAN approach does not require a formal centre. The SCAN team composition is depending on the type of hospital category. The hospital can be divided into three categories: (1) Level A: Hospital Kuala Lumpur (HKL) and state Hospitals; (2) Level B: other hospitals with specialists; and (3) Level C: hospitals without specialists. Level C hospitals are expected to refer all cases of child abuse and neglect to hospitals with specialists.

The SCAN teams include accident and emergency staffs, paediatricians, gynaecologists, forensic pathologists, nurses, and medical social workers who work with designated welfare officers from Department of Social Welfare (DSW) and police officers in the management of abused or neglected children. These SCAN teams work closely with children and adolescents and their families (Guidelines for the Hospital Management of Child Abuse and Neglect Malaysia: Ministry of Health Malaysia, 2009). Each person in charge in hospital collected their SCAN

local data and sent the local data returns by 3-monthly to the Violence and Prevention Unit at Non-Communicable Disease Section under the Disease Control Division, MOH. It helps to identify risk factors, the vulnerable groups, to improve the networking, referral system and emphasis on effective prevention programme using the multiagency approach.

3.1 Local SCAN Data

SCAN data were collected from sources at 3-level hospitals, once every 3 months. The SCAN data were categorised into cause of injury: unintentional and intentional injury. Unintentional injury subsided into Physical and sexual injury, where else the intentional injury subsided into shaken baby syndrome, physical and sexual, emotional abuse or neglect, and physical neglect/ abandonment. SCAN data were categorised further by gender, location of incidence and suspected perpetrator. In this report, we are revealed some of the SCAN data results in 2 years in 2015 and 2016 due to limited data.

Table 1. Percentage of SCAN data in year 2015 and 2016 with various categories of SCAN cases

Category of SCAN cases/ Year	**2015**	**%**	**2016**	**%**	**difference**	**% difference**
Total SCAN cases	**802**		**893**		91	11%
Type of SCAN cases						
physical	225	28%	322	36%	97	43%
sexual	497	62%	517	58%	20	4%
shaken baby syndrome	8	1%	0	0%		
emotional abuse/ neglect	72	9%	11	1%	-26	-33%
others	0	0%	43	5%		
Gender						
Female			714	80%		
Male			179	20%		
Perpetrator						
mother/ father	201	25%	224	25%	24	12%
babysitter/ childminder	176	22%	62	7%	-114	-65%
others	201	25%	273	31%	73	36%
siblings	96	12%	21	2%	-75	-78%
stepparent	48	6%	42	5%	-6	-13%
relatives	40	5%	49	5%	9	22%
child	24	3%				
girlfriend/ boyfriend	16	2%	222	25%	206	1284%

Table 1 shows the frequency and percentage of SCAN data in the year 2015 and 2016 according to various categories. The total SCAN cases in 2015 were reported 802 cases, then in the subsequent year 2016 were reported 893 cases. The total SCAN cases in 2016 were reported 11% an increased from year 2015 from 820 cases to 893 cases. Among 802 cases in year the 2016, the sexual cause reported 497 cases (62%), followed by the physical cause reported 225 cases (28%), the emotional abuse/ neglect cause reported 72 cases (9%), the baby shaken syndrome cause reported 8 cases (1%), and other causes reported zero number (0) cases (0%). The sexual cause reported 517 cases (58%), the physical cause reported 322 cases (36%), other causes reported 43 cases (5%), the emotional abuse/ neglect cause reported 11 cases (1%), and the baby shaken syndrome cause reported zero (0) cases (0%) in the year 2016. The most common causes of SCAN cases in both years are the sexual, followed by the physical, the emotional abuse/ neglect cause, the baby shaken syndrome cause, and other causes revealed different frequency for each year. Among 893 cases in year 2016, the proportion of females was higher (80%) than males (20%), with a sex ratio of 4 girls per each boy (4:1) meanwhile in year 2015, no gender data were available during this reporting. Mother/ father the most common perpetrator (25%), followed by others (25%), babysitter/

childminder (22%), siblings (12%), stepparent (6%), relatives (5%), child (2%), and girlfriend/ boyfriend (2%) in year 2015, which means that 25% of perpetrator of child abuse/ neglect is their own parent. Among perpetrators in year 2016, the others (31%) showed the highest percentage then the rest perpetrators which were the Mother/ father (25%), followed by girlfriend/ boyfriend (25%), step-parent (5%), relatives (5%), and siblings (2%), which showed the girlfriend/ boyfriend as perpetrator shoot up to 25% from 2% in the past a year, is an alarming figure of the perpetrator as an immediate family members has been awarded temporary guardianship or being close to the child to provide protection. There was no perpetrator data available for child-category during this reporting.

4. Discussion

In this report, stated the frequency and comparison of SCAN data in Malaysia of all its categories in both the year 2015 and 2016. An increased 11% SCAN cases in year 2015 from 802 cases to 893 cases in year the 2016, might due to the current gazettement of the Child Act (Amendment) 2016 as a revision from previous Child Act 2001 (Child Act (Amendment), 2016) in the Parliament, is a positive step. The Child Act (Amendment) 2016 has four main amendments: child registry, enforcing the community service order (CSO) for child offenders, improving child protection through the National Council for Children and Child Welfare Teams and stricter penalties. Under Section 31 with jail term doubled to a maximum of 20 years and the fine increased to RM50,000 from RM20,000 for child abuse and neglect cases. The child offenders will be rehabilitated under the CSO through the communal work, counselling, parental and reconciliation programmes, in addition to a jail term or a fine. Details of all those convicted of any offence will be kept in the Register of Children. Affected children or victims of abuse or neglect will be placed with their families or relatives. It will also be an offence for not to report incidents of child abuse. Another possible increased number of reported SCAN cases due to activation of a free call initiative programme in 2015 from local telecommunication company to the 24-hour helplines of Talian Nur and Childline 15999 in partnership with the government agency-Ministry of Women, Family and Community Development and Childline Malaysia is another good example to provide easy, better and protective access. Talian Nur is a hotline link to enable early intervention for victims of domestic violence and Childline 15999 initiated by the Malaysian Children TV Programme Foundation in 2008 is a confidential 24-hour helpline for children and young people to seek information, share feelings and get needed help.

4.1 Child Abuse and Neglect Registry/Information System

Child abuse and neglect is an important cause of childhood morbidity in terms of its impact on physical health and disability, emotional health and healthy child development (Taib & Filzah, 2015). The SCAN local data reported from various related government hospitals using the administrative or conventional system by filling up the reporting forms and sent through electronic via email. These reports derived from various sources from the doctor, staff nurse, social worker, other authorities such as the police officer about suspicion of child abuse and neglect. Variation in standard definition for child maltreatment even within various agencies is problematic and cannot be compared. Official statistics or child abuse and neglect data are important specifically designed to measure the incidence or prevalence of child abuse and neglect (child maltreatment). Survey data, particularly on those using group data, are not adequate to represent Malaysia population and less reliable. It needs a most robust survey involving a large representative sample of the population. This might incur more cost to do a population-based survey. A similar survey was done in UK 2009 showed an overall response rate was 60.4% (Radford, Corral, Bradley, & Fisher, 2013). A survey data or population-based survey or study, although useful, cannot be compared to official statistics of child maltreatment by either the child survivors or the suspected perpetrators. A good quality epidemiological data on child injury and its determinants are essential for identifying priority issues, risk factors, high-risk groups, and also for understanding the underlying causes of child injury in Malaysia. Detailed analysis of sound SCAN data has undoubtedly been instrumental in achieving the high rates of success in SCAN prevention programme in Malaysia. A few countries have robust child abuse and neglect information systems for example in Australia, Belgium and Canada (AlEissa et al., 2009). There is a need to develop a national child abuse and neglect registry or comprehensive and data-driven national action plans as a monitoring or screening platform to formulate effective national plans of action or other policy frameworks for the safety of children in Malaysia.

4.2 Research and Prevention Programme

Reductions in child injury, morbidity and mortality as a result of the application of evidence-based programmes based on rigorous research and priority-setting, have been achieved in some countries. Research into the whole spectrum of SCAN, from the primary prevention through to rehabilitation, deems much higher levels of funding. There are not much current published studies to reflect the extent of child injury in Malaysia nor the gaps in prevention programming and service delivery. It is vital to have a national action plan are driven by good epidemiological data, as the findings provide pointers for government agencies, other non-government agencies as

well as international violence prevention partners. SCAN prevention programme should be a responsibility shared between multiple government agencies, non-government organisations, academic institutions, mass media and private sectors. A well-targeted investment of funding resources is needed to tackle the problem of child injuries, besides address the infectious diseases, the major killer of children under five years of age. Effective injury prevention is a very cost-effective public health strategy and is usually much lower than the cost of the consequences of injury.

5. Conclusion

A reliable and cost-effective SCAN registry or data collection system is needed to integrate into other child health screening or programme and enables the Government to do comprehensive and effective policy formulation related to the care, protection, rehabilitation, development and the participation of children at the national, regional and international levels. It will provide a thorough understanding of the true epidemiology of the problem as well as the burden of SCAN injuries on the vulnerable and victimised child.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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The Perspectives of Amateur Soccer Players and their Coaches on the Use of Performance Enhancing Substances

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Abstract

Adolescent and youth sports seem to have progressively developed in South Africa to the point where young athletes are considering doping and the use of performance-enhancing substances (PES). This study determined the perspectives of U-19 soccer players and their coaches in the eThekwini region, KwaZulu-Natal, South Africa, on the use of supplements and drugs. Male participants (n = 449) playing first team soccer from development clubs in the eThekwini region, and their respective coaches (n = 30), volunteered to participate in this study. A questionnaire was administered to players and coaches were interviewed. Soccer players and their coaches believed that consuming prohibited substances in sport was unethical. The majority of the players (73.9% either agreed or strongly agreed) and coaches believed that doping in soccer is on the increase. About a quarter of the players consumed nutritional supplements and smoked cannabis. Anti-doping educational programmes and behaviour change interventions are vital in order to educate and transform athletes' and coaches' perspectives on doping and PES, and their resultant behaviour.

Keywords: supplements, cannabis, soccer players, coaches, doping

1. Introduction

Doping is regarded as a form of cheating, where athletes use substances that are on the prohibited list, predominantly for gaining an edge over their competitors. Coaches are often identified as a critical factor in an athlete's doping behaviour (Lazuras, Barkoukis, Rodafinos, & Tzorbatzoudis, 2010) and are as important as potential agents in doping prevention (Kirby, Moran, & Guerin, 2011; Cléret, 2011). A lack of engagement around the topic of doping issues by coaches, and pressure from management through a win-at-all-costs emphasis, were identified as factors that contributed to athletes making the decision to dope (Kirby et al., 2011).

An alternative to doping can be the use of a nutritional substances, which may help to improve the health and performance of active adolescent athletes (Gradidge, Coopoo, & Constantinou, 2010). However, besides the growing concern of unintentional doping through the use of nutritional supplements, adolescent athletes' perceptions about the use of performance enhancing substances (PES), and how they may think it is acceptable to consume PES to give them an edge, is also of concern. A performance enhancing substance can be any substance taken in non-pharmacological doses, specifically for the purpose of improving sports performance. Dietary supplements, prescription medications and illicit drugs can be considered as PES (Gomez, 2005).

Backhouse, Whitaker and Petróczi (2013) reported on the 'gateway hypothesis' in their study of competitive collegiate athletes. This hypothesis predicts that the use of nutritional supplements, cannabis and/or alcohol can increase the risk of transitioning to PES or other 'hard' drugs such as steroids. Comparing non-users and regular nutritional supplement users, it was found that a significantly higher percentage of the nutritional supplement users reported that they doped (22.9% vs 6%). Individuals who used nutritional supplements had the perception that the use of PES to gain a favourable advantage in competition was acceptable and a viable option (Backhouse, Whitaker, & Petróczi, 2013).

Morente-Sánchez and Zabala (2015) believed that team-based sports were less prone to doping practices than individual sports. However, there appears to be an increase in doping among adolescent and amateur soccer

players. The use of local and traditional supplements among amateur soccer players from the African continent is increasing (Ama, Betnga, Ama Moor, & Kamga, 2003).

In South Africa, an earlier study was conducted in 1992 on androgenic anabolic steroid use in secondary school learners (Grade 12) in the Western Cape (Nolte, 1992). Another study in 2010 (Gradidge et al., 2010) investigated the attitudes towards, and perceptions of, PES use in high school boys in Johannesburg. More recently, Nolte et al. (2014) studied the attitudes, beliefs and knowledge of talented young athletes (males and females) residing in Gauteng regarding prohibited PES and anti-doping rules and regulations. Results from these studies show an increase in the use of prohibited PES among the youth. Adolescent and youth sports seem to have developed to the point where young athletes are considering doping, including the use of PES.

2. Purpose of Research

Taking into consideration the increase in doping practices among soccer players, and the influence of coaches on their players, there appears to be a gap in the literature regarding players' and coaches' perspectives of PES. Moreover, studies on South African soccer players are limited, particularly in the province KwaZulu-Natal. The purpose of this study was to determine the perspectives of U-19 soccer players and their coaches on the use of PES in the eThekwini region, KwaZulu-Natal.

3. Methods

This study used a mixed-methods design. Ethical clearance was granted by the University's Human Resource Social Science Ethical Committee (HSS/0268/015M). The KwaZulu-Natal Department of Sports and Recreation granted permission to conduct the study on the players and coaches from soccer clubs in the eThekwini region.

A purposive sample comprised participants playing first team male U-19 soccer from 30 development clubs in the eThekwini region and their respective head coaches. The development league is a platform where scouts can recruit players to play in higher divisions. To be eligible to participate in the study, both the players and coaches had to be registered with their respective club for a minimum of six months.

Information sheets were handed out to participants outlining the purpose and possible outcomes of the study. Participants 18 years and over signed informed consent forms, while participants younger than 18 years signed assent forms and provided signed parental consent forms to participate in the study.

The player self-determined structured questionnaire was used to determine the attitudes, beliefs and knowledge of the athletes with regards to PES. The questionnaire was adapted from three studies, one local and two international (Ama et al., 2003; Nolte, Steyn, Krüger, & Fletcher, 2014; Van Aswegen, 2014). A pilot study was conducted with 10 local soccer players that were not part of the selected development teams. No changes were necessary, based on feedback from the participants. The questionnaire was thereafter translated into isiZulu (the local language). Participants were given clear instructions on how to complete the questionnaire and anonymity was ensured in order to allow the participants to answer the questions as openly and honestly as possible.

Semi-structured interviews were conducted with each coach. The questions were based on the general perceptions and sources of information about prohibited substances and PES; knowledge of supplement use; and attitudes towards doping in sport. The 45-minute interview was recorded and transcribed accordingly.

Data collection was conducted during the off-season training sessions. The researchers were present to assist with any queries while players completed the questionnaire. Additionally, an IsiZulu translator was present for players as well as coaches. Data collection was completed within three weeks.

Descriptive statistics were conducted using SPSS Statistics 20 (IBM, USA) for the player questionnaire analysis. Responses from the coaches' interviews were analysed methodically by clustering themes and thereafter identifying patterns. To enhance and demonstrate the trustworthiness of the results, a peer-review process was employed to examine the thematic analysis.

4. Results

Thirty development soccer clubs from the eThekwini region volunteered to participate in this study. However, questionnaires were completed by 449 players from 29 development soccer clubs. Results of the questionnaire are presented in Tables 1 to 4. Table 1 shows responses based on perceptions and knowledge of prohibited substances and PES, as well as attitudes towards doping. The majority of the players appear to agree or strongly agree that the use of prohibited substances is unethical, although their use is on the increase. Over half (52.1%) of the sample was African (black) (n = 234), with Asians (Indians) (n = 113) and mixed-race respondents (Coloureds) (n = 63) comprising 25.2% and 14%, respectively. Whites (n = 39) were the smallest group, at 8.7%.

4.1 Players' Questionnaires

Table 1. General perceptions and knowledge of prohibited substances

Questions	Agreed or strongly agreed	Disagreed or strongly disagreed	Neutral
The use of prohibited substances in sport is unethical	74.4%	16.3%	9.3%
The use of prohibited substances in sport is increasing	73.9%	9.6%	16.5%
Athletes are being pressured to use prohibited substances (by coaches, media, their parents etc.)	55.2%	31.2%	13.6%
A drug testing programme will prevent the use of supplements in school sports	82.2%	11.3%	6.5%
I am familiar with the current prohibited list of substances and supplements as indicated by the World Anti-Doping Agency	51%	31.2%	17.8%
I am aware of the punishment for doping offences in sport	78.4%	10.7%	10.9%

Almost three-quarters of the participants (Table 2) obtain information on supplementation from their coaches, books and personal trainers. The players may not always have their own personal trainers, but have friends or colleagues who are personal trainers. At least a quarter (42.3%) of the participants currently do not use PES.

Table 2. Sources of information regarding supplementation and use of supplements

Responses	Yes	No
Pharmacist	69.5%	30.5%
General Practitioner	65%	35%
Personal Trainer	73.9%	26.1%
Coach	74.6%	25.4%
Biokineticist/Trainer	59.7%	40.3%
Parent	53.2%	46.8%
Sibling	46.3%	53.7%
Internet	72.4%	27.6%
Books	74.2%	25.8%
Magazines	67.7%	32.3%
Videos	65.7%	34.3%
Use of supplements		
Response	**Frequency**	**Percentage**
Yes, currently use	111	24.7
Yes, but have discontinued usage	148	33.0
No, never used	190	42.3

The more popular magazines mentioned were Men's Health; FIFA; USN; Sport Science Nutrition; body building magazines and Laduma. Television, posters and flyers were also used as sources by the participants. With regards to internet sources, the majority of participants used search engines such as Google, Yahoo and Bing to find information about supplementation. Google was used by 85.2% of the sample. More than one-third (38.4%) of participants viewed You Tube videos about supplementation to gather information. The sites reported as least viewed were USN (12.1%), Wikipedia (12.5%) and body building websites (6.1%).

The majority of the participants appear to have a positive attitude towards anti-doping (Table 3).

Table 3. Attitudes towards doping in sport

Questions	Agreed or strongly agreed	Disagreed or strongly disagreed	Neutral
Sport organisations should offer educational programmes for athletes on the use of substances in sport	86.4%	8.7%	4.9%
There are too many athletes in South Africa using substances to enhance their athletic performance in my sport	71.5%	11.1%	17.4%
There are too many athletes world-wide using substances to enhance their athletic performance in my sport	72.4%	12.2%	15.4%
The illegal use of substances by athletes has not been reported on enough by the media	71.3%	16.9%	11.8%
The use of PES and supplements has risen in the last five years	72.8%	11.4%	15.8%
Taking prohibited/illegal substances is harmful to my health	84.4%	9.4%	6.2%

Reasons for PES use (Table 4) were predominately personal and social. Almost a third of the participants consumed PES for sport-related purposes, like recovery or nutrition.

Table 4. Reasons for consuming PES

Responses	Agreed or strongly agreed	Disagreed or strongly disagreed	Neutral
Recreational or social reasons	64.8%	18%	7.2%
Assisting me in coping with the stresses of sport	31.6%	32.4%	36%
Assisting me in coping with life's stresses	61.3%	21.6%	17.1%
Improving my sport performance	43.2%	39.8%	27%
The good feeling they give me	69.3%	19%	11.7%
Enhancing recovery	28.8%	54.1%	17.1%
Counteracting tiredness	20.7%	63.1%	16.2%
Meeting nutrient needs	27.9%	55%	17.1%
Increasing my energy	30.6%	52.3%	17.1%

Table 5 shows smoking, alcohol consumption and cannabis use by participants who currently use, or have previously used, PES.

Table 5. Smoking, alcohol consumption and cannabis use (PES-users)

Smoking and alcohol consumption		
Questions	**Yes**	**No**
Do you smoke before matches	47.7%	52.3%
Do you smoke after matches	59.5%	40.5%
Do you drink alcohol before matches	32.4%	67.6%
Do you drink alcohol after matches	65.8%	34.2%

Cannabis knowledge and use		
Questions	**Yes**	**No**
Do you know of banga (marijuana)	91.9%	8.1%
Do you know of wie-wie (a locally manufactured powdered traditional product)	77.5%	22.5%
Do you know of iboga (a hallucinogenic drug)	69.4%	30.6%
Do you know of cocaine	68.5%	31.5%
Do you use banga (marijuana)	70.3%	29.7%
Do you use wie-wie (a locally manufactured powdered traditional product)	8.1%	91.9%
Do you use iboga (a hallucinogenic drug)	12.6%	87.4%
Do you use coccaine	36.9%	63.1%

The incidence of marijuana smoking is high among the participants (70.3%). The use of cocaine (36.9%) is of major concern.

4.2 Coaches Interview

The following themes emerged among coaches regarding their perceptions of prohibited substances: the use of illegal substances is unethical; substances on the WADA prohibited substance list; and source/s of information.

4.2.1 The use of illegal substances in sport is unethical:

The coaches felt that the use of illegal substances gave athletes an unfair advantage against rivals who cannot afford such substances. Additionally, there are many harmful side-effects associated with the use of these substances, which can affect the athlete in the long-term. However, coaches expressed the opinion that if these substances were provided to all 22 players on the field, then it could be considered fair. Statements reported by coaches included:

"It is against the principle of sport to dope. It is unfair to the people who cannot afford them." "It is discomforting to see our youngsters consuming prohibited substances to get an edge. Training is vital but prohibited substances give an unfair edge."

"Everything should be all natural and you should be dependent on your own ability rather than having substances to enhance your performance." "Gives an unfair advantage to individuals and the harmful effects heavily outweigh the positive gains."

4.2.2 Substances on the WADA Prohibited Substance List

The coaches were unfamiliar with the substances that were on the published WADA prohibited list. However, they were knowledgeable about the common prohibited substances. Furthermore, coaches were unaware that the prohibited list is updated yearly. Comments expressed by coaches included:

"I have an idea but I don't know the list in detail." "I am aware of the common prohibited substances or methods such as blood doping."

4.2.3 Sources of Information

The majority of the coaches sourced their information about supplementation for the players from the internet, Sports Illustrated magazine, health shops, USN brochures, experienced coaches, media such as television, dieticians, sport physicians and biokineticists.

Comments reported included:

"I source my information from reliable sources such as sport physicians, fellow experienced coaches and biokineticists." "Although I rarely source information about supplementation, if I had to I would source them from management staff, fellow colleagues, media, sports magazines and experienced coaches."

4.2.4 Knowledge About Supplement Use

The following themes emerged among coaches regarding their knowledge about supplement use: consumption of supplements; consumption of cannabis or PES; consequences of doping.

4.2.5 Consumption of Supplements

Players held mixed views about the use of supplements. At least half of the coaches believed that their players

should be taking PES. Many of the coaches believed that their players would not be able to afford substances or supplements.

Coaches who recommended that their players consume supplements often recommended protein shakes, energy drinks such as Monster, creatine supplements and glutamine. However, the majority of the coaches were not aware of what their players were consuming, specifically at practices or matches in the absence of a coach.

4.2.6 Consumption of Cannabis or PES

The coaches were adamant about the use of cannabis and they made a rule that if any player was caught taking drugs, they would be barred from the club. These were some of the comments voiced by coaches:

"I have outlawed the consumption of any drugs. If caught I make sure that they are kicked out of the club"

"My players cannot afford to buy drugs" "I assume they do not take, although I cannot say for sure."

4.2.7 Consequences of Doping

Coaches believed that their players were aware of the consequences if they were caught doping. However, coaches were not well informed about the range of sanctions that can be imposed on a player. Many of the coaches reported that they were aware of cases where players were caught doping in other sports.

4.2.8 Attitudes Towards Doping

The following themes emerged among coaches regarding their attitude towards doping: doping is a problem in soccer; media documentation of doping; doping in South Africa and internationally; the need for educational programmes.

4.2.10 Doping is a Problem in Soccer:

The majority of the coaches believed that doping is prevalent among players. However, the problem of doping in soccer is minimal when compared to sports such as rugby and athletics. Coaches accept that doping is an addiction.

4.2.11 Media Documentation of Doping

Coaches believed that the media frequently do not document or report the cases of doping, especially at U-19 club level soccer. Local cases should receive more exposure in the media. Coaches also believed that educational programmes about doping should be publicised in the media.

4.2.12 Doping in South Africa and Internationally

Coaches reported that there is a problem with doping in South Africa; but more so in international sports. They believed that, to meet the high demands of the professional game, a player has to dope. Furthermore, players are accessing doping supplements more easily as substances are easily available. Comments included:

"I do not believe that there is drug-free sport at a high level. In all sports there is doping, because to win you have to be excellent; and it is difficult to achieve excellence without doping." "I can't see how a player is able to keep up such an intensity for 90 minutes without doping."

"Players are uneducated about doping, so if they are told that if you take this it will make you play better, they are going to try it."

4.2.13 The Need for Educational Programmes

Coaches believed that education about doping should start from school-boy level. Comments included:

"Educational programmes will help our players learn about risks of doping and also learn about alternatives to doping."

"It would make them aware of what is legal and what is illegal. Will also make them aware of procedures on doping check-ups."

5. Discussion

Peretti-Watel et al. (2004) noted that the majority (90%) of athletes believed that doping is dishonest, unhealthy or very dangerous to an individual's health. Similarly, in this study, 37% of athletes agreed that taking prohibited substances in sport is unethical; whilst 37.4% strongly agreed with this statement. The majority of U-19 soccer players also believed that the use of prohibited substances in sport is on the increase and that drug testing or anti-doping programmes will help prevent the use of banned substances in schools.

In this study, most players are of the belief that they are being pressured into taking prohibited substances to enhance performance. Approximately a quarter (25.8%) of participants agreed with this statement; while 29.4%

strongly agreed with this statement. Sanchez and Zabala (2013) found that 6.5% of players were pressured by coaches to consume PES; whilst Gradidge, Coopoo and Constantinou (2010) found that 84% of athletes felt pressured to use PES in order to win. Ajzen (1991) reported on the Theory of Planned Behaviour. Lazuras et al. (2010) reported on 'situational temptation' with reference to this theory. Situational temptation focuses on coaches' suggestions; athletes' belief that teammates were consuming PES; expectations that athletes improve their performance; and whether they would take PES in preparation for an important game (Lazuras et al., 2010). It was found that there was greater intention amongst players to dope when these factors are present. It can therefore be assumed that, if coaches pressure specific players to consume PES, and their teammates are aware of it, or if players feel pressured to win, then the players are more likely to dope in order to improve their performance to the level of their teammates, who are already consuming PES.

Access to information and athletes' sources of information are critical for them to make informed and justifiable decisions. Waddington et al. (2005) reported that more than 50% of participants wanted additional information regarding supplement use; whilst Erdman et al. (2007) stated that 63.2% of players had access to anti-doping information. In this study, the majority of U-19 soccer players reported that they gathered information about doping and supplement use from coaches, the internet, books, personal trainers, pharmacists, magazines and videos. The lowest percentages of participants chose to seek information from general practitioners, biokineticists, parents and siblings. These findings indicate that most of our youth soccer players, as well as their coaches, do not source scientifically-based information regarding nutrition and do not consult with a dietician or other registered practitioner.

In this study, 28.7% of U-19 soccer players agreed that they were familiar with the current list of prohibited substances, as indicated by the WADA; while 22.3% strongly agreed. Of the participants, 49% were not familiar with the list. The majority of coaches also reported that they were not familiar with the substances or supplements that were on the WADA banned list. Similarly, a study conduct by Sanchez and Zabala (2015) found that 84.9% of coaches were not familiar with the WADA list of banned substances; whilst over half of the coaches did not know what the acronym WADA meant. Giraldi et al. (2015) also reported that coaches and athletes show a significant lack of knowledge about supplementation. From these findings, we can deduce that there is a clear lack of education regarding prohibited substances. This lack of knowledge by both players and coaches can, in turn, lead to more incidents of doping. A study conducted by Erdman et al. (2007) found that 76.7% of respondents reported that they were aware of the anti-doping regulations and 89.5% of athletes believed that they were following these rules. However, only 63.2% of the athletes reported that they had access to anti-doping information. This lack of knowledge is concerning and can result in unintentional doping by athletes.

In this study, 78.4% players stated that they are aware of the consequences of doping. Nieper (2005) reported that just over half (50.5%) of athletes knew the consequences if caught doping. However, players were unaware of the new 2015 WADA sanctions; i.e. athletes can receive a four-year ban from competition for a first offense for obtaining, consuming and attempting to use prohibited substances (2015 WADA Code Changes|U.S. Anti-Doping Agency (USADA), n.d.). Findings indicate that athletes need more education about the consequences of doping, which could impact on their perceptions about consuming PES and prohibited substances.

5.1 Patterns of Substance Use

In this study, 24.7% of soccer players admitted to consuming PES, cannabis, smoke and/or alcohol. A further 33% of participants had admitted to consuming these substances at least once, but had discontinued consumption. Coaches had mixed views on whether they would recommend PES for their players. A similar study conducted by Gradidge, Coopoo and Constantinou (2011) found that 30% of adolescent boys from Johannesburg high schools admitted to using PES. Backhouse, Whitaker and Petróczi (2013) reported on a 'gateway hypothesis'. This hypothesis states that athletes who consume nutritional supplements, cannabis or alcohol run an increased risk of transitioning to consuming illegal substances and doping.

Sanchez and Zabala (2013) reported that the main reasons for consuming PES were to achieve athletic success, improve self-confidence, and for social recognition. Another study conducted by Gradidge, Coopoo and Constantinou (2010) found that 84% of athletes in Johannesburg high schools consumed PES, cannabis, alcohol and/or smoked, as they felt pressured to win. The majority of athletes indicated that they use PES to improve performance; to help reduce food cravings – thus decreasing body weight; and to cope with the stress that sport places upon them. Kirby, Moran and Guerin (2011) noted that a lack of communication about doping by coaches, and pressure from management through a win-at-all-costs approach, were identified as factors that contributed to athletes' deciding to dope. Furthermore, Backhouse and Mckenna (2012) reported that 30% of coaches believe if players do not consume PES or dope, they have very little chance of success. Hence, athletes feel pressured to use

PES in order to perform at a high level and to win.

The majority of the soccer players began PES consumption in high school. Players believed that their coaches were unaware of their PES, cannabis and/or alcohol consumption. On the other hand, coaches believed that they were aware of their players' substance use. It appears that coaches are unaware of substance use among players, particularly during non-practice and match days.

Players in this study reported that they have used creatine, protein shakes, testosterone boosters and USN products. Coaches interviewed in this study also advised their players to consume protein shakes, energy drinks such as Monster, creatine supplements and glutamine. The similarities between coaches' suggestions and their influence on players is evident. The current study showed that players smoked and consumed alcohol before and after matches. Moreover, players also admitted to consuming drugs such as banga (marijuana), wie-wie (a locally manufactured powdered traditional product), iboga (a hallucinogenic drug) and cocaine. Almost a third of the players consumed banga before matches. The high usage of these substances could be due to their easy availability. However, coaches believed that their players do not consume cannabis due to their strict policy against the use of cannabis. Thus, findings indicate that coaches are unaware of substances consumed by their players.

5.2 Attitudes About Doping in Sport

One-third of the soccer players agreed that many athletes in South Africa consume PES. The majority of players either agreed or strongly agreed that the use of PES or supplements has increased over the past five years. A study conducted in Australia reported that athletes who believe their teammates are consuming PES are more likely to partake in such practices. Additionally, the study indicated that 19% of athletes felt that PES were widely consumed by other athletes and a further 30% believed that recreational drugs are consumed by other athletes (Moston, Engelberg, & Skinner, 2014).

The theme that doping is a minor problem in local soccer, as opposed to a major problem in international soccer, emerged from the coaches' interviews. The Theory of Reflection can assist in analysing coaches' perceptions of their roles and how this relates to their actions. The logic behind this theory is that coaches frame their role according to what information is most pertinent to them; which issues are identified as 'problematic'; and what strategies are developed to address them (Schoen, 1983). With regards to this study, coaches believe that doping is a problem in soccer, but not a major problem or priority. As a result, the risk of an athlete doping may not be identified or dealt with accordingly.

A study conducted by Backhouse, Whitaker and Petróczi (2013) used a 'gateway hypothesis', which predicts that the consumption of nutritional supplements, cannabis or alcohol can increase the risk of transitioning to use of PES or prohibited substances. Based on the Theory of Reflection and the findings from the current study, the problem of doping in sport may never be addressed. Coaches have a pivotal role in doping and the prevention thereof. If coaches do not discuss the consumption of PES with athletes, then athletes may find it acceptable to consume PES; which, according to Backhouse, Whitaker and Petróczi (2013), may lead to more incidences of doping.

In this study, 32.1% of soccer players agreed, and a further 54.3% of participants strongly agreed, that sport organisations should provide more educational programmes about the use of supplements. These sentiments were also commonly expressed by coaches. Many studies indicate the major lack of knowledge and education around the topic of doping and substance use (Ali, Al-Siya, Waly, & Kilani, 2015; Giraldi et al., 2015; Morente-Sánchez & Zabala, 2015; Nieper, 2005; Waddington et al., 2005). Kirby, Moran and Guerin (2011) found that only 10% of coaches in France had organised a doping prevention programme during the previous year; although they understood that they played an crucial role in preventing doping among players. Another study conducted by Laure, Thouvenin and Lecerf (2001) reported that 80% of French coaches believed that the current structures implemented by sports organisations are not effective enough in reducing doping. A further 73% of these coaches believed that more training and educational programmes should be implemented to reduce doping, and that stricter control of doping in sport should be implemented. This lack of education and knowledge about doping among coaches could, in turn, explain the low number of prevention programmes provided by coaches. There is a need for sports organisations to implement and deliver more educational programmes to effectively educate athletes, as well as coaches, about substance use and anti-doping regulations.

6. Conclusion

There is a definite lack of knowledge by players and, to an extent, coaches on the topic of doping in sport and the consumption of PES. Furthermore, coaches are unaware of the doping practices of their players. Anti-doping educational programmes and behaviour-change interventions are vital in order to transform athletes' and coaches' perspectives on doping and PES, and their resultant behaviour.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Public College Students' Perception of Underage Drinking In Nigeria: Analysis of Current Issues

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Abstract

Background: Alcohol is the most widely used substance of abuse among youths in Nigerian. Currently, underage drinking has become a serious public health problem in most colleges and despite the health and safety risk, consumption of alcohol is rising. Having recourse to the public health objective on alcohol by the World Health organization, which is to reduce the health burden caused by the harmful use of alcohol, thereby saving lives and reducing injuries, this study explored the nature of alcohol use among college students, binge drinking and the consequences of alcohol consumption. Secondary school students are in a transition developmentally and this comes with its debilitating effects such as risky alcohol use which affects their health and educational attainment (Loukas, Cance, & Batanova, 2016; Adekeye, 2012).

Methods: This is a cross-sectional study of 809 college students (ages 14–20 years) using the research survey method. For data collection, an adapted and validated version of the youth questionnaire on underage drinking was employed.

Results: Bivariate analysis found that more male students consume beer and spirits while wine was the reported preference of female students. Heavy episodic drinking (HED) was discovered among few male students while 50.2% of the sample had their first drink between ages 14 and 17. 81% of the sample had ever drank alcohol while more than half (65%) of the sample consume alcohol once in a month. Further analyses show prevalence of alcohol consumption, strategies to reducing alcohol use, reasons for underage drinking and effects of alcohol consumption.

Conclusions: A majority of underage students supported increasing efforts to control underage drinking. The students reported that an effective approach to decreasing alcohol use could be public presentations by people who have been seriously hurt or impaired by alcohol use. This will be a veritable public health intervention.

Keywords: Alcohol, college, underage drinking, youths, perception

1. Introduction

Alcohol use and abuse among underage is a growing public health problem in Nigeria and the consequences of underage drinking affects everyone regardless of gender, age or drinking status (Adekeye, Amoo, Adeusi, Chenube, Ahmadu, & Idoko, 2019). These effects could manifest in acts of aggressive behaviour, arson, property damage, injuries, risky sexual behaviour, violence, and deaths. Underage drinking is now pervasive that its influence goes beyond family setting. It is a nationwide cum global issue. Alcohol can be misused because it is available in different forms and easily accessible; in some countries and society, its consumption is legal as it is perceived as a social drink. However, Keller and Vaillant (2011) noted that if consumed moderately, alcohol could have positive health outcomes.

Some underage drinking statistics in the United States show that young people consume alcohol. Report from SAMHSA (2016a) revealed that at 15years, a third of teens (33%) have had at least 1 drink. This increased to 60% by age 18. In 2015, SAMHSA (2016b) reported that 7.7 million young people (12–20 years) reported that they

drank alcohol beyond "just a few sips" in the past month. In the United States, young people (12–20 years) drink 11% of all alcohol consumed yearly. The report further stated that adults consume more alcohol than youths; but when youths drink, they consume more at once, through binge drinking (CDC, 2016). There is almost the same level of prevalence of drinking between young boys and girls, but often among older teenagers, more boys than girls engage in binge drinking.

As noted by Grant and Dawson (1997), the lifetime prevalence of alcohol dependence is more than 40% among those who initiated drinking at the age of 14years or earlier. However, the percentage decreases with older age of initiation. Young adults above 20 years have about 10 percent probability to misuse and abuse alcohol or to turn an alcoholic in their lifetime. To corroborate this, Jernigan (2001) noted that there is more empirical evidence to suggest that those who are initiated too early into the drinking culture end up abusing and misusing alcohol and they experience more alcohol-related injury during lifetime than those who start drinking in later life. Adolescence period is a developmental stage of life normally characterized by experimentation, risk-taking, sexual exploration, drug use and consequently drug abuse (Adekeye, 2005). During this stage of life, there may be poor attitude to life, behavioural issues that may affect educational attainment and health may develop (Loukas, Cance, & Batanova, 2016; Morgan & Todd, 2009). Results from the Middle School Youth Risk Behavior Survey for "ever drank alcohol" show a prevalence of 20.5% for seventh graders and 30.5% for eighth graders (CDC, 2015).

Alcohol consumption has been a source concern in many societies however; underage drinking is a huge source of concern globally due to the impact on the under-aged individual which adversely affects the future of any nation (Adekeye, Adeusi, Chenube, Ahmadu, & Sholarin, 2015). Recently, Guinness Nigeria rolled out campaign against under-age drinking in Lagos Schools' using drama and interactive educational tools to enable pupils toappreciate the dangers of alcohol consumption, dangers, and the effects of alcohol use, misuse and abuseg (Okeh, 2018).

In Nigeria, a wide variety of substances have been and are still in use despite the growing body of evidence of serious health risks associated with unauthorized administration of psychoactive substances (Adekeye, Odukoya, Chenube, Igbokwe, Igbinoba, & Olowookere, 2017). According to Guardian Newspapers (2018), availability and easy access (at bars and liquor stores) to alcohol resulted to increased alcohol consumption. Availability and easy access is fueled by the production of locally brewed alcoholic beverages. This is often done in the hinterland, far from the sight of regulating authorities. Information Services Division, Scotland (2014) revealed prevalence of 32% for 13-year-olds and 70% for 15-year-olds while in England, underage drinking remains fairly prevalent. 38% of teens (11–15-years) have consumed alcohol though the rate is higher among older teens (16 and 17-years) (Health and Social Care Information Centre (HSCIC, 2015).

Apart from age, the prevalence of alcohol drinking can also be appreciated by looking into gender and socio-economic groups. HSCIC (2015) revealed that young teen males and females drink at the same level till about age 16. At age 16, males are much more likely to drink. It was reported that about 64% of 17-year-old boys and about 48% of girls drink weekly. The relationship between socioeconomic status and underage drinking is less clear. In Nigeria, children from both deprived and privileged homes consume alcohol, the difference being the type and quality of the drink. Children from local communities and less privileged homes consume more of locally brewed drinks or inferior quality beers and other distilled products which are readily available and relatively cheap. However, children from privileged and affluent homes consume more of wines, spirits and good quality beers. In England for example, teens from low socio-economic families drink less compared to teens from high socio-economic families while in Scotland, there is no distinct difference in underage alcohol consumption based on socio-economic status. It was further revealed that there are substantial differences in the rate of underage drinking across different ethnicities. Of the 11–15-years sampled, 42% were white children, black children (21%) and 10% were Asians.

The most recent European School Survey project on Alcohol and other Drugs (ESPAD survey) carried out in 2011 show that young people's drinking in the United Kingdom is well above the European average on a number of metrics (Hibell, Guttormsson, Ahlström, Balakireva, Bjarnason, Kokkevi et al., 2012). In the United Kingdom, a sample of 15–16 year-olds show that 85% had drank alcohol in the past 12 months with the European average being 79%. Among the same sample in the UK, 65% had drunk alcohol in the past 30 days with the European average being 57%. Also in the UK, 55% reported ever having been drunk with the European average being 47% (Hibell et al., 2012).

Underage drinking has become a recurrent issue in the world today and the sources where the underage get their drinks from remain worrisome. The 2009 Victorian Youth Alcohol and Drug Survey indicate that 58 percent of 16 and 17 year olds tend to drink alcohol at private parties, 53 percent at friend's houses, and 36 percent in their own homes. It was also revealed that less than 7 percent of the survey respondents said they drank alcohol in licensed

premises, and only 4 percent said they usually drank in public places. Furthermore, it was said that most young people (62%) got their alcohol from friends or acquaintances, 44 percent said their parents bought it for them, and around one in ten said they bought it themselves, or it was bought for them by a brother or sister.

The inquisitiveness of youths to copy or model after some adult drinking style can sometimes be excused but the danger of underage drinking cannot be over emphasized. It was revealed that when a child begins drinking before age 15, they are much more likely to become long-term drinker, or problem drinker which means they get drunk, have accidents related to drinking, get into trouble with the law, their families, friends, schools, or the people they date (Vorvick, 2016). Ipsos MORI (2016) revealed that 43% of young people who drink alcohol, have reported that they are drinking to cope in some way, such as to cheer themselves up or to forget about problems, how possible, if not the lies or make believe from their models. Cooper and Orcutt (1997) and Cooper, Pierce, and Huselid (1994) opine that underage drinking plays a significant role in risky sexual behaviour, including unwanted, unintended, and unprotected sexual activity and sex with multiple partners which increases the risk for unplanned pregnancy and promotes contracting of sexually transmitted infections including HIV/AIDS.

1.1 Objectives of the Study

This study was designed to bring to the fore the understanding underage drinkers have of alcohol use including perceived consequences of unregulated alcohol use. It is also to explore factors contributing to the problem of alcohol use by the under aged. To achieve the aims of this study, some specific objectives were set such as:

1) To explore the strategies to reducing underage alcohol consumption
2) To evaluate how often underage consume alcohol
3) To examine why underage students drink and the effects of alcohol on underage drinkers
4) To determine among the ever drinkers, the frequency of drinks, and whether alcohol consumption among underage drinkers have increased

1.2 Research Questions

1) What are the strategies to reducing underage alcohol consumption
2) How often do underage consume alcohol?
3) Why do underage students drink and what are the effects of alcohol on underage drinkers
4) Among the ever drinkers, what is the frequency of drinks, and has alcohol consumption increased

2. Methods

2.1 Design/Population/Sample and Sampling Techniques

The design used for this study is the cross-sectional survey design. This study involved participants from some selected secondary schools in Ota, a sub-urban location in Southwest, Nigeria. Participants were selected from across all core areas such as sciences, arts and humanities and business classes through stratified and simple random sampling, to cater for variables such as gender, age, living location, subject area and ethnicity. Characteristics of the participants included a gender mix of 553 males (68.4%) and 256 females (31.6%), age ranges from 14 and 20 years (mean age = 16.3years, +/- 1.49years).

2.2 Ethical Consideration

The department of Psychology internal review board (IRB) certified the study fit as not constituting harm to the respondents. Furthermore, parents of the selected participants signed an informed consent form to indicate their approval. School principals of the selected students provided informed consent and conveyed their approval to the researchers in writing. Participants were informed that they were free to participate or to decline participation in the study. Anonymity was assured by asking participants not to write their names on the questionnaire forms.

2.3 Instruments

A questionnaire form with items on use of alcohol and perception to underage drinking was used to elicit information from the respondents. The first part of the questionnaire dealt with participants socio-demographic details. In order to ensure the psychometric requirements of the scale as advocated by Odukoya, Adekeye, Igbinoba, & Afolabi (2018), the reliability of the instrument was established using a test-retest reliability method. It was administered to 30 secondary school students and a second administration after a three-week interval with a Cronbach's Alpha of 0.83. The research trajectory was therefore considered adequate for data gathering purposes.

2.4 Procedure for Data Collection and Analysis

The questionnaire forms were administered to the participants with the aid of research assistants. The questionnaires were administered and some were collected on the spot while others were retrieved later. Eight hundred and nine of the nine hundred forms were fit for statistical analyses, representing 90% response rate. The data were expressed as both descriptive and inferential statistics, such as frequency counts, percentages and chi-square analysis to answer the research questions. A p-value of ≤ 0.05 was considered significant. All statistical analyses were performed using IBM statistical software.

2.5 Study Participants and Inclusion/Exclusion Criteria

The respondents comprised 809 senior secondary school students who were selected to participate in the study. The inclusion criteria included that the school principal must provide informed consent in writing; the respondent (student) must be in senior secondary school class, agree to participate freely, inform their parents/guardians about the study, and provide a letter of consent from them. A participant must also be at least 14 years of age and not more than 20 years. Those who did not meet these criteria were excluded from the study.

3. Results

3.1 Demographic Data

This section shows the data obtained from the study in frequency counts and percentages

Table 1. Demographic characteristics

Variables	Frequency/Percent
Sex	
Male	553 (68%)
Female	256 (32%)
Age	
14yrs	104 (13%)
15–17yrs	568 (70%)
18–20yrs	137 (17%)
Preferred Drink	
Beer	Male (401 [92%]), Female (89 [41%])
Spirits	Male (353 [81%]), Female (41 [19%])
Wine	Male (318 [73%]), Female (212 [97%])
Ethnicity	
Yoruba	618 (76.4%)
Igbo	142 (17.6%)
Hausa	16 (2.0%)
Others	33 (4.0%)
Age at first drink	
Less than 10 years	56 (8.5%)
10–13 years	253 (38.5%)
14–17 years	330 (50.2%)
18 years and above	18 (2.8%)

Among the respondents in Table 1, 68% were males. Age ranged from 14 to 20 years. Because the setting was in the Southwestern part of Nigeria, underage from the Yoruba ethnic group made up the majority (76.4%) while about half of the sample had their first drink between ages 14 and 17. More male students consume beer (92%) and spirits (81%) while wine (97%) was the reported preference of female students. About 39% had their first drink

between ages 10 and 13 years while 50.2% of the sample had their first drink between ages 14 and 17.

3.2 Responses to Research Questions

Research Question 1: Strategies to Reducing Underage Alcohol Consumption

Table 2. Strategies to reducing underage alcohol consumption

Which of the following approaches would you support to decrease alcohol use by youth?	**Frequency/(%)**	**Rank**
New and/or stiffer penalties	247 (30.5%)	6th
More law enforcement	402 (49.7%)	4th
More alcohol education in schools	588 (72.7%)	1st
More alcohol education in the mass media (TV, radio, magazines)	541 (66.9%)	2nd
Alcohol-free teen night clubs	200 (24.7%)	8th
Public presentations by people who have been seriously hurt or impaired by alcohol abuse	384 (47.5%)	5th
Driver's license suspension for youth who drink alcohol	235 (29.0%)	7th
Ban on alcohol advertising	490 (60.6%)	3rd

Respondents were given some strategies and thereafter asked to pick which of the strategies or approaches they would support in the quest to decreasing alcohol use by the underage (Table 2). Their responses were ranked ordered and about 73% agreed that there should be more alcohol education in schools while about 67% felt there should be more alcohol education in the mass media. Others advocated for ban on alcohol advertising (60.6%) and about half of the respondents were of the view that more law enforcement (50%) will reduce alcohol consumption by the underage.

Research Question 2: How often do underage consume alcohol?

Table 3. Frequency of Alcohol consumption

How often do you drink alcohol? (n = 657)	**Frequency/(%)**
Once a Week	154 (23.4%)
Once a Month	427 (65.0%)
More than once a Month	76 (11.6%)

On the frequency of alcohol consumption, 427 (65%) drink once in a month while 154 (23.4%) drink once in a week. Only 76 (11.6%) drink more than once in a month. There was little evidence of binge drinking among those who drink as only 54 (8%) of the 657 have had five or more drinks at a time and of the 54, 34 (63%) have had five or more drinks in the last month.

Research Question 3: Why do underage students drink and what are the effects of alcohol on underage drinkers

Table 4. Reasons for underage drinking and effects of alcohol on underage drinkers

Why do underage students drink and what are the effects of alcohol on underage drinkers	Frequency/(%)
Underage drink because ------	
They want to have a good time at a party	525 (26.0%)
They are sad or depressed and want to feel better about themselves	478 (23.8%)
They wish to rebel and defy their parents, teachers and other adult authorities	197 (10.0%)
They wish to fit in or be accepted by their friends or peers	485 (24.2%)
They are bored	318 (16.0%)
Effects of Alcohol	
Been absent from school	97 (22.7%)
Been drunk at school	28 (6.6%)
Performing poorly in school	21 (5.0%)
Having family problems	21 (5.0%)
Been arrested	17 (4.0%)
Driving under the influence of alcohol	27 (6.3%)
Been driven by a drunk driver (passenger)	104 (24.4%)
Been drunk at a party	86 (20.0%)
Had an injury	26 (6.0%)

As depicted in table 4, the respondents advanced varied reasons for drinking such as having a good time at a party 525 (26%), wishing to fit in or be accepted by their friends or peers (24.2%) and because they are sad or depressed and want to feel better about themselves (23.8%). Respondents were asked if they had experienced some situations due to alcohol consumption. Responses ranged from been a passenger in a vehicle in which the driver was under the influence of alcohol (24.4%), been absent from school because of alcohol (22.7%) and been drunk at a party (20.0%).

Research Question 4: Among the ever drinkers, what is the frequency of drinks, and has alcohol consumption increased by sex and age

A majority of male (66.7%) students and respondents between ages 15 and 17 (75.6%) reported being ever drinkers. Only 33.3% of female respondents indicate being ever drinkers. In Table 5, there is an association between gender and being ever drinkers. The p-value indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables. Majority of the ever drank alcohol drink once in a month.

Table 5. Bivariate Analysis on ever drinkers, frequency of drinks, drinking and driving and whether alcohol consumption has increased

		Have you ever had alcoholic beverages like beer, wine, or spirit?		**X^2**
		Yes	**No**	
Sex	Male	438 (66.7%)	115 (75.7%)	.019
	Female	219 (33.3%)	37 (24.3%)	
Age	14yrs	73 (11.1%)	31 (20.4%)	.000
	15-17yrs	497 (75.6%)	71 (46.7%)	
	18-20yrs	87 (13.2%)	50 (32.9%)	

		How often do you drink alcohol? (Frequency of Consumption)			X^2
		Once a Week	**Once a Month**	**More than once a Month**	
Sex	Male	99 (22.6%)	287 (65.5%)	52 (11.9%)	.755
	Female	55 (25.1%)	140 (63.9%)	24 (11.0%)	
Age	14yrs	36 (49.3%)	34 (46.6%)	3 (4.1%)	.000
	15-17yrs	93 (18.7%)	348 (70.0%)	56 (11.3%)	
	18-20yrs	25 (28.7%)	45 (51.7%)	17 (19.5%)	

		Do you think alcohol consumption by underage is a ---------			X^2
		Serious problem	**Not at all a problem**	**Minor problem**	
Sex	Male	447 (87.7%)	34 (5.3%)	29 (7.0%)	.001
	Female	192 (82.2%)	20 (6.6%)	32 (11.2%)	
Age	14yrs	72 (80.0%)	10 (11.1%)	8 (8.9%)	.000
	15-17yrs	491 (91.6%)	21 (3.9%)	24 (4.5%)	
	18-20yrs	76 (59.4%)	23 (18.0%)	29 (22.7%)	

		Do you think drinking and driving among underage is a -------			X^2
		Serious problem	**Not at all a problem**	**Minor problem**	
Sex	Male	450 (87.7%)	27 (5.3%)	36 (7.0%)	.107
	Female	199 (82.2%)	16 (6.6%)	27 (11.2%)	
Age	14yrs	72 (79.1%)	7 (7.7%)	12 (13.2%)	.000
	15-17yrs	485 (89.8%)	24 (4.4%)	31 (5.7%)	
	18-20yrs	92 (86.0%)	12 (9.7%)	20 (16.1%)	

		Within the past year, do you think alcohol consumption among people your age has ----------			X^2
		Increased	**Decreased**	**Stayed the same**	
Sex	Male	341 (69.0%)	119 (24.1%)	34 (6.9%)	.016
	Female	180 (76.6%)	35 (14.9%)	20 (8.5%)	
Age	14yrs	53 (58.9%)	23 (25.6%)	14 (15.6%)	.000
	15-17yrs	402 (76.4%)	101 (19.2%)	23 (4.4%)	
	18-20yrs	66 (58.4%)	30 (26.5%)	17 (15.0%)	

65.5% of male and respondents between ages 15 and 17 (70%) drink once a month. More females (25.1%) than males (22.6%) drink once a week. Only few respondents across gender and age drink more than once a month. Alcohol was seen as a major problem by the respondents with 87.7% of male and 82.2% of females respectively.

All the age categories (14 years – 80%; 15–17 years – 91.6%; 18-20 years – 59.4%) perceive alcohol consumption among underage as a serious problem. The respondents displayed good knowledge of the negative influence of alcohol consumption on driving. When asked "do you think drinking and driving constitute a serious, minor or no problem at all, 89.8% of 15–17 year olds, 87.7% of male and 82.8% of female respondents agreed it was a serious problem. The same trend was observed among the 14 year olds (79.1%) and 18–20 year olds (86%). On the question of heavy use of alcohol within the past year, females (76.6%), males (69%), and 15–17 year olds (76.4%) reported that there is increased while 24% of male respondents 25.6 of the 14 years olds and about 27% of the 18–20 year olds reported that it is decreasing.

Table 6. Description of other Variables

Have you ever had alcoholic beverages like beer, wine, or spirit?		**Have you ever purchased alcohol without being asked for your age? (n = 756)**	
Yes	657 (81.2%)	Yes	165 (21.8%)
No	152 (18.8%)	No	591 (78.2%)
Gender Distribution of Ever Drank Alcohol		**Do you think alcohol use by underage youth is a.....**	
Male	438 (66.7%)	Serious problem	639 (%)
Female	219 (33.3%)	Not at all a problem	54 (%)
		Minor problem	61 (%)
Gender Distribution of Ever Drank Alcohol		**Who/What Contributes to the problem of alcohol use by the underage?**	
14years	73 (11%)	Parents	314 (%)
15-17years	497 (76%)	Public agencies	180 (%)
18-20years	87 (13%)	Alcohol outlets, such as liquor stores, bars and restaurants	456 (%)
		Advertising	253 (%)
Do you ever have five or more drinks of alcohol at a time?		Youth themselves	454 (%)
Yes	54 (8.0%)	Government	96 (%)
No	603 (92.0%)	Peer group	36 (%)
If "Yes," have you done this in the last month?		**Do you think drinking and driving among youth is a**	
Yes	34 (63.0%)	Serious problem	649 (%)
No	20 (37.0%)	Not at all a problem	43 (%)
		Minor problem	63 (%)
Do your parents permit you to drink alcohol in your home? (n = 316)		**Do you know someone with an alcohol problem?**	
Never	217 (68.7%)	Yes	482 (%)
On special occasions only	53 (16.7%)	No	302 (%)
Under parental supervision	24 (7.6%)		
Anytime I want to	22 (7.0%)	**If response was "Yes," what was their relationship to you?**	
		Relative	100 (%)
		Non-relative (e.g., friend or acquaintance)	382 (%)

Do you discuss alcohol use with your parent(s)? (n = 354)	
Yes	116 (33.0%)
No	238 (67.0%)
Do your parents know how much you drink? (n = 335)	
Yes	77 (23.0%)
No	258 (77.0%)
Have your parents ever seen you drunk? (n = 351)	
Yes	47 (13.4%)
No	304 (86.6%)
How many times in the last two months has someone offered to give you, buy for you, or sell you alcohol?)	
None	196 (%)
Once	84 (%)
2-3 times	38 (%)
4 or more times	25 (%)
Sources where underage obtain alcohol?	
Parent's home	107 (13.2%)
Liquor store	175 (21.6%)
Bar/restaurant	320 (39.6%)
Supermarket/convenience store	16 (2.0%)
Friends/relatives	169 (20.9%)
Other	20 (2.5%)
Have you successfully used a fake age to obtain alcohol? (n =)	
Yes	21 (%)
No	325 (%)
Do you know of parents or adults who permit non-family members under the age of 21 to consume alcohol in their homes? (n =)	
Yes	173 (%)
No	161 (%)

In Table 6, of the 809 respondents, 657 (81.2%) had ever drank alcohol and of this are 438 (66.7%) males and 219 (33.3%) females. For the age distribution of the ever drank, 497 (76%) are in the 15–17 years age bracket while 73 (11%) and 87 (13%) are in the 14 years and 18–20 years age category. Respondents report on whether parents permit them to drink at home show that parents never permitted alcohol consumption [217 (68.7%)] while 53 (16.7%) reported that they are allowed to drink on special occasions only. 24 (7.6%) and 22 (7.0%) reported that they drink under parental supervision and anytime they want to drink respectively. 116 (33%) of the respondents engage with their parents in discussing alcohol use while 238 (67%) do not. Of the 335 that responded to this item, 77% reported that their parents do not know how much they drink while 13.4% reported that parents have seen them drunk. 21.8% have bought alcohol without being asked of their age. This is similar to report from Yoon, Lam, Sham and Lam (2017). They reported that Chinese teen drinkers often convince vendors that they were of legal drinking age to source alcohol.

4. Discussion

On the frequency of alcohol use, report revealed that 154 (23.4%) drink at least once in a week while 76 (11.6%) drink more than once in a month. Majority of those who drink reported drinking at least once in a month (65%). This shows a relatively low rate of alcohol consumption when compared to data from other sources. For example, in a Finnish sample, 78% of boys and 79% of girls aged 18 years said they drink alcohol at least once a month. In the same year, 18% of girls and 22% of boys aged 16 years reported drinking once a month or more (Ministry of Social Affairs and Health, 2006). In this study, the respondents reported that their peers drink because they want to have a good time at a party (26%), to deal with sadness or depression (24%) and they wish to fit in or be accepted by their friends or peers (24%). However, in a study by Adekeye (2012), it was found that the main reasons for student's drinking were because friends (peers) drink (77%), curiosity (63%), because drinks are readily available (27%), and to get away from worries (23%).

A review of 22 studies examining parental monitoring and alcohol use showed that increased parental monitoring is significantly associated with later alcohol initiation and decreased alcohol use (Ryan, Jorm, & Lubman, 2010). In the US, studies indicated that increased parental monitoring is associated with reduced alcohol use and the possible negative consequences of use among adolescents (Bourdeau et al., 2011; Stone, Becker, Huber, & Catalano, 2012; Walls, Fairlie, & Wood, 2009).

On the effects of alcohol, underage drinkers (24%) reported been a passenger in a vehicle in which the driver was under the influence of alcohol, 22.7% went on to report being absent from school because of alcohol use while others reported been drunk at parties (20%). There are several contributing factors to alcohol use by students. Correia, Murphy and Barnett (2012) listed among other factors cultural norms, expectations on benefits of drinking, parent's attitude towards drinking and affordability of alcohol. All these result to a culture of drinking (Obot, 2000) that can be harmful to the students. Various researches have shown that drinking among youths is done excessively and this lowers their ability to make decisions, control their impulse, or drive a car and fades their memories.

According to Vorvick (2016), Newbury-Birch, Walker, Avery, Beyer, Brown, Jackson, Lock, McGovern, & Kaner, (2008), Sincelar, Barnett and Spirito, (2004), the havoc of underage drinking include falls, car crashes, weight loss, disturbed sleep, headaches, drowning, various accidents, suicide, violence, homicide, increase in addiction, sexual assault or rape, engage in unprotected sex or have multiple sex partners, unwanted pregnancy, damage of brain cells which can lead to lasting damage to memory, thinking and judgment or decision making, poor academic performance, depression, low self-esteem, serious injury and ultimately death. Office for National Statistics (2017) corroborates the above findings that in Britain, significant number of people are now dying with alcoholic liver disease in their twenties, what a pity.

On the approach and strategies to reduce consumption of alcohol, 73% of the under aged agreed that there should be more alcohol education in schools while about 67% felt there should be more alcohol education in the mass media. A qualitative study by Coleman and Cater (2009) argued the case for the compulsory inclusion of alcohol education in schools, and structural reforms to encourage a change in the binge-drinking culture. In measuring binge drinking, which is the consumption of excessive alcohol in a single drinking episode, it was phrased as do you ever have five or more drinks of alcohol at a time? It is dangerous because in most cases it becomes more and more frequent which leads to addiction. In a more accurate perspective, binge drinking is taking more alcohol than is recommended by doctors and taking the UK as an example, it is taking more than 64 grams or 4 beer cans for a man and more than 48grams or three beer cans for a woman (Coomber, Mcelrath, Measham, & Moore, 2013). A qualitative study by Coleman and Cater (2009) examined young people's perceived motivations for 'binge' drinking, and the associated harmful outcomes among14 to 17 year olds in southern England who had experience of binge drinking. Given the underage sample, most of this drinking occurred in unsupervised, outdoor locations. It seems that making the transition to drinking in pubs/bars, offers a protective factor for a number of risky outcomes. For example, Hingson, Heeren, Zakocs, Kopstein and Wechsler (2002) estimated that approximately 42%, or over 3 million of the 8 million students attending colleges in the U.S. have consumed five or more drinks during a single drinking occasion within the past 30 days.

5. Conclusion

To salvage the destiny of the underage, parents and significant care givers should discourage the act of drinking, create great awareness on the dangers of drinking let alone underage participation, serve as positive models, prevent the availability of alcohols to underage at parties, school, homes, or supervise all parties to ensure there is no alcohol, promote healthy activities or gathering that will not involve alcohol.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Factors Contributing to Poor Environmental Hygiene in Kehemu location, Rundu, Namibia

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Abstract

Solid waste management in Rundu, Namibia, is a major challenge, resulting in significant environmental health hazards. The purpose of this study was therefore to identify and describe the factors contributing to poor environmental hygiene specifically in Kehemu location in Rundu, while the objectives were to explore the factors contributing to poor environmental hygiene in the area. A qualitative approach was employed comprising an explorative and descriptive design. The research population for this particular study consisted of residents of Kehemu location and a sample was drawn from this population using purposive sampling. Data were collected from focus group discussions conducted with 15 (fifteen) residents. The transcribed interviews and narratives from the research notes were organised into codes, main themes and sub-themes. The results from this study revealed, among other things, that the methods used by most households for disposing of waste included digging holes, burning the waste and dumping it in open areas. In addition, factors contributing to poor environmental hygiene in Kehemu location include a lack of dumping sites, dustbins and refuse removal services. The findings of this study call for well-articulated actions to address the factors identified as being associated with poor environmental hygiene in Kehemu. The study recommends that the town council should empower the community by providing dustbins, initiating clean-up campaigns and providing education and awareness-raising as some measures for curbing problems related to environmental health.

Keywords: factors, environment, hygiene**,** solid waste, poor

1. Introduction

Solid waste, according to Oelofse and Godfrey (2008, p. 244), is defined as "any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities". ADemir & Araujo (2012, p. 2) defines solid waste as that which is produced after wastewater treatment and its characteristics are influenced by anthropogenic activities. In view of the fact that the appearance of the environment is very important for all cities, dumped waste causes the environment to become aesthetically unattractive.

In addition, many other serious problems may be caused – heaps of waste can become mosquito breeding areas and hence result in outbreaks of diseases like malaria. Waste which has been blown into storm water drains may cause serious blockages and can pollute the water in the rivers that supply the municipality with drinking water. Poor waste management thus impacts on both the community and the environment, having negative effects in terms of economic issues, education, corruption, service delivery, poverty, crime and unemployment. Waste which is illegally (or legally) dumped has undesirable and/or superfluous by-products, both from what it emits and from its residue. Uncollected waste may thus have an adverse effect on the environment and on people's lives. Moreover, illegal dumping sites may create problems such as contaminated air, or suitable breeding habitats for mosquitoes.

Throughout history, human advancement has been intrinsically linked to the management of solid waste due to its effect on both public and environmental health. Solid waste management (SWM) has a long and convoluted history (Nathanson, 2015). It is also important to deal with this issue directly because if left unmanaged, waste can have detrimental effects on both environmental and human health (Narayana, 2009). Globally, the production of

waste has practically doubled over the past ten years and is expected to reach 2.5 billion tons per year in 2025 as a result of the combined effect of urban development and changes in consumption patterns (Périou, 2012).

An ideal waste disposal site must be adequately fenced off to prevent illegal entry and windblown litter and must at all times be maintained in a manner that prevents the breeding of flies, as well as other public health risks. In addition, no waste may be burnt either on public or private property or at a waste disposal site. Finally, local authorities must regulate the transportation of the different waste streams to the waste disposal site in accordance with the applicable laws to prevent environmental pollution and public health risks (Public and Environmental Health Act, 2015).

There are a number of waste management principles that contribute to reducing waste volumes. However, it is questionable whether their value has been realised. And, if so, it is questioned to whether they are being implemented in Namibia, particularly in the town of Rundu, where this research was conducted, because their solid waste management systems seem to be ineffective when it comes to addressing solid waste.

Waste management is one of the important aspects of environmental management in Namibia (EMA, 2007). Currently, Namibia is ranked 10th among the cleanest countries in Africa (Windhoek), down from the number one position which it held for a number of years. Despite the efforts of various town councils in Namibia to keep it the cleanest country on the African continent and beyond, it appears that some towns in Namibia, including Rundu, are failing to manage and dispose of their waste in accordance with waste management policy. Failure to remove waste from undesignated dumping sites may result in diseases such as malaria, cholera and the like. This study sought to answer the following research question: What are the factors contributing to poor environmental hygiene in Kehemu location in the town of Rundu in Namibia?

2. Goals and Objectives

The purpose of this study was to explore the factors contributing to poor environmental hygiene in Kehemu location in Rundu, Namibia, while the objectives included describing these factors in detail.

3. Research Design and Methods

3.1 Design

A cross-sectional qualitative and explorative design was employed Brink, Van der Walt, and Van Rensburg, (2018)

3.2 Study Population

The research population for this particular study was the residents living in Kehemu location in Rundu, Namibia.

3.3 Inclusion and Exclusion Criteria

All residents of Kehemu location, Rundu, who were willing to participate in this study, were included in this study, while those who were unwilling were excluded.

3.4 Sampling and Sample Size

In qualitative studies the size of a sample is guided by the purpose of the inquiry. Therefore, in this study there was no specification of the sample size, with data saturation being determined by the sample size. Data saturation was reached with (15) fifteen participants in two focus group discussion. Each focus group discussion lasted for 90 minutes. Maree (2016) describes purposive sampling as a strategy that is used in qualitative studies whereby participants are grouped according to predetermined criteria that are relevant to a particular research question. Purposive sampling was used to select the participants for this study. The number of participants recruited was based on data saturation, and data collection was stopped when no new information emerged from the second focus group discussion. A total of 15 residents of Kehemu location eligible for participationg in the study were included in the study. The participants were all residences of Kehemu location in Rundu of Kavango East Region.

3.5 Data Collection Tool

In this study, focus group discussions was used as a primary source of data collection with focus group discussion guide were conducted to enable participants to express their views on factors contributing to poor environmental hygiene in Kehemu location. This data collection method was used as it is considered to be relevant for use when the researcher seeks to learn about people's feelings, thoughts and experiences (Maree, 2016). One central question was asked, "Could you kindly describe your views related to factors contributing to poor environmental hygiene in Kehemu location?" This question was followed by clarity seeking questions to probe after the first response of each participant.

3.6 Data Collection Methods

The researcher conducted the focus group discussions with residents of Kehemu location in Rundu, Namibia. Triangulation was done through the use field notes which were captured from non-verbal communication and voice recorder of all the focus group discussions sessions.

3.6 Data Analysis

In this study, focus group discussions were structured in accordance with a focus group discussion guide. A thematic analysis method was employed to analyse the data.

4. Ethical Considerations

Permission to conduct the research was obtained from the Rundu town council and the Ministry of Health and Social Services. The subject of hygiene is considered a sensitive issue as it has the potential to demean human dignity and, as such, participants in this study were assured of confidentiality and anonymity. They were not obliged to divulge their names or personal particulars except for their gender, age and educational background. They were also assured that their identities would not be revealed. To ensure this, codes were used in such a way that participants would remain anonymous. Accordingly, the researcher used number codes (P1 to P15) to identify the participants. Participants signed an informed consent form prior to participation. They were also assured that research material and all documents that contained their responses would be safeguarded and would only be accessible to the researcher.

5. Results

5.1 Socio-Demographic Description of Study Participants

Participants were all residents of Kehemu location in the town of Rundu in Namibia. All participants were under the age of 61 years. The educational level of the participants varied with the majority having attained Grade 12, although five had received no education at all. The majority of the participants were employed.

Table 1. Characteristics of Participants

Age	**Total**
18–30	6
31–40	3
41–50	2
51–60	2
61 and Above	1
Sex	
Male	7
Female	8
Employment status	
Employed	4
Unemployed	11
Education level	
Grade 1–7	0
Grade 8–12	10
Tertiary education	0
No education	5

Table 2. Themes and Sub-themes of Data Analysis

Themes	**Sub-themes**
5.1 Contributing factors to poor environmental hygiene	5.1.1 Lack of dumping sites
	5.1.2 Lack of dustbins
	5.1.3 Lack of refuse removal services
5.2 Management of waste	None
5.3 Effects of poor environmental hygiene	5.3.1 Health-related effects (diseases and injuries)
	5.3.2 Image-related factors
5.4 Mechanism for improvement	5.4.1 Keeping the environment clean
	5.4.2 Educating the public

5.2 Contributing Factors to Poor Environmental Hygiene

This theme reflects the factors that the participants perceived contributed to poor environmental hygiene in Kehemu location, Rundu. The theme expresses factors that include the lack of dumping sites, lack of dustbins and lack of refuse removal services.

5.2.1 Lack of Dumping Sites

Participants revealed that they do not have a dumping site where they can dispose of their waste. They also reported that they do not have a choice but to dispose of their waste on any open areas they find, since they cannot access places where they are allowed to dump their waste. This was highlighted by a few extracts from the interviews which are included below:

I don't see any place where they indicate where we can dump our rubbish; I don't see such things here, so it becomes a problem when we have to dispose the wastes. The only places where I can put my rubbish is any open space that I can find because I don't have a choice (P3G1).

… not everyone can afford transport where they can go and dispose their waste, so in a town set up like this, there should be already something in process which guides people on how to dispose their waste (P1G1).

5.2.2 Lack of Dustbins

Some participants revealed that they do not own dustbins at home. They believe that this is one of the factors contributing to poor environmental hygiene in their location.

The fact is that we don't have dustbins in our house, if we did have dustbin in our house we could not dump that side (pointing to the tarred road). If we had dustbins, then the place will be clean (P1G2).

5.2.3 Lack of Refuse Removal Services

Some participants in this study reported that even if they try and bring the waste together, put it into big plastic bags and put the bags outside their gates, the town council does not come and pick them up; they just stay there and thus residents are left with no choice but to go and dump them in open areas.

I don't see any places where they say put your rubbish here, at a certain period of time we are going to pick it up at intervals. I don't see such things here in town. It becomes a problem on how to dispose our waste. The only places where I can put my rubbish is any open space that I can find (P1G1).

5.3 Theme 2: Management of Waste

This theme reflects the ways in which the residents of Kehemu are managing their waste. Most participants stated that they dig holes in their yards in order to dispose of their waste there. Some revealed that they burnt the waste as a mean of getting rid of it.

We cannot live with waste in our houses because everyone wants that their yard has to be clean, so for us to sit with rubbish is not nice, so we dig holes and put the rubbish in and if the hole is full, we either burn the rubbish or close it up but now our yards are very small, we cannot dig anymore (P5G2).

The common practice is digging holes within the yards and then burning the rubbish in a sense that they become minimal (P7G1).

5.4 Effects of Poor Environmental Hygiene

This theme indicates the effects that are associated with poor environmental hygiene. The theme is divided into two sub-themes, namely, health-related effects and image-related factors.

5.4.1 Health-Related Effects

Some participants raised concerns that the poor environmental hygiene is contributing negatively to their health, with some indicating that the waste near their houses gives off a foul smell thus attracting flies to their homes.

This rubbish is bringing a lot of problems to us. There are people who don't have toilets in their houses and they just go and do their stuff that side (pointing at the waste) (P4G2).

It's really not nice to our health, some of us are already old and we are sick, with this smell its contributing to our health (P5G2).

To us who are close to the rubbish, we are the most affected ones. It's really affecting us in terms of our health. We have street kids and places like that attract street kids because in their mind they think where there is a lot of rubbish maybe I might find that bread, I might find that apple which is not healthy (P2G2).

5.4.2 Image-Related Factors

Some participants raised concerns about the image of their town. They stated that tourists who come and visit will form a poor image not only of Rundu but also of Namibia in general. They worry that the tourists who visit Rundu will take pictures of the heaps of waste that are lying next to the road and go and show others in their countries, which will discourage them from coming to visit.

If we look closely, this is a street full of institutions. We have RVTC (Rundu Vocational Training Centre), we have gender, youth centre and then UNAM (University of Namibia) and for sure once the tourists get in the region it's obvious that they would want to see where Rundu Campus is, where RVTC is and they are all in the same line. The tourists are the ones contributing to our economy. It's so disappointing getting to a place and it is so dirty like this (P1G2).

5.5 Mechanisms for Improvement

This theme reflects the mechanisms the participants suggested introducing for the residents in order to improve the environmental hygiene. The theme is divided into two sub-themes, namely, keeping the environment clean and educating the public.

5.5.1 Keeping the Environment Clean

Participants in this study stated that they are doing their best to contain the waste. They stated that they have done all they can and that they have run out of options. Now they are putting it in the hands of the town council to do its part.

As residents, we have major roles as well, that is not to throw anywhere and to make sure that whatever we know may litter the area should be kept under control in terms of you put them in the dustbin, make sure the dustbin is closed so that even if dogs roam around they cannot remove them (P1G1).

The town council should come and clean up the place and bring dustbins. They should also encourage people to try their best to have toilets at their houses (P2G2).

5.5.2 Educating the Public

Some participants stated that educating the people on how to handle waste could help reduce the illegal dumping.

I do educate the kids around me on how to handle waste and avoid playing with refuse, so all in all we try our level best; I try my level best to contain the waste instead of letting it be scattered all over (P7G1).

5.6 Trustworthiness

The trustworthiness of this study was ensured by using the criteria of Lincoln and Guba (1985), namely, credibility, transferability, dependability, and conformability.

6. Discussion

6.1 Lack of Dumping Sites

Participants in this study revealed the lack of designated dumping sites as one of the reasons for illegal dumping. Illegal dumping generally happens when people are not provided with refuse removal serves; hence they are forced to dump their waste at the closest convenient site. This is in agreement with a study by Asase, Yanful, Mensah,

Stanford, and Amponsat (2009), who noted that there was a lack of proper disposal sites and landfills in the country.

6.2 Lack of Dustbins

Participants in this study revealed that a lack of dustbins is one of the major factors contributing to poor environmental hygiene. This finding is in contrast to the findings of a study done by Hazra (2009), who found that the poor condition of containers and inadequate maintenance and replacement of worn-out collection vehicles contributed to behaviours such as littering and illegal dumping by citizens, who felt they could not properly dispose of trash because rubbish bins and waste services were not properly maintained.

6.3 Lack of Refuse Removal

Participants in this study revealed that lack of refuse removal services was one of the factors contributing to poor environmental hygiene. This is in agreement with a study conducted in Palestine by Al-Khatib (2010), who stated that, on average, up to 50 per cent of residents in the urban areas of low and middle-income countries lack collection services. There are limited opportunities for the development of sustainable solid waste management systems, as government budgets are limited and proper waste collection is neglected.

This study revealed that one of the current methods participants use to remove waste from their homes is to bury it in their yards. Some reported that they burn the waste or dispose of it in open areas. This concurs with the findings of a study done in Ghana by Patrick (2014), who revealed that waste is burnt in pits as a way of getting rid of it. In addition, some people dump waste in random locations, or dispose of it in open areas without any further management.

Participants in this study revealed that the waste is causing serious problems for them, especially with regard to their health. They revealed that the elderly and young children in particular are suffering from certain diseases that they suspect may be caused by lack of waste management. This is in agreement with the findings of a study done in Nairobi by Troschinetz and Mihelcic (2009), who state that residents living close to the dumpsite are exposed to environmental and disease risks. In their study it was found that waste disposal sites were in most cases located in environmentally sensitive low-lying areas such as wetlands, forest edges or close to bodies of water.

6.4 Image-related Factors

Participants in this study were worried about the image of their town. They were aware that waste makes an environment look unattractive. This concurs with a study done by Masange (2013) who states that waste causes the environment to be untidy and unattractive and may place people's lives at risk. He further states that filthy habits are evident when people thoughtlessly make a mess of public utilities, office premises, streets, parks and neighbourhoods.

6.5 Keeping the Environment Clean

Participants in this study were aware of the role they play in keeping the environment clean. By contrast, in a study conducted in India (Milea, 2009), researchers found that although the majority of respondents perceived garbage to be a big problem in Delhi, there was little knowledge on the ways one could contribute to solving it. A sense of responsibility for one's waste was found to be the major factor determining littering and waste separation, but waste minimisation was mainly associated with income and not perceived to be part of the waste.

6.6 Educating the Public

Most participants did not dwell on educating the public as a solution to improving poor environmental hygiene. In a study conducted by Marshall and Farahbakhsh (2013), it was found that issues related to public acceptance, changing value systems, public participation in planning and implementation stages, and changes in waste behaviour are as important as the technical and economic aspects of waste management. Marshall maintains that adequate public participation should involve stakeholders from the outset, thus providing a creative forum for the public to discuss issues, identify key actors, generate possible solutions and alternatives, implement part of the selected solutions and participate in the monitoring and evaluation of solutions.

7. Conclusions

The findings of this study lead to the conclusion that a lack of dumping sites, a lack of dustbins and a lack of refuse removal services are the major contributory factors to poor environmental hygiene. The heaps of refuse that accumulate in the surroundings have the potential to produce foul odours which attract flies, which in turn harbour major organisms that spread harmful germs. The results of the study show that poor environmental hygiene also has the potential to damage the image of the town. On the basis of these results, a call should be made for

well-articulated plans and action to address the factors identified as major contributors.

8. Recommendations

Based on the study findings, the following recommendations are made:

- It was reported in this study that a lack of dustbins is one of the major factors contributing to poor environmental hygiene. It is therefore recommended that Rundu town council should increase the number and optimise the distribution of litterbins on the streets and in other public places as a measure to discourage people from littering.
- It was reported in this study that a lack of designated dumping sites is one of the reasons for illegal dumping. It recommended that the town council should create more dumping sites in accordance with the environmental needs, bearing in mind the importance of sustainable waste management systems.
- Appropriate distribution of responsibilities, authority and revenue between national, regional and local governments must be determined so that waste management programmes can succeed and be effective.
- Enactment and enforcement of policies and legislation will serve as useful strategies for improving solid waste management, as poor management in this regard is associated with weak policy enforcement and implementation.

9. Study Delimitations and Limitations

The study was delimited to information given by residents of Kehemu location in Rundu. Apart from English, the other language used to collect the data was Rukwangali, and responses give in this language were later translated into English. Accordingly, there is always a possibility that some of the original ideas of the participants were lost during the translation process.

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Competing Interest Statement

The authors declare that there is no conflict of interest.

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Sexuality in Elderly Adults: Study on Knowledge and Attitudes Related to Sexuality in Older Adults

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Abstract

Introduction: Aging is a universal and natural phenomenon that causes structural and physiological changes. It is a process of deterioration, progressive and intrinsic.

Objective: Determining the level of knowledge and attitudes about sexuality in older adults living in three centers.

Materials and Methods: A cross- sectional descriptive study in 80 elderly adults enrolled and attending three life centers on the City of Cartagena, Questionnaires about Knowledge on Sexual Health of the Elderly (2007) and the Attitude Scale towards Sexuality were applied in the Elderly Adult (Scale ACASAM-MM-2013).

Results: On a population of elderly adults, female sex predominated 58%, average age of 74 years, adults widowers 35% of the total population, and 31% maintain a relationship. Older adults reported having inadequate knowledge in relation to the three sessions evaluated, the access section to a couple predominated, they reflected having an average general attitude, being the cognitive and volitional component those of greater significance.

Conclusion: The attitudes that reflect the elderly is favorable, being so, that the elderly are clear that society notice them regarding sexuality, and are autonomous to express and experience it.

Keywords: sexual health, sexuality, elderly adult, knowledge, attitudes

1. Introduction

Aging is a universal and natural phenomenon that produces structural and physiological changes (Alvarado & Salazar, 2014). It is a deleterious, progressive and intrinsic process that occurs in every living being as a result of the interaction of genetics and its context. It is inevitable to stop this biological process by which we all pass, but to which we will not all pass with satisfaction (Perez & Arcia, 2008).

According to figures reported by the World Health Organization (WHO, 2007) the population is aging rapidly worldwide (2015-2050), the proportion of the population over 60 years of age will go from 900 million to 2,000 million, which represents an increase of 12% to 22% (MinSalud, 2007).

The World Health Organization (WHO) emphasizes that more than 22% of older adults in the world, in addition to their biological and systemic complications, present problems with their sexuality, where prejudice, idiosyncrasy and culture take a inseparable part of it (OMS, 2007).

In this sense, the aging process causes alteration in sexual capacity and activity, in fact, it varies from one individual to another. Talking about sexuality, includes two clearly defined aspects: biological sexuality (anatomo-physiological) and socio-cultural eroticism (Gonzalez, 2002).

In this same order, sexuality has different perceptions in all stages of life, hence its relationship with age, personal experiences and its influence with the social environment, this makes the event a topic of interest (WHO, 2006). Generally, sexuality is associated with genitality and reproduction, leaving aside emotional ties, moral ties and erotic encounters that proportionally influence sexuality and quality of life (Gonzalez, Nuñez, Hernandez, & Betancourt, 2005).

Society relates sexuality to youth and fertile age (Cequera, Lopez, Nuñez, & Porras, 2014); during elderliness, sexual behavior depends on many factors, such as general health, availability of a healthy partner, personality,

sociocultural factors, level of education, previous sexual activity, previous practices and interests, and life degree of satisfaction (Echenique, 2006).

Currently, the influence of aging on sexual activities is a subject that has faced the prolongation of ignorance of the physiological changes of a cultural pattern governed by the concept of sex, transmitted in the different generational changes. It is striking to believe that this age group are not capable of maintaining sexual activity, seen as asexual beings, deprived of the right to express their feelings in society (Perez & Arcia, 2008).

Starting from the previous assumptions, Cayo et al., he estimates that one of the possible causes of the lack of sexuality in the elderly is the negative self-perception of his body, where they stop being attractive, supported by comments from society, where he indicates that his body moves away from the cultured beauty standards of youth, also, widowhood lowers expectations to start a new life as a couple (Cedeño, Cortes, & Vergara, 2016).

In short, sexuality in the elderly is abused, little known and less understood by society, by the elderly and health professionals adults who attend the elderly with shoo ting and doubts (Gonzalez et al., 2005). Geriatric sexuality is a very controversial topic, since many people believe that when the reproductive process ends, all expression of affection and sexuality ends. Because of this, it was decided to determine the level of knowledge and attitudes related to sexuality in older adults in three centers of life.

2. Materials and Methods

Descriptive study - cross - sectional, carried out with a sample of 80 adults Attendees at three life centers on the City of Cartagena, who met the criteria determined: to be older adults enrolled and assistants to the center of life, and not to present any type of mental limitation (Note 1).

For the data collection was obtained by applying an adapted version of the Questionnaires Knowledge on Sexual Health of the Elderly (2007) and Attitude Scale towards Sexuality in the Elderly (ACASAM-MM-20 13 scale) validated by experts

The adjusted version of the questionnaire has three parts, the first part addresses the sociodemographic data, the second, knowledge about sexuality in the elderly, evaluated in 3 sessions (myths and realities, access to a couple and access to the privacy), each one has a scale for measuring dichotomous questions, where only one is correct and has a value of one point. It was considered an inadequate knowledge of less than 8 points and adequate knowledge between 8 to 10 points for each session.

The third part measured attitudes related to sexuality in the elderly, has a Likert scale, where 1 is totally in agreement, 2 is neither agree/disagree and 3 is totally disagree. This part is divided into 3 components: cognitive component (knowledge, beliefs, assumptions and value judgments), volitional component (positive feelings and negative feelings) and the conative or action component (facilitating behaviors and inhibitory behaviors), considering high attitude of 7 to 9 points, average of 4 to 6 points and low of 1 to 3 points.

For the analysis of the information, the data recorded in the collection instrument were entered in a Microsoft Excel 2016 spreadsheet, where a data matrix was constructed for further analysis and interpretation. A Pivot Table was used to establish the absolute frequency in each category of sociodemographic, for analysis NOWLEDGE c towards sexuality in the elderly, each item was encoded by assigning a (1) point to the correct answer, through a logical function (SI function). Then, the summation of the score of each answer was made, to obtain an accumulated and then categorize with the SI function again as adequate or inadequate knowledge depending on the data obtained.

Finally, in the third part called attitudes about sexuality in the elderly, the data obtained through the summation of the result of the subgroups of each dimension, then the average function was used to average the results and function *desvest* to find the standard deviation that indicates how scattered the data are with respect to the mean. Subsequently, this same process was carried out for the population in general and the general results were obtained.

Helsinki, 1964, the research was guided under the ethical principles of beneficence and non-maleficence and sought to protect the life, dignity, integrity and intimacy of the participants (Belmont, 1979). In accordance with Resolution 008430 of 1993 (MinSalud, 1993), the proposed research is within the classification Research with *minimal risk*, the project was endorsed by the school's research committee and ethics and institutional bioethics committee.

3. Results

3.1 Sociodemographic Characteristics of the Elderly in the Centers of Life

According to the participating population and the analysis of the results, it can be observed that the average age of

the adults attending the centers of life onwards CDV corresponded to 74 years, with a minimum age of 57 years and a maximum age of 88 years. In the same way, results were obtained relevant to the sex of the attending adults, in which the female sex prevails with an average of 58%, equivalent to 46 participants, while 42% corresponds to the male sex.

In relation to the data reported, it was obtained that 49% of the participants belong to the socioeconomic level II, followed by 44% of the adults who live permanently in the socioeconomic stratum I.

Likewise, in the study it was found that the civil status with the highest prevalence corresponds to the widower with 35%, while 17% corresponds to older adults who are married and 14% to adults in free union; indicating that 31% of the study population have a relationship and those who still experience sexuality in any of its manifestation without limiting it only to penetrative sex.

With regard to religion, there was a predominance of the Catholic religion with 65% of the total population, regarding the level of education of the respondents, the data show that in general the attending adults have a level of academic education that guarantees them the basic skills such as reading and writing, however these can be affected by age and visible visual difficulties in such a way that most have low visual acuity, according to these data the primary level ranks first with 54%, followed by 33% of the participants who completed high school studies and 4% of seniors are professionals in different areas.

Table 1. Sociodemographic characteristics

Socio-Demographic Characteristics		
Age	The average age was 74 years. Minimum age: 57 years Maximum age: 88 years	***Percentage (%)***
SEX		
Female	46	58%
Male	34	42%
total	**80**	**100**
Socioeconomic level		
I	35	44%
II	39	49%
III	5	6%
IV	1	1%
Total	**80**	**100**
Civil status		
Married	14	17%
Divorced	2	3 %
Separated	14	17%
Single	11	14%
Free Union	11	14%
Widower	28	35%
Total	**80**	**100**

Religion		
Adventist	1	1%
Catholic	52	65%
Christian	20	25%
Other	4	5 %
Jehovahs Witness	3	4 %
Total	**80**	**100**
Level of education		
None	5	6%
Primary	43	54%
Secondary	26	33%
Professional	3	4 %
Technical	2	2%
Technological	1	1 %
Total	**80**	**100**
Residence area		
Urban	80	100%
Total	**80**	**100**

Source: Information collection instruments.

3.2 Knowledge About the Sexuality of the Elderly in the Centers of Life

The category of knowledge myths and realities of sexuality shows that in the dimension, it is highlighted that 91% of adults presented inadequate knowledge and only 9% of older adults presented adequate knowledge. According to this analysis it can be shown that society plays an important role in shaping the myths, beliefs and realities related to the previous knowledge that the older adult has about sexuality and that this in some way influences the behavior and / or thoughts of them.

In this sense, older adults experience reduced orgasm pleasure compared to the young, a large majority of adults do not lose and still maintain sexual interest, sexual relationships in this population are held with desire and not by simple obligation, while that other participants consider that they do not maintain their physiological capacity for the sexual act limiting a healthy and spontaneous sexuality.

Also the level of knowledge about sexuality in the elderly according to access to a partner, was inadequate in 96% of the population and only 4% presented adequate knowledge. According to this, the questions that influence for inadequate knowledge are: 1. Remain alone after losing the partner, 2. you can only have one partner until the death of your spouse, 3. Not having a partner at this age is good because they are calmer. These responses indicate that the older adult tends to be without a partner for different reasons, feeling satisfied with this situation.

Regarding the knowledge regarding sexuality in the elderly according to access to privacy, the data showed that 48 adults had inadequate knowledge represented in 60% and 40% adequate knowledge.

That said, the older adult considers that intimacy refers to sexual intercourse with penetration and that living with children or relatives and not having an adequate environment does not hinder intimacy, that is, that the elderly is limited and only thinks that intimacy is very related to the sexual intercourse, and that regardless of having or not third parties, this will not alter or modify an intimate relationship.

3.3 Attitudes Related to the Sexuality of the Elderly in the Centers of Life

Table 2. Attitude of the elderly by components

	Attitude	Average	Standard deviation
Cognitive component dimension			
Knowledge	high	7	1.81
Beliefs	Half	6	1.38
Assumptions	high	7	1.58
Value judgment	high	8	1.43
Volitional component dimension			
Positive feelings	high	7	2.13
Negative feelings	high	7	1,63
Component dimension conative or action			
Facilitative behaviors	high	7	2.45
Inhibitory behavior	Half	5	1.53

Source: Information collection instruments.

It can be observed in Table 2, in relation to the evaluation of the cognitive component that knowledge, assumptions and value judgments with an average of 7,7 and 8 respectively, represented a high attitude. These results indicate that older adults really have clear information about what society perceives about them, and about the sexuality that these may have.

In the category of beliefs, older adults strongly disagree that it is not natural to have sex after age 55 and at the same time agree that the same anxiety manifested upon reaching middle age causes sexual disorders and affects the physiology of the male sexual response.

In the next category (suppositions) older adults presume not to have an exact idea of what their sex life should be like when they reach this life trajectory, causing them restlessness and thoughts of illness, others on the contrary can get to enjoy the sexual relations without having ejaculation.

In the last category (value judgment) for the criterion of older adults, men are more vulnerable to show symptoms of anticipatory anxiety about their sexual performance, consider that a monotonous relationship can progressively lead to the loss of sexual interest and that Economic concerns can deviate sexual activity.

With respect to the data presented of the volitional component, it was observed that both positive and negative feelings presented a high attitude, that is, older adults have the will and disposition to know and experience their sexuality.

For the evaluation of the volitional component to the sexuality of the older adult, with respect to positive feelings, older adults say they feel alive when they enjoy their sexuality, despite their age they would like to maintain relationships with a partner and if someone attracts them would like to have sex regardless of their age.

However, in the negative feelings, they said they feel totally disagree because they still do not feel that their sex life is over, they like having a desire to have relationships with other people and do not dislike talking with people their age.

In the conative or action dimension, a high attitude was observed in facilitating behaviors and mediating inhibitory behaviors. This indicates that although they demonstrate a form of interest to attract, please and have a person, at the same time they are reserved in front of their sexual situation and place a barrier at the moment that a person manifests sexual interest without knowing your sex life.

For the evaluation of the conative component to the sexuality of the elderly, in terms of facilitating behavior older adults try to be well groomed, attend any activity that they invite and do things like: dance, sing, listen to jokes in order to attract or get sexual partners

As in inhibitory behavior, they violently reject any sexual approach made by another person, refuse to disclose

their past sexual life and pray because they see it as a way of rejecting thoughts related to sex.

Table 3. Attitude of the older adult before his sexuality - behavior by dimensions and general.

Dimensions	Attitude	Average	Standard deviation
Cognitive	high	7	0.82
Volitive	high	7	0.39
Conative	Half	6	1.43
General Attitude of the 3 dimensions			
Total attitude		6	
Average		Half	
Standard deviation		0.75	

Source: Information collection instruments.

The attitude in general shows a medium tendency, an attitude considered favorable within this population. Sexuality in old age is framed within the close relationship that exists between biological, psychological and social aspects. The physiological changes in the elderly, used erroneously as an excuse and barrier to deny their sexual activity, are now known, concluding that despite the limitations they can impose in some aspects, allow sexual activity and satisfaction in old age.

4. Discussion

When analyzing the distribution according to sex of the population belonging to the CDV , the data indicate that the participation was greater for the female sex compared to the male sex, showing a difference of 16%, Cedeño, Atiñol, Suarez & Leon, 2014 in the results of his research he found that in this age group the female sex predominates , likewise, Cremé, Alvarez, Perez, Fernandez and Riveaux, 2017 it observes a slight predominance of the feminine sex, with a man - woman ratio of 0.8, which means that there are 80 men for every 100 women, whereas for this study the relation is of 0.7 indicating that there are 70 men for each 100 women in the CDV studied.

According to the marital status, the predominant state was the widower, it is important to emphasize that a high percentage of this population has a stable partner and they maintain regular or stable sexual relations, Contrary with the study of Cremé et al 2017 who shows that the largest population is in a conjugal state, whether they are married or in a consensual union and only 10% are widowed or divorced. The Catholic religion was the most predominant coherent study entitled psychological and sociocultural factors in the adult life of older adults Can, Sarabia, Guerrero, 2015 where it was obtained that 60% of the research population practices the Catholic religion. Finke and Starr (Can et al., 2015) affirm that it is important to observe that in the third age the religious activities are presented in greater degree due to the need to relate for different reasons such as; the loss of the spouse or to make sense of life.

On the other hand, the knowledge that older adults have about sexuality were inadequate in terms of the myths and realities section. In this sense, older adults considered that sexual activities are not carried out without a wish and some participants consider that sexual activity is frequently dangerous for health, a situation that coincides with the study of Cedeño et al. (2014), where older adults state that sexual relations are good and healthy for the organism if there are difficulties on the part of the couple, in addition, they considered them normal and pleasurable.

In the context of the access to intimacy section, the study shows that the population under study has inadequate knowledge for this dimension, due to the fact that older adults relate sexuality with the sexual act with penetration exclusively, showing approximations with the In the study by Cremé et al. (2017) who found that adults claim to have coital relationships, only one person recognized that their relationships were primarily from caresses, kisses, and other forms of expressing sexuality.

Within this framework, it is also contemplated that the population agrees on the importance of respecting the right to sexual privacy at any age, this being related to the study of Cremé et al. (2017) who expresses in its results that older adults has the right to enjoy their sexuality free from prejudice.

According to the cognitive component, older adults reflect a high attitude, that is, they know the concepts and

perceptions that society has regarding their sexuality and know what the changes that aging brings, besides, they combine their values with this idea. Thus, these results do not depart from the study conducted by Molina, 2013. No results showing that older adults had a mean attitude, that is, this age group is based on the values that have to promote sexuality, but the information they have about this is not so clear.

Continuing with the volitional component, it was evidenced that both the positive and negative feelings of the study represented a high attitude, that is, older adults have the will and disposition to experience their sexuality. This does not coincide with the aforementioned study, in it, it was shown, that positive and negative feelings have a neutral attitude, indicating that the feelings they harbor can not be definitively good or bad.

Finally, for the conative component or action, reflect having a high attitude in terms of facilitating behaviors and media in relation to inhibitory behaviors, indicating that adults show interest in having a sexual relationship, but in turn, know in what time to facilitate those actions and when to put barriers. However, in a study conducted by Molina, 2013. It was observed that both the facilitating or inhibitory behaviors represented an average attitude, indicating that older adults are exposed to undergo positive or negative transformations about sexuality.

5. Conclusions

According to the results of research carried out in the elderly population it was evident that there are significant differences in the level of knowledge and attitudes seniors have regarding their sexuality.

In this same context and taking into account the objectives set out above, the results previously disclosed were taken as a starting point. Thus, demographically, women predominated as a population attending the centers of life, a high percentage belong to socioeconomic status II, widowers, from urban areas and professing the Catholic religion.

In the cognitive component of the older adult, this shows clearly about knowledge and concepts preset by society and are closely related to sexuality, and population group strongly agree that many people are concerned about how it affects aging in sexual activity that society within its culture integrates rigid concepts about of pleasure and sexuality.

Older adults identify changes that causes aging in sexual activity, and although manifest need a partner until very old age do not feel uneasy if you do not have and relate intimacy with penetration or sexual act itself and not to provide support, security and trust.

In the same way it was possible to conclude that the attitudes that the older adults reflect were average, an act considered as favorable, the dimension in which the highest favorability was appreciated corresponded to the cognitive dimension and the volitional dimension, that is, that the adults in addition to being clear about what society perceives of them in terms of sexuality, they are also autonomous to express and experience it.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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Notes

Note 1. Older adults with mental limitations are excluded, because the data collection instrument is self-applicable, which limits the responses and produces bias in the information.

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