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Knowledge Towards Energy Drinks Consumption and Related Factors Among Young Male Athletes in the United Arab Emirates

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Abstract

Objectives: We aim to investigate the knowledge towards Energy Drinks (EDs) consumption and related factors among young male athletes in the United Arab Emirates (UAE).

Subjects and Methods: A cross-sectional study included 688 young male athletes from Al Ain sports club aged between 7 to 18 years. Data were collected using a modified version of a validated questionnaire from the European Food Safety Authority.

Results: Overall EDs consumption was 24%. About 44% of the athletes consumed EDs one to two times per month. Athletes who were training between 5–7 days per week consumed significantly more EDs compared to those who were training 3–4 days per week (81% vs. 15 %, $P<0.001$). Athletes aged 7–12 years were 2.4 times more likely to consume EDs than athletes aged 13-18 years ($P<0.001$). Moreover, athletes living with both parents were significantly less likely to consume EDs compared to those living with a single parent ($P=0.01$). Knowledge score about EDs consumption was significantly higher for non EDs consumers compared to EDs consumers ($P<0.001$).

Conclusions: EDs consumption among young male athletes was moderate. Educational programs are needed to increase the awareness regarding EDs consumption and its potential adverse effects among the young athletes. A regulation policy for EDs consumption should be addressed and consideration of labels with EDs contents and age identification is highly recommended.

Keywords: adolescent, athletes, consumption, energy drinks, knowledge

1. Introduction

Energy Drinks (EDs) has become one of the most popular beverages worldwide. They are defined as any type of non-alcoholic beverages that contains caffeine as a main ingredient, taurine, vitamins, and other ingredients combination (such as guarana and ginseng, etc.) (Metrology, 2015; Zucconi, 2013). They are marketed as to relieve fatigue and improve mental alertness, in contrast with sports or isotonic drinks which are intended to help athletes rehydrate after exercise (Campbell et al., 2013; Schneider & Benjamin, 2011). EDs marketing targets athletics as the primary target population, but as the expanding of EDs marketing into a different niche, teenagers and young adults are today the target population for EDs consumption as this group is more attracted to advertisements of these type of products (Heckman, 2010; Lal, 2007).

Many reports on the adverse effects of EDs consumption have been received by poison control centers and regulatory authorities (Ali, Rehman, Babayan, Stapleton, & Joshi, 2015; FDA, 2012; Gunja, 2012; Seifert, Schaechter, Hershorin, & Lipshultz, 2011). These reports included cardiac, neurological and gastrointestinal adverse effects. An excess amount of caffeine can lead to many negative health effects such as sleep disturbance, anxiety, jitteriness, gastrointestinal effects, tachycardia, and other cardiac symptoms and in some rare cases seizures and death (Harris & Munsell, 2015; Reissig, Strain, & Griffiths, 2009; Seifert et al., 2011). According to the U.S. Food and Drug Administration (FDA), the higher limit of moderate caffeine consumption among healthy

adult people is 400 mg/day (FDA, 2018). Health Canada issued recommendations for maximum caffeine intake levels for children aged 4 to 12 years to be between 45–85 mg caffeine per day and for children aged 13 years and above caffeine consumption should not exceed 2.5 mg/kg/day (Canada, 2012).

Data from the European Food Safety Authority (EFSA) showed that the consumption of EDs was 68% among adolescents, 30% among adults and 18% among children (<10 years old) (Zucconi, 2013). O'Brien et al. found that 34% of EDs consumers were aged between 18 to 24 years in the USA (O'Brien, McCoy, Rhodes, Wagoner, & Wolfson, 2008). Moreover, Gallimberti et al. reported a significant increase in EDs consumption from 18% among sixth grade to 56% among eight-grade adolescent students (Gallimberti et al., 2013). EDs consumption among college students in the United Arab Emirates (UAE) was reported to be 92% (Shery Jacob, 2013). There is a scarcity of studies on EDs consumption among young athletes. We aimed to investigate the knowledge towards EDs consumption and related factors among young male athletes in the UAE.

2. Materials and Methods

2.1 Study Protocol

This cross-sectional study was carried out during the period from May to October 2017 among young male athletes in Al Ain Sports Club, Al Ain city, Abu Dhabi, UAE. A convenient sample of total of 688 male athletes aged between 7 to 18 years from different sports disciplines were selected.

A structured and validated questionnaire of 37 questions was created based on a previously validated questionnaire used for gathering consumption data on specific consumer groups of EDs by the European Food Safety Authority (EFSA) (Zucconi, 2013). The questionnaire was modified and adapted to our culture and objectives and was administered in both English and Arabic. It was translated from English to Arabic and back-translated. The questionnaire was reviewed by three other nutritionists and pilot tested on 27 young athletes to ensure the validity and clarity of the questions.

This study is approved by Al Ain Medical District Human Research Ethics Committee (CRD504/17, Protocol No.17–27). The consent was obtained from the participant's parent. All study data and participant's information were handled confidentially and coded, and no one but the research team from the Community Nutrition Department had access to it.

2.2 Data Collection Tools

The questionnaire consisted of 6 sections: section (1) demographic data (gender, age groups (7–12 years and 13–18 years), weight, height, general health status and family type (living with both parents, single parent, other) , average sleeping duration during weekdays (<7 hours, 7-9 hours, <9 hours), Type of sports: team sports (football, basketball, handball, vollyball) or individual sports (swimming, JiuJitsu); (2) overall beverages consumption; (3) EDs consumption frequency (during the past 3 days and the past year), can size, location, reasons for consumption, preferred brand, choice of sugar or sugar free, parental EDs consumption; (4) Physical Activities (PA) [exercise frequency (5–7 days per week, 3–4 days per week, 1–2 days per week), EDs consumption before/during/after exercise and number of cans per session]; (5) Other caffeinated beverages (coffee, tea, hot chocolates, and cola) consumption frequency, cup or can size and caffeine and sugar choice); (6) knowledge about EDs price, caffeine and vitamins contents.

Each athlete was interviewed face-to-face by a nutritionist. Pictures and samples of EDs products with all available sizes were used during the interview. Body Mass Index (BMI) of the athletes were measured and calculated as weight in kilograms (kg)/ (height in meter)^2 . BMI was classified according to the Centers for Disease Control and Prevention (CDC) Growth Charts into underweight (less than 5th percentile); healthy weight (5th percentile to the 85th percentile); overweight (85th percentile to less than the 95th percentile) and obese (equal to or greater than the 95th percentile). (CDC, 2015)

2.3 Statistical Analysis

Data from all the questionnaires were coded and entered using SPSS (Statistical Package for the Social Sciences, version 23). Descriptive and frequency analysis was used to analyze the baseline athletes characteristics. Pearson x^2 test was used to assess differences in the distribution of frequency of replies and to analyze the influence of selected related factors (BMI categories, family type and frequency of PA) on overall EDs consumption). Logistic regression was performed to test the effects of various factors (age group, family type, average sleeping hours per weekdays and frequency of PA) on overall EDs consumption.

For each athlete, a knowledge score (K score) ranging from 4 to 8 was calculated based on the number of the correct answers to four questions. The higher the score, the lower the knowledge towards EDs. Independent t-test

was used to test if the K score means differs based on overall EDs consumption. Simple linear regression was used to study if a K score can predict overall EDs consumption, age groups, and family type. In our study, the significant criteria were set at $P<0.05$ and were used for all the statistical analysis.

3. Results

3.1 Athletes Characteristics

Table 1 describes athletes sociodemographic characteristics according to EDs consumption. The study included 688 male athletes (mean age 11.5 ± 2.5 years, mean BMI =19 ± 4.1 kg/m^2). Among all athletes, 21% were either overweight or obese. Around 87% of all the athletes lived with both parents and 12% lived with a single parent. The majority of the Athletes reported no health problems (92%).

Table 1. Athletes characteristics as related to EDs consumption (n=688) **

Socio-Demographic data	Overall EDs consumption		
	Yes	No	Total
	n (%)	n (%)	n (%)
Age groups (Years)			
7-12	69 (42)	371 (58)	440 (64)
13-18	94 (71)	150 (29)	244 (36)
BMI (kg/m^2)			
Underweight	12 (9)	29 (6)	41 (6)
Normal	95 (69)	309 (68)	404 (59)
Overweight	17 (12)	70 (15)	87 (13)
Obese	13 (10)	49 (11)	62 (9)
Family type*			
Both parents	133 (82)	468 (89)	601 (87)
Single parent	28 (17)	56 (11)	84 (12)
Other	2 (1)	1 (0.2)	3 (0.4)
Average sleeping weekdays (hours)			
< 7	38 (23)	50 (10)	88 (13)
7-9	101 (62)	332 (63)	433 (63)
> 9	24 (15)	142 (27)	166 (24)
Type of sports			
Team sports	139 (85)	462 (88)	601 (87)
Individual sports	24 (15)	63 (12)	87 (13)
PA frequency*			
1-2 days/week	7 (4)	50 (11)	57 (8)
3-4 days/week	24 (15)	120 (26)	144 (21)
5-7 days/week	132 (81)	295 (63)	427 (62)

Note. BMI= body mass index, PA= physical activities.

**Some values were missing for some variables.

*Significant $P<0.05$.

Interestingly, athletes living with both parents consumed significantly fewer EDs (89%) as compared to athletes living with a single parent (11%, $P=0.01$). Moreover, athletes who trained between 5-7 days per week consumed significantly more EDs compared to those who trained between 3-4 days per week (81% vs. 15%, $P<0.001$), Table

1.

3.2 Energy Drinks Consumption

In our study, the overall EDs consumption among young male athletes was 24% (n=163). The majority consumed at least one can once or twice per month (44%). 22% of athletes parents consumed EDs sometimes, the majority (16%) were athletes fathers. In terms of the preferred brands, two brands of the tested emerged to capture market share of over 80%. The most popular brands of EDs were Redbull (54%) and PowerGold (29%). The majority of athletes consumed 250 ml EDs can size (87%). The main reasons for EDs consumption by the athletes were its good taste (54%), energy/performance enhancement (19%), and friends influence (20%), Figure 1. Regarding EDs consumption as related to PA, 17% of athletes reported never consumed EDs during PA, 5% reported sometimes consumed before and/or after or during PA, 2% reported EDs consumption always before or after PA.

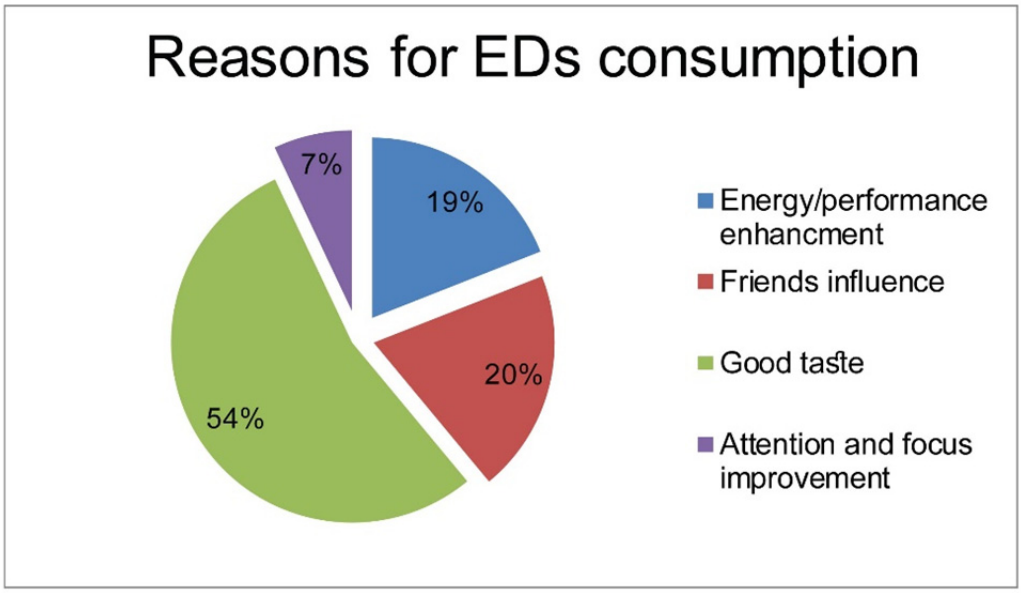

Figure 1. Reasons for Energy Drinks consumption among young male athletes

3.3 Overall EDs Consumption and Related Factors

Age and sleeping hours were significant predictors to EDs consumption, Table 2. Athletes aged 7–12 years were 2.4 times more likely to consume EDs than athletes aged 13–18 years after controlling for all other factors in the model. Additionally, athletes sleeping between 7–9 hours and those more than 9 hours were more likely to consume EDs compared to athletes sleeping less than 7 hours (Table 2). A Pearson correlation analysis showed a positive correlation between EDs consumption and average weekdays sleeping hours ($r = 0.186$, $n = 687$, $P < 0.001$). On the other hand, a negative correlation was shown between age groups and EDs consumption ($r = -0.257$, $n = 684$, $P < 0.001$).

Table 2. Logistic regression of overall EDs consumption with selected variables (n=624)

Variables	OR	95% CI
Age groups (years)		
13-18 (ref)		
7-12	2.38	1.56, 3.63*
Family type		
Both parents (ref)	0.6	0.35, 1.02
Single parent	0.25	0.02,3.6
Others		
Average sleeping weekdays (hours)		
<7 (ref)	1.73	1.04, 2.89*
7-9	2.31	1.19, 4.52*
>9		
PA frequency		
5-7d/week (ref)		
3-4d/week	1.55	0.92, 2.62
1-2d/week	2.02	0.86, 4.74

Note. OR= Odds Ratio; CI= Confidence Interval; PA= physical activities.

*Significant $P<0.05$.

3.4 Knowledge Towards Overall EDs Consumption

Around 82% of the athletes didn't know that EDs contained caffeine and only 20% believed that EDs contained vitamins. The majority of athletes (76%) assumed that EDs and soft drinks are different.

The average knowledge score (K) of EDs consumption among all the athletes was 6.5 ± 0.96 (n = 687). We found that K score was significantly higher for non EDs consumers 6.6 ± 0.96 (n = 524) compared to K score for EDs consumers 6.05 ± 0.88 (n=163) ($P < 0.001$). These results suggest that athletes who were not consuming EDs had lower knowledge towards EDs consumption.

EDs consumption and age groups were significant predictors of K score as described in Table 3. These results suggest that as the age increases, knowledge towards EDs increases and as the overall EDs consumption increases, knowledge towards EDs decreases.

Table 3. Multiple linear regression of K score with related factors

Variables in the model	b	SE b	β	95% CI
Overall EDs consumption	0.24	0.044	0.213	0.16,0.33*
Age groups	-0.21	0.078	-0.102	-0.36,-0.054*
Family type	-0.038	0.103	-0.014	-0.24,0.17

Note. b and SE b = unstandardized coefficient and its standardized error; β = the standardized coefficient; CI = Confidence Interval

*Significant $P<0.05$.

4. Discussion

This study reported that overall EDs consumption among male athletes aged 7 to 18 years was 24%. Forty-four percent of athletes in this study reported EDs consumption 1-2 times per month. Similarly, The EDs consumption among adolescents in Bahrain was 2 to 3 times per week (28.8%) and 1-2 times per month (15%) (Maryam, 2015).

While lower EDs consumption rate was reported among adolescents aged 11-13 years old in Italy (20%) (Gallimberti et al., 2013). Musaiger et al. (Musaiger & Zagzoog, 2013) reported that about 55% of adolescents consumed EDs once or more each week. In our study, it has been found that athletes aged 7-12 years were more likely to consume EDs than athletes aged 13-18 years. Similar to other, our study showed that the consumption rate decline with increased age (Simon, 2007). In contrast, Gallimberti L. et al. (Gallimberti et al., 2013) demonstrated that EDs consumption increased steadily with age where eight graders (50%) consumed more EDs as compared to sixth grader (18.6%).

Our study showed that athletes living with both parents were less likely to consume EDs (89%). However, some athletes reported that 22% of their parents consumed EDs sometimes. This indicates the influence of parents on their children's attitudes towards EDs consumption. It was shown that parental lack of awareness about caffeine-related health risks on young children and the differences between EDs and other soft drinks was the reason for allowing their children to consume EDs (Oddy & O'Sullivan, 2009).

In contrast to Koivusilta L. et al. (Koivusilta, Kuoppamaki, & Rimpela, 2016), Our study showed that athletes who slept 7 hours and more were more likely to consume EDs than athletes sleeping less than 7 hours. This could be explained that athletes who sleep longer hours felt that they needed to drink EDs in order to feel energized for their sports activity. Nowak D. et al (Nowak & Jasionowski, 2016) showed that 28% of respondents claimed that EDs gave them a boost of energy. Similarly, our study showed that 19% of the athletes consumed the EDs to increase their energy and enhance their performance. Caffeine is the primary source of energy in EDs. It has been shown that caffeine enhances physical performance in adults by improving concentration, reduces fatigue, enhance alertness and power (Paluska, 2003). However, these effects vary according to the consumer age, sex and caffeine dependency (Schneider & Benjamin, 2011). Two randomized studies among elite junior athletes showed that pre-exercise ingestion of EDs had a positive effect on participants sports performance (Abian-Vicen et al., 2014; Gallo-Salazar et al., 2015), however both studies involved small numbers of participants thus this should further be investigated in a bigger sample with concerns to the long-term effects of EDs on physical performance and overall health issues.

It has been showed that some adolescents consume EDs for their perceived physiological benefits without being aware of the potential health risks of these drinks (O'Dea, 2003). Similar to others (Maryam M. Nassaif, 2015; Musaiger & Zagzoog, 2013; Nowak & Jasionowski, 2016; Zucconi, 2013), 54% of EDs consumers in our study reported that the main reason for consuming EDs was its good taste. In contrast with another study, we found that 82% of the athletes didn't know that EDs contained caffeine and 20% believed that EDs contained vitamins (Musaiger & Zagzoog, 2013). The majority of athletes in our study believed that EDs and soft drinks are different (76%), which was in contrast to Musaiger et al. (Musaiger & Zagzoog, 2013) who found that 67% of adolescents considered EDs similar to soft drinks. Hardy. et al (Hardy, Kliemann, Evansen, & Brand, 2017) investigated the association between EDs consumption and overall knowledge score and found that users of EDs scored significantly lower on the section of food/nutrients sources and disease knowledge than did non EDs users. Caffeine content in EDs ranges from 50-505 mg in a can or bottle depending on the capacity. This amount is equal to or even exceeds the amount of caffeine in a cup of coffee (Clauson, Shields, McQueen, & Persad, 2008; Reissig et al., 2009). In addition to EDs consumption, athletes in our study also consumed other caffeinated beverages such as soft drinks (23%), and tea (39%) which can further increase their daily caffeine intake. An excess amount of caffeine can lead to many negative health effects such as sleep disturbance, anxiety, jitteriness, gastrointestinal effects, tachycardia, and other cardiac symptoms and in some rare cases seizures and death (Harris & Munsell, 2015; Reissig et al., 2009; Seifert et al., 2011).

Different countries have set their own regulatory policies regarding labeling, distribution, and sale of EDs with a high content of caffeine. Regulations of the European enforced additional caffeine labeling for EDs with 150 mg/l caffeine (Thomson, 2010). In all EU Member States, EDs can be sold but with specific regulations including setting rules for sales to youths. For example, in Sweden, some products sales are regulated by pharmacies and sales to children under the age of 15 years are illegal (Oddy & O'Sullivan, 2009). In Canada, EDs require warning labels, the maximum daily consumption amount and advise against mixing EDs with alcohol (Temple, 2009). In the UAE, the Emirates Authority for standards and Metrology (ESMA) have set regulation policies for EDs labelling such as not allowing pregnant and lactating women, persons under the age of 16 years, persons with sensitivity to caffeine, and those with heart and arterial problems, as well as athletics during exercises to drink EDs (Metrology, 2015). It is necessary to amend the UAE standards for EDs for those under the age of 18 years by placing restrictions on EDs marketing, limiting EDs sales places, active enforcement of a minimum purchase age with age verification card. Moreover, relevant authorities should be instructed to discourage mixing EDs with other beverages.

5. Conclusions

EDs consumption rate was moderate among young male athletes in the UAE. Educational programs are needed to increase awareness regarding EDs consumption and its potential adverse effects. A regulation policy for EDs consumption should be addressed, and consideration of warning labels with EDs contents and age identification is highly recommended.

5.1 Strength and Limitation

To our knowledge, this is the first study investigating the EDs consumption prevalence among young athletes. The face-to-face questionnaire interview gave more accurate responses compared to self-reporting data. We used a modified validated questionnaire from the EFSA study to examine practices of EDs with reliable measurements.

We have to acknowledge that this study has certain limitations. Our study is a cross-sectional study, so implications of casual association cannot be accurately made. Additionally, athletes included in this study may not be representative of all sports athletes in the UAE.

5.2 Implications

The present study gave unique information regarding the prevalence of EDs consumption among children and adolescents in Al Ain city. The study also investigated the related influence factors of EDs consumption and knowledge towards EDs consumption among athletes.

On October 1, 2017, the UAE Federal Tax Authority has implemented excise tax at a rate of 100% on EDs. it would be very interesting to conduct a follow-up study after tax implementation on EDs to compare it with our findings.

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Author Contributions

AAA contributed to conception and design, acquisition of data, data analysis and interpretation. Both AAA and HR drafted the paper and critically reviewed the manuscript; NA contributed to study design, data collection and reviewed the manuscript. All authors gave the final approval of the version to be published.

Competing Interests Statement

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

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Knowledge on HIV Prevention Measures Among Male Learners in Secondary Schools in Oshana Region, Namibia

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Abstract

Human Immunodeficiency virus (HIV) has continued to pose significant social, economic and developmental challenges worldwide.The purpose of the study was to assess the knowledge on HIV prevention among male learners in secondary schools in Oshana Region. The objectives of the study were to: assess and describe the knowledge of male learners in Secondary Schools in Oshana Region about HIV preventive measures. A quantitative, cross sectional design, based on the self-report of the participants, was utilized to achieve the aim of the study. Findings of this study showed that 95.4% had knowledge that HIV can be prevented by consistent and correct use of a condom during sexual intercourse. It has become evident that much still need to be done to make HIV prevention among youth more effective.It is hereby recommended that the Ministry of Education takes the lead to educate the learners on HIV preventive and control measures.

Keywords: knowledge, adolescent, HIV preventive measures, risky sexual behaviours, male learners

1. Introduction

Since its entry into the global public health arena in the eighties, Human Immunodeficiency virus (HIV) has continued to pose significant social, economic and developmental challenges worldwide. Globally, an estimated 36.9 million people were living with HIV in 2017 while the number of new HIV infections in eastern and southern Africa in 2011 were 1.1–1.3 million (UNAIDS, 2017). Heterosexual activities remain the commonest mode of transmission especially in sub-Saharan Africa (NDHS, 2016) Sexual behavior change appears to be the most effective way of curbing further spread of the disease. Sub-Saharan Africa remains the region that is most affected by the HIV epidemic, despite positive signs that HIV prevalence is declining overall among young people in the region (UNAIDS, 2017). The high numbers of new infections among young people in eastern and southern Africa (ESA) remain a serious concern, as is the fact that the majority of adolescents and young people living with HIV are growing up in the same region. Africa remains the most affected region in the world (UNAIDS, 2017).

HIV prevalence in Namibia is among the highest in the world. The first case of HIV in Namibia was recorded in 1986 and since then the prevalence of the disease has been on the increase with occasional decrease in numbers. The Ministry of Health and Social Services (MoHSS) conducts a sentinel zero-survey every two years to monitor the progression of the epidemic in the country. HIV prevalence has risen from 17, 8% in 2008 to 18, and 2% in 2012. The HIV prevalence for 2014 was 16.9%, which indicates a slight decline, while in 2016 is 17.2%. There is still a high rate of infection among the youth (MoHSS, 2016). The trend in HIV prevalence among young people is a better indication of recent trends in HIV incidence and risk behaviour (UNAIDS, 2017).The National Demographic and Health Survey (NDHS) conducted in the year 2016 in Namibia indicated that the age at which young people first have sex is from thirteen years, implying that young people have sex before the age of 15. This is considered premarital sexual activity and it increases young people's potential exposure to HIV (UNAIDS, 2017).

Adolescents and young people represent the future of every society According to Kar, Choudhury & Singh (2015) documented that secondary school learners are in the adolescent age, which is the time that they begin to take interest in sexual relationships. It has concluded that youths are at a stage when they may want to experiment with

sex without giving much consideration to the implications of their present behaviour. Therefore, better education and public health measures can be hugely beneficial to their health and development. The main goal of the afore-mentioned is to delay the age at which young people first have sex and discourage premarital sexual activity as this will reduce their potential exposure to HIV.

MoHSS (2016) National HIV Sentinel survey reported that there was an increase in HIV prevalence among the youth (15–24 years) in Oshana Region from 8.3% in 2008 to 14.8 % in 2010. The 2014 HIV Sentinel survey indicated an increase in HIV prevalence in the same age group from 7.8% in 2012 to 9.4% in 2014 while in 2016 is 9.0% (MoHSS, 2016). This age group comprises those who are in secondary schools and at the post-secondary levels. They constitute part of the active and vibrant members of the community and generally it is known that men play a key role as gate-keepers in the community. The high prevalence of HIV infection among this active and vibrant member of the population may in part be attributed to lack of adequate information that would engender behaviour change.

This study was therefore undertaken to fill the knowledge gap on the subject matter and further arm health educators, peer counselors, and other stakeholders with the necessary information to address the information needs on HIV. Increasing knowledge of HIV can be a powerful means of fostering positive attitudes and building safe practices among youth. Hence, a clear understanding about knowledge among any population is very important for planning to control or prevent the spread of HIV (Pharr, Enejoh, Mavegam, Olutola, & Karick, 2017). Although HIV related KAPs are reported in studies from other countries, there was no such information for male learners in secondary school in Oshana region. Therefore, this study was conducted among male learners in Secondary School in Oshana region to determine their level of knowledge toward HIV preventive measures.

2. Goals and Objectives

The goal of the study was to assess and describe the knowledge on HIV prevention among male learners in secondary schools in Oshana Region. Its objectives were to assess the knowledge about HIV preventive measures among male learners in Secondary Schools in Oshana Region.

3. Research Design and Methods

3.1 Design

A cross-sectional quantitative design utilizing a descriptive design was conducted. This study employed a quantitative approach as a preferably, efficient and inexpensive method in collecting data from a large number of respondents in a survey (Brink, van Rensburg, & van der Walt, 2018)

3.2 Study Population

The study population for this study comprised of all male learners in four selected senior secondary schools in Oshana region, Namibia.

3.3 Inclusion and Exclusion Criteria

All learners who were randomly selected from the list, who were 18 years old by then and whose parents/guardians consented to the study and were willing to participate in the study were included in the study. Learners under the age of 18 years without permission from their parents/guardians to participate in the study were excluded from the study.

3.4 Sampling and Sample Size

Participants were randomly selected from the selected secondary school list of 1429 male learners. Simple random sampling technique was used and every second or third officer on the list was selected for participation. A total numbers of 592of male learners were selected. A total number of (731) data collection instruments were prepared and circulated to all selected Secondary Schoolwithin the region.

3.5 Data Collection Tool

In this study, data was collected using questionnairesas primary source of data collection. This data collection method was used for the study, as it is considered to be a relevant tool to use when the researcher seeks to collect data from larger sample (Brink at el, 2018).

3.6 Data Collection Methods

The researcher distributed 731 questionnaires to participants and a total number of 592 (80%) questionnaires were completed and returned.

3.7 Data Analysis

Data analysis from the questionnaires was presented as descriptive statistics and evaluated with quantitative, computerised statistical techniques, using SPSS version 24.

4. Ethical Considerations

HIV is considered as sensitive issues due to the nature of the stigma and discrimination surrounding the disease. Participants in this study were assured confidentiality and anonymity. They were not obliged to divulge their names or personal particulars expect their gender, age and educational background. Participation in the study was voluntary and informed consent form was considered prior participation. Participation in the study was voluntary and participants were informed that they could withdraw at any stage. Participants were assured that research material and all documents with their response are going to be kept safe in an area only accessible to the researcher. For privacy, schools were study was conducted were coded with letters as school A to school D.

5. Results

5.1 Socio Demographic Description of Study Participants

5.1.1 Age of Participants

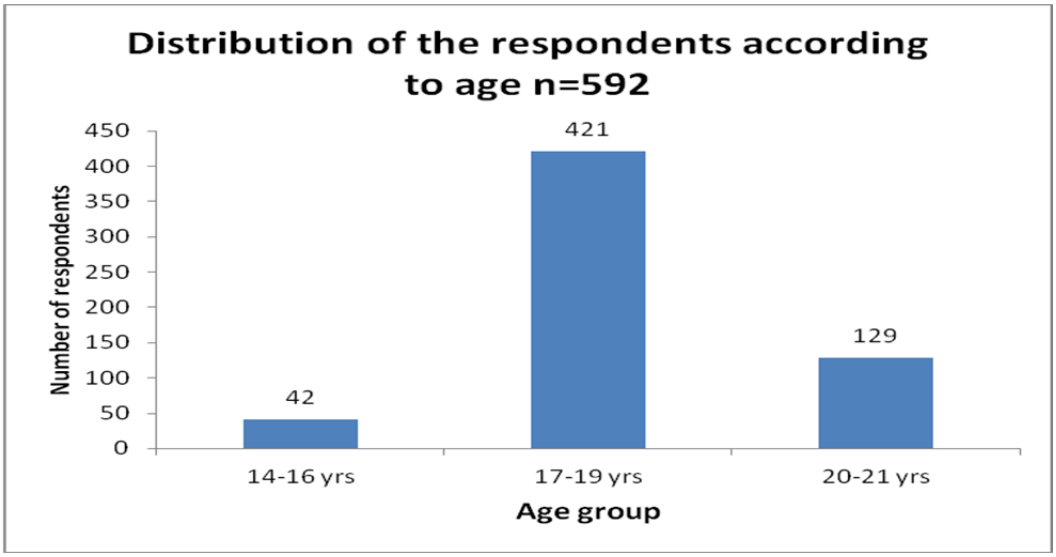

Figure 1. Distribution of respondents according to age

Figure 1 outlines the age of learners who took part in the study. It indicates majority of 421 (71.1%) were 17-19 years old, followed by age group 20-21 years that were 129 (21.8%). The learners who were 14-16 years old were 42 (7.1%). Respondents of age 14-16 years were very few. This could be because learners of mentioned age had to obtain written consent from their parents or guardians.

5.1.2 School Distribution

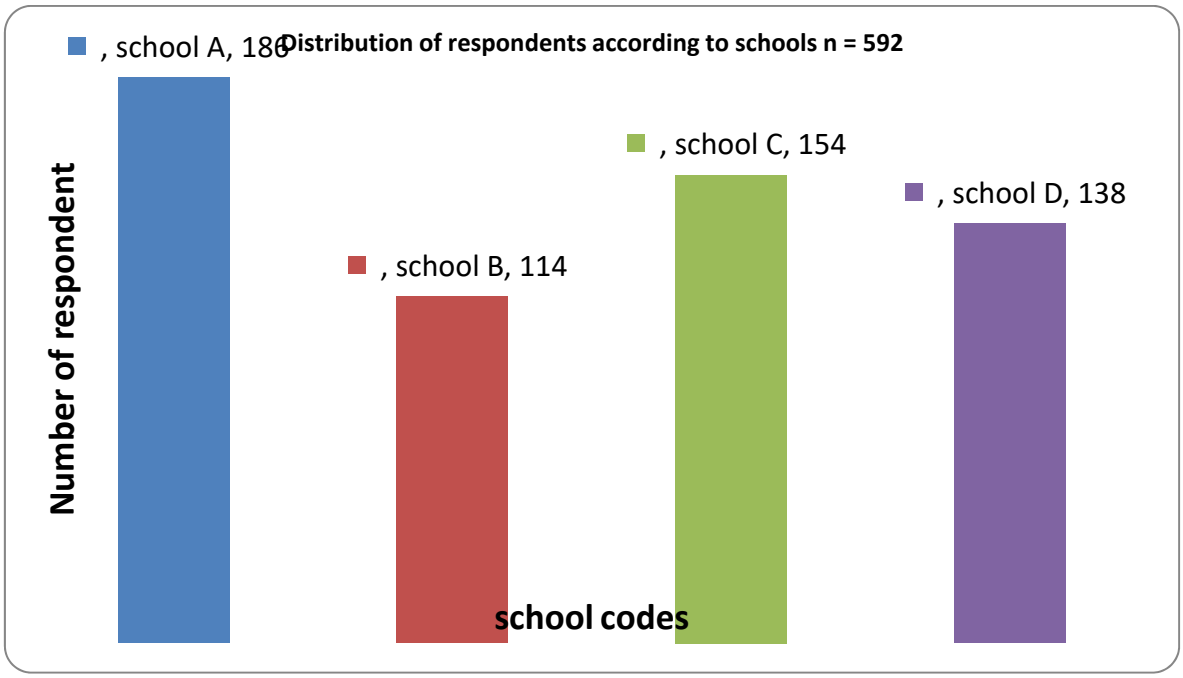

Figure 2. Distributions of respondents according to schools

Figure 2 outlines the distribution of respondents by Schools. A total of 592 respondents participated in the study from all the four schools as indicated in figure 5.2 respectively. The sample comprised of 114 (19.3%) respondents from School B, 154 (26.0%) from School C and 138 (23.3%) from School D. The largest numbers of respondents of 186 (31.4%) were from School A.

5.1. 3 Level of Education of Participants

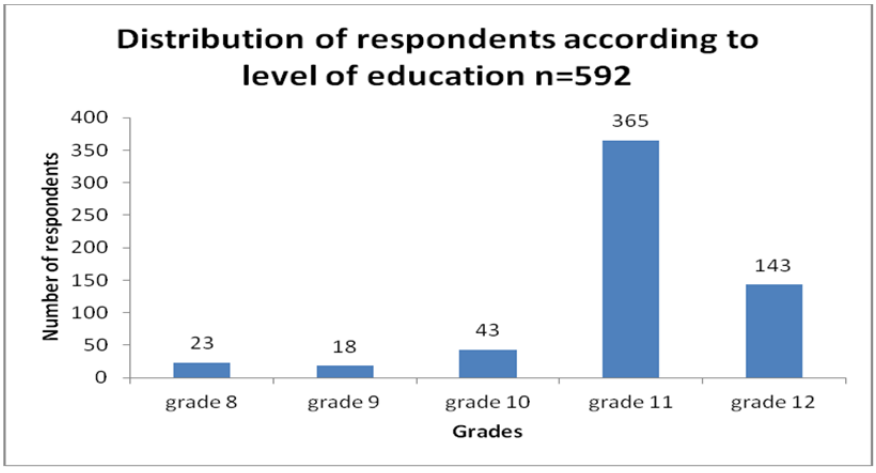

Figure 3. Distribution of respondents according to level of education

Figure 3 outlines the all the grades that were represented in each school. The majority 365 (61.7%) were in grade 11, followed by grade 12, 143 (24.2 %) 43 (7.3%) were in grade 10, while 23 (3.9%) were in grade 8 and 18 (3%) of respondents were in grade 9.

5.1.4 Religious Affiliation of Respondents

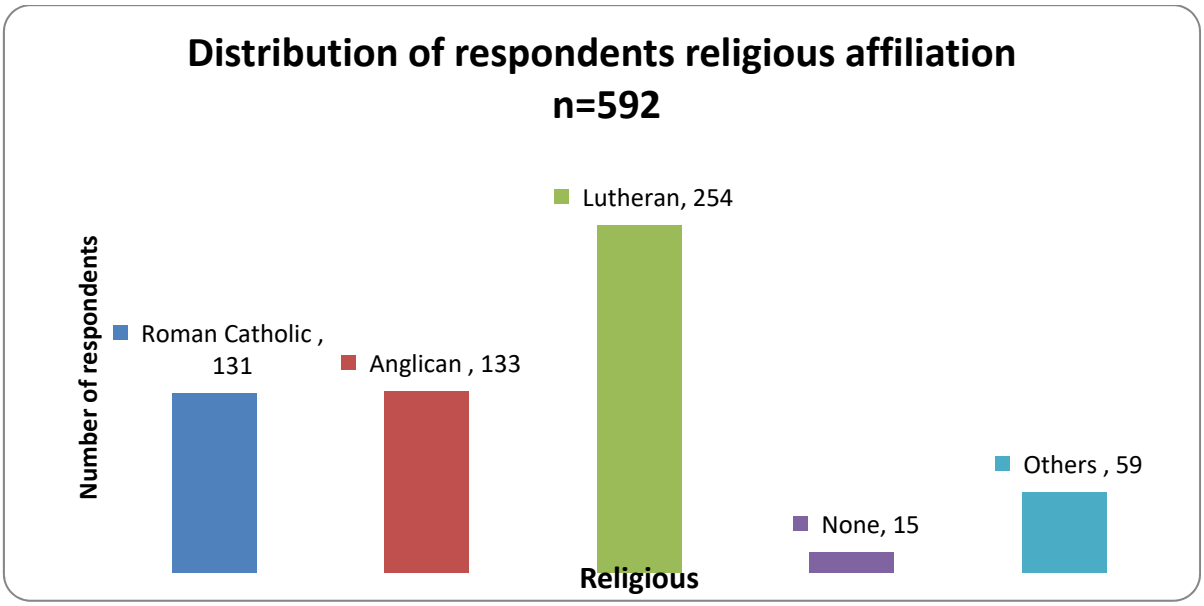

Figure 4. Distribution of respondent's religious affiliation

Figure 4 indicates the religious distribution of respondents in the study. The respondents mainly represented the following four religious groups, whereby majority 43.0% (254) out of 592 are Lutherans, 22.3% (132) are Anglicans, 10 % (59) belong to other religious affiliations, namely Four Square, Jehovah Witness, Potters House, Seventh Day Adventist and 2.5% (15) of the respondents indicated that they did not belong to any religious affiliation.

5.1.5 HIV Prevention Through the Correct Use of Condom During Sex

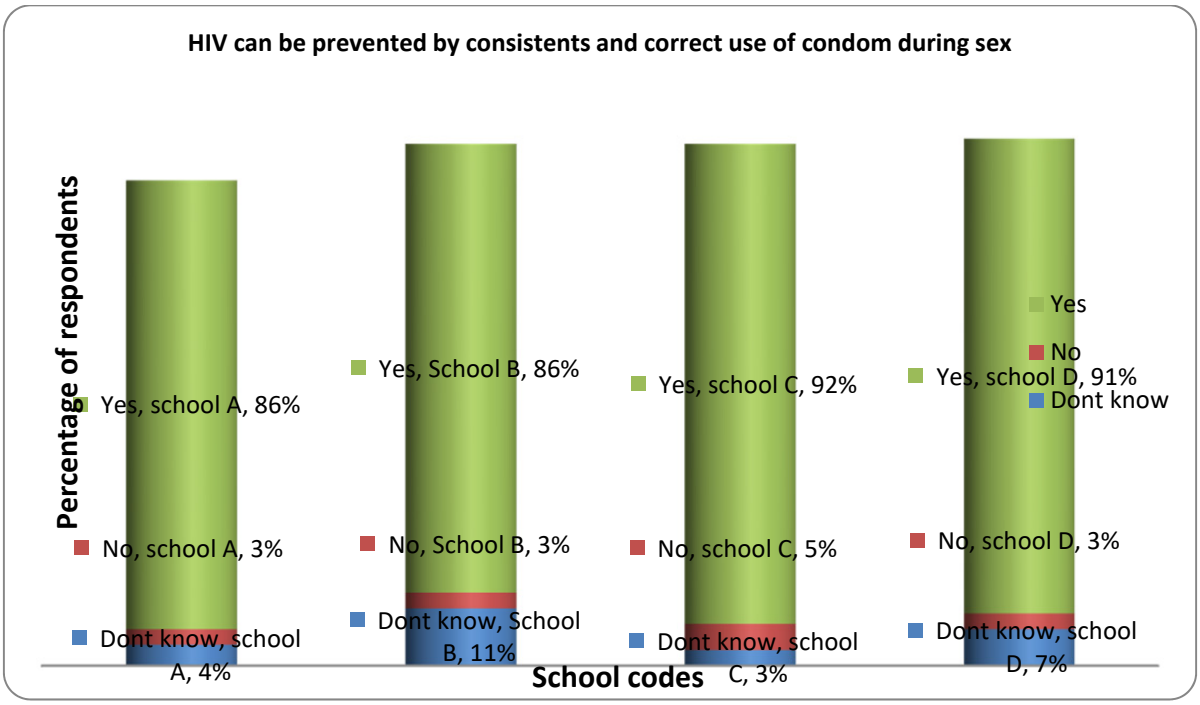

Figure 5. HIV can be prevention by consistency and correct use of condom during sex

Figure 5 indicates that shows the respondents' knowledge about prevention and control of HIV. Item number ten, indicates a total number of 565 (95.4%) out of 592 respondents had knowledge that HIV can be prevented by consistent and correct use of a condom during sexual intercourse, while 16 (2.7%) out of 592 indicated that that HIV cannot be prevented by consistent and correct use of a condom during sexual intercourse and 11 (1.8%) respondents stated that they did not know if HIV can be prevented by consistent and correct use of a condom during sexual intercourse.

5.1.6 HIV Prevention by Sticking to One Faithful Single Partner

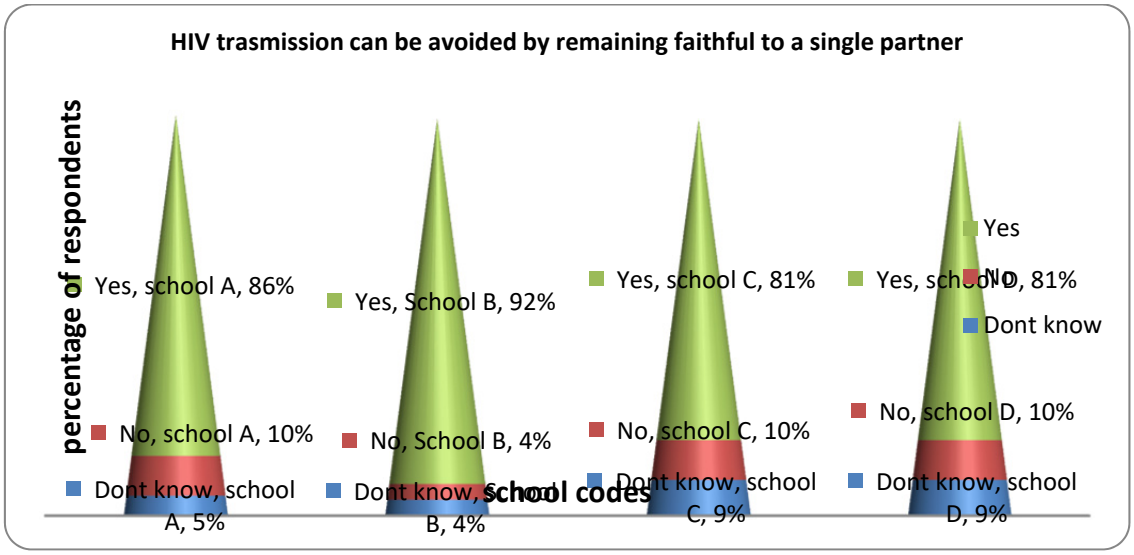

Figure 6. HIV transmission can be avoided by remaining faithful to a single partner

Figure 6 reveal that majority of participants 501(84.6%) out of 592 respondents were aware HIV transmissions can be avoided by remaining faithful to a single partner.

5.1.7 HIV Prevention Before Marriage by a Blood Test

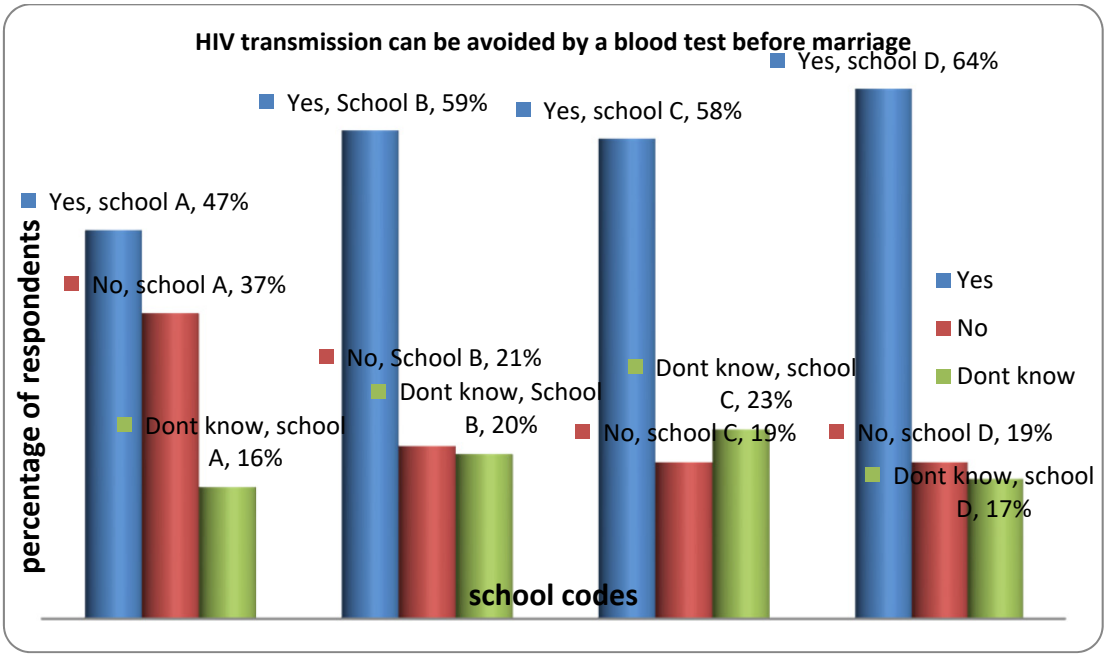

Figure 7. HIV transmission can be avoided by a blood test before marriage

The study findings indicate the respondents' knowledge about prevention and control of HIV, that HIV infection can be avoided by a blood test before marriage. The study revealed that only 333 (56.2%) out of 592 affirmed that HIV transmission can be avoided by a blood test before marriage, while 112 (18.9%) and 147 (24.8%) of them indicated that they do not know whether it can be avoided or not respectively.

5.1.8 HIV Prevention Through Male Circumcision

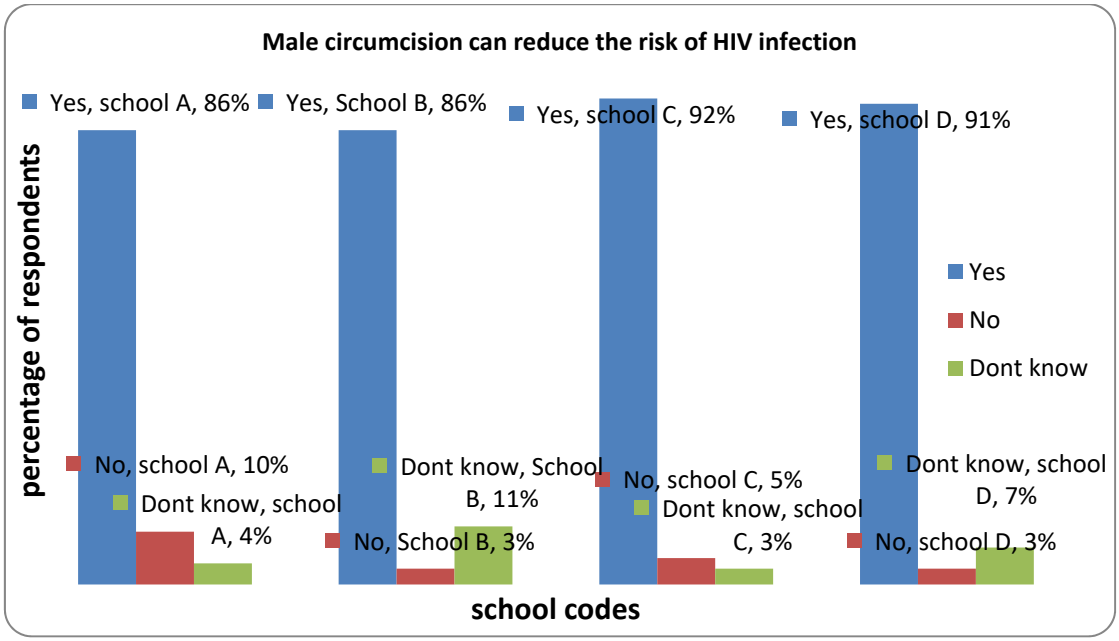

Figure 8. Male circumcision can reduce the risk of HIV infection

The study findings show that majority of 523 (88.3%) out of 592 of the respondents were aware that male circumcision can reduce the risk of HIV infection, while 35 (5.9%) were not aware thereof. Thirty four (5.7%) of them think that male circumcision cannot reduce the risk of HIV infection at all.

5.1.9 HIV Prevention Through Awareness Control Programme in the Region

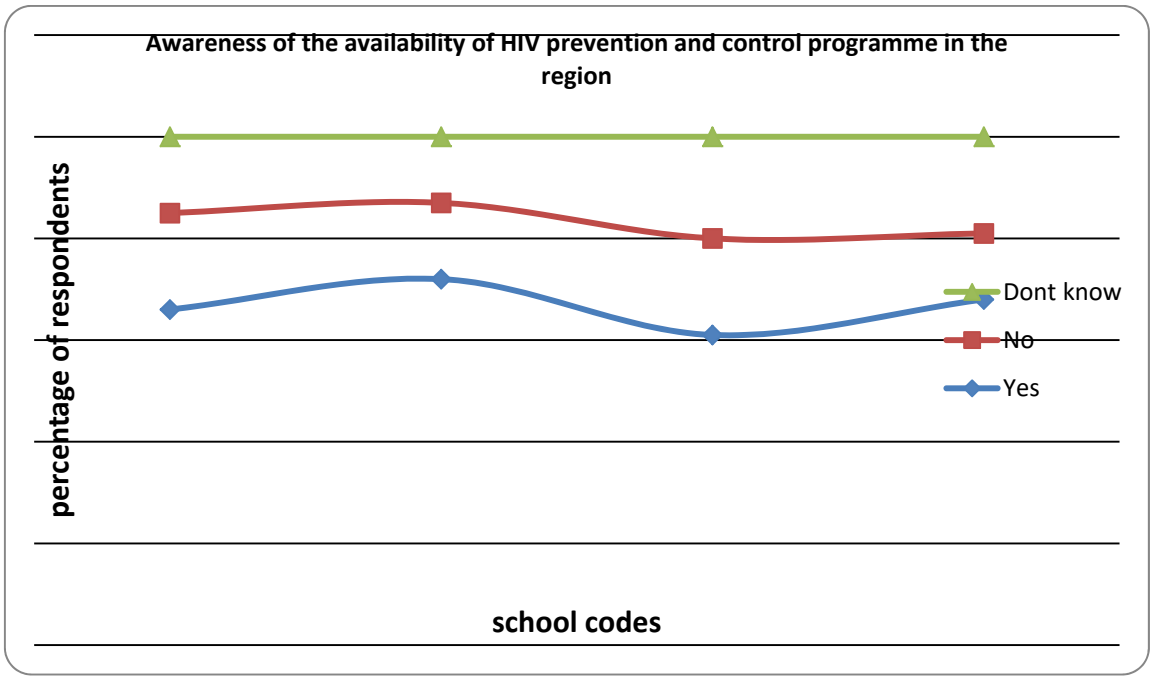

Figure 9. Awareness of the availability of HIV prevention and control programme in the region

The study indicates that majority of 393 (66.3%) out of 592 of the respondents were aware of the availability of HIV prevention and care programmes in the region. One hundred respondents (16.8%) of them do not know whether HIV prevention and care programmes are available in the region or not, respectively and 99 (16.7%) of them were not aware at all.

5.1.10 Effectiveness of Post Exposure Prophylaxis

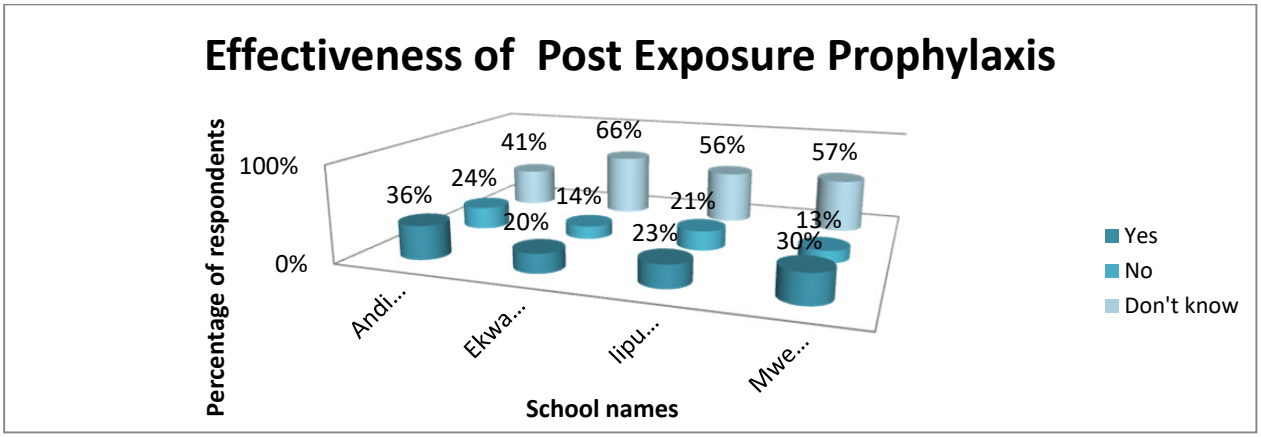

Figure 10. Effectiveness of Post Exposure Prophylaxis

Only few of the respondents 167 (28.2%) out of 592 were aware that Post Exposure Prophylaxis (PEP) is only effective if the medicine is started within 72 hours of possible exposure to the virus, while more than a half (315) (53.2%) of the respondents were not aware whether PEP can be effective if it is given within 72 hours or not. Hundred and ten (18.5%) of them replied "No", indicating that PEP is not effective if it is given within 72 hours of possible exposure to the virus.

5.2 Validity and Liability

The sample size was sufficiently large and was drawn from the large group of the same characteristic to the sample. The questionnaire was pre – tested prior to actual data collection with similar characteristic to the sample. The questionnaire was administered in language understood by both respondents and the researchers. Data quality checks were done in the field as well as before and data processing to ensure completeness and consistency. To address reliability in this study, the same questionnaire was used to collect data from all the participants and this was only done by the researcher alone.

6. Discussion

The majority of the respondents were highly knowledgeable about HIV prevention and control with the range between 28.2% to 95.4%. The most HIV preventive and control measures mentioned were consistent and correct use of a condom, remaining faithful, not sharing needle or syringe and male circumcision. This finding is similar to the findings reported among male high school learners in Cameroon by Nubed & Akoachele (2016). The findings on HIV prevention and control measures specific to remaining faithful to a single partner and condom use in this study were significantly high at 84.6% and 95.4% respectively, compared to 48% and 69 % reported by (Mkumbo, 2013) in a similar study in Bukoba, rural Tanzania.

The proportion of respondents who were aware that using condom is effective to prevent HIV transmission was high (95.4%) compared to the study carried out by Macugu, Joash & Jonathan (2013). In that study, *Condom use, awareness and perceptions among Secondary School students in Kenya* which showed only 22.9% of learners thought condoms were effective in protecting against HIV.

This study showed that male circumcision could be one of the HIV prevention measures among youth. A randomized control trial showed that circumcision reduces the risk of HIV infection among heterosexual men by up to 60%. It is expected that this prevention strategy is adopted in many countries that are affected by the epidemic. Namibia is one of the countries that adopted Voluntary Medical Male Circumcision as HIV preventive measures (NDHS, 2016)

It was indicated in this study that condom distribution was among the HIV prevention measures mentioned by the learners. This is also supported by (NDHS, 2016) that increase in condom distribution and use has been a key objective of the National Strategic Framework and both male and female condoms have proved to be effective in preventing HIV, STI and unwanted pregnancy.

It was further documented that getting tested for HIV was one of the HIV prevention measures among youth mentioned by the learners. The Voluntary Counseling and Testing has been identified as an entry point to most HIV and AIDS interventions globally (UNAIDS, 2017) Knowledge of HIV status helps HIV-negative individuals make specific decisions that will help reduce the risk of contracting HIV. For those who are HIV positive, knowledge of their status allows them to take action to protect their sexual partners, to access treatment, and to plan for the future (UNAIDS, 2017) .Therefore, youth should be encouraged to go for voluntary HIV counseling and testing.

Re- introducing of a religious subject in school was one of the effective HIV preventive measures suggested by the respondents. According to social control theories of adolescent behavior, religious functions do encourage adolescents to avoid actions that they might otherwise have taken. It is well known that one of the primary functions of religion is to help people deal with adversity (Arosell & Carlbom, 2016). Therefore, based on the findings, the respondents' suggestion about the re-introducing of religious education to be a taught subject in schools can be one of the effective HIV prevention measures among youth.

In this study it was found that few learners indicated that HIV can be prevented among youth by avoiding sexual intercourse while under the influence of alcohol.Information on alcohol and drug abuse is important for all adolescents, both regarding its effects on protected sex (for example, forgetting "intentions" to use condoms and a greater risk of incorrect use as well as the potential for HIV infection through sharing unsterilized injecting equipment. Only few learners mentioned peer counselling as one of HIV preventive measures among youth. This finding is similar to the study conducted by (Muswede, 2015) about Perceptions of young adults with regard to condom use in Vhembe district, Limpopo province where it was revealed that respondents seemed to be less comfortable talking about the epidemic with peer educators.

7. Conclusions

This study aimed to assess the knowledge toward HIV prevention measures among male learners in Secondary School in Oshana region. A high level of knowledge about prevention was found. Although, the study has found high knowledge about HIV prevention, the HIV prevalence among youth for 2016 is still high 8.5% looking at

17.2% for Namibia. Therefore, much still need to be done to make HIV prevention among youth more effective.

7.1 Recommendations

- **The study has found that lack of awareness among learners about the effectiveness of condom used in prevention of HIV and AIDS observed**. Therefore, this study recommended that the Ministry of Education to takes the lead to educate the learners on HIV preventive and control measures required because learners should know all methods that they can use to protect themselves from infection.
- **Lack of awareness about the availability of HIV prevention and care programme were found by the study**. This study recommended MoE -Life skills teachers to mobilize the learners about the availability of HIV prevention and care programmes in school, to strengthen HIV prevention programmes in schools and to make sure that learners are involved from the initial process of planning or designing HIV and AIDS prevention programmes
- **The study has found that Learners are less informed about Post-exposure prophylaxis (PEP) and they may not avail themselves to utilize these services if the need arises**.

Therefore, this study recommended that MoHSS specific Infection Control Nurse at regional level should take the lead to educate the learners about the Post exposure Prophylaxis guideline so that learners should be aware that if the condom burst during sexual intercourse without knowing one's HIV status they need to visit the hospital within 72 hours.

7.2 Study Delimitations and Limitation

The study was delimited to four secondary Schools in one region involving 592 male learners. This limits the generalization of study findings to other regions and to all male learners of the same age. Moreover, and given the sensitive nature of the study, the participants may have given limited information which may have influenced the findings.

Acknowledgements

Researchers thank all the respondents who took time to participate in this study; without their participation this study would not have been possible. We also thank the Ministry of Education, Arta and Culture for having granted us permission to conduct research in its correctional facility.

Competing Interests Statement

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

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Postpartum Depression Experience Among Jordanian Mother With Hospitalized Infant in Neonatal Intensive Care Unit: Incidence and Associated Factors

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Abstract

Postpartum depression (PPD) is a global mental health problem that affects about 13% to 19% of mothers who have recent given birth. This problem increases if the infant is admitted to the intensive care unit (NICU). The aims of this study were to examine the prevalence and risk factors of postpartum depression among mothers with hospitalized infant on NICU and to explore mothers experience after admitting their infants to the NICU. A varied methods research design were undertaken in two hospitals in Jordan. The Edinburgh Postpartum Depression Scale (EPDS) was used to survey 188 Jordanian mothers with infants in the NICU, it deals with semi-structured in-depth interviews to identify the themes that characterize mothers PPD experience in the NICU. The quantitative results of this study showed that the mothers with hospitalized infant in NICU experienced high level of PPD with the mean score was 20.81 (SD = 4.92). With regard to qualitative results, two major themes with nine subthemes : the first one is Postpartum Depression Experience and the second theme was sources that influence postpartum depression.

In conclusion, the mothers with hospitalized infant in NICU experience PPD. the PPD mothers experience many manifestations during this situation such as : shock, surprise, crying, Anhedonia,hopelessness and thinking about harming themselves or their babies after admission of their infants to the NICU, Also there are many sources that influence postpartum depression such as baby gender, lack of knowledge, social support, mother role, mother infant attachment, stigma and shame.

Keywords: postpartum depression, mothers, NICU, experience

1. Introduction

Postpartum depression (PPD) is a global mental health problem that affects about 13% to 19% of mothers who have recent given birth. This problem increases if the infant is admitted to the intensive care unit (NICU), a recent statistic published by (Rahal, 2018) found that PPD may affect as many as 70 percent of mothers whose infant is admitted to NICU in the following of their births.

PPD is characterized as a persistent low mood, feelings of sadness, hopelessness, or/and worthlessness. There are many factors that increase the incidence of postpartum depression. Most studies have found a direct correlation between born premature infant and admitted to NICU and increase the incidence of postpartum depression (Alaradi, 2014; Busse et al., 2013; Dellenmark-Blom & Wigert, 2014; Mohammad, 2008).

A cross-sectional comparative study was carried out by Shelton et al. (2014) to compare depression symptoms among mothers after hospitalizing their infants to NICU. The study was conducted on a convenient sample of 55 first-time mothers during the second week after admission of their infants to NICU. Results showed that approximately 62% of mothers report high depression levels. They concluded that mothers with hospitalized infants in NICU suffer from depression which will effect on their everday life activties (Shelton et al., 2014).

In addition, Yurdakul et al. (2009) conducted a case control study among two groups. The first is the NICU group of mothers with hospitalized infants in NICU, and the second is a control group of mothers with healthy full-term infants. The purpose of this study was to determine depression symptoms, as well as attachment style. The researchers used the Edinburgh Postpartum Depression Scale (EPDS). Results showed that depression was

significantly higher in the NICU group M (SD) = 9.6 (5.6) than in the control group M (SD) = 4.9 (4.9).

Postpartum depression is a very important issue. Unaddressed, it may be harmful to the family system by influencing the behaviors and cognitions displayed by mothers to their children (Roy et al., 2014). A premature birth with the infant hospitalized in NICU has been associated with psychological problems among mothers. High prevalence of postpartum depression among mothers of hospitalized infants in NICU compared to mothers with healthy full-term infants may be attributed to separation from the infant. Early separation between mothers and infants, that is, within the first 24 hours after birth, contributes to an increase in postpartum (Flacking et al., 2012). Studies show that these issues continue beyond the NICU hospitalization period after discharge from NICU, it was found that mothers elevated depression level and infants' low responsiveness negatively impact development of a relationship with their premature infants (Korja, 2009; Flacking et al., 2012). A few studies in Jordan determined the postpartum depression by difference associated factors such as (Mother Infant Contacts, Breastfeeding and infant characteristic). The present study aims to examine the prevalence and risk factors of postpartum depression among mothers with hospitalized infant on NICU and to explore mothers experience after admitting their infants to the NICU.

2. Methodology

2.1 Design

An Explanatory mixed methods design was used to conduct this study. This explanatory study consists of two phases: quantitative design, followed by qualitative design. The quantitative research design used a descriptive, cross-sectional survey design. A quantitative approach was chosen because it allows the researcher to describe and examine the relationship among the variables (Creswell, 2013). A cross-sectional survey was selected, as self-reported data facilitates collection at one point in time. Mothers who participated in the survey and experienced high postpartum depression level were invited to attend a face-to-face interview to explore their experiences.

2.2 Participants

Convenience sampling technique was used to recruit 188 the mothers chosen for quantitative design and A non-probabilistic, purposive sampling method was chosen to recruit participants who met the qualitative sampling criteria.

- **Quantitative Sampling Technique**

Convenience sampling technique was used to recruit the mothers chosen for quantitative design. The inclusion criteria includes: Jordanian mothers, who speak Arabic language, consent to participate in the study; they have hospitalized infants in the NICU and they are product of a singleton pregnancy. The exclusion criteria are non-Jordanian mothers, mothers with critically-ill infants in the NICU, mothers who have lost their babies after NICU admission, mothers who have an admission to NICU experience, and mothers whose hospitalized infant is the product of a twin pregnancy.

Sample size is calculated based on the estimation population proportion formula (Scheaffer, Mendenhall III, Ott, & Gerow, 2011). The purpose of drawing a sample is to make inferences about the population from the information collected about the sample. Scheaffer et al. (2011) clarified that the sample size of a survey is usually determined by estimating the proportion of the population.

In this study, the population is 3171 infants admitted to NICU per year. This is considered large population; therefore the formula below, with reference to Scheaffter et al. (2011), was used to calculate the sample size.

- **Calculating Sample Size**

$$\mathbf{D} = \frac{\mathbf{B^2}}{\mathbf{4}} = \frac{(0.05)^2}{4} = 0.625 \times 10^{-3}$$

$$\mathbf{n} = \frac{\mathbf{N}\boldsymbol{pq}}{(\mathbf{N}-\mathbf{1})\mathbf{D}+\boldsymbol{pq}} = \frac{3171 \times 0.5 \times 0.5}{3170 \times (0.625 \times 10^{-3}) + 0.5 \times 0.5} = 188.161994$$

Hence, the recommended sample size for this study is 188.

- **Qualitative Sampling Technique**

A non-probabilistic, purposive sampling method was used to recruit 18 mothers who met the qualitative sampling criteria. The study included mothers who had their first experience with NICU admission and didn't lose their babies after NICU admission.

The aim of the qualitative study is not to obtain a statistically representative sample size for generalizability of the findings (Myles, 2015). However, it was emphasized by Baker, Edwards (2012),Guest, Bunce, and Johnson (2006) that sample size should be adequate to allow in-depth analysis and provide deeper understanding of the topic.

The qualitative sample size is determined until the data reached a saturation point (Baker & Edwards, 2012; Guest et al., 2006). Thus, no sample size calculation is performed.

2.3 Instruments

Infant Demographic Data Questionnaire

Demographic data about infants were collected from the electronic medical system. Information obtained includes infants name, gender, birth weight, gestational age, and medical diagnosis.

Information on infant characteristics was sorted into three classes according to the severity of the infants' medical conditions because all hospitals in Jordan follow this classification (Kliegman, Stanton, Geme, Schor, and Behrman, 2015). The "severe" class consists of infants who are fasting, depending on total parental nutrition (TPN) and intravenous fluid, or depending completely on mechanical ventilators; the "moderate" class consists of infants who need oxygen supplements by incubator or nasal cannula, phototherapy, nasogastric tube feeding, or blood transfusion; and the "mild" class consists of infants who are admitted to the NICU for feeding and weight gain (Kliegman et al., 2015)

The Edinburgh Postpartum Depression Scale (EPDS)

The EPDS was developed for screening postpartum women up to 8 week postpartum. The EPDS consists of 10 questions. The test can usually be completed in less than 5 minutes. Responses are scored 0, 1, 2, or 3 according to increase severity of the symptom. Items marked with an asterisk (*) are reverse scored (i.e., 3, 2, 1, and 0). The total score is determined by adding the scores for each of the 10 items together. A rating of 0 means that the experience did not cause any depression for the mother; whereas a rating of 3 means that the experience upset the mothers and caused a great deal of depression. The scales were translated into Arabic version, then tested and found acceptable in Jordan, where the alpha coefficients were >.70 for all scales. The internal consistencies for the entire scales of the Arabic version were.72 and.95.

2.4 Study Setting

This study was conducted in two government teaching hospitals in Jordan; they were selected because they are the biggest teaching hospitals. Hospital A is located in Amman, with a capacity of 1,100 beds and NICU capacity of 65 beds. Hospital B is located in Irbid, with a capacity of 140 beds and NICU capacity of 30 beds. All NICUs are Level III NICUs (Provide care for infants with less than 32 gestational weeks, infants born with critical conditions at all gestational ages, and infants who need to gain weight. This unit consists of advanced respiratory technological support, providing care for healthy full-term infants who need continuous monitoring and phototherapy; provide basic level of care for infants requiring short-term intensive care, tube feeding, and continuous positive airway pressure (CPAP)). Both hospitals provide similar medical services: advanced respiratory support and mechanical ventilator support.

2.5 Ethical Consideration

The study was approved by the Ethical Committee of the Medical Research Ethics Committee, Ministry of Health, Jordan (No. Development/plans/74321), conducting the study in all public hospitals in Jordan. Two of the biggest hospitals in Jordan were selected because these hospitals offer NICU services. Mothers were assured of the confidentiality of the study. Anonymity was established through the use of codes, rather than mothers and infants' names. Informed written consent was obtained from participants after clear and detailed explanations about the objectives of the study.

2.6 Data Collection

Data collection was conducted in two phases: quantitative phase, and qualitative data phase. The former includes the administration of the **EPDS** instrument to a convenience sample, whereas the latter includes semi-structured in-depth interviews with selected mothers.

On the first day of hospital admission, the infant's files and electric medical system records were checked, to identify those who met the inclusion criteria. The home address and phone number of mothers were recorded. The researcher interviewed mothers in the small room beside NICU to provide privacy, and then distributed questionnaires to 188 mothers. The questionnaires were then collected from each mother before they leave the unit.

In the second phase, qualitative semi-structured in-depth interviews were used to identify the themes that characterize mothers experience in the NICU. The researcher prepared two questions (How did you feel when your baby was admitted to the NICU, why did you feel depressed when your baby was admitted to the NICU?), which were reviewed by four nursing professionals (A, B, C). Professional A is an Assistant professor in nursing college at University of Jordan; Professional B is a lecturer in the Department of Nursing Sciences at Jordan University of Science and Technology and Professional C is an associate professor in the Faculty of Nursing at Irbid National University.

Mothers were interviewed in a closed room to avoid interruptions and ensure privacy during the interview. First of all, the aim and the process of interview were identified by the researcher. After that informed consent was obtained by the researcher and assured mothers that all data would be confidential and the mothers were informed that they could withdraw at any time. During the interview, the researcher asked mothers two open-ended questions to encourage mothers to explain their ideas and feelings. The researcher recorded the interview by smart phone after written permission obtained by mothers to record the interview. The researcher recorded the interview because taking comprehensive notes in real-time would have resulted in decreased eye contact and reduced listening capacity throughout the interview, also he/she may lose a lot of important information.

After the interview, the researcher uploaded all the audio recording data into a computer by connecting the mobile phone via USB port. The researcher made many copies of the audio files and stored them in many different data storage devices (e.g. a computer, USB drive, Google Drive and external hard drive) to prevent data loss.

2.7 Normality Test for the Data Distribution

A Kolmogorov-Smirnov test ($p < .5$) (Razail & Wah, 2011) and a visual inspection of the histograms, normal Q-Q plots, and box plots show that depression level scores do not follow a normal distribution, with space a askewness of -0.873 (SE =.125) and kurtosis of.023 (SE =.262) (Razail & Wah, 2011). Thus, nonparametric tests are used.

2.8 Planned Analysis

Data analysis was conducted separately for the quantitative and qualitative data sets. The quantitative results were analyzed using descriptive and inferential statistics, the Mann-Whitney U test, the Kruskal-Wallis test, Spearman's rank correlation coefficient, and Smart PLS. The qualitative results, on the other hand, required transcription, translation, coding, and thematic analysis.

Planned Statistical Analysis of the Quantitative Design

Statistical Package for Social Sciences (SPSS) Graduate Pack 21.0 was used to analyze relationships among the variables and answer the research questions. Descriptive and inferential statistics were used to describe the sociodemographic data of the sample. The researcher computed the total score for EPDS, and then compared the means and calculated the mean and standard deviation to each item. The Mann-Whitney U test was used to compare differences in overall depression for infant characteristics such as gender. The Kruskal-Wallis test was employed to compare the differences in overall depression levels and impact of depression for infant characteristics, the same tests were used for gestational age, birth weight, and severity of medical condition.

The researcher followed Mayer (2015) steps of qualitative analysis steps to analyze the data of this study (Table 1). After each interview, audio recording files from the interview were uploaded from a mobile smart Phone into a computer, and stored in a folder. Then, through repeating recordings; the researcher transcribed the audio recordings verbatim into textual data. The researcher took notes of mother's response, attitude and behavior during the interview, to avoid loss of details due to forgetfulness. Interview transcripts and written field notes were saved as Word documents. After that, two translators translated the data from Arabic into English. Transcripts were read and reread for immersion. Following that, the researcher reflected on the overall meaning about what the mothers said, and assessed the general impression of credibility and depth of the information. After initial reading to acquire a general, preliminary sense of the content of the textual data, thorough reviewing data was carried out, beginning with the interview transcripts. Textual data was read, sentence-by-sentence and in details, as part of the comprehensive data treatment described by Silverman (2005). While reading through the data source, the researcher was mindful to ask related questions about the data such as, "What is this person trying to say? Which experience is represented here?" The researcher strove to be alert to participants' statements and meaningful expressions of perspectives, views, or experiences. The preliminary coding process was done manually, with attempts to interpret interview responses. The researcher made annotations of thoughts that arose regarding to particular data segments. The coding process analysis was assisted by two researchers; segments of textual data were assigned different coding labels and negative cases were excluded. Data analysis was done manually by three professionals to identify recurrent themes. Theme refers to "topic or information with similar content". All

information that had been coded from a single source (interview transcripts) were inspected and compared with other coded information within the data sources. During the coding process, themes were identified and analyzed from individual cases and across different cases.

Each theme was identified and described. The researchers discussed information regarding each theme and rationalized it. Parental experiences, as gathered from the interview transcripts, were categorized into relevant themes. Direct quotes served as evidence for each theme.

Table 1. Steps of qualitative analysis

Qualitative Data Collection
Step 1: Preparing, organizing and translating of data analysis
Step 2: Reading through all the data
Step 3: Reading and understanding interviews and coding process
Step 4: Forming themes and subthemes using the coding process
Step 5: Representing and describing themes
Step 6: Reviewing and refining the themes by experts
Step 7: Interpretation

3. Results

3.1 Quantitative Results

A total of 188 Jordanian mothers with infants admitted to the NICU participated in this study. Mother's ages ranged between 17 and 55 years, and the mean age for mothers was 32.93 ± 7.077. All mothers were married Muslims ones. More than half of the participants (54.2%, n = 105) had bachelor degree, 18.9% (n = 38) had diplomas, 9.6% (n = 22) had postgraduate degrees, 16.1% (n = 18) had secondary education, and 1.2% (n = 5) had primary education. The result showed that the majority (n = 104) of the mothers had a high income more than $ 714; on the other hand (n= 4) mothers who had a low income equal or less than $357.

3.2 Infants' Demographic Data

In this study, there was the total of 188 infants admitted to NICUs across two hospitals. 106 infants were male (54.9%) and 82 (45.1%) were female. More than half of the sample (58.7%, n = 111) consisted of premature infants aged from 28 to 36 weeks, 35.5% (n = 66) were full-term babies aged from 37 to 42 weeks, and 5.8% (n = 11) were very premature infants aged less than 28 weeks. Other infant characteristics recorded are birth weight and classification of medical condition. Table 2 represents the demographic characteristics of infants.

Table 2. Infants' demographic data (N=188)

Variables	**Mothers Characteristics** N = 188 (%)
Infant Gestational Age	
Very premature (< 28 weeks)	11 (5.8%)
Premature (28-36 weeks)	111 (58.7%)
Full-term (37-42 weeks)	66 (35.5%)
Infant Gender	
Male	106 (54.9%)
Female	82 (45.1%)

Infant Birth Weight	
Very low (< 1500 grams)	71 (37.4%)
Low (1500-2500 grams)	96 (47.5%)
Normal (> 2500 grams)	21 (15.1%)
Classification of Medical Condition*	
Mild	36 (19.2%)
Moderate	53 (28.7%)
Severe	99 (52.1%)

3.3 Perception of Post Partum Depression

The perception of post partum depression among the mothers was measured using Edinburgh Postpartum Depression Scale. As shown in table 1, descriptive analysis showed that the mean score was 20.81 with SD = 4.92, with the lowest score was 0 and the highest score was 30.00. The descriptive analysis of perceived stress item analysis (see Table 1) showed that the highest mean score (M (SD) = 2.26(1.15) was reported for item 8 "I have felt sad or miserable" followed by item 4 M (SD) = 2.25(1.17) "I have been anxious or worried for no good reason". The lowest mean score M (SD) = 1.72 (1.31) was reported for item 1 "I have been able to laugh and see the funny side of things".

Table 1. Total item mean and standard deviation of The Edinburgh Postpartum Depression Scale (EPDS)

The Edinburgh Postpartum Depression Scale	**M (SD)**
1. I have been able to laugh and see the funny side of things	1.72 (1.31)
2. I have looked at things with enjoyment	1.75 (1.19)
3. I have blamed myself unnecessarily when things went wrong	2.40 (1.29)
4. I have been anxious or worried for no good reason	2.25 (1.17)
5. I have felt scared or panicky for no very good reason	2.24 (1.20)
6. Things have been getting on top of me	1.86 (1.18)
7. I have been so unhappy that I have had difficulty sleeping	2.08 (1.20)
8. I have felt sad or miserable	2.26 (1.15)
9. I have been so unhappy that I have been crying	2.22 (1.25)
10. The thought of harming myself has occurred to me	2.03(1.36)
Total Score	20.81 (4.92)

3.4 The Influence of Infant Characteristics on Depression

The infant's gender, gestational age, birth weight, and medical condition were examined for impact on depression levels. Based on the Mann-Whitney U test of 489.9 (p = .001), the mean rank for depression among mothers with male infants (n = 106) was 89.14, whereas the mean rank for depression among mothers with female infants (n = 82) was 100.39. Thus, gender is a statistically significant contributing infant characteristic to postpartum depression. The mother who born a girl gender infant have postpartum depression compared with a mother who born a boy gender.

Differences in depression related to gestational age (χ^2 = 25.85, df = 2, p =.001) were found to be significant. Mothers of infants with lower gestational age (< 28 weeks) (M = 111.23) have higher depression levels than mothers of infants with higher gestational age (M = 64.68). Birth weight has a significant impact on depression in mothers (χ^2 = 30.108, df = 2, p = .001), whereby mothers of infants with very low birth weight of less than 1500 grams (M = 106.66) experience higher levels of anxiety than mothers of infants with low (M = 60.90) or normal (M = 86.40) birth weight. The severity of an infant's medical condition is determined by the gestational age, birth weight, medical complications, and dependency of technology to recover or survive. This is divided into three

classes: mild, moderate, and severe, and found to be significant related to depression ($\chi^2 = 49.226$, $df = 2$, $p = .001$). Mothers of infants with severe conditions (n =99, M = 116.94) experience more depression than those with moderate (n = 53, M = 84.99) or mild (n = 36, M = 43.87) infants (Table 2).

Table 2. The influence of infant characteristics on postpartum depression

Infant Characteristics	N	Mean Rank	χ^2	*p*-value	*df*
Gestational Age (weeks)					
Very premature (< 28)	11	111.23	25.85	.001	2
Premature (28-36)	111	71.33			
Full-term (37-42)	66	64.68			
Birth Weight (grams)					
Very low (< 1500)	71	106.66	30.108	.001	2
Low (1500-2500)	96	60.90			
Normal > 2500	21	86.40			
Medical Condition					
Mild	36	43.87	49.226	.001	2
Moderate	53	84.99			
Severe	99	116.94			

3.5 Qualitative Results

The demographic characteristics of 18 mothers are presented in Tables 2 to provide context and facilitate deeper understanding of mother postpartum depression experience.

Table 3. Mother characteristics

Variable	Mean Average
Age (Year)	29
	N (18 mothers)
Hospital	
Hospital A	10
Hospital B	8
Education Level	
Elementary	1
Secondary	4
Diploma	6
Bachelor	5
Postgraduate	2
Financial Status (JD)	
≤ 250	5
251-500	8
> 500	5

Distance between Residence and Hospital (km)	
≤ 15	10
16-25	5
26-35	2
≥ 36	1
First Baby	
Yes	9
No	9
Type of Delivery	
Caesarian Section (CS)	7
Normal Vaginal Delivery (NVD)	11

Thematic analysis of textual data from interview transcripts and field notes yielded two major themes with nine subthemes, as presented in Table 4.

Table 4.

Themes
Postpartum Depression Experience
• Shock
• Crying
• Anhedonia and Hopelessness
• Thinking about harming herself or her baby
Sources that influence postpartum depression
• Baby Gender
• Lack of knowledge
• Social Support
• Mother Role and Mother Infant Attachment
• Stigma and shame

3.6 Post-Depression Experience

This section provides details of mother's experience of many depression symptoms with themselves and their family members, as a direct result of having a baby admitted to the NICU. These various intense emotions are divided into the subthemes of:

3.6.1 Shock

All mothers were inundated with many depression symptoms such as shock, crying, losing interest in activities and thinking about harming herself or her baby. All mothers had not prepared themselves to face this problem due to normal pregnancy period.

One of the mothers [A] recounted her experience as below:

"I was shocked. I do not believe it, why this happened to me, the world is dark in my eye, I couldn't stand on my feet when the doctor told me your baby need admition to NICU, this is a crisis for me"

3.6.2 Crying

For most of the mothers, the initial response after they were informed of their baby's admission to the NICU was a crying. This is a common expression among mothers as they feared their babies might be perceived as having some genetic disorder.

Mother [B] expressed their response of crying as below:

"When my baby is admitted to NICU, the initial response is crying, I can't do anything except continues cryin ".

3.6.3 Anhedonia and Hopelessness

For a few mothers, the period of NICU admission was struggling feelings of Anhedonia and hopelessness. For others, the hopelessness of the situation caused begging feelings of hatred towards themselves, the babies, and their lives. Illustrative quotes for mother [C] as below:

"I hate my life when my daughter is admitted to NICU; I feel hopeless because I can't help my daughter.... I hate my life.... my family..... My daughter.... and even myself..... I lose the interest in anything... I hate everything; I don't have a pleasure to do anything".

3.6.4 Thinking About Harming Herself or Her Baby

At the same time, several mothers expressed irrational feelings of hatred towards themselves, their babies, or their lives. There are a number of mothers who wanted to harm their infants, neglected them, didn't care them, also they neglected and tried to harm them. Illustrative quotes for mother [D] as below:

"I hate myself..... I hate my son.... I don't want to change diaper.... feed.... change the clothes for him.... I don't want him because he is sick and unhealthy baby.....

3.7 Sources That Influence Postpartum Depression

3.7.1 Baby Gender

Most of mothers depressed because the gender of their baby is a girl.. Illustrative quotes for mother [f] as below:

"I hate my baby.... I want to kill her because it is a girl..... I have six girls... I hate myself because I can't bear a boy... I have just born a girl.... God please end my life I do not love my life.... I hate being alive."

3.7.2 Lack of Knowledge

Lack of knowledge is an important reason for depressed feeling because the mothers have many questions regarding infant health status, recovery progress, medications, medical interventions, medical jargon, or how to care for the infant in the future. Mothers had many questions about the duration of hospitalization, appropriate treatments and interventions, and the impact of NICU admission on the physical and mental development of their infants.

It is known that the parents have misconceptions about premature babies or babies are admitted to the NICU, mistakenly believed that their babies are abnormal or different from other infants. In addition, mothers fear is aggravated by the medical jargon used among health care professionals; they assume the worst about their infants' health status because they do not fully understand the medical terms used.

Mother [I] expressed their feelings as below:

"I was depressed when I heard a doctor using many medical terms.... I worried about my baby.... I think the doctor used Medical terminology and talked to the nurse in English because he didn't want me to understand the health status of my baby...., the nurse refused to tell me any information about the status of my baby"

3.7.3 Social Support

A few mothers can't find any support from their friends or families, they feel lonely, they can't explain their feelings to any one which increased the symptoms of postpartum depression.

Mother [h] expressed their feelings as below:

"I can't express my emotions to anyone.... All people around me are busy.... I need someone to tell him or her about my feelings.... I need to talk but I didn't find anyone".

3.7.4 Mother Role and Mother Infant Attachment

Infant hospitalization in the NICU holds many stressors for mothers, many of them are evoked by the crisis of mother-infant separation early in the infant life. Many mothers, separated from their infants, reported an interruption in the development of a healthy mother-infant relationship. Normal transition to motherhood is delayed, so mother cannot carry out their role of mothering. The primary cause of depressed feeling for mother is the inability to carry out their roles and responsibilities as mothers, which is to feed, clothe, and hold their infants. Mothers are unable to breastfeed their babies. Rather than bringing their infants home, they are separated from their infants by a pane of glass, from where physical touch and personal interaction is difficult, if it is not impossible. Illustrative quotes for mother [g] as below:

"This is a first baby for me.... I can't do my mother role.... I miss to breast him.... change his clothes.....look to his small eyes..... Carry him with my arms"

3.7.5 Stigma & Shame

The majority of the mothers. Especially, who born a girl infant, have common feeling is shame and stigma from admission their baby to NICU and they feared their babies might be perceived some genetic disorder.

Mothers expressed their feelings of shame and stigma as below:

"I feel shame when my family or any person asked me about my daughter… I am ashamed when telling her/him "My daughter has been admitted to the NICU after delivery", I am worried about her future because people may say this family has a genetic disorder and nobody may want to marry her or any girl from my family.

4. Discussion

In this mixed methods design study, qualitative results provide useful information that explain and support quantitative results. The quantitative results of this study showed that the mothers with hospitalized infant in NICU experienced high level of PPD with the mean score was 20.81 (SD= 4.92). The result of this study was similar to Davis et al, (2003) & Lefkowitz, Baxt, & Evans, (2010) who found that the mother experienced high prevelance of postpartum depression when their infant hospitalized in NICU with mean score 22.91 and 21.09 respectively.

According to our knowledge, there are no mixed design studies which support our findings, there are no studies comparing between the influence of mothers and infant characteristics on postpartum depression. The results of this study found that the gender of the infant results in a significant difference in postpartum depression; mothers with female infants experience higher scores of postpartum depression than those with male infants. Infant gestational age of less than 28 weeks resulted in higher depression scores in mothers. Finally, mothers of infants with severe medical conditions experienced higher depression than mothers of infants with moderate or mild conditions.

To explain the quantitative results of the study, the qualitative results showed that mothers who experience postpartum depression suffered from many emotional problems such a shock, surprise, crying, anhedonia and hopelessness and thinking about harming herself or her baby after the admission of their infants to the NICU. Mother felt shocked and surprised when their infants needed admission to the NICU. They described this situation as a crisis; most of them had not been mentally prepared to face this challenge. Many mothers expressed that their pregnancy experience had been normal and they were expecting a normal transition into motherhood, as well as a normal first encounter with their infants.

The infant hospitalization in the NICU put mother in a complicated emotional situation which results in shock and thinking to harm herself or her baby. Furthermore, the hospitalization of an infant within the first two weeks of birth, either directly after birth causes a number of problems for mothers; many are evoked by the experience of separation or interrupted mother-infant attachment (Eapen et al., 2014, Maghaireh et al, 2017, Arnold et al., 2013, Heidari et al., 2012, 2013; Heinemann et al., 2013; Whittingham et al., 2014).

Moreover, a hospitalized infant takes a toll on the mother's emotions and peace of mind; they descend into postpartum depression such as despair and disappointment. Heidari et al. (2013) found that mothers who diagnosed postpartum depression after hospitalizing their infant to NICU experience many symptoms like continuous crying, anhedonia (don't feel pleasure to anything), hopelessness and thinking about harming herself or her baby. The negative feelings of PPD were the main reason for delaying the mothers' normal transition to motherhood and carrying out their mother's roles. They feel like an outsider because of the NICU environment and not knowing what to do in the unfamiliar situation (Heidari et al., 2012, 2013; Eapen et al., 2014, Maghaireh et al, 2017). The sources that increased the incidence of PPD are baby gender, lack of knowledge, social support, and mother role and mother infant attachment.

The baby gender is one of the sources that increased the incidence of occur PPD among mothers with hospitalized infant in NICU, especially if the infant gender is female infant (Mohammad, 2008). According to Jordanian socio-culture the mothers of female infants fear that rumours about their babies' possible disease or deformities may prevent her from getting married in the future (Mohammad, 2008).

Furthermore, lack of knowledge is another source of PPD for mothers with hospitalized infants, whether it is regarding infant health status. Mothers need to know all information regarding to their babies health status, medications, medical interventions, medical diagnosis (Tahirkheli et al, 2014; Mohammad, 2008). The Lack of knowledge among mothers is due to the absence of health education in government Jordanian hospitals. It is often the case that mothers have misconceptions about premature babies or babies admitted to the NICU, mistakenly

believing that their babies are abnormal or different from other infants (Tahirkheli et al, 2014; Mohammad, 2008). In addition, mothers fears are aggravated by the medical jargon used among health care professionals; they assume the worst about their infants' health status as they do not fully understand the medical terms used (Tahirkheli et al, 2014; Mohammad, 2008). In addition, Mothers with hospitalized infant in NICU experienced lack of social support from husband, family, siblings, relatives and friends. The social support is very important for mothers in this situation because the mothers feel alone in the world; they can't express their feelings to any one that may increase the symptoms of postpartum depression.

Another source of PPD is mother role and mother infant attachment. Mother fear separation from their infants, as well as interruption in the mother-infant relationship. The major problem is that mothers are unable to act their role of breastfeeding, diapering and clothing their babies. Also mothers often cannot touch, carry or hold their babies, as their babies are hospitalized behind a pane of glass in NICU (Tahirkheli et al, 2014; Mohammad, 2008). In the absence of physical contact between mothers and their infants- who have waited for months to kiss and care for – feel stressed, guilty, and helpless. It is fundamentally an interruption in the transition to motherhood. Instead of stepping into the role of being loving mother, they are left feeling like outsiders (Tahirkheli et al, 2014; Mohammad, 2008).

Moreover, the results showed that mothers experience shame and stigma from the admission of their infants to the NICU. This result is due to Jordanian socio-culture glorifying perfect infant appearances and finding ways to criticize or judge anything less than perfect. Mothers with hospitalized infants in the NICU have had their hopes dashed. They do not have perfect, normal and healthy babies; furthermore, they need to provide explanations to their relatives and friends. They need to defend themselves from accusations of genetic or hereditary diseases in their families, so that they do not carry the burdens of that stigma for the rest of their lives. In a conclusion, the mothers with hospitalized infant in NICU experience PPD. the PPD mothers experience many manifestations during this situation such as: shock, surprise, crying, Anhedonia and hopelessness and thinking about harming herself or her baby after the admission of their infants to the NICU, Also there are many sources that influence postpartum depression such as baby gender, lack of knowledge, social support, mother role and mother infant attachment and stigma and shame.

Competing Interests Statement

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

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Practice and Attitudes of Physicians Regarding Disclosure of Information to Patients With Serious Illness

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Abstract

Background: Health Information disclosure is the cornerstone in respecting the patients' autonomy and beneficence, particularly in the context of serious illness. Some Middle Eastern cultures prioritise beneficence over patient autonomy. This may be used as a justification when patient's family takes over the decision-making process. Although guidelines and protocols regarding information disclosure are fast evolving, there are no sufficient data regarding the application of these guidelines in the clinical context. The objective of this study is to explore the truth disclosure practices of physicians in Bahrain.

Method: In this cross sectional study, a random sample of 234 physicians was obtained from the database of Salmaniya Medical Complex (the largest public hospital in Bahrain). We used self-administered 21-item questionnaire to assess the practices and attitudes of physicians regarding disclosure of information to patients with serious illnesses.

Results: A total of 200 physicians completed the questionnaire with a response rate of 69.6%. The question about the usual policy of disclosure revealed that 62.5% (125) of the doctors would always disclose the diagnosis to the patients, 26% (52) would often disclose the diagnosis and only 1% would never disclose the real diagnosis to a competent adult. Only 15% of the physicians would never make exceptions to their policy of "telling the patient" while all remaining physicians (85%) made exceptions to their policy either often, occasionally or rarely. The most common reason for not disclosing the diagnosis was family request (39.5%). About 64.5% of the physicians were not aware of any existing protocol or policy for diagnosis disclosure to patients. There was no statistically significant association between doctors' policy of disclosure and other demographic variables.

Conclusion: Most physicians opt to disclose the truth; however, the majority would make exceptions at some point particularly upon family request. Regional truth disclosure policies should take into consideration the interplay and balance between patient autonomy and the role played by the family in the decision-making process.

Keywords: disclosure, truth, diagnosis, ethics, breaking news

1. Introduction

Confidentiality, the foundation of the doctor-patient relationship, is a key part of respecting the patient's autonomy, one of the four traditional pillars of medical (Beauchamp & Childress, 2013). Autonomy implies the capacity to think, decide and act on one's own free initiative (British Medical Association., 2013). In the Western culture, this is highly valued by both healthcare providers and patients, who are usually well informed about this topic, which ultimately lead to gradual attenuation of medical paternalism (Gilbar & Miola, 2015; Gillon, 1994; Khoury & Khoury, 2015; Surbone, 2006; Tuckett, 2004). However, in some Middle Eastern cultures, beneficence usually precedes autonomy. Breaking the news to the patient might be considered harsh and it is expected that family members take over the decision-making process especially in the context of serious illness (Al-Mohaimeed & Sharaf, 2013; Bou Khalil, 2013; Hamadeh & Adib, 1998; Harrison et al., 1997; Mobeireek et al., 2008; Rodriguez Del Pozo et al., 2012).

Multiple studies conducted across the Middle East showed cross-cultural differences in truth-telling attitudes and practices by physicians, further highlighting the variation in emphasis on patient's autonomy and beneficence

(Al-Mohaimeed & Sharaf, 2013; Bou Khalil, 2013; Hamadeh & Adib, 1998; Harrison et al., 1997; Mobeireek et al., 2008; Rodriguez Del Pozo et al., 2012).

In 1998, a study in Lebanon showed that only 47% of Lebanese physicians disclosed cancer diagnosis directly to the patient (Hamadeh & Adib, 1998). Nearly a decade later, a Saudi study showed that 56% of the Saudi physicians would disclose bad news directly to the patients even if that was against the family wishes (Mobeireek et al., 2008). In 2012, a Qatari study showed that 90% of the physicians would disclose cancer diagnosis to the patients but 66% of them said they may make exceptions to that rule (Rodriguez Del Pozo et al., 2012).

On the opposite side, public's point of view was also investigated. In Lebanon, 42% of respondents were against direct disclosure to the patient (Hamadeh & Adib, 1998). In the above-mentioned Saudi study, 49% of respondents would prefer bad news be told to the patient directly despite the family's objections to direct disclosure (Mobeireek et al., 2008).

There are scarce published studies from the Kingdom of Bahrain about truth telling among physicians hence, we conducted this cross-sectional study in a diverse cohort of physicians to assess physicians' attitudes and practices towards diagnosis disclosure in the context of serious illness.

2. Method

2.1 Design

A descriptive cross-sectional study was conducted to assess physicians' attitudes and practices towards truth telling while encountering patients with serious illnesses. Ethics approval was obtained from the Royal College of Surgeons in Ireland – Medical University of Bahrain Research Ethics Committee and Ministry of Health.

2.2 Participant (Subject) Characteristics

A random sample of 234 physicians was obtained from the total list of physicians. The exclusion criteria include specialties that either have no direct interaction with the patient in terms of explaining and discussing the final diagnosis, e.g. "pathologist and radiologist" or who commonly deal with patients who are incapable of giving informed consent, such as children and those with mental disorders (paediatricians and psychiatrics).

2.3 Sampling Procedures and Setting

We obtained a list of all residents, chief residents, specialists and consultants working at Salmaniya Medical Complex. We excluded non eligible physicians from the list and then, we took a randpme computer-generated sample of 234 physicians.

The study was conducted at Salmaniya Medical Complex (SMC) the largest public hospital in Bahrain with a capacity of nearly 1,200 beds.

2.3.1 Sample Size, Power, and Precision

A sample of 234 is sufficient to provide us information within 5% margin of error; using the following equation:

$X = Z_{\alpha/2}^2 * p*(1-p) / MOE^2$, and $Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of **95**%, α is 0.05 and the critical value is 1.96), MOE is the margin of error, p is the sample proportion, and N is the population size.

2.3.2 Measures and Covariates

The questionnaire was adapted from a previous study and modified for use in the present study (Naji, Hamadeh, Hlais, & Adib, 2015). The same tool has been used on 86 physicians in a parallel study in Jordan (Borgan, Amarin, Othman, Suradi, & Qwaider, 2018). The questionnaire was reviewed by two external experts and piloted on a sample of twenty physicians. The reliability of the questionnaire was tested and showed a chronbach's alpha value of 0.87.

Our definition of serious illness included a terminal illness (for example, metastatic cancer), a slowly progressive, life-threatening illness (for example, AIDS), or an adequately treatable condition with a high risk of mortality (for example, myocardial infarction).

3. Results

3.1 Statistics and Data Analysis

Data were entered into the Statistical Package for Social Sciences (SPSS). Descriptive statistics were generated fro all items. Pearson's Chi square test was used to test the association between disclosure policy and other demographic variables. A p-value of <0.05 was considered statistically significant.

3.2 Baseline Data

A total of 200 doctors completed the questionnaire giving an overall response rate of 69.6%. Males constituted 56% (112) of the sample population. The mean (SD) age was 38.2 (9.22) years. Majority of participants were engaged or married (79.5%; 159). Although Bahrainis made up to 83.5% (167) of the participants, 72% (144) of the total sample had graduated from outside Bahrain. About 28% graduated from the two medical schools located in Bahrain; 21% (42) from Arabian Gulf University (AGU) and 7% (14) from the Royal College of Surgeons in Ireland-Medical University of Bahrain. Residents and chief residents formed 74.5% and 28.5% of the total sample respectively, specialists were 13% of the total sample and consultants formed 11%. The mean (SD) years of practice was 11.75(9.22) years (Table 1). The participants' specialities are presented in figure 1 and shows that a significant percentage of respondents came from general surgery and internal medicine departments (12.5%; 25) and (10%; 20) respectively.

Table 1. Characteristics of particpants (n=200)

Variable	**%(N)**
Gender	
Male	56% (112)
Female	44% (88)
Nationality	
Bahraini	83.5% (167)
Non-Bahraini	16% (32)
Marital Status	
Single	17.5% (35)
Married/Engaged	79.5% (159)
Divorced/Widowed	2% (4)
Undergraduate Studies	
AGU	21% (42)
RCSI-MUB	7% (14)
Other	72% (144)
Medical Employment Level	
Resident	74.5% (95)
Chief Resident	28.5% (57)
Specialist	13% (26)
Consultant	11% (22)
Years of Practice	
< 12	42% (84)
≥ 12	58% (116)

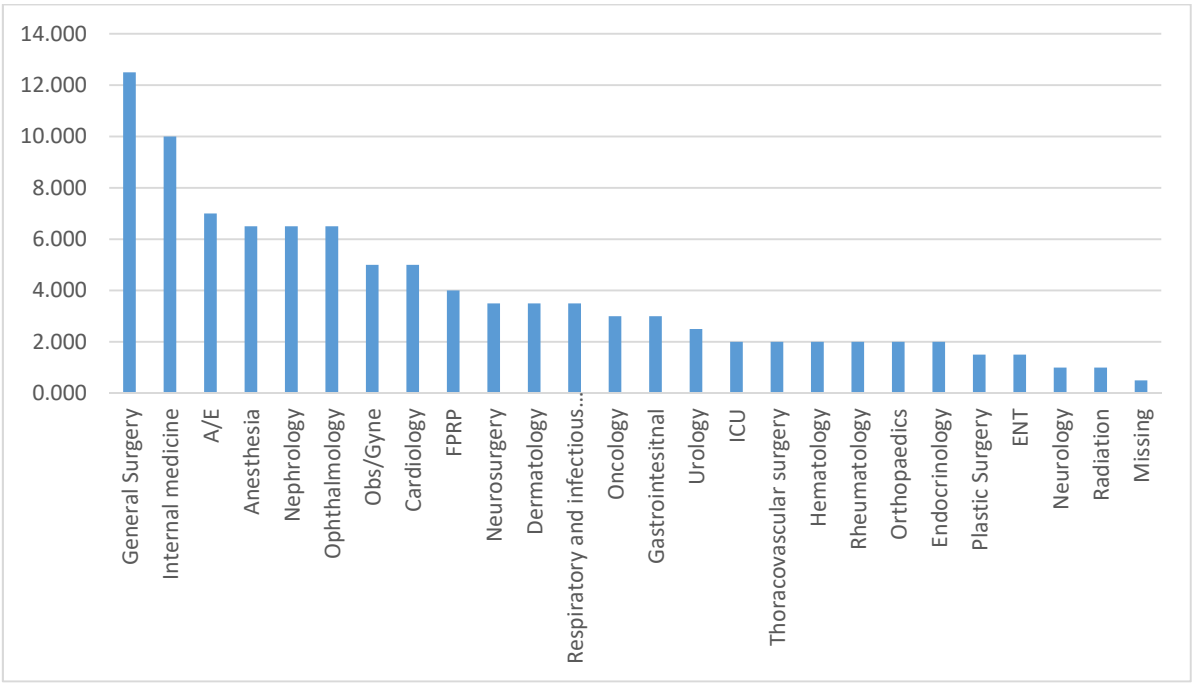
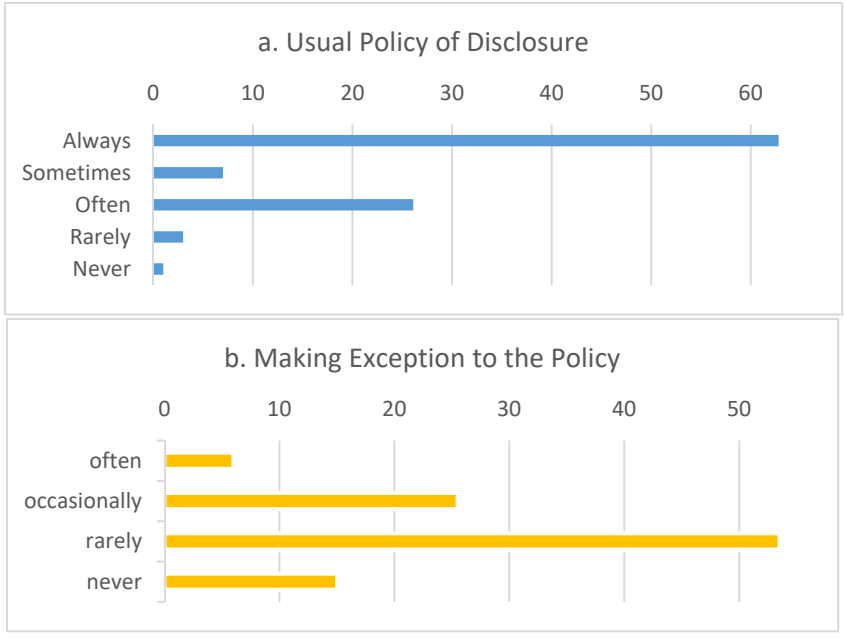


Figure 1. Specialities of Participants (n=200)

About 68% of the physicians would encounter patients with serious illnesses at least daily or weekly. The question about the usual policy of disclosure revealed that 62.5% (125) of the doctors would always disclose the diagnosis to the patients, 26% (52) would often disclose the diagnosis and only 1% would never disclose the real diagnosis to a competent adult (Figure 2a). Only 15% of the physicians would never make exceptions to their policy while all remaining physicians (85%) made exceptions to their policy of "telling the patient" either often, occasionally or rarely (Figure 2b).



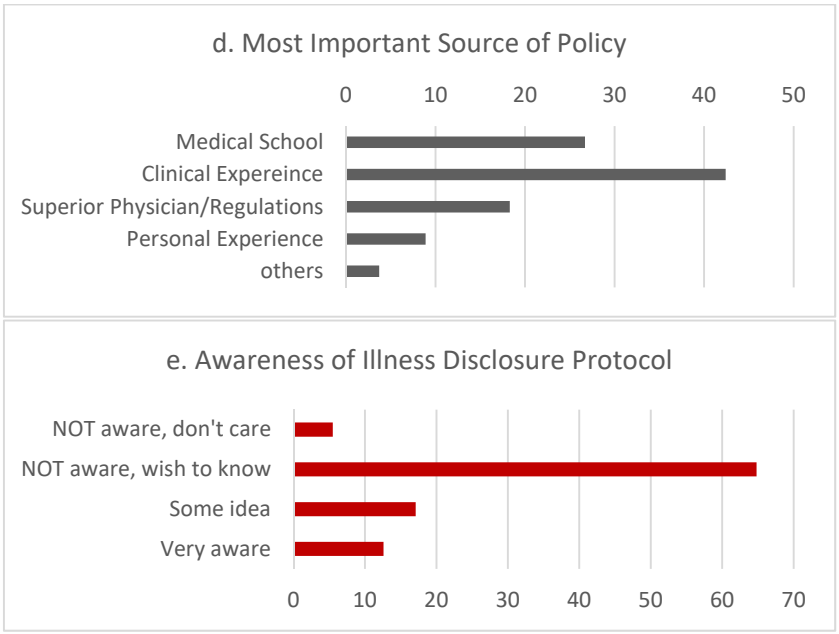


Figure 2. a. Usual policy of disclosure; b. Making exception to the policy; c. Reasons for not disclosing to patients; d. Most important source of policy; e. Awareness of illness disclosure protocol

On further questioning, the most common reason for not disclosing was family request (39.5%), 14% of the physicians would take this decision by themselves and 15% would request the patients' consent (Figure 2c). The two most important sources of the adopted policy was physicians' clinical experience (40.5%) and medical school curriculum (25.5%) (Figure 2d).

About 64.5% of the physicians were not aware of any existing protocol or policy for diagnosis disclosure to patients in Bahrain. (Figure 2e) and the majority (96%) believed that hospitals should develop clear policies on how to deal with disclosure issues.

The physicians were given two statements to judge. The first was: "all patients have the right to know their diagnosis" and almost all doctors (97.5%) agreed with it. The second statement was: "most patients prefer to know their diagnosis" and here too, the majority (84.5%) agreed with it.

The majority of physicians (96.5%) thought that, God forbid, if they were patients they would like their doctor to tell them their diagnosis however, 31.8% thought withholding information might be beneficial to the patients' general health.

The participating physicians were asked to evaluate the importance of 11 factors in determining whether a diagnosis should be told or withheld from the patient. The most important factors were the patient's wish, age, emotional status and patient's educational level. Gender, nationality and religious beliefs were listed as less important.

There was no statistically significant association between doctors' policy of disclosure and other demographic variables such as age (P-value 0.582), gender (P-value 0.572), nationality (P-value0.103), marital status (P-value 0.963) and employment post (P-vales 0.877).

4. Discussion

This is one of the few reports in the Middle East evaluating the attitudes and practices of physicians regarding the disclosure of information to patients with a serious illness. The main aim is to set the foundation for establishing culturally sensitive guidelines and legislations concerning truth disclosure in the Kingdom of Bahrain. The lack of such legislations in most parts of the Middle East was reported as the main challenge in this area (Bou Khalil, 2013).

Most doctors agreed that there is no clear policy regarding the disclosure of information and also believed that it is important to develop clear policies and training on how to deal with disclosure issues.

Only 62.5% of the doctors claimed to always disclose full information regarding the disease to the patients. This

finding remains unchanged when compared to other studies conducted in the region recently as well as studies conducted two decades ago (Al-Mohaimeed & Sharaf, 2013; Bou Khalil, 2013; Gillon, 1994; Harrison et al., 1997; Mobeireek et al., 2008; Qasem, Ashour, Al-Abdulrazzaq, & Ismail, 2002; Rodriguez Del Pozo et al., 2012; Tuckett, 2004) . However, compared to the western studies, the level of truth-telling in the USA has jumped from 10 to 97% of physicians favouring full disclosure in the last 20 year (Kazdaglis et al., 2010).

This physician hesitance in telling the truth is challenged by the discrepancy between family and patients' attitudes regarding truth disclosure. Whilst family members and caregivers may be in favour of "protective" concealment, patients show a steady desire for knowing the truth about their illness (Al-Amri, 2009, 2016).

The patient's wish for knowing the truth was considered the most important factor related to information disclosure as seen by the physicians. Additionally, most physicians agreed that all patients would like to know and have the right to know their diagnosis – showing that the attitude of information disclosure is generally patient driven. However, the main reason for not disclosing information to a patient was "family's request" which is in accordance with the study in Jordan (Borgan et al., 2018). Bahraini culture, just like other Middle Eastern cultures appreciates the role of the family in the illness experience. Although this has a multitude of benefits – providing social and emotional support for example – making decisions concerning a particular patient solely based on the wishes of their family, and without including them, even when patients are fully capable of receiving and processing the information, is considered unethical (British Medical Association, 2013).

The policy of disclosure was consistent all across the board and didn't show significant associations with any sociodemographic variables. This is in agreement with other studies in the region (Borgan et al., 2018).

In this study, the most common reason for nondisclosure is a direct request from the patient's family, without the patient's consent. This finding provides evidence of the role played by family in health decision making. This is identical to the findings from the Jordanian study where a similar culture exists (Borgan et al., 2018).

When deciding to withhold health information from the patient, about 14 per cent of respondents usually made the decision independently. This is congruent with the study from Jourdan and reflects medical paternalism (Borgan et al., 2018). However, the study did not include a question about the impact of patient's gender differences on the disclosure policy.

Strengths of this study include random sampling technique, high response rate and the use of a previously validated structured questionnaire. However, there are a few limitations which need to be addressed. This study did not explore patient's preference about truth disclosure which could be influential in shaping future guidelines. One should note however that this has been studied over the last two decades in other Middle Eastern countries (Hamadeh & Adib, 1998), where results indicated a striking shift in patient's preference towards knowing the truth.

These findings illustrate the way in which actual medical practice often derives from local medical culture rather than what is taught in textbooks or at medical school. In this case the current Middle Eastern culture regarding disclosure of bad news is reminiscent of the transition of attitudes and behaviours that took place in the west a generation ago. A major force that could inhibit such a transition of practice towards greater disclosure is the closeness and deep continuity of family relationships that exist in Bahrain when compared to a typical western country. This raises the issue of a model of "relational autonomy" as opposed to a traditional western individualistic view of autonomy (Dove, 2017). Whilst relational autonomy cannot generally be used to justify deceit or concealment the underlying cultural assumption that - within a family your business is in fact my business – can easily lead to this if the family feel stressed or distressed by bad news. Clearly, doctors strongly want to know the truth themselves and also usually believe patients have a right to the truth. The disparity between this view and the reality of clinical practice can therefore be understood as culture trumping theory.

The relationship between culture and ethics is complex – they are inextricably bound to each other (Pellegrino, Mazzarella, & Corsi, 1992). Nevertheless, it would be wrong to see this as an argument for moral relativism. This paper supports the argument that central ethical principles are held in common across different cultures, however culture can influence the degree of importance, or ranking, that we attribute to each principle with respect to the others (Misselbrook, 2017).

5. Conclusion

Information disclosure is a crucial and complex topic and the cornerstone to retain the doctor patient's relationship. Protocols, regulations and training are fundamental to protect both patients' and physicians' rights, taking into consideration the interplay and balance between patient autonomy and the decision-making role of family and caregivers when shaping the regional truth disclosure polices. Patients need to be taught to expect truthfulness

from their doctors, but families also need support to understand why this is almost always appropriate, and how they themselves can deal with the strains and possible distress that truthful disclosure may cause.

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Competing Interests Statement

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

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Depression Level and Burden of Care Among Family Caregivers of Older People With Physical and Mental Disability in Makkah City KSA

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Abstract

Aims: This study is aimed at examining the burden of care and depression level among the family caregivers of client diagnosed with physical or mental disability. In addition, this study purposed to test the relationship between socio-demographic factors and level of depression and burden of care.

Methods: Study design was a descriptive survey design. Study sample was 129 family caregivers of patients diagnosed with physical and mental disabilities in Makkah, Kingdom of Saudi Arabia. Data collected using a pre-designed structured interviewing questionnaire including the Beck Depression Inventory scale (Beck, Steer, & Brown, 1996) and Family Burden Interview Schedule.

Results: Percentage of depression level ranged from 63% among caregivers of physically disorder clients to 69% among caregivers of mentally disorder clients. Moreover, there were many factors that may increase risk of depression such as old age of caregivers, spouse and caregivers who cared for their charges four hours or more per day. There was significant difference in depression level and burden of care as regard to nature of relative illness ($p < 0.05$).

Conclusions: Policies and programs to alleviate the burden of care and to provide social support for these family caregivers are equally important for both family caregivers and their care receivers.

Keywords: depression, burden of care, older people, home care

1. Background

There is an increase in the numbers of older people. People worldwide and it is estimated that the proportion of the world's older adults will reach 22% in 2050. Older people individuals are at risk of developing mental disorders, neurological disorders or substance abuse problems as well as other health conditions such as diabetes, hearing loss, and osteoarthritis. Furthermore, some of older people may experience co-morbidity, being diagnosed with several diseases at the same time (WHO, 2016). As a result, older people frequently need support in daily life activities and/or help from others to cope with disabilities and make their life easier to perform activity of daily living (Mosqueda et al., 2004).

Few studies have examined the factors associated with depression among caregivers. Pirraglia et al. (2005), conducted a study to explore the relationship between depression and burden of care among informal caregivers of HIV-infected persons. Study design was cross-sectional; the study sample was 176 of HIV patients and their informal caregiver. A scale of 21-questions called Beck Depression Inventory (BDI) was used to measure caregiver's depression while the caregiver's burden was assessed using the Caregiver Strain Index (CSI). The study revealed that median age of caregivers was 42 years, 53% were females, 30% had an educational degree beyond high school, 47% were the patient's partner, friends were 18% and 35% were a family member. Caregivers who had a high caregiver burden were 27%, and 50% of them were depressed. In addition, 25% of informal caregivers

were themselves having HIV positive. Results revealed that the burden of caregiving was strongly and independently associated with depression in the informal caregiver of HIV-infected individuals. In addition, medical comorbidity besides HIV in the informal caregiver, illicit drug use by the informal caregiver, having others to help besides the HIV patient, spending all day together, and duration of the HIV patient's diagnosis were also associated with greater depression in the informal caregiver. Of all other characteristics of the informal caregiver, of the relationship between the informal caregiver and HIV patient, or of the HIV patient, none was independently associated with depression in the informal caregiver.

The study recommends the need for additional research to determine effective means to support caregivers and the older patients with depression and to identify their problems, which has significant implications not only for the health and well-being of caregivers but also for their ability to provide effective care for a susceptible group of older adults. Masakazu et al., (2014) investigated the factors led to depression among family caregivers of older people with physical disabilities who used Home Health Care in the Metropolitan City of Hokkaido, Northern Japan. The design was a cross sectional, using a self-administered questionnaire, including the Center for Epidemiologic Studies Depression Scale (CES-D) to evaluate the participant depression. The study showed that 45.5% of caregivers were depressed and the finding also revealed that there were many factors that may increase risk of depression such as old age of caregivers, spouse, caregivers who cared for their charges four hours or more per day and caregivers having chronic disease. The study recommends that care should be directed to family caregivers especially spouse or older caregivers in addition to the care given to disabled older people.

A study conducted by (Toyoshima et al., 2014), aimed to evaluate the burden and depression among 78 pairs of psychiatric clients who were receiving services of nursing home visits and their caregivers. A cross sectional design was used to investigate the caregivers and their clients who were having psychiatric problems. The used questionnaire included self-administered Japanese version of Zarit Caregiver Burden Interview (ZBI) and a Japanese version of the Center for Epidemiologic Studies Depression (CES-D) Scale. The results showed that (50%) of caregivers were depressed and (57.7%) clients were diagnosed with schizophrenia. The results also revealed that depressed caregivers attend hospitals for treatment for their own chronic diseases and were significantly burdened. The study also mentioned that physically disabled clients might need physical care only while psychiatric clients needed both (physical and psychiatric care). In a study conducted by (washio, et al., 2015) in Japan to investigate factors that lead to depression among caregivers of frail clients who were using visiting nursing services, sample was 68 pairs of caregivers and their clients, and the design of the study was cross sectional. The questionnaire was used for measuring the burden of caregivers. Mental disability defines as any form of mental illness according to DSM-V and physical disability includes any form of somatic disorder, mainly neurological and cardiac problems (Khan et al., 2016).

The result revealed that 43.3% of the caregivers were depressed and significantly burdened and using public services more than non-depressed caregivers. Results also revealed that there were many factors that may increase risk of depression such as old age of caregivers or being a spouse. The study also showed a heavy burden among caregivers when spending more time with the clients; it is considered additional risk factor for them

Khan et al. (2016) conducted a study to examine burden and depression among caregivers of visually impaired patients in a Canadian population. It was a clinic-based, cross-sectional survey in a tertiary care hospital. Caregivers were considered unpaid family members for patients whose sole impairment was visual. Patients were stratified by vision in their better seeing eye into two groups: Group 1 had visual acuity between 6/18 and 6/60 and Group 2 were those who had 6/60 or worse. Burden was evaluated by the Burden Index of Caregivers and the prevalence of being at risk for depression was determined by the Center for Epidemiologic Studies Depression scale. Results revealed that total mean Burden Index of Caregivers scores were higher in Group 2. Female caregivers, caregivers providing greater hours of care, and caregivers of patients who have not completed vision rehabilitation programs were at higher risk for depression. The aim of the study was to assess the burden of care and level of depression among the family caregivers of older people patients. This study added to understand the Saudi caregivers psychosocial problems as a result of providing direct care for ill relatives.

2. Methods

2.1 Design

The study was employed descriptive survey design.

2.2 Study Setting & Recruitment

In the Kingdom of Saudi Arabia there are 209 hospitals implement the services of “Home Health Care”. The number of service users are 27764 patients. In Makah where the study was conducted, there are 7 hospitals provide

home health care services to, 1749 patients. (Statistics from the home health care program administration, department of statistics, till the end of April 2017).

2.3 Sampling

2.3.1 Participants

Inclusion Criteria

Caregivers had to be free from any mental illness, they had to consent voluntarily to participate in the study and they had to be willing to participate. Caregivers needed to be able to read and understand either Arabic or English.

Sample Size

The target sample of this study was 300 family caregivers and the final sample consisted of 129 family caregivers (response rate 43%) of patients diagnosed with physical and psychiatric problems. The sample size was calculated based on power 80%, level of significance 0.05, then the required sample size is 270 with attrition rate 15%.

Data Collection Procedure

Ethical approval was obtained from the Institutional Review Board (IRB) committee in the Ministry of Health. Following the explanation phase of the initial approach, eligible potential participants were given written information about the study, including the electronic information sheet along with relevant consent forms that they could take home prior to deciding whether to participate in the study. These electronic information sheets were supported by text message explanation about the study's importance and the proposed effect on their life. They were told they had the freedom to withdraw from the study at any time without explanation.

Data Collection Method and Outcomes Measure

A pre-designed structured interviewing questionnaire including the following items:

Personal data: Age, sex, residence, marital status, level of education, economic status, occupation, relation of the caregiver to the patient, number of contact hours spent with the patient and duration of caring process.

Determination of the severity of depression symptoms among caregivers using Beck Depression Inventory scale. This scale was devised by Beck, Steer, and Brown (1996) and was used to assess the severity of affective, behavioral, cognitive and somatic symptoms of depression. It includes statements that cover items related to the basic symptoms of depression, such as hopelessness and irritability, feeling of guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss, and lack of interest in sex. The translated version showed excellent reliability, Cronbach's Alpha coefficient of the scale as a whole amounted to (0.807), which is an acceptable reliability coefficient since it exceeds (0.70) as stated by (Malkawi and Odeh, 2014).

This scale consists of 21-items, each answer of the participants was scored on a Likert type scale ranging from 0 to 3, the highest score indicates that individual's experience of severe episode of depression.

Measurement of the burden of care among caregivers using the family burden interview schedule (FBIS). This scale was devised by Pai and Kapur (1981). The FBIS has 24 items and focuses on six domains of primary caregivers' burden: family finance, routine, leisure time, physical health, mental health and family interaction. Each item is rated on a three-point Likert scale (0: no burden, 1: moderate burden, 2: severe burden) scored from 0 to 48; a higher score indicates a higher level of burden. The scale has a (Cronbach's alpha of 0.87) and test-retest reliability of 0.83. The translated version showed excellent reliability (Cronbach's alpha, 0.86) and inter-rater reliability (ICC, 0.86).

2.4 Ethical Approval

Ethical approval was obtained from the Institutional Review Board (IRB) committee in the Ministry of Health. All participants were informed and a written consent was taken from every participant after explaining the aim of the study. No obligation of any kind for participating in the study, and every participant was free to withdraw from completing the study at any time.

2.5 Data Analysis

Data entry and statistical analysis were done by using the Statistical Package for the Social Sciences (SPSS) version 23. Statistical significance was set at $p < 0.05$. Descriptive and inferential statistical techniques were utilized to analyze the collected data. These techniques included (frequencies, percentages, mean value and standard deviations). In addition to Chi Square Test applied to examine differences among groups for most of the variables such as age, gender, marital status or level of education.

3. Results

3.1 Sociodemographic Characteristics of the Study Participants

Approximately 300 of electronic questionnaires were distributed, a Google Play link (Google Play link was used to prepare the questionnaire). The total number of returned questionnaire was 129 (response rate is 43 %).

Tables 1 and 2 summarize the sociodemographic characteristics of the study participants. The majority (47.3%) of the participants' age ranged from 31–40 years (17.1% caring for mentally disabled and 30.2% caring for physically disabled). In addition, the majority of the family caregivers were female in both groups. Over half of those who were caring for physically or mentally disabled were married, more than half (67%) were holding bachelor degree. In terms of economic status, most of the study participants had a monthly income of less than 9000 SR. Most of the family caregivers were son and daughter. Most of them caring for their relative more than one year they formed 35.7% and had more four contact hours daily.

Table 1. Sociodemographic Characteristics of the study participants

	Mental disability		**Physical disability**		**Total**	**P value**
	Frequency	%	Frequency	%		
Family Caregivers						
Gender of caregiver						
Male	24	18.6 %	36	27.9 %	60	0.92
Female	27	20.9 %	42	32.6 %	69	
Total	51	39.5%	78	60.5%	129	
Age						
20 or less	0	0 %	1	0.8 %	1	
21-30	10	7.8 %	15	11.6 %	25	
31-40	22	17.1 %	39	30.2 %	61	0.29
41-50	13	10.1 %	19	14.7 %	32	
>50	6	4.7 %	4	3.1 %	10	
Total	51	39.5%	78	60.5%	129	
Social status						
Single	11	8.5 %	20	15.5 %	31	
Married	32	24.8 %	44	34.1 %	76	0.92
Divorced	7	5.4 %	12	9.3 %	19	
Widow	1	0.8 %	2	1.6 %	3	
Total	51	39.5%	78	60.5%	129	
Educational status						
Can read and write	0	0 %	1	0.8 %	1	
Primary level	0	0 %	3	2.3 %	3	
Secondary level	1	0.8 %	2	1.65 %	3	0.59
High school level	16	12.4 %	17	13.2 %	33	
University level	34	26.4 %	54	41.9 %	88	
Postgraduate	0	0 %	1	0.8 %	1	
Total	51	39.5%	78	60.5%	129	

Economic status						
Less than 3000 SR	6	4.7 %	13	10.1 %	19	**0.83**
3000 - Less than 6000 SR	13	10.1 %	16	12.4 %	29	
6000 - Less than 9000 SR	20	15.5 %	30	23.3 %	50	
9000 SR or more	12	9.3 %	19	14.7 %	31	
Total	51	39.5%	78	60.5%	129	
Relationship to patient						
Parent	4	3.1%	8	6.2%	12	0.97
Spouse	6	4.7%	6	4.7%	12	
Patients brother and sister	7	5.4%	11	8.5%	18	
Offspring	34	26.4%	53	41.1%	87	
Total	51	39.5%	78	60.5%	129	
The number of hours spent with the patient per day						
Less than four hours	42	32.6%	64	49.6%	106	0.96
Four hours or more	9	7.0 %	14	10.9 %	23	
Total	51	39.5%	78	60.5%	129	
How long have you been caring?						
Less than 6 months	11	8.5%	12	9.3%	23	
6 months or more	40	31.0%	66	51.2%	106	0.37
Total	51	39.5%	78	60.5%	129	
Are you a primary caregiver?	39.5%		60.5%		100%	
Are you occupied with other issues?						
No	11	8.5%	19	14.7%	30	
Yes	40	31.0%	59	45.7%	99	0.71
Total	51	39.5%	78	60.5%	129	
Gender of Patients						
Male	33	25.6%	56	43.4%	89	
Female	18	14.0%	22	17.1%	40	0.39
Total	51	39.5%	78	60.5%	129	
Age of Patients						
≤20	1	0.8%	3	2.3%	4	
21 and 30	1	0.8%	4	3.1%	5	
31 and 40	5	3.9%	2	1.6%	7	0.96
41 and 50	5	3.9%	5	3.9%	10	
>50	39	30.2%	64	49.6%	103	
Total	51	39.5%	78	60.5%	129	

The mean score of depression among caregivers of clients diagnosed with mental disability was higher than caregivers of clients diagnosed with physical disability (17.43 and 17.03 respectively), as indicated in Table 3. Independent sample t-test was used to compare the depression score between family caregivers of clients diagnosed with mental or physical disability. There was no significant difference in depression level as regard to nature of relative illness ($p < 0.05$).

Table 3. Depression Scores amongst the caregivers

	Type of Patients disability	N	Mean	Std. Deviation	P value
Depression Score	Mental disability	51	17.43	10.743	0.84
	Physical disability	78	17.03	12.360	

The mean score of depression among caregivers of clients diagnosed with mental disability was higher than caregivers of clients diagnosed with physical disability (18.62 and 13.84 respectively), as indicated in Table 4. Independent sample t-test was used to compare the depression score between family caregivers of clients diagnosed with mental or physical disability. There was no significant difference in depression level as regard to nature of relative illness ($p < 0.05$).

Table 4. Burden of Care Scores amongst the caregivers

	Type of Clients disability	N	Mean	Std. Deviation	P value
Burden of care score	Mental disability	51	18.6275	11.05796	0.03
	Physical disability	78	13.8462	7.60884	

4. Discussion

Caring of elder people with disabilities is often associated with mentally and physically burdened of caregiver (Maeda, 2003). The psychological health of the family caregiver is negatively affected by providing care to elder people with disabilities. Higher levels of depressive symptoms and mental health problems among caregivers than among their non-caregiving peers (Pinquart et al., 2003).

The result of the study showed that percentage of depression ranged from 63% among caregivers of physically disorder clients to 69% among caregivers of mental disorder clients. This finding agreed with (National Alliance for Caregiving [NAC], 2008, 2009) which stated that between 40 and 70% of caregivers have clinically significant symptoms of depression, with approximately one quarter to one half of these caregivers meeting the diagnostic criteria for major depression.

On the other hand, level of depression among caregivers in the present study was higher than the previous studies of (Washio et al., 2003; Oura et al., 2007; Hashimoto et al., 2013; Washio et al., 2014; Masakazu et al., 2014) and (Pirraglia et.al 2005) who stated that percentage of depression among caregivers ranged from (43%–50%). This result can be explained that the caregivers in the present study were married (54.8%) with multiple social responsibilities, university students (31%) and offspring (12%) forming large sector of the sample. Moreover, percentage of caregivers in the present study who were caring their clients for a period of six months or more was (76.2%) and those who were occupied with other issues were (79.8%). These factors leaded to higher percentage of depression among caregivers in the present study than the previous studies.

In the current study, level of depression among caregivers was higher in females than males. Moreover, level of depression was higher among caregivers > 50 years old, and among caregivers with spousal relationship with the disabled client. These findings were in agreed with (Mc Grath et al., 2002; Vitaliano et al., 2003; Masakazu et al., 2014; Khan et al., 2016; Pinquart, 2003) who stated that greater degrees of depression and low ratings of subjective well-being among caregivers are consistently associated with old age of caregiving, a spouse relationship with the clients and being a female who have higher rates of depression than men in the care-giving role.

However, a study by Khare et al., (2016) stated that aunts, nieces, and cousins were as depressed and burdened as spouses, parents, and children.

The result of the present study revealed that long period of caregiving every day was associated with higher level of depression among caregivers. Percentage of depression among caregivers who were caring for disabled clients for four hours or more per day was higher than those who were caring for their clients less than four hours per day. This result is in consistent with the study of (Washio et al., 2014) which showed that the spending more hours in caring of disabled clients was associated with higher percentage of depression among caregivers. This can be explained that spending longtime in caring or doing same duties routinely and necessarily every day is logically

leading to depression. More time spent by the caregiver may be a risk factor for stress, caregivers is heavily stressed when spending more time for caring for older people, with mental and physical disability.

The present study showed that the duration of caregiving (>6 months) is significantly correlated to caregiver depression and is a predictor of caregiver burden. This is consistent with the findings of a study that was carried out on caregivers of Alzheimer's dementia patients (García-Alberca et al., 2011). This may be because of the nature of organ failure patients and the unexpected fluctuating course of disease, which places more burden on caregivers.

However, a study by Razali et al. (2011) shows that caregiver's depression is not significantly related to the duration of caregiving. In contrast, McConaghy and Caltabiano (2005), found that caring for a patient with dementia over a long period of time was associated with decreased levels of caregiver's depression and increased well-being. In the current study, the mean score of burden of care level among caregivers of clients diagnosed with mental disability was higher than caregivers of clients diagnosed with physical disability (18.84 and 18.62 respectively), as indicated in Table 3. In addition, the mean score of depression among caregivers of clients diagnosed with mental disability was higher than caregivers of clients diagnosed with physical disability (17.43 and 17.03 respectively), as indicated in Table 4. Moreover, there was no significant difference in depression level and burden of care as regard to nature of relative illness ($p < 0.05$). This finding agreed with Scultz & Martire (2004) who stated that caregivers of an older people. With psychological illness such as dementia were associated with higher levels of mental health problems compared to caregivers of a relative with a physical illness. This can be explained that most patients with mental disabilities have been living in close contact with their families, which have often represented the primary resource for their social integration. Fluctuation of symptoms is more prevalent among mentally disabled clients creating additional source of burden and depression among their caregivers. Numerous studies have demonstrated that family caregivers of clients with severe mental illness suffer from significant stresses, experience moderately high levels of burden, and often receive inadequate assistance from mental health professionals. For families who are already confronted with a range of day-to-day problems that affect all aspects of their lives, a member with a severe mental illness may have a significant impact on the entire family system (Saunders, 2003). The main limitation of the study is that small sample size and participants were recruited from one site which jeopardies the generalizability of the study findings.

Conclusion and Recommendation

The study concluded that providing are for clients diagnosed with mental disability posits higher level of burden on family caregivers compared with caregivers of clients diagnosed with physical disability. This negative consequence was linked with high level of depression among those caregivers. As a result, the main recommendation based on the study findings is

1) Implementation of programs in each healthcare unit to educate caregivers how to deal with care stressors and their negative effects as well as enhance caregivers' abilities regarding coping strategies and problem solving.
2) There is a need to adopt effective strategy to lower burden of caregiving and to prevent adverse outcomes for disabled clients and their caregivers.

Authors' Contributions

The authors had equal contribution into the manuscript

AAH Design the study

AAH Collected data

AAH – Analyse and Report the Result

Ethics Approval and Consent to Participate

Ethical approval was obtained from FCMS and from all the study participants

Consent to Publish

"Not applicable" in this section as no personal information is provided in your manuscript.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request

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Competing Interests Statement

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

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Use of Internet Health Information Among Students in Jeddah, Saudi Arabia: A Cross-Sectional Study

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Abstract

Background: Internet is a resource used to deliver health information, and has the potential to provide nutrition education in particular for individuals with a good level of education. The purpose of this study was to investigate the use of internet as a source for health information and analyzing the related factors for internet as a source for health information among students in Jeddah, Saudi Arabia.

Methods: We recruited 164 high schools, undergraduate and postgraduate students living in Jeddah, Saudi Arabia. A self-administered structured questionnaire to collect data on searching the internet for health information was used. It included frequency and timing of search, type of information, use of information in decision making, general health condition and socio-demographic characteristics. Differences between students who perceived and those who did not perceive improvement in health care after using internet health information were assessed using the chi-squared test.

Results: 92.7% of the students usually searched the internet for health information and 84.8% perceived internet health information as a help towards improving their health status. Students at higher educational levels talked significantly more often with their doctors regarding the health information they got from the internet ($p = 0.014$). We found significantly higher rates of perceived improvement in health among females ($p < 0.001$), participants who trusted the health information they got from the internet ($p < 0.001$), those who searched the internet for health information for themselves and other persons ($p = 0.034$), who searched for information on health care, physical fitness and nutrition and specific diseases ($p = 0.005$) and those who did it to increase their knowledge ($p = 0.024$).

Conclusion and Recommendations: The majority of participants perceived the health information they got from the internet as a help towards improving their health status. Interventions should be developed to enhance the use of internet health information among males and high school students.

Keywords: internet, health information, health care, nutrition education

Key Message: Internet is widely used as a source for health information among Saudi students

1. Introduction

Today's culture enhances patients and healthy individuals to play an active role in taking care of their health. Most young adults are able to search electronic sources for health information and to use these for decision making (Stellefson et al., 2011; Stellefeson et al., 2012; Britt et al., 2017; Bakarman, 2017), and internet is becoming a major source of health information for the new generation (Tao, 2017). Several studies examined students' online habits and their use of internet as a source for health information (Osei Asibey, Agyemang, & Boakye Dankwah, 2017; Albarrak et al., 2016; O'Carroll, 2015; Aldebasi & Ahmed, 2013; Schwartz, 2016; Horgan & Sweeney, 2012; Percheski, 2011; Bensley et al., 2014). A cross-sectional study conducted in 3 universities in Ghana and included 650 students (Osei Asibey, Agyemang, & Boakye Dankwah, 2017), reported that 67.7% of the students used the

internet for health purposes. Most of the students (72.4%) used internet health information to assist in modifying their lifestyle and only 39.5% used it for discussions with their health professionals. 73.6% of the students reported a 'lot to somehow' improvement in health after using internet health information (Osei Asibey, 2017). A cross-sectional study which was conducted among 448 college students in Riyadh, Saudi Arabia, found that half of the students used internet to search for health information on obesity and more than a half used this information to modify their lifestyle (Albarak, 2016). Female students used internet health information to modify their lifestyle significantly more than male students (Albarak, 2016). A web-based survey of 213 medical students in Halifax, Canada, showed that most of the participants used Google on a daily basis and that Wikipedia and UpToDate were also commonly used (O'Carroll, 2015). A study conducted in four medical colleges in Qassim University, Saudi Arabia, enrolled 500 students (Aldebasi & Ahmed, 2013). While internet was the most preferred source of medical information in males (84%), it was used for this purpose in only 14% of the females. Whereas most of the male students (54%) accessed internet at cyber cafés, the majority of female students used it at home (84%) (Aldebasi & Ahmed, 2013). Horgan and colleagues investigated internet habits of 922 university students aged 18–24 years in Ireland (Horgan & Sweeney, 2012). 72.4% used the internet several times per day and 66.1% used it to search for health information. They used the internet to search for health information on specific diseases (7.1%, n = 37), signs and symptoms (11.6%, n = 60), treatment options (4.4%, n = 23), causes of the diseases (1.5%, n = 8), prescription medication (6.2%, n = 32) and alternative treatments (3.5%, n = 18) (Horgan & Sweeney, 2012). A further study of 1,060 first-year university students at the Midwest of USA showed that 78% of the students used the internet to search for health information (Percheski & Hargittai, 2011). They found that female students used internet health information significantly more often than male students. Non-native English speakers, students with greater Web skills and students living away from their parents showed significantly higher likelihood to use internet health information (Percheski & Hargittai, 2011).

The aim of our study was to investigate the use of internet as a source for health information and analyzing the related factors for internet as a source for health information among students in Jeddah, Saudi Arabia.

2. Methods

We followed the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) guidelines for reporting our study methods and results (von Elm, 2007).

Study design: A cross-sectional study was conducted between September 2017 and February 2018.

Study participants: We recruited 164 high school students, undergraduate and postgraduate students living in Jeddah, Saudi Arabia. Students ≥16 years old were eligible to participate. University students were recruited from King Abdulaziz University in Jeddah. We used flyers and social media to invite students to participate in the study. Excluded from the study were students who suffered from health problems that affect their ability to use internet.

Study setting and location: The study was conducted in Jeddah city, a coastal city on the Red Sea on the western region of Saudi Arabia.

Data collection method and study variables: We used a self-administered structured questionnaire that was developed and used by Power and colleagues (Power, 2017). After taking permission from the authors, we modified the questionnaire and customized it to the Saudi culture. The questionnaire contained questions on age, sex, educational level, searching the internet for health information, number of searched websites, trustworthiness and usefulness of internet health information, type of internet health information, use of information in decision making, general health conditions.

Sample size: Our primary expected outcome was the role of internet health information in improving health. We anticipated that 88% of our study participants will find internet health information as a help for improving health. Assuming this rate of perceived improvement in health in our study, we needed to recruit a minimum of 162 students to estimate improvement in health care with a precision of 5%. We succeeded to recruit a slightly higher number of eligible students in our study sample (n = 164).

Statistical analysis: We used frequencies and absolute numbers to describe categorical variables and mean and standard deviation to describe continuous variables. Differences between students who perceived and who did not perceive improvement in health care after using internet health information were assessed using the chi-squared test. A p value less than 0.05 was considered significant. SPSS version 21.0 was used to conduct all statistical analyses.

Ethical considerations: The study protocol was reviewed and approved by the Biomedical Research Ethics Unit at King Abdulaziz University. Participation was voluntary, data confidentiality was assured and informed consent was obtained from all participants.

3. Results

Our study included 164 participants, 53% of them were females and 86% were less than 25 years old. High school students consisted of 30.5%, undergraduate university students 61%, whereas postgraduate university students consisted of 8.5% of the participants.All the participants were using the internet to search for health information and 46.3% (n = 76) did that daily, 63.4% (n = 104) visited 1-5 websites and 17.7% (n = 29) visited 6-10 websites when they searched the internet for health information. More than three quarter(84.4%) perceived internet health information as a help for improving their health status.Searching the internet health information for themselves was done by 22.6% (n = 37)and73.2% (n = 120) searched for other persons including parents. Ninety four students (57.3%) searched the internet for information on health and health care, physical fitness, nutrition and specific diseases. When the participants searched the internet for health information on a specific disease, 45.7% (n = 75) of them looked for information on symptoms and 22.6% (n = 37) sought information on medications. Half of the participants (54.3%) found moderate benefit from the health information they got from the internet and 26.2% (n = 43) reported a large benefit from it. Another half (54.9%) stated that the health information they got from the internet generated new questions and 30.5% (n = 50) reported that it stimulated a visit to their doctors. The detailed descriptive statistics of our study sample are shown in Table 1.

Table 1. General characteristics of study participants (n= 164)

Variables		**Statistics**	
		N	*%*
Sex	Male	77	47
	Female	87	53
Age	17-19	48	29
	20-22	88	54
	23-25	5	3
	Above 25	23	14
Educational Level	Secondary school students	50	30.5
	Undergraduate university students	100	61.0
	Postgraduate university students	14	8.5
What is the number of different electronic sites you entered searching for health information?	1-5	104	63.4
	6-10	29	17.7
	11-15	8	4.9
	16 and more	23	14.0
For whom did you search for health information on the internet?	For myself	37	22.6
	For one of my parents	4	2.4
	For another person	3	1.8
	All the above mentioned	120	73.2
What is the type of health information you searched for lately on the internet?	Health and health care	12	7.3
	Physical fitness and nutrition	28	17.1
	Specific diseases	22	13.4
	All the above mentioned	94	57.3
	Others	8	4.9
When you search for health information on a specific disease on the internet, what type of	Symptoms	75	45.7
	Medications	37	22.6

information do you search for?	Prognosis	20	12.2
	Others	32	19.5
What was usually the effect of the health information you got from the internet?	No effect	4	2.4
	Generated new questions	90	54.9
	Stimulated a visit to my doctor	50	30.5
	Stimulated a visit to another doctor than my doctor (second opinion)	20	12.2
How do you evaluate your general health condition?	Fair	15	9.1
	Good	111	67.7
	Excellent	38	23.2

We found 87.2% (n = 143) of the participants trusted some of the internet's health information they retrieved, compared to nearly 10% who stated they trusted all internet health information. However, this had no statistical significance (P>0.05). Those who searched the internet health information to increase their knowledge equaled 65.9% (n = 108) and 18.3% (n = 30) searched it to check information before or after a visit to their doctors. Others (15.9%), searched the internet as an alternative to visit their doctors, but this was without statistical significance (P>0.05).One hundred and thirty students (79.3%) admitted that the health information they got from the internet affected their decision on health care or medical treatment and 76.2% (n = 125) reported that it affected their decisions on food choices or physical exercise. Again this was of no statistical significance (P > 0.05).

Table 2. Characteristics of Study Participants by Educational Level(n= 164)

Variables		**Educational Level**						**p value ***
		Secondary		**University**		**Post-graduates**		
		n	*%*	*n*	*%*	*n*	*%*	
Trusting health information from the internet?	None	3	60.0	1	20.0	1	20.0	0.244
	Some	41	28.7	89	62.2	13	9.1	
	All	6	37.5	10	62.5	0	0.0	
Reasons for searching health information on the internet?	As alternative to visiting my doctor	7	26.9	18	69.2	1	3.8	0.961
	Check information before visiting the doctor	6	31.6	11	57.9	2	10.5	
	Check information after visiting the doctor	4	36.4	6	54.5	1	9.1	
	To increase my knowledge	33	30.6	65	60.2	10	9.3	
Types of health information searched lately on the internet?	Health and health care	2	16.7	9	75.5	1	8.3	0.656
	Physical fitness and nutrition	6	21.4	20	71.4	2	7.1	
	Specific disease	10	45.5	10	45.5	2	9.1	
	All the above mentioned	29	30.9	56	59.6	9	9.6	
	Others	3	37.5	5	62.5	0	0.0	
Have you ever talked with your doctor about the health information you got from the internet?	No	28	40.0	40	57.1	2	2.9	0.014
	Yes	22	23.4	60	63.8	12	12.8	

Internet health information affects your decisions concerning health care or medical treatment?	No	10	29.4	20	58.8	4	11.8	0.751
	Yes	40	30.8	80	61.5	10	7.7	
Health information you got from the internet affects your decisions concerning food choices or physical exercises?	No	15	38.5	20	51.3	4	10.3	0.364
	Yes	35	28.0	80	64.0	10	8.0	
Health information got from the internet usually helps you in improving your health?	No	7	28.0	15	60.0	3	12.0	0.787
	Yes	43	30.9	85	61.2	11	7.9	
The effect of the health information you got from the internet?	No effect	1	25.0	2	50.0	1	25.0	0.212
	Generated new questions	28	31.1	52	57.8	10	11.1	
	Stimulated a visit to my doctor	18	36.0	29	58.0	3	6.0	
	Stimulated a visit to another doctor than my doctor (second opinion)	3	15.0	17	85.0	0	0.0	

*Based on the result of chi-squared test.

As shown in Table 2, students at higher educational levels talked significantly more often with their doctors regarding the health information they got from the internet (P = 0.014).

In comparison, between students who perceived and who did not perceive improvement in health after using internet health information, we found that the participants who trusted the health information they got from the internet (p <0.001), who searched for internet information on health and health care, physical fitness and nutrition as well as on specific diseases (p = 0.005) and those who were stimulated by the internet health information to generate new questions or visit their doctors (p = 0.002) reported significantly higher rates of perception of internet information as a help for improving health. For more details on differences between students who perceived and who did not perceive improvement in health after using internet health information can be seen in Table 3.

Table 3. The differences between students who perceived and who did not perceive improvement in health after using internet health information (n= 164)

Variables		**Improvement in Health**				p value*
		No		**Yes**		
		N	*%*	*n*	*%*	
Educational Level	Secondary school students	7	14.0	43	86.0	0.787
	Undergraduate university students	15	15.0	85	85.5	
	Postgraduate university students	3	21.4	11	78.6	
What is the type of health information you searched for lately on the internet?	Health and health care	2	16.7	10	83.3	0.005
	Physical fitness and nutrition	4	14.3	24	85.7	
	Specific disease	3	13.6	19	86.4	
	All the above mentioned	11	11.7	83	88.3	
	Others	5	62.5	3	37.5	

When you search for health information on a specific disease on the internet, what type of information do you search for?	Symptoms	6	8.0	69	92.0	0.109
	Medications	9	24.3	28	75.7	
	Prognosis	4	20.0	16	80.0	
	Others	6	18.8	26	81.2	
What is the number of different websites you usually visit searching for internet health information?	1-5	19	18.3	85	81.7	0.394
	6-10	4	13.8	25	86.2	
	11-15	0	0.0	8	100.0	
	16 and more	2	8.7	21	91.3	
What was usually the effect of the health information you got from the internet?	No effect	3	75.5	1	25.0	0.002
	Generated new questions	16	17.8	74	82.2	
	Stimulated a visit to my doctor	3	6.0	47	94.0	
	Stimulated a visit to another doctor than my doctor (second opinion)	3	15.0	17	85.0	
How you evaluate your general health condition?	Fair	4	26.7	11	73.3	0.338
	Good	17	15.3	94	84.7	
	Excellent	4	10.5	34	89.5	

*Based on the result of chi-squared test.

4. Discussion

More than 90% of our students searched the internet for health information. This represents a higher rate of internet use for health purposes than that found in studies on university students from USA (78%) (Percheski & Hargittai, 2011), Ghana (67.7%) (OseiAsibey, 2017), Ireland (66.1%) (Horgan & Sweeney, 2012) and Saudi Arabia (50%) (Albarak, 2016). Our study included students from different educational levels ranging from high school to post-graduate students. The vast majority of previous studies on use of internet as a health information source among students included under-graduate university students (Osei Asibey, Agyemang, & Boakye Dankwah, 2017; Albarrak, 2016; O'Carroll, 2015; Aldebasi & Ahmed, 2013; Horgan & Sweeney, 2012; Mahmood et al., 2016; Percheski & Hargittai, 2011). Educational level of students might play a central role on health information seeking behavior. Our study found no significant difference between students at different educational levels in use of internet as a source of health information, in its impact on the decisions concerning health care, medical treatment, food choices or physical exercises. However, we did find that students at higher educational levels talked significantly more often with their doctors about the health information they got from the internet (P = 0.014). This might be explained by the fact that most school students are usually accompanied by their parents or caregivers during consultations with health professionals. In our study, 76.2% of the students used internet health information to assist them in improving their lifestyle through better food choices and higher rates of physical exercises. The study of Osei Asibey and colleagues from Ghana found a comparable rate (72.4%) of use of internet heath information to modify the lifestyle of university students (Osei Asibey et al., 2017). However, a study among Saudi students found a lower rate of utilization of online health information on obesity to modify lifestyle (52.2%) (Albarak, 2016). We found that 57.3% of our study sample discussed the health information they obtained from internet with their doctors. A study from Ghana observed a lower rate (39.5%) of use of internet health information for discussions with health professionals (Osei Asibey et al., 2017). This may well be an indicator for the availability of less time for patient-physician interaction during clinic visits. More important is our finding that 84.4% of the students reported an improvement in their health after using health information from the internet. A lower rate of self-reported improvement in health after the use of internet health information was found by OseiAsibey and colleagues among Ghanaian students (73.6%) (Osei Asibey et al., 2017).

5. Conclusions and Recommendations

The majority of our study participants used the internet as a source for health information and perceived the health information they received as a help for improving their health status. Interventions should be developed to enhance the use of internet health information among males and high school students.

Competing Interests Statement

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

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Exploring Website Preferences for African American Women: An Evaluation of an Internet-Based Source of Health Information on Eating Healthy and Being Active

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Abstract

Introduction: Internet-based health interventions continue to be popular and effective, and one area of focus of such interventions is weight loss. Although African-American women are regular users of Internet-based health interventions, there is a dearth of research regarding Internet usage and website preferences of this group. The purpose of this study was to explore the relationship between website attributes that influence African American women to use health-related websites, their stage of change for using the Internet to access information on health care, and predictor variables for website ratings.

Methods: The study used a backwards stepwise regression analysis to determine the best predictor of high ratings of the *Eat Healthy - Be Active* web portal and the *Rating and Evaluating Health Care Websites Survey* to measure website attitudes and beliefs and stage of change for using the computer and Internet to access health care information. The participants were 206 African American women who use the Internet.

Results: The regression analysis indicated that the predictor variables were education level, BMI, and weight.

Conclusion: This study demonstrates that various factors influence the effectiveness of Internet-based interventions targeted at African-American women. Future research should continue to explore these factors, particularly for groups with higher rates of preventable diseases.

Keywords: African American women, health disparities, internet health, website preferences, obesity, health communication

1. Introduction

Obesity is a public health problem that has reached epidemic proportions (Bleich, Bennett, Gudzune, & Cooper, 2012). It affects over 35% of all adults and 17% of all children in the United States (Bleich et al., 2012; Ogden, Carroll, Kit, & Flegal, 2014) and crosses age, gender, class, and racial/ethnic lines (Wright & Aronne, 2012). Healthy People 2020, a set of national objectives designed to increase quality and longevity of life and to eliminate health disparities, includes obesity as one of the leading causes of preventable death in the United States (U.S. Department of Health and Human Services, 2015).

The group with the highest rates of obesity in the United States is African American women (Sira & Pawlak, 2012). Public health researchers are trying to understand why there is such a disparity in obesity rates between this demographic and others. What is understood is that various factors contribute to weight-related problems and the higher prevalence of obesity in African American women. First, body-type ideals for African American women show a preference for more weight (Sira & Pawlak, 2012). Second, poor and minority communities have fewer supermarkets and health food stores than do more affluent communities; hence, members of these communities are more likely to shop in local corner stores or bodegas that carry unhealthy processed foods that are higher in fat and sugar (Kirby, Liang, Chen, & Wang, 2012). Finally, low health literacy also contributes to higher rates of obesity in African American women (U.S. Department of Health and Human Services, 2010).

The most effective programs for weight loss have been those that involve weekly clinic visits (Kodama et al.,

2012). However, these programs tend to be time consuming and impractical (Kodama et al., 2012). Thus, weight-loss/obesity prevention intervention approaches that are Internet-based have gained popularity in recent years (Kodama et al., 2012; Patrick et al., 2011). With greater numbers of individuals' gaining access to the Internet, such programs have become a viable means for delivering public health interventions (Kodama et al., 2012; Adewuyi & Adefemi, 2016).

Community-based interventions have been shown to be effective in addressing public health issues in the United States, and the use of technology to improve health has become important in this effort (Kodama et al., 2012; Patrick et al., 2011; Bravender et al., 2013; Tate, Wing, & Winett, 2013). Internet-based health programs have grown in popularity because they reduce delivery costs, are more convenient to users, can be provided in a more timely manner, reduce stigma, increase control of the intervention, and reduce geographic, time, and mobility-based barriers and, as such, provide opportunities for obesity prevention interventions (Kodama et al., 2012; Patrick et al., 2011). Currently, the Internet serves several purposes in the field of health care, including providing health information (Skranes, Lohaugen, & Skranes, 2015), creating web-based health support groups (Bravender et al., 2013), and facilitating online pharmaceutical purchases (Skranes, Lohaugen, & Skranes, 2015). Computer-tailored interventions have been used since the 1990s to promote healthy eating behaviors and for promoting weight loss (Kodama et al., 2012; Patrick et al., 2011; Ling & Mengjun, 2013; Springvloet, Lechner, de Vries H, Candel, & Oenema, 2015).

Notably, the Internet has great potential for providing such programs to lower income and minority populations (Cavallo et al., 2012). African American Internet users, however, may have a different set of needs and interests, as compared to other minority populations, that must be taken into consideration (Wilson, Alia, Kitzman-Ulrich, & Resnicow, 2014; Pew Research Center, 2017). Messages regarding health behavior changes are most effective with African American audiences when these messages, particularly those delivered through the Internet, are tailored to their needs and capabilities (Bennett et al., 2014).

Practitioners must be able to use this medium effectively to reduce obesity rates among African American women. To this end, the factors that serve as motivators for African American women to utilize an Internet site for health reasons must be established. Hence, the purpose of this study was to determine the predictors of a positive rating for a weight management website as perceived by African American women. Another aim was to determine these women's attitudes and beliefs about what they value in websites and how these attitudes and beliefs relate to their stage of change and to using the Internet to access health care information, in general, and healthy eating and physical activity information, in particular.

1.1 Theoretical Framework: The Transtheoretical Model

The theoretical framework for this study is the transtheoretical model, developed by Prochaska and DiClemente (Cancer Prevention Research Center, 2010). The transtheoretical model, also known as the stages of change theory, concerns how people modify a problem behavior or acquire a positive behavior (Cancer Prevention Research Center, 2010). According to this model, change is a process that involves progression through five stages: pre-contemplation, contemplation, preparation, action, and maintenance (Cancer Prevention Research Center, 2010). The stages of change theory has been found to be helpful in the design, delivery, and evaluation of interventions to help people to adopt healthy behaviors (Norcross, Krebs, & Prochaska, 2011; West et al., 2013). When the model is used correctly, the intervention developer can assess an individual's current stage of change to develop an intervention that will help to move that individual through successive stages (Norcross, Krebs, & Prochaska, 2011; West et al., 2013; Mastellos, Gunn, Felix, Car, & Majeed, 2013). Applying the stages of change model to change dietary behaviors can help to identify the types of interventions that are most effective at each stage of change (West et al., 2013; Mastellos, Gunn, Felix, Car, & Majeed, 2013; Glanz, Patterson, Kristal, DiClemente, Heimendinger, Linnan, & McLerran, 1994). In this study, the stages of change theory provided a guide for identifying the significant behaviors and attributes that website users exhibit during the adoption of a new technology (e.g. using health information websites). Specifically, the stage of change model was used to identify the progression or changes in the behavior and attitudes of African American women who used a health information website.

2. Methods

Divahealth.org, specifically, Donna Bacon, Ed.D.; Barbara Wallace, Ph.D.; and Rupananda Misra, created the D.I.V.A.S (Developing Individual Attitudes Values and Skills) website (www.DIVAhealth.org). The website, launched in 2007, was designed to educate and empower women, especially young African American women, with regard to improving their health. The website provides women with information about a variety of health issues through the use of a simple design with limited technological enhancements.

The authors of the current study expanded the D.I.V.A.S website by adding a section/portal that is dedicated to obesity prevention, which provides information on nutrition, physical activity, and weight loss (Eat Healthy, Be Active; http://www.divahealth.org/EatHealthy/BeActive/index.html). The purpose of this expansion was twofold: (1) to provide the www.DIVAhealth.org website with new section/portal that aims to meet the needs of African American women at risk for obesity, overweight, poor nutrition, low physical activity, and the health outcomes associated with these risk factors by providing information and education on these topics; and (2) to host a survey designed to ascertain women's multiple personal-level variables (e.g., health status, engagement in healthy living behaviors, perception of neighborhood safety factors that affect their physical activity, computer/Internet access, attitudes and beliefs about what they value in websites, self-efficacy in using health care websites, stage of change for using computers/Internet for accessing health care websites), and their rating of the new website portal as well as to obtain their responses to and recommendations for improving the new portal. The evaluation of the new section/portal enables an understanding of what these women find most effective in an online weight-loss/physical activity website designed to address their needs.

A convenience sample of 206 African American women who use the Internet was used for this study. Participants were recruited through a social marketing campaign that included a snowballing technique based on word-of-mouth communication and social networking technology; the posting of flyers in community settings that members of the target population tend to frequent; e-mails, text-messaging, and postings on websites or website bulletin boards; online classified advertisements; and the social media websites Twitter and Facebook.

The researcher determined the relationship between participant personal-level variables and the website attitudes and beliefs (WAB-10) portion of the Rating and Evaluating Health Care Websites Survey (REHWS-74) (Tettey, 2010). The WAB-10 contains 10 items that are used to assess attitudes and beliefs about what constitutes good website design, including a website's use of color, pictures of people, and social interactive opportunities. The WAB-10 is Likert-scaled (1 = strongly disagree, 10 = strongly agree), with higher scores' indicating higher ratings. The scale also generates a global score, which is a sum of all ratings.

The stage of change for using the computer and Internet to access health care information (SOCCIAHCI-7) scale also was used (Tettey, 2010). This scale is drawn from the REHWS-74, with minor modifications made specific to obtaining information on healthy eating and being physically active (the original scale contained items in regard to HIV/AIDS). Like the original scale, the present scale still has six items to assess stage of change for various Internet-based activities (e.g., getting information, visiting support groups). The scale also generates a global score, which is a sum of the scores for all six items.

Participants used SurveyMonkey, an online survey service, to complete the survey questionnaire. Participants' successfully accessing and completing the survey established that they knew how to use the Internet and its basic functions. The survey tool included the IRB-approved research description, informed consent, and a statement of participants' rights. The tool included an opportunity to provide an electronic signature, indicating informed consent, after which participants proceeded to the main survey questionnaire.

The data analyses, using SPSS, utilized both inferential and descriptive statistics. The Pearson correlation coefficient was used to determine the relationship between variables. To determine the internal consistency of the measures, the researcher used Cronbach's alpha, which was a measure of how closely items are related to each other (Tavakol & Dennick, 2011) and, hence, a measure of scale reliability (Tavakol & Dennick, 2011). A backward stepwise regression, which included all predictor variables that were significant at the $p = .05$ level in the bivariate analyses, was performed to determine the significant predictors of high ratings of the portal.

3. Results

A total of 265 respondents began the survey; of these, 206 completed the survey in their entirety, resulting in an 80.2% response rate. The demographics of participants are presented in Table 1.

Table 1. Demographic Characteristics (N = 206)

Characteristic	*n*	%
Age		
18–30 years	85	41.3
31–40 years	59	28.6
41–50 years	47	22.8
51–60 years	11	5.3
61+ years	4	1.9
Education		
High School/GED	34	16.5
Associate's	48	23.3
Bachelor's	73	35.4
Graduate	51	24.8
Religious Involvement		
None	24	11.7
Low	50	24.3
Moderate	74	35.9
High	58	28.2
Marital Status		
Partner (No)	135	65.5
Married (Yes)	71	34.5
Country of Birth		
Born in the United States	169	82
Foreign-born	37	18
Employment		
Employed	74	35.9
Unemployed	132	64.1

Reliability of the data was determined using Cronbach's alpha. The WAB-10 had a Cronbach's alpha of .910 for all 10 items, indicating very good internal consistency. The SOCCIAHCI-7 had a Cronbach's alpha of .922 for all seven items, also indicative of very good internal consistency.

As noted, backward stepwise regression was performed for this analysis to determine the significant predictors of high ratings of the portal, the first objective of the study. The regression began with a number of models, and the variables that were least significant were excluded until the significant predictors remained. The regression analysis indicated that the predictor variables were education level, body mass index, and self-perceived weight. The adjusted R^2 for this model was .091, which indicates that, for the full model with all variables entered, 9.1% of the variance is explained by these three variables. Those who rated the portal more favorably were less educated (B = -.248, SE = .110, p = .026); were heavier, based on self-perception (B = .392, SE = .141, p = .006), and scored higher on the WAB-10; i.e., they rated website features as more important (B = .144, SE = .061, p = .020).

WAB-10 scores were used to determine attitudes and beliefs about what participants value in websites, the second objective of the study. The item with the highest mean (8.95, SD = 1.45) was Item 3, "Important for websites to be easy to read." "Strongly agree" was chosen by 61.2% of participants (n = 126). The second highest rating was for Item 1, "Important for websites to have direct links to the information that I need, so I can get to it quickly," with a mean of 8.93 (SD = 1.84). This item was rated at the highest level, 10 ("strongly agree"), by 61.2% of the women (n = 126). The least important attribute, "Have a talking voice" (Item 9) had a mean of 5.37 (SD = 3.04), with only 18% of participants (n = 37) who chose "strongly agree."

To determine correlation between scores on the WAB-10 and the SOCCIAHCI-7, Pearson correlations were used. There was a positive relationship between high stage of change for accessing health care information, specifically, to share information with others (e.g., family, friends, students, clients) (Item 4), and high website attitudes and beliefs (e.g., rating web features as highly important) (r = .196, p = .005). There was a weaker, yet significant, relationship between high stage of change for accessing health care information (Item 1) and high website attitudes and beliefs (r = .149, p = .033). The complete results are presented in Table 2.

Table 2. Relationship between website attitudes and beliefs and the stage of change for using the computer and the internet to access health care information

	Website Attitudes and Beliefs (Rating High)		
	N	Pearson Correlation	Sig. (2-tailed)
More advanced stage of change for computers and Internet	206	.149	.033*
In terms of using the computer and Internet to access health care information	206	.086	.217
In terms of using the computer and Internet to access health care information, specially about prescription medications and other remedies and treatments	206	.116	.097
In terms of using the computer and the Internet to access health care information, specifically about my personal medical conditions and health concerns	206	.126	.071
In terms of using the computer and the Internet to access health care information, specifically to share information with others (i.e., family, friends, etc.)	206	.196	.005**
In terms of using the computer and the Internet to access health care information, specifically about physical activity and exercise	206	.102	.146
In terms of using the computer and the Internet to access health care information, specifically about nutrition and healthy eating guidelines	206	.103	.139

4. Discussion

The findings of the present study add to the literature by suggesting that African American women can be effectively recruited for participation in Internet-based research using social marketing campaigns that rely on e-mails, text-messages, and social networking. Moreover, African American women in the sample demonstrated that the quality of computer and Internet access and self-efficacy for accessing Internet websites are necessary for effectively interfacing with Internet-based health programs and interventions.

The main finding of the study was that the positive rating of the *Eat Healthy - Be Active* portal was significantly predicted by fewer educated African American women with heavier weight perception and higher scores on WAB (i.e., they rated web features as more important). An implication of this specific finding is that education level was operating as a key factor in this study. As education level increased, positive website ratings decreased. Because the D.I.V.A.S. website is considered simple, and those who rated the portal more positively were less educated, it is important to have websites tailored for this group of African American women. The new portal apparently was better tailored to meet the needs and preferences of women with less education, making the portal more appealing to them. On the other hand, there appears to be a need for more advanced websites tailored to meet the needs of more educated African American women. Again, diversity among African American women as a group must be considered.

Another finding of the study was that the most important consideration when evaluating African American women's attitudes toward a weight loss website is that the site should be easy to read and have direct links to desired information. On the other hand, the least important attribute is having a talking voice. This result is

consistent with other studies that focused on websites with topics other than weight loss (Cebi, 2013; Huang & Benyoucef, 2013). These studies found that ease of use and ease of navigation to desired information are important to users. This finding is based on the ratings of people who are generally less educated, report themselves as being overweight, and gave higher ratings on website attributes and behavior (e.g., those who rated website features as more important).

In relation to the important aspects of a website for African American women, there was a significant positive correlation between high stage of change for accessing health care information, specifically sharing information with others (e.g., family, friends, students, clients), and high website attitudes and beliefs. There was also a significant positive correlation between high stage of change for accessing health care information and high website attitudes and beliefs. These positive correlations demonstrate that it is important to create websites that meet the needs of the target audience. It has been noted that women are critical to improving the health of those within their communities. Therefore, knowing that African American women are using the Internet to access health information may have implications for delivering and tailoring health messages. The significant positive relationship between a high stage of change (i.e., action, maintenance) for accessing health care information, specifically to share information with others, and high website attitudes and beliefs, demonstrates that although a website may be dedicated to the health of African American women, information relevant to the health of African American men and children can still be disseminated.

There were several methodological limitations to the study. The first limitation was that the convenience sample of volunteers with access to computers and the Internet may not be generalizable beyond this sample. Nevertheless, the population of focus in the study is appropriate because the target audience of the D.I.V.A.S. website is African American women. Additionally, conducting a study that requires Internet access creates many limitations. The recruitment of study participants was largely conducted through the Internet, as well as other technologies, such as text messages. As a result, the sample may not be representative of African American women who do not have Internet access.

Another limitation of the study is that current websites that focus on similar issues related to weight, nutrition, and physical activity are more advanced and possess more tools than the number of available tools on the pilot website used for this study. Therefore, this study is limited because it does not offer an assessment of the highest levels of technology and resources that are currently available for Internet-based weight loss interventions.

5. Conclusion

The findings of this study are important because as technology continues to advance, web developers may want to create websites that are complex. However, this study demonstrates that African American women are a diverse group; for those with lower levels of educational attainment, easy-to-read websites using simple navigation may work best—while not meeting the needs of African American women with higher levels of educational attainment. Therefore, it is important to design website content that is tailored to meet the needs of various categories of consumers. This study suggests that what was to be culturally-appropriate website content designed for African American women emerged as only being embraced by those women with lower levels of educational attainment. Thus, designers of website content must consider yet another level of complexity, namely, the diversity that arises from not only racial or cultural background, but also from the interplay of these factors with variables such as educational level of attainment.

Future research should further explore the role of these demographic variables (i.e., race, education), as well as others such as age, gender, professional attainment, and income in relation to preferences for website content. Future studies should also assess the attitudes and beliefs of African American women towards websites and social media interventions that utilize more advanced tools and strategies, given that they value ease of use of a website.

The elimination of health disparities will require a multi-faceted approach. African American women continue to suffer disproportionately higher rates of preventable illnesses. Understanding Internet preferences is necessary for the creation of effective web-based interventions. Therefore, being aware of the Internet preferences of this group will lead to the development of Internet-based wellness and weight loss programs with features tailored to African American women; these programs will also serve as public health tools for disseminating health information to their family members and perhaps to a larger community.

Competing Interests Statements

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

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Poverty, Gender and Primary Education: Experiences of Learners in Elandskop, KwaZulu Natal

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Abstract

This article discusses the interconnectedness of poverty and gender and learning at primary school level in KwaZulu Natal Province of South Africa. A qualitative study was conducted in two schools in the poverty stricken Elandskop area where data were collected using in-depth face-to-face interviews from purposely selected participants comprising of learners, educators and the headmasters. The aim was to analyse how male and female learners experience poverty, gender role socialisation and the effect on children' bio-psychosocial health of both sexes. While the findings of the study revealed that poverty and gender socialisation of boys and girls have bio-psychosocial negative influences on them, the gender dimension of poverty had the most negative influence on girls. It was found that primary school learners grapple with coping mechanisms when confronted with poverty coupled with limited family and professional support. Gendered family roles and oppressive religious beliefs have been found to have influence on early marriages and teenage pregnancies resulting in school dropouts. The findings of the study imply that school social work is vehemently lacking yet necessary in schools in the area to assist educators in addressing the psychosocial ill-health of learners which educators are less equipped to professionally handle. The study recommends appropriate bio-psychosocial interventions early in the lives of learners to curtail lifelong developmental predicaments.

Keywords: poverty, gender, social workers, education, intervention

1. Introduction

The problem of poverty in South Africa is not new but the interconnectedness of poverty, gender and primary school education has been given a blind eye by scholars. This is a challenge today more especially to young children, (Paddison, 2017), with the hardest hit being those living in rural areas, where scanty interventions are the order of the day resulting in untold bio-psychosocial problems. The oppressive nature of the communities of KwaZulu Natal Province to children and the girl child, especially in Elandskop, has resulted in extreme polarized gender socialisation of boys and girls which influences violence on boys and early marriages for the girls and teenage pregnancies. It is common wisdom that the legacy of the Apartheid regime left many adult South African Black people in poverty due to unfair policies (Meiring, Kannemeyer, & Potgieter, 2018). Statistics South Africa (2017) published that about 23 million people are living in poverty in the country. About 64.2% in 2015 of these people were Black people (Statistics South Africa, 2017). Poverty among the adult population affects mainly their children, (66.8%), and affects critical developmental spheres with the girl child being the recipient of the unfairness of poverty, gendered development and socialisation within a family. Such challenges are a threat to proper physical, social and intellectual development of the children. Poverty and skewed socialisation of children towards gender roles are vehemently embedded in rural areas where the majority of the Black people live. Common among the rural population of South Africa are the extremes of unemployment, the huge income gap between the *"haves"* and the *"have nots"* and the effects of global warming which has resulted in huge droughts recently.

Among the worst affected populations are children with many of them struggling to attend school. Statistics South Africa (2017) reported that 66.8% of the population affected by poverty were children. In the views of United Nations Children's Fund (UNICEF) (2012) the widespread poverty in South Africa has a significant bearing to violence and negligence against children with necessities such as food, water, shelter and clothing lacking. This

paper argues that if these critical basic needs are not met for children from poor backgrounds, education is negatively affected and becomes less important despite the need to achieve the much debated Universal Primary School Education (UPE) (Sabates, Akyeampong, Westbrook, & Hunt, 2010). Social ills such as increased rates of violence and crime and high teenage pregnancy rates are likely to take centre stage and steal the show where young children do not attend school.

Scholars such as Ahmed, Khan, Alia and Noushad (2013) and Psaki (2014) have proven that poverty and gender socialisation have become intricate in ways that pull back the children from poor families to manage navigating their way through education system due to reasons such as early marriages, lack of material things needed for learning especially those that need financial resources. Education of children is made more complex in societies where gender roles are assigned to them and structurally enforced. In South Africa, this happens against the widespread and well pronounced rights of children in the Bill of Rights in the South African constitution. Poverty has been associated with complex matters into lives of children such as anger, truancy, school drop outs, criminal elements and lack of motivation to learn and resulting in educators struggling to handle these problems in schools due to limited professional expertise. In poverty stricken families, gender socialisation of children take precedence, (Ahmed et al., 2013), and parental and family support for education lacks exacerbated by parents' little understanding of the importance of education. Girls are forced into early marriages, (Ahmed et al., 2013, Cummins, 2017), which brings developmental and health complications, (Lawani, Ekem1, Onoh, Eze, Ekwedigwe, Egede, & Isikhuemen, 2018), especially that people in Elandskop area practice the Shembe religion notorious for polygamous child marriages.

3. Objectives of the Study

The objectives in the study were twofold; firstly to determine how poverty and gender affect the bio-psychosocial health and learning of children at primary school level in Elandskop area of KwaZulu Natal Province and secondly to determine the plight and professional support needs of educators of children from poor backgrounds.

4. Conceptual and Theoretical Framework

Social work literature and theories that explain the dynamics of poverty, gender and primary school education and bio-psychosocial health *per se* are scanty. Whilst this study was germane and incumbent in the social work domain, literature is drawn from several disciplines of the social sciences, education and health. This denotes the scarcity of literature in social work of the subject in question and the need for multidisciplinary approach in addressing the plight of children from poor family backgrounds.

Literature shows that South Africa among other countries is one of the most diverse and complex country. The country experiences massive rates of poverty, inadequate education and health services, especially in rural areas. Black Africans in South Africa live in demoralising conditions with lack of access to proper sanitation, housing and proper nutrition which has seen the country marked with service delivery protests on a daily basis. Noteworthy, these conditions have a negative effect on the psychosocial health and education experience of young learners especially coupled with skewed gender socialisation of children from impoverished homes.

4.1 Central Concepts

Poverty is a central term in this paper and a number of definitions have been given to the term 'poverty' from different perspectives and academic formalism. It is bedeviled by what it does to people and associated with low income. Poverty is also explained in terms of deprivation, that is, insufficiency in basic human needs such as food, housing clothing, education, medical care and other items required to maintain decent living standard (Spicker, 2015). To describe poverty, the two important terms that need elucidation are absolute poverty and relative poverty. Mack (2016) asserts that absolute poverty is "a condition in which people are deprived of basic shelter, food, drinking water, health, sanitation facilities and clothing" (p.1). In this paper, the contention is that relative poverty is experienced when children from poor backgrounds begin to question and compare themselves from other children from well-up families which breeds despondency among them; a high level predictor of ill psychosocial health among young children.

Scholars agree that poverty is greatly influenced by the individual's background, experiences and environment (Mack, 2016; Spicker, 2015; Zastrow & Kirst-Ashman, 2013). In that light, poverty in South Africa is experienced differently according to the rural-urban dichotomy, race, age, gender, cultural and religious characteristics with the production of differential experiences of poverty. In terms of psychosocial health, poor children have been associated with increased emotional and social problems (Zastrow & Kirst-Ashman, 2013). Sadly, such ill psychosocial health associated with poverty can replicate itself from generation to generation. When such ill psychosocial health is accompanied by insufficient education of children, there would be future regeneration of

poverty contributing immensely to the cycle of poverty

One important concept is the question of gender. As children grow, the messages given to them of "who they are" and "who they can be" is a critical predictor of their future position in society. The World Health Organisation (WHO) (2017) defines gender as a social construction of the "characteristics of women and men including norms, the roles and relationships of and between the groups of women and men", (p.1). Gender changes and is experienced differently from one society to the other whilst there is a concession that it can be changed. This implies that learners in South African communities experience gender differently due to different socioeconomic and cultural backgrounds.

4.2 Challenges Faced by Poor Leaners

Learners experience a myriad of challenges emanating from poverty induced circumstances around them. An arsenal of their experiences are amassed with social exclusion, lack readiness to attend school, poor performance at school and an exhibition of a negative attitude towards learning.

4.2.1 Social Exclusion Aspect

Booyens and Crause (2012) contend that social exclusion is "a process by which individuals or households experience deprivation, either of resources or of social links to the wider community society", (p.260). Learners from poor backgrounds find it difficult to access basic amenities in their lives most of which are directly linked to their educational needs. Impoverished learners find it hard to access computers, books and school uniforms which are the basic needs for education. Further, learners struggle to get the necessary nutrition for proper development which lands them in ill-health (Kumar, 2018). In their homes, television sets are normally a luxury despite the important educational role played by media to the children. They are socially excluded from others and the world at large. Social exclusion correlates with relative poverty because people are judged to be poor if they are poorer in comparison to other people. Socially excluded children face the problem of lack of knowledge and skills. Education contributes not only to the acquisition of knowledge and skills but also influences the socialization, inclusion and empowerment of individuals which young learners from poor and socially excluded backgrounds lack. Education among other things is a means to personal fulfillment.

Biologically, lack of education on a child reduces the psychological, mental and physical development drastically, (Ahmed et al., 2014; Gaura, 2012), contributing to developmental struggles. Noteworthy, education can also be a source of exclusion if the process of education fails to promote equal participation between the *"haves"* and the *"have nots"*.

4.2.2 Lack of Readiness for School

Research has established that poverty decreases a child's bio-psychosocial readiness for school and for those in school, it reduces their ability to learn due to influences of poor physical health owing to under nutrition, (The BMJ, 2018), unfavourable home life which predisposes them to psychosocial ill-health (Zastrow, 2010). Furthermore, children from poverty stricken families lack psychological motivation to start school and have higher chances of performing poorly once enrolled in schools (Zastrow & Kirst-Ashman, 2013). Their parents who focus on battling poverty, also are likely to be trapped in lack of proper parental supervision especially on school related matters. In many instances, such parents may not have attained proper education themselves and lack the zeal to motivate their children.

4.2.3 Reduced Academic Performance

Iannuzzi (2009) shares that the ill effects of poverty can leak into classrooms unobtrusively and without notice. When learners arrive at school, the expectation from teachers is that they need to demonstrate good performance in their work. Poor learners find it difficult to focus on their school and leave the *"chaos"* of their home life behind, only to return to it after school. Students raised in poverty are especially subject to psychological stressors, (Zastrow & Kirst-Ashman, 2013), that undermine appropriate school behaviour and reduce academic performance. Girls exposed to abuse tend to experience mood swings in school, while boys experience learning impairments such as increased curiosity, low critical learning abilities and memory loss.

4.2.4 Attitudes of Poor Learners Towards Education

Poverty has been associated with negative attitudes towards learning and the school system and inability to attend school. Unhealthy psychosocial factors such as lack self-confidence and low self-esteem have been observed among poor learners. Payne (2013) attributes such factors as extra aggravating circumstances to children's social circles at school such as exclusion and negative labels. Payne further points to psychologically harmful labels such as aggressive, attention disordered, dropouts, drug abusers as more influential in the attitudes of learners from poor

backgrounds towards education. In addition, the learner may develop insecurity to attend school and this creates a negative attitude associated with truancy. This paper however takes cognizance of Mapingire (2016)'s warning that a critical analysis of a wider spectrum of other factors should be considered to determine what influences the attitudes of learners on education in addition to Payne (2013)'s specificity on poverty.

5. Theoretical Framework

In conducting the study, a feminist approach was adopted in explaining the experiences of female learners in their gendered education whilst employing a social constructivist theory in the methodology.

5.1 Feminist Theories

Feminist theories have long argued that society have a tendency of oppressing the weak and reducing them to a subordinate population. Feminists argue that these differences begin at birth and continue throughout the lifespan of people. The type and colour of clothes families buy for the boys and girls differ as well as the type of dolls they play with which denote oppression of girls from an early age (Teater, 2010). Central to the feminist theories is the gender schema theory which examines how society influences individuals to view gender with specific lens and the establishment of roles that are attached to a specific gender (Teater, 2010). In this children are taught and conditioned to learn specific roles according to gender which shape their future development of self. Various feminist theories appear in literature, but this paper endorses the explanations of radical and liberal feminism in highlighting poverty and the gendered education of children in primary schools in KwaZulu Natal Province.

Radical feminists condemn power relations in the society and dominance of men in oppressing women and girls using structural and social systems that limit their advancement and entrenching poverty. They critique cultural norms and values such as the Shembe religion in KwaZulu Natal emboldened in society for oppressing women and girls which limits their choices and assert that there is need for lessening systematic and institutionalised gender oppression for women and girls to advance in society without which women and girls will remain subordinate among societal members.

Liberal feminist spell freedom for women and girls in society and demonise society for not according women and girls equal opportunities with men and boys. The society is seen to have a false belief that women and girls are naturally less intelligent physically weaker than men (Tong, 2009, p. 2). The argument of the liberal feminists have been supported in this paper in that KwaZulu Natal communities need to provide the same opportunities to women and girls as it does to men and boys. Tong (2009) argues that society ties gender and sex together and assigns roles to girls and women that are traditionally feminine and less beneficial to current advancements in society. The liberal feminists raise an important suggestion which resonates with the contention of this paper that women and girls should be given the freedom to self-actualise rather than be forcibly entangled in social oppression such as forced early marriages organised religiously or to "bail-out families" from poverty.

5.2 Social Constructivist Theory

The social constructivist theory was critical in this study as it helped in understanding how primary school learners experience poverty, gender and education. The point of departure in a social constructivist theory is that people construct reality and come to 'know the world by interacting with other people, organisations and institutions' (Teater, 2010, p. 12). The theorists acknowledge the fact that reality and experiences are different from one person to another and each person's experiences of social and cultural values is critical and essential in understanding their view of the world. Thus the social constructivists argue that there is no better way of understanding what people experience if they do not recount their experiences within a historical and cultural context. The theorists concede that the social environment plays a significant role in shaping the experiences of children and positioning their future success or failure within a broader society. The theory was central in this study in that a qualitative explanation of the experiences of children and educators illuminated on how children experience poverty and gender in Elandskop.

6. Methods and Materials

The study used a qualitative approach to collect first-hand information obtained directly from participants (Miles & Huberman, 2009). Data were collected from the participants within their environment so that participants could feel free to recount and share their lived experiences.

The population of the study comprised of the learners and the staff members of Nana and Lala Primary Schools (not real names), in Elandskop in KwaZulu Natal. Most of the learners in these schools come from poor family backgrounds. Educators of the schools have the plight of teaching learners from poor family backgrounds and hence have better information on how poverty affects the learners. Non-probability purposive sampling technique

(Denscombe, 2010; Padgett, 2017; Whittaker, 2012) was employed to get a sample of grades seven, six and four learners to participate in the study. The aforementioned, (grades seven, six, and four), learners had a reasonable thinking capability to respond to questions in the study and have experienced poverty for the longest time while learning. Educators became participants so that they could provide their work experience with learners from poor backgrounds. The Headmasters of Nana and Lala Primary Schools were selected as they oversee learning in their schools and have overall information on how the learners are affected by poverty, gender and learning at the schools. The researcher purposely (Denscombe, 2010; Padgett, 2017) selected a sample size of twenty participants, however data saturation was experienced with eighteen participants who eventually become part of the study. The aim was to obtain in-depth information on the interplay of poverty, gender and learning rather than to obtain quantity and less valuable information for the study. Many sections of the South African communities have improved poverty alleviation strategies, adhere well to rights of children and have different religious practices. Elandskop was purposely selected to indicate disparities of development and democratic achievements of the South African communities in observing the rights of children. The area is characterised by skewed gender socialisation, poverty and cultural and religious practices that oppress girls. Thus the area was suitable for conducting the study to indicate the developmental leg and bring the debate of rights and democracy into light. Padgett (2017) suggests that when determining sample size, the researcher needs to go "an inch wide and a mile deep," suggesting that a smaller number is desirable for collection of intense information in a qualitative study, (p.70). There were four (two female, two male) learners from each of the following grades per school; grade seven, six, and four; that were interviewed from the two schools. For grades one and two, four teachers participated in the study with two teachers from each school being part of the study because the leaners were too young to participate and answer questions. There were also two headmasters (one per school) that participated in the study. This brought the sample size to eighteen which was qualitatively adequate to provide in-depth information for this study. The researcher could not interview grades five as initially planned due to their commitments in their academic activities and timetable congestion until the time that data saturation was reached.

6.1 Instrumentation and Data Collection

Three separate interview schedules were used to collect data on individual face-to-face semi structured interviews administered on selected learners, educators and the Headmasters. The rationale for using face-to-face interviews was that the researcher sought to find first-hand information from participants and also to observe non-verbal cues during the interviews. Face-to-face interviews, (D'Cruz & Jones, 2014; Whittaker, 2012), were used to systematically collect data from the participants following predetermined themes that guided the questions on the three interview schedules. The interviews helped the researcher to understand the experiences of the learners, including the sensitive issues that learners do not often talk about. This also helped the educators to express themselves fully during the interviews. Open ended question and probes were used to facilitate unrestricted expressions and responses from the participants.

Data were analysed thematically from the information provided by the participants. Hardwick and Worsely (2011) describe data analysis as 'creating order from chaos', (p.114). Thematic data analysis was defined by Whittaker (2012) as 'identifying, analysing and reporting patterns (themes) in data' (p.96).

6.2 Ethical Considerations

Brynard, Hanekom and Brynard (2014) enlighten that ethics relates to what conduct is 'right or wrong' on the part of the researcher. Consistent with research ethics, the researcher obtained permission from the parents of the leaners and gained access to conduct research from the Headmasters of the two schools (D'Cruz & Jones, 2014; Silverman, 2010). Congruous with the ethic of voluntary participation, the participants were also not coerced to take part in the study. The learners were given ballpoint pens as token of appreciation for being interviewees. Parental permission to engage their children in the study was sought and adolescent informed consent was sought from the learners before interviews were conducted. The identity of individuals and personal information was not obtained. The real names of the primary schools that participated in the study were not used. Nana and Lala Primary Schools are pseudo names of the schools. This ensured the ethical obligation of confidentiality and privacy of the participants, (Hardwick & Worsley, 2011), as required and concomitant with ethical conduct of research.

7. Discussion of Findings

The findings as discussed emanated from the interviews with the headmasters of Nana and Lala Primary Schools, educators and lastly the learners. The headmasters provided an overview of the experiences of the learners as leaders of the schools whilst the educators constantly engage the learners in classes and bring the classroom experiences of the psychosocial challenges of learners. The learners bring their personal experiences and realities,

home and social circumstances that impact on their psychosocial health and educational aspirations.

7.1 Findings From the Interviews With the Headmasters

Interviews with the Headmasters, yielded that bio-psychosocial and educational factors are prominent among the challenges faced by learners from poor family backgrounds. An arsenal of the prominent challenges included hunger, lack of adequate clothing and school drop-outs. In the current context of widespread social security in South Africa, a juxtaposed and paradox finding was that hunger was a dominant challenge experienced by the learners in the schools as most parents in the area were not working and therefore found it difficult to provide adequate and nutritious food (Paddison, 2017) for their children. The headmasters confirmed this:

'I have had cases where learners reported that their lunch was stolen by a child who has not eaten for over the past 8 hours', (Headmaster of Lala Primary School).

'A child fainted during lunch break. The cause of this was that the child had not eaten for two days', (Headmaster of Nana Primary School).

The implication of these findings are that hunger has serious health issues for young children in primary schools with the possibility of death (Paddison, 2017). This results into eminent poor health and psychosocial developmental challenges needed for normal functioning. For those that soldier on and battle the ordeal, they feel fatigued, lack concentration in classes and the needed energy to meet the mental demands of learning which has negative implications on academic performance. It is not imaginary that proper and adequate clothing is one of the greatest needs of children. Evident to this contention was the revelation from the headmaster who indicated that children from impoverished backgrounds do not dress adequately. They come to school inappropriately and humiliatingly dressed. The headmaster of Nana Primary revealed this:

'I have seen learners coming to school bare footed, no jersey, tight and uncomfortable school shirt in some instances they do not wear school shirts at all. Such learners shiver and they suffer from the cold which makes it difficult for them to pay attention in class this in turn negatively affects their academic performance'.

From this finding it can be argued that psychosocially, the appearance of a child affects the child's esteem towards education. Further, when a learner notices that he or she is different from other learners the feeling of embarrassment and depression is stimulated. Often learners withdraw from maintaining social relationships with their peers and further aggravates poor performance or less motivation to learn (Valdez, 2015). An inappropriately dressed child, especially in cold weather, is negatively affected making it difficult to pay attention in class. Drop-outs from school then become inevitable as young learners find it difficult to cope with the experiences of attending school either inappropriately, partially or differently dressed. So this has developmental challenges for the learners. Scholars have noted that education is a key to development and transformation and without it children may find it difficult to develop socially, economically and politically (Ahmed et al., 2013; Obeng-Denteh, Yeboah, & Monkah, 2011; Paddison, 2017).

A globally condemned phenomenon found by the study was that gender roles negatively affect female children's education (Ahmed etal, 2013). In the two schools, the study revealed a higher dropout rate among female learners compared to their male counterparts. Though unconstitutional in South Africa, in Elandskop, families tend to overburden female learners with chores at home and often such girls are too young to take huge responsibilities. Some take care of their siblings when their parents succumb to Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS), a phenomenon very common in KwaZulu Natal Province due to the high levels of HIV cases (Cullinan, 2013). This causes a huge problem on female learners as they are inhibited from getting education that improves their lives and possibly takes them out of the cycle of poverty and contributes to their personal development. At a more pragmatic level, UNICEF (2012) sees poverty in families being a steering factor in widespread "violence against children", (p.18) such as what children from Elandskop experience.

Female learners attending school at Nana and Lala Primary Schools find themselves with family responsibilities at their homes at a young age, (Psaki, 2015), at the expense of the education, so inconsistent with the Children's Act of 2005 of South Africa. This is aggravated by the religion (Ahmed et al., 2013), of Shembe in KwaZulu Natal which mandates early marriages among young female congregates mostly to older males within the religious group. The religion is so strong in the area such that reporting such practices and abuse of children is protected by the religious group and often emotional and challenging. Economically, the families mitigate poverty and inability to send girls to school by arranging marriages to meet the stinging family financial demands and poverty. This practice is directly a victim of feminist argument such as liberal feminists who argue that girls are forced into social roles which are deemed to be feminine. They militate and oppose the society and families on their misconception of assigning inferior roles to girls which they see as an oppression that must be ended. This is what the headmaster

of Lala Primary revealed:

'I have had cases of three grade seven learners who dropped out of school because they had to become wives as per Shembe Church arrangement with families'.

Whilst female learners drop out of school for carrying out home chores and early arranged marriages, males learners are not spared from school dropout either. Boys are forced to seek employment due to difficult family circumstances. This deprives the learners of their desperately needed education and re-engineers the continuation of the cycle of poverty. The overly concerned headmaster of Nana Primary School had this to say:

'The most devastating explanation of a learner dropping out of school was that, the family circumstances forced a child to drop out of school to seek employment in order to survive'.

It is an astonishing fact that poverty in Elandskop area influences child labour because families that struggle financially supplement their income by engaging children to participate in paid cheap labour. Contrary to the findings by Sabates et al. (2010) that learners have higher chances of completing lower secondary school in South Africa, in the study area, it was found that parents take their children out of school and force them to seek employment to supplement their home income. Child labour is illegal in South Africa and deprives children of their social functioning, physical and mental development (Gaura, 2012). Eventually, it influences repetition of the cycle of poverty within families and the larger society. This raises questions on the pragmatic application and observation of children's rights in Elandskop. Children's rights seem to be at higher risks and vulnerability to be broken where poverty is symptomatic in families and minimal professional intervention is realised to ameliorate the situation. Besides, child labour has negative bio-psychosocial developmental issues for children.

7.2 Findings From the Interviews With Educators

Educators have direct contact with the learners on a daily basis and provided their experiences with learners from poor background. The study had interesting findings from the interviews with the educators. Learners from poor background have been found to have disruptive behaviour in classrooms. They tended to disturb learning activities which then forced educators to carefully manage such behaviour for the benefit of fellow learners. This is a practical fragile situation for teachers who have meagre professional training to handle behavioural problems of learners. It further compromises learning which is a gap that should be closed by use of the services of a professional school social worker or child psychologist. This is what the educators had to say:

'Poor learners are at an increased risk of physical, social and psychological problems and because they are under a lot of strain they tend to be troublesome', (Grade 1 educator from Nana Primary School).

'As educators we are faced with a challenge of dealing with disruptive behaviour. When a learner is disruptive, this has a negative impact on a lesson because the teacher is compelled to stop teaching and reprimand the troublesome learner by doing so everybody suffers', (Grade 2 educator from Lala Primary School).

From the declaration by educators, it can be deduced that, the disruptive behaviour of poor learners is caused by the lack of nurturing guidance and supervision from their parents and so they seek attention wrongly. The negative behaviour a learner exhibits is symptomatic to the psychosocial strain that the learner experiences.

Not only does poverty contributes to school dropout, early marriages, (Ahmed et al., 2013), and cheap child labour, it also contributes to absenteeism from school for those still in school. This cuts across both genders of learners. The learners lose out on classes which contributes to poor school-related performance (Mosibudi, 2012; Teixera, 2014). It was found that educators also experience challenges of improving academic progress of learners from poor backgrounds by providing extra lessons for them to catch up with other classmates. A Grade 2 teacher from Nana Primary school revealed this:

'The problem of absenteeism is quite prevalent in Nana Primary. Poverty is the most dominant factor on absenteeism, this remains a huge challenge for educators because they must re-teach the previous lesson to accommodate those learners that were absent'.

Repeating the previous lessons done by teachers, wastes progressive teaching time of the educators and tends to be boring to learners that attend school regularly. Time wasted negatively affect educators' planning and work that must be covered for the entire syllabus, therefore educators fall behind schedule. In the views of Mosibudi (2012) learners' absenteeism has a negative effect on dynamic teaching and learning environments and smooth running of classes. This has a demotivating factor on the educator and is unfair to frequently attending learners for repeating lessons several times.

The attitude of the learners from poor backgrounds towards education yielded interesting and contrasting findings. In some findings the learners were unexpectedly highly motivated to learn while in other findings they had a

negative attitude towards education. The educators revealed these contrasting findings during the interviews:

'Attitude of poor learners varies according to their family background. In my class I have a learner living in extreme poverty but her attitude towards education is positive. I admire her resilience and her attitude because she does not allow her circumstance to deprive her of getting educated', (Grade 1educator from Nana Primary School).

'Majority of learners in my class lack discipline and are disrespectful. Their attitude towards learning further aggravates the problem of poor academic performance. Such learners ignore the siren, they come late to class and disturbs the learning process. It is frustrating to educate in such environment. Very often these learners possess a negative attitude because they lack motivation to learn', (Grade 2 educator from Lala Primary school).

Scholars have underscored that poor learners have a negative attitude towards learning (Payne, 2013; Zastrow & Kirst-Ashman, 2013). Learners lack motivation to learn and sometimes they behave as a reaction to the negative labels they receive from their fellows at school. Negative attitudes discourage, limit and prevent learning. Such attitudes therefore resist change and discourage growth, which can stunt the learning to a large extent. In other instances, learners are encouraged and have great enthusiasm towards their education. This is in sharp contrast to the negative behaviour other learners reportedly displayed. In view of highly motivated learners, Siribaddana, (2012) holds that learners can open their minds and get rid of the self-imposed limitations that could negatively influence the learning process and as such demonstrate a highly positive attitude towards learning. The implications for these findings have led the researcher to view it in two ways. Firstly that learners may feel overwhelmed by poverty and lose focus if guidance is not provided to facilitate re-focusing on their educational goals. Secondly, learners have the ability to take poverty as a motivator to work hard at school in order to change their future lives. This therefore calls for the educators to provide an enabling and facilitative environment to their learners so that learners realise their future goals. However, the question that can be raised and needs critical thinking is whether the educators have the professional capacity to facilitate psychological re-focusing of learners towards their education without the professional expertise of social workers who are currently not available in these schools.

7.3 Findings From the Interviews With Learners

The interviews with the learners focused on their own understanding of education and its importance and their brief family backgrounds which have direct impact on their bio-psychosocial health.

7.3.1 An Understanding of Education to the Learners From Poor Backgrounds

Twelve learners gave their views on the meaning attached to education. Of the twelve learners, the majority (ten) relate education to success in their lives. They had an understanding that education can enable them to improve their lives in the future. They associated education with better jobs and achievement. This is what Learner 2 from Nana had to say:

'Education means going to school to learn about things that will help to achieve great things in life and provide a secure future for a person'.

Only one learner had a different understanding of education in life and contrastingly associated it with lack of success. The above findings confirm that learners understand the benefits of education and as such drives them to achieve better in their learning activities. However, the study has also presented evidence that some learners may be unfortunate to be swerved off from focusing on education by poverty and search for work in an endeavour to improve immediate poor home circumstances. This supports the contention of the social constructivist theory that individuals experience realities differently and that it is only through engagement with them that their individual experiences can be comprehended (Teater, 2010).

7.3.2 The Importance of Education to Learners From Poor Backgrounds

The importance of education to the learners also yielded interesting results from the interviews. The learners from poor backgrounds gave honest responses on whether they value education in their lives. Many of the learners (ten out of twelve) indicated that education was important to them because they related education to finding better jobs and better social status in their communities. From the learners who regarded education as important in their lives, this is what Learner 4 from Lala Primary School revealed during the interviews:

'*Yes education is important to me because, if I get educated I will find a job and earn a large amount. I will be able to buy things I like that I never had. If I am educated my social status will be respected'.*

Solomons and Fataar (2011) also pick up the argument adding that education has an imprint in adding citizenship values on the learner. The authors further argue that education adds to nation building through active participation

of the learners in matters of their communities. On the contrary, some learners resent school apparently due to observational learning from their parents especially from families with uneducated parents who never participate in the learning activities of their children. While some of the uneducated parents may try to send their children to school but the learners find education having little meaning in their lives. Others find the school environment unfriendly to them as they cannot associate well with fellow learners. It is clear that from home-to-school environments, learners from poor backgrounds experience demotivating factors to learn. This is what the learners revealed in the study:

'I do not like to go to school. My parents are not educated but they can survive, I do not need education to survive. My parents force me to go to school it is not my will', (Learner 1 from Lala Primary School).

'I do not think education is important because I do not have friends at school because I feel that they are better than me when I am with them'. (Learner 2 from Lala Primary School).

As has been found by the study, children from poor families lack control of their education, are anxious and may be less motivated to learn. With lack of control over their education and little motivation to learn, it becomes inevitable to lose focus and drop out of school with girls getting married early (Ahmed et al., 2013). This indicates that children struggle to pursue their goals in life when faced with difficult environmental circumstances that militate their educational goals (Paddison, 2017). This is when professional social work needs to be made use of in schools to deal with such psychosocial struggles and apathy towards learning.

7.3.3 The Influence of Family Background

It is argued that the foundation of learning for children is within the family. The family background has tremendous influence on the education of children and their attitude towards it thereof. Research argues that a home for a child is the most crucial social setting that is conducive to grooming and supporting children with school work (Payne, 2013). Disorganised family background and poverty stricken families are less favourable environments for proper upbringing of learners (Zastrow, 2010; Zastrow & Kirst-Ashmen, 2013). Of the twelve learners that participated in the study, the majority (ten) indicated that they have been badly affected by family disorganisation such as fights and congestion in homes. Children become stressed, anxious and fight for meagre resources leading to nutritional deficiencies, (Amedeker & Obeng-Denteh, 2011), consequently affecting the development of their brain, a factor resulting into a multitude of behavioural problems (Zastrow & Kirst-Ashman, 2013). Low level of education among parents of learners from poor backgrounds has been found to lower the love for education for their children. Given the education system of South Africa which relies heavily on the involvement of parents, therefore learners with uneducated parents find it hard to do their home works. Parents are unable to assist the learners at home and are therefore hardly involved in their work (Menheere & Hooge, 2011). This affects performance at school and reduces the zeal for education of the learners which has negative ripple effects on optimal bio-psychosocial development of children.

8. Conclusions and Recommendations

The findings of the study have shown that there is significant interplay of poverty and gender towards young learners' education at primary school level. Learners from poor backgrounds, especially girls are negatively affected by their religious and social backgrounds. It is concluded that the poor home circumstances and fervent adherence of parents to oppressive religions affect primary school learners negatively and contributes towards school drop outs and unwanted early marriages. This has negative effects towards children's bio-psychosocial health manifesting in children grappling with physical, psychological and social development. Learners have fragile coping mechanisms and without family support at home and professionalised interventions in schools, they are forced to drop out of school which for them is an easy way out of the humiliating and uncomfortable circumstances they find themselves in, which has the potential to unintentional reproduce the cycle of poverty in their families. There is also natural strength and resilience for some learners who, despite the odds, soldier on and continue with education despite difficult circumstances, though their performance could be enhanced if provided with nurturing support from both the families and school environments.

In Elandskop area in KwaZulu Natal, unhealthy and unlawful practices such as early marriages of girls and cheap labour for boys contribute to school dropouts. This explains the skewed cultural and gender socialisation component children undergo in their developmental milestones in KwaZulu Natal. Clearly, conducive environments play a critical role in the education of a child both at home and at school. While the absence of school social workers in schools affects learners directly, this study also concludes that educators are equally affected as they live with the psychosocial ordeal of learners in need of professional help.

Though the study was purposive in nature and based on a specific area, the findings revealed important grounds for

making essential recommendations. Based on the findings discussed and conclusions reached, it is recommended that:

- The Department of Education in KwaZulu Natal Province of South Africa should consider using the services of School Social Workers to assist educators with a host of psychosocial problems experienced by learners. Apparently there is an enormous lack of professional support from Social Workers especially in the area of the study.
- The current cultural and religious context of the study militates progressive policies applicable in the post-apartheid South Africa. Extensive community education on children's rights and healthy religious practices is needed to curtail gendered education and Primary School dropout of learners, whilst embracing and maintaining inclusive universal education. This will assist in the prevention of early marriages amongst girls and child labour for boys which have enormous bio-psychosocial developmental consequences.
- Bio-psychosocial health practitioners, inclusive of social workers, psychologist and nutritional experts need to support impoverished communities such as Elandskop and to centre practice on distributive justice, gender matters, children's rights, parental skills and mobilise resources needed for supporting healthy bio-psychosocial developmental needs of children.

Competing Interests Statement

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

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Impact of Media Breast Cancer Awareness Campaign on the Health Behaviour of Women in Southeast Nigeria

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Abstract

Objectives: The goals of the paper are to find out if there is any relationship between breast cancer preventive/curative measures and the contents of media campaign against it; ascertain if the media campaign established a high level of awareness among women; and examine the relationship between breast cancer awareness and the practice of preventive/curative behaviours.

Subjects & Methods: The paper adopts a cross-sectional survey method that involves primary and secondary methods of data collection. Structured questionnaire was used to collect responses from women in relation to questions raised while published materials such as relevant books, journal articles, conference and workshop papers, and internet materials were reviewed to ascertain the current level and dimensions of research findings in the field across the world. Review of literature lasted for 8 weeks while distribution and collection of questionnaire lasted for 5 weeks. The study area is Southeast Nigeria, which comprises the five Igbo speaking states of Nigeria. A sample of 1000 women was randomly selected from markets, churches, schools, and civil service in the capitals of these states, i.e. Abakiliki, Awka, Enugu, Owerri, and Umuahia for the distribution of the structured questionnaire.200 questionnaires were distributed in each of the five study areas using multi stage random sampling technique with the aid of three research assistants. Their responses were tabulated and analysed using descriptive statistics in the SPSS version 20.0 tools.

Results: Results reveal a high level of breast cancer awareness although only 31.2% learnt of it through media campaign; the awareness did not orchestrate health behaviour modification among the respondents; while lack of appropriate knowledge of breast cancer disease, lack of fund and high cost of cancer treatment, and absence of accessible treatment facilities are the cause.

Conclusion: Media campaign against breast cancer in the Southeast Nigeria is deficient in terms of scope, reach, and contents. Secondly, poor standard of living and lack of appropriate corporate response to campaign and treatment of the disease are major problems. Therefore, modification of media contents and campaign programmes, together with government assisted breast cancer treatment mechanisms are recommended.

Keywords: breast cancer, curative and preventive, media, contents, awareness, and behaviour modification

1. Introduction

Breast Cancer is a common female terminal disease across the world and in every culture with more than 4.7million new cases reported annually. 55% of this number occurs in Less Developing Countries (Adetifa & Ojikutu, 2009). The spread of breast cancer has continued to increase at the rate 50–100% globally (Hayam, Howida, & Zakeya, 2014) and 0.5% each year since 1985 in Nigeria (WHO, 2004). Nigeria records about 500,000 new cases yearly since 2010 with a dismal 10% survival rate (Lambo, 2007; Salant et al., 2006). The Lagos State Ministry of Health observes that 15% of these cases occur in women less than 30 years, while majority of the cases occur at age range of 43–50 years (Oluwatosin, 2012; Adebamowo & Ajayi, 2006).

Despite the growing campaigns on breast cancer awareness in Nigeria generally and Southeast particularly (Okobia, Bunker, Okonofua, et al., 2006), the rates of its spread tend to grow while the practice of required

remedial practices continue to vary widely among women. Most of the rural women are either unaware of the cancer, have poor knowledge of breast cancer, or exhibit poor preventive and curative practices (Akpo, 2010; Makanguola, Amoo, Ajibade, et al., 2003). Consequently, civil society organisations, and relevant agencies in the Southeast Nigeria embarked on multiple media programmes using different radio channels, televisions, newspapers, and social media to create awareness of the cancer, its preventive and curative behaviours or measures. This paper investigates the phenomenon in Southeast with a view to the level and nature of awareness therein, and the associated influence on the health behaviour of women.

1.1 Objectives of Study

The primary objective of this inquiry is to evaluate the impact of media breast cancer awareness campaign on the health behaviour of women in Southeast Nigeria. However, its specific objectives are:

i. To find out if there is any relationship between breast cancer preventive/curative measures and the contents of media campaign against it.

ii. To ascertain if the media campaign established a high level of awareness among women.

iii. To examine the relationship between breast cancer awareness and the practice of preventive/curative behaviours.

1.2 Study Significance and Literature Review

The study will enable relevant agencies concerned with eradicating breast cancer in Southeast Nigeria and Nigeria in general to appraise the cancer media campaign, its contents, and framework for possible modification. The finding is expected to provide information to health care providers that will shape their education and awareness programmes on breast cancer. It shall identify the problems limiting the success of the media campaign. The information obtained from this study may be of help to other researchers interested in working in this field as it will serve as a reference material for further research. Numerous researches reveal that the major causes of breast cancer in women are blood lineage, pre-12 years menstruation, menopause after 55 years, old age, post 30 years first pregnancy, infertility, use of contraceptives, hormonal treatment after menopause, no history of breast feeding, overweight and obesity, excessive exposure to ionizing radiations before 30 years of age, hormonal dysfunction, stress and unhealthy lifestyle (Obaji, Elom, Agwu, Nwigwe, Ezeonu, & Umeora, 2013; Arif, Al-Saif, Al-Karrawi, & Al-Sagair, 2011). Others observe that lack of knowledge/awareness and resources, absence of regular test/screening, lack of effective screening and treatment strategies, late presentation and treatment of patients appear to exacerbate its spread and increase the death rate (Ojong, Etim, Samson-Akpan, et al., 2013; Akpo, 2010) As a panacea to combating cancer, the Nigeria Federal Government began to establish diagnostic/treatment centres, acquire medical treatment facilities, and drew a National Cancer Policy with strategic framework to implement it (Lambo, 2007). Relevant agencies and Civil Society Organisations such as Care Organization Public Enlightenment (COPE), Bloom Cancer Care and Support Services, etc initiated cancer awareness campaign across Nigeria to sensitize women about the cancer, its prevention, government policy and the availability of treatment schemes/facilities. Scholars suggest that creating breast cancer awareness, preventive health behaviour such as breast self-examination and early screening, educational empowerment of women, and medical assistance as solutions to breast cancer (Virginia, 2012; Salati & Rather, 2009).

Consequently, in a study to determine the level of awareness, attitude and practice of rural women regarding breast cancer in Southeast Nigeria using 1,600 rural women aged 20 to 60 years, Onwere, Okoro, and Chigbue, et al. (2009) observed that 58.2% of them are aware of the scourge but lack appropriate knowledge of its cause, symptoms, prevention and medical treatment. This research failed to investigate or analyse the medium and contents of the cancer awareness programme to find out if it is the cause of the observed ignorance. Similarly, the investigation conducted by Jebbin and Adotey (2009) on the level of awareness, attitude to, knowledge and practice of preventive/curative measures among women residents in Port Harcourt city, South-south Nigeria reveals that women are aware of the scourge and its preventive measures but fail to practice them. The inquiry equally failed to identify the medium and content of the awareness programme, and the reasons why the women did not practice the preventive/curative measures.

The study by Okobia, Bunker, Okonofua and Osime (2006) equally revealed poor knowledge of breast cancer among Nigerian women. However, the result further shows that majority of the women are willing to participate in the awareness programme and engage in positive health behaviour modification. Similarly, in their study on rural women of Ibadan, Nigeria Oluwatosin and Oladepo (2006) observed that 73.7% of the respondents are ignorant of symptoms of breast cancer and the mechanisms for practicing self-examination. Another study by Alam (2006) for rural women in Port Harcourt, and that conducted by Amosu, Adegun, Thomas and Babalola (2011) among rural

women in Ipokia Local Government Area, Ogun State, Nigeria revealed similar result.

Nevertheless, scholars like Okorie and Abiodun (2016),Okorie, Oyesomi, Olusola, Olatunji and Soola (2014); Kreps and Sivaram (2009); and Okorie (2011) argue that in the sphere of human health management, sources of information and campaign programmes are essential for health promotion. This is because media awareness campaigns 'are varied, multifaceted, highly planned and strategically assembled media symphonies designed to increase awareness, inform, or change behaviour in target audiences" (Day, 2011:79). The campaigns are designed to suit the behaviours and environments of target groups in order to tackle diseases and health challenges, and are influential in motivating attitudinal change.

In this regard, Kreps and Sivaram (2009) and Okorie (2011) acknowledged the efficaciousness of mass media outlets in the campaigns to promote breast cancer prevention and care. A study conducted by Irurhe, Raji, Olowoyeye, Adeyomoye, Arogundade, Soyebi, Ibitoye, Abonyi and Eniyandunni (2012) on knowledge and awareness of breast cancer among female secondary students in Nigeria reveals that 97% of the respondents heard of breast cancer through the media. Breast cancer has formed the main theme of media programmes both in Nigeria and abroad (Al-Naggar & Jashamy, 2011; Cohen, Caburnay, Luke, Kreuter, Cameron, & Rogers, 2006).An analysis of these reviews reveals that researchers are more interested in assessing knowledge, awareness and attitude but failed to assess media contribution to the awareness, reasons for poor knowledge or awareness of the people, the content of the media awareness campaigns, and the impact of the awareness on the health behaviour of women particularly in the Southeast, Nigeria. This paper fills this lacuna.

1.3 Theoretical Review

This study adopts the agenda setting theory and the framing theory as its framework of analysis. The main proposition of the Agenda setting theory is that the media has the ability to transfer issues of importance from media agendas to public agendas and thereby influence people's perceptions on what should constitute the most important issues of the day (Ogbuoshi, 2011; Folarin, 1998). Thus, the media can make cancer preventive/curative programme a public agenda through its contents (Kalu, 2010). It stimulates people's interest through idea framing - the framing theory. The basic principle of framing theory is that the media focuses attention on certain events and then places them within a field of meaning. The media organizes and presents events and issues in the way audiences interpret what they imply (Asemah, 2011). In this case, how an issue is presented (the frame) influences the choices people make. This affects people's beliefs, attitudes and behaviours because it connects a particular meaning or interpretation to an issue. Here the media connects the meaning and consequences breast cancer, and associated preventive practices to women mortality. These two theories provide the framework adopted by this paper to assess the impact of the media cancer awareness campaign on the health behaviour modification of women in Southeast Nigeria.

2. Subjects and Methods

Geographically, the study covers the five states of the Southeast. Thematically, the study investigates the level awareness of breast cancer in states studied, the nature of media campaign driving the awareness and their impact on behaviour modification. This is not a periodic study because it deals with life experience. Consequently, it adopts a cross-sectional survey of the five states of the Southeast Nigeria. Due to the overwhelming landmass and population of people in Southeast Nigeria, the capitals of these states, i.e. Abakiliki, Awka, Enugu, Owerri, and Umuahia are selected as areas of study. Primary and secondary sources of data were explored. In the primary source, structured questionnaire in five-point Likert scale format was used to collect primary data from a sample of 1000 women randomly selected from markets, churches, schools, and civil service. 200 questionnaires were distributed in each of the five study areas while multi stage random sampling technique was used to select respondents in the target areas. In a period of five weeks, the questionnaires were administered by three research assistants, who interpreted same in local language (Igbo language) to those who were non-literate, and all questionnaires were retrieved from the respondents. To complement the primary data, data were equally collected from secondary sources. In the secondary source, the researcher consulted books, journals, conference and workshop papers, newspapers, magazines, and government gazettes as can be found in public and private libraries, and the internet for secondary data. Experts in the Faculties of Arts and Social Sciences University of Nigeria were asked to assess the relevance of the contents and tools used, and test the validity of the instrument used for data collection. Further, a test-retest method was carried out within an interval of two weeks in three towns of Enugu state to test its reliability. An analysis of the reliability coefficient of the research instrument was estimated to be 0.95 using Cronbach's Alpha technique. The data generated during the research was analysed using percentage and analysis of variance (ANOVA) with the aid of SPSS, version 20.0.

3. Results

An analysis of respondents' age groupings reveals that 14.5% are within 15–35 years i.e. 145 respondents; 47% are within 36–45 years i.e. 470 respondents; 27.5% are within 46–60 years i.e. 275 respondents; while 11% representing 110 respondents are within the ages of 60 years and above. Further, investigation into the educational attainment of the respondents reveals that 44.3% representing 443 respondents acquired secondary/high school education, 17.4% of the respondents i.e. 174 obtained non-formal education, 29.6% representing 296 respondents acquired only primary education, while 87 respondents i.e. 8.7% acquired tertiary education. Occupationally, the analysis equally reveal that 14.5% of the respondents i.e. 145 are Civil Servants, 46.4% representing 464 respondents are traders, 33.3% of the respondents i.e. 333 are farmers and self-employed, while 5.8% representing 58 respondents are house wives. Equally, inquiry into the marital status on the respondents reveals that 188 respondents i.e. 18.8% are single, 58% representing 580 respondents are married, 8.7% i.e. 87 respondents are widows, while 14.5% of the respondents i.e. 145 are divorced. A review of the above demographic data statistics shows that the respondents are appropriate, spatially and fairly distributed among the female folk, ought to possess the requisite knowledge and experience on the subject of investigation. Therefore, they are the appropriate target of breast cancer media awareness campaign and for the study. The SPSS univariate analysis of responses to questions interrogating women's awareness of breast cancer disease reveals a total grand mean of 4.21 with a standard error of .032 and a standard deviation of 1.063. The confidence interval of the responses lies between 4.152 and 4.276. According to its Tests of Between-Subjects Effects in Table 1, the mean differences of the entire responses show a significant difference (P = .000).

Table 1. Tests of between-subjects effects

Dependent Variable: Responses					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	122.054[a]	4	30.513	30.175	.000
Intercept	17757.796	1	17757.796	17561.007	.000
Southeast	122.054	4	30.513	30.175	.000
Error	1006.150	995	1.011		
Total	18886.000	1000			
Corrected Total	1128.204	999			

a. R Squared = .108 (Adjusted R Squared = .105).

The analysis further reveals that 31.2% i.e. 312 respondents learnt about breast cancer through radio and TV programmes, 403 respondents representing 40.3% learnt about it through antenatal clinics and civil society campaign, 188 respondents i.e. 18.8% got their own information from the print media, while 97 respondents representing 9.7% have no idea about breast cancer. On the impact of breast cancer public education program over time, the analysis of response to the questions of what they call breast cancer in their days of ignorance and methods of treating it, entire 789 respondents representing 78.9% said that people called it poisonous attack from enemies, while 211 respondents representing 21.1% termed it punishment from the gods. Consequently, the first set that consider it poisonous attack resort to different forms of herbal treatments while those that consider it spiritual punishment resort to purifications and ritual sacrifices. Both approaches fail to prevent the terminal nature of the disease as patients die in agony. However, the univariate analysis of their responses to the question of attending or performing clinical breast cancer examination by health workers reveals a total grand mean of 2.23 with a standard error of .023 and a standard deviation of .762. The confidence interval of the responses lies between 2.183 and 2.273. According to its Tests of Between-Subjects Effects in Table 2 below, the mean differences of the entire responses shows a significant difference (P = .000).

Table 2.Tests of Between-Subjects Effects

Dependent Variable: Responses

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	49.326[a]	4	12.331	23.121	.000
Intercept	4963.984	1	4963.984	9307.061	.000
Southeast	49.326	4	12.331	23.121	.000
Error	530.690	995	.533		
Total	5544.000	1000			
Corrected Total	580.016	999			

a. R Squared = .085 (Adjusted R Squared = .081)

In Table 2, further analysis of the factors responsible for women's observed attitudes to cancer preventive and curative measures shows that lack of appropriate knowledge of the nature, consequences and curative measures of breast cancer has a total grand mean of 4.04, a standard error of .038 and a standard deviation of 1.264. The confidence interval of the responses lies between 3.969 and 4.119. Its Tests of Between-Subjects Effects reveals that the mean differences of the entire responses shows a significant difference (P = .000). Similarly, analysis of responses to the statement that lack of fund/high cost of treatment influenced women's attitudes to cancer preventive and curative measures reveals a total grand mean of 4.21 with a standard error of .071, and a standard deviation of 1.063.The confidence interval of the responses lies between 4.152 and 4.276. Its Tests of Between-Subjects Effects reveals that the mean differences of the entire responses shows a significant difference (P = .000). Equally, analysis of responses to the statement that lack of accessible breast cancer facilities influenced women's attitudes to cancer preventive and curative measures reveals a total grand mean of 4.00 and a standard deviation of .891. The confidence interval of the responses lies between 3.94 and 4.05. Its Tests of Between-Subjects Effects reveals that the mean differences of the entire responses shows a sig. Difference (P = .000).

4. Discussion

This paper investigated the impact of media Breast Cancer Awareness Campaign on the Health Behaviour of Women in Southeast Nigeria. In pursuit of this objective, the paper investigated the level of women's awareness of breast cancer disease, which reveals a total grand mean of 4.21 with the mean differences of the entire responses showing a sig. difference. The grand mean response of 4.21 representing 'Agreed' in our likert scale measure was accepted. This implies that the majority of the respondents are aware of breast cancer disease. According their responses, majority of them received the knowledge through antenatal clinics and civil society campaign (40.3%), and radio/TV programmes (31.2%).

However, in spite of the acknowledged awareness of breast cancer disease, analysis of their responses to the question of whether they attend or perform clinical breast cancer examination reveals a total grand mean of 2.23 with the mean differences of the entire responses shows a significant difference. The grand mean response of 2.23 representing 'Disagreed' was accepted. This implies that majority of the respondents do not attend or perform clinical breast cancer examination.

It must be observed here that although majority of respondents do not attend or perform clinical breast cancer examination, there are some, which are in the minority that attend the clinical services. This is an indication that the campaign or breast cancer public education has positive but gradual impact on women's health behaviour modification overtime. The analysis of responses to questions that interrogated the cause of or the factors responsible for this low impact reveals that lack of appropriate knowledge of the nature, consequences and curative measures of breast cancer with a total grand mean of 4.04, and mean differences of the entire responses showing a significant difference imply that it is one of the factors responsible for their non-participation in clinical breast cancer examination and preventive/curative treatments. The grand mean response of 4.04 representing 'Agreed' was accepted, and implies that lack of appropriate knowledge of the nature, consequences and curative measures of breast cancer prevents women health behaviour modification in Southeast Nigeria.

The analysis also reveals a total grand mean of 4.21 with mean differences of the entire responses showing a significant difference for responses to the statement that lack of fund and high cost of cancer treatment militate against women engagement in cancer preventive and curative measures in Southeast Nigeria. The grand mean

response of 4.21 representing 'Agreed' was accepted, and implies that lack of fund and high cost of cancer treatment prevents women health behaviour modification in Southeast Nigeria. The analysis also reveals a total grand mean of 4.00 with the mean differences of the entire responses to the statement that lack of accessible breast cancer facilities militates against women involvement in cancer preventive and curative measures showing a significant difference. The grand mean response of 4.00 representing 'Agreed' was accepted, and implies that lack of accessible breast cancer facilities also militates against women health behaviour modification in Southeast Nigeria. Apart from the available minimal breast cancer treatment women receive in University of Nigeria Teaching Hospital Enugu (UNTH), none of the specialised breast cancer facilities is located in any of the Southeast states. People travel to University Teaching Hospital Ibadan for diagnosis and treatments.

The key findings made by the above analysis are:

1) Majority of the Southeast women are aware of the breast cancer disease.
2) Antenatal clinics, civil society campaign and radio/TV campaign programmes are the major sources of information concerning breast cancer disease.
3) Majority of Southeast women do not attend or perform clinical breast cancer examination. However, considering the people's response to the disease before the public education programme, and the fact that some respondents, although in the minority, attend breast cancer clinical services now, there is low health behaviour modification among Southeast women in spite their assumed knowledge of the disease.
4) Lack of appropriate knowledge of the nature, consequences and curative measures of breast cancer disease contributes to the observed women low health behaviour modification in Southeast Nigeria.
5) Lack of fund and high cost of cancer treatment hinder the participation of Southeast women in breast cancer preventive and curative measures.
6) Absence of accessible Breast Cancer Treatment Facilities also militates against women's participation in breast cancer preventive and curative measures in Southeast Nigeria.

The implication of these findings in the context of existing research is complementary and recommends modification of media breast cancer campaign and programmes. These findings concur with previous studies in the areas of media role in creating breast cancer awareness but unlike them, highlight the inadequacy of the media campaign and content, and the inability of women to access Breast Cancer Treatment Facilities due to some factors. However, this study is limited in thematic scope to investigate the nature of Breast Cancer Treatment Facilities available, their adequacy, constraints and their solutions.

5. Conclusions

After due consideration of these findings, this paper concludes that inappropriate media awareness campaign and knowledge of the nature, consequences and curative measures of breast cancer disease, lack of fund/poverty, high cost of treatments, and absence of accessible breast cancer treatment facilities are the major factors responsible for low but gradual health behaviour modification among women and the spread of breast cancer disease in Southeast Nigeria. The relevance of this conclusion lies on the high level of breast cancer infections in the Southeast, and its request for the re-evaluation and modification of media contents and public education programmes as precursor to proper women health behaviour modification in the area. This paper, therefore, recommends appropriate modification of media campaign contents and programmes to incorporate the nature, signs, consequences and curative measures of breast cancer. Secondly, each state government in the Southeast should urgently establish free breast cancer examination, detective and treatment centre as part of their corporate social responsibility. In addition, government should introduce a health policy that makes it compulsory for women to attend clinical breast cancer examination and engage in preventive health behaviour modification across the Southeast. Thirdly, relevant organs of United Nations, international Non-governmental Organisations, and the African Union should provide assistance to enable these states provide this assistance and services.

Ethics Approval and Consent to Participate

Appropriate Ethics approval and Consent of the respondents to participate in the research were obtained after detailed explanation of the intent of the research, guarantee of individual anonymity were given. We hereby authorise and consent to the publication of this paper if accepted.

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Authors contributed equally in all aspect of this research.

Competing Interests Statement

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

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Influence of NAFDAC Mobile Drugs Authentication Service on the Use of Fake Drugs Among Consumers in Southeast Nigeria

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Abstract

Objective: This paper investigates the influence of Mobile Authentication Service (MAS) in eliminating the consumption of fake/counterfeit drugs in South-east Nigeria.

Methods: 1000 respondents were randomly selected in the five states of the South-east as study sample, while a structured questionnaire was used for collecting data. SPSS version 20.0 was used to analyse the data.

Results: Analysis results reveal that there is a low level of MAS scheme awareness while few persons operate the MAS scheme. It further reveals that MAS scheme made no impact on the distribution and consumption of fake/counterfeit drugs. It also reveals people's inability to procure appropriate phone technology, poor network services, and low level of MAS scheme media awareness campaign was responsible for MAS scheme ineffectiveness.

Conclusion: NAFDAC MAS scheme has not reduced or eliminated the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria. This is because of inappropriate media awareness campaign, people's inability to procure the appropriate phone technology and access good network services required to operate the MAS scheme. This paper recommends appropriate massive media awareness campaign on the MAS Scheme, modernisation of MAS scheme software to accommodate lower level of phone technology, and improved network access as panacea for MAS scheme effectiveness.

Keywords: fake/counterfeit, drugs, MAS scheme, phone technology, and awareness

1. Introduction

The manufacturing, distribution and consumption of fake drugs or counterfeit medications in South-east Nigeria is perverse and has led to many adverse health problems such as injury, disability, paralysis, complications and treatment failure, and even death in some instances (Akinyandenu, 2013; Foreman, 2014; Iwokwagh, 2013; IMPACT, 2013). For instance, 'the intake of counterfeit anti-malaria drugs alone takes the lives of more than 700,000 Africans yearly' (NAFDAC News, 2013:11). Scholars like Osibo (1998) and Bamitale (2013) observed that there are more fake or counterfeit drugs than genuine drugs in circulation in Nigeria. Lambo (2006) reported that 54% of drugs in every major pharmacy in Lagos were fake in 1990, and that the figure rose to 80% in the subsequent year. Fake or counterfeit drugs as used here refers to pharmaceutical products that deceptively represent their origin, authenticity or effectiveness (Ukaoha, Dim, Odikayor-Ogbomo, & Daodu, 2015; Wertheimer & Wang, 2012). Their components differ from the original and are incorrect or harmful ingredients. Akunyili (2010: 17-18) comprehensively defined it as that drug "which appears to be what it is not or drug product that does not measure up to the required quality standards, or drug whose approved time limit for the expected performance of the active ingredients has expired".

The Federal Government promulgated the counterfeit and fake drugs (miscellaneous provisions) Decree No. 21 of 1988, which prohibited the sale and distribution of counterfeit, adulterated, banned, and fake drugs. The weaknesses of the decree led to the emergence of Decree No.21 of 1989 and other subsequent amendments (Akunyili, 2013) that culminated in the establishment of the National Agency for Foods and Drugs Administration and Control (NAFDAC) by Decree No. 15 of 1993. Primarily, NAFDAC was fully responsible for regulating and controlling the manufacture, importation, exportation, advertisement, distribution, sale and use of food, drugs, cosmetics, medical devices, chemicals and packaged water in Nigeria (Akunyili, 2005). These products have high records of fakes in circulation across the country and beyond.

NAFDAC adopted enlightenment campaign programmes in the form of jingles, fliers, leaflets, posters, billboards, workshops, and seminars to combat counterfeit drug consumption. However, these strategies failed due to many problems such as limited access of the media to the populace. Thus, NAFDAC adopted Mobile application services, which posses easier and wide access, as instrument for fighting the use of fake drugs in Nigeria. A mobile application refers to a software application that can be run on a mobile platform using phone or web page (Wigmore, 2013). With the application, customers check if the drugs they want to purchase are genuine typing-in a single-use alphanumeric character contained on the drug packaging to a designated server (Zeppa & Lewis, 2013). In a response time of 30 seconds or less, a network reply of "genuine" or "fake" will follow. This Drug Checker Mobile Authenticating service is designed for use on Android-based phones and other smart phones. This is called NAFDAC Mobile Authentication Service (MAS) using Short Message Service (SMS).

All goods approved by NAFDAC are to be covered under the MAS service scheme particularly antibiotics, anti-inflammatory and anti-malarial pharmaceutical products. Four MAS Service Providers and their Short Codes as approved are: PharmaSecure (code: 38351); Sproxil (Code: 38353); Savanté (Code: 38120); UBQ-t/Kezzler (Code: 20966); and M-Pedigree (Code: 1393). Any of these service providers can be used by consumers provided: i) Theyscratch the product's pin and send it as text message at the point of purchase. ii) They text the right pin to the right code of the provider they want to use. iii) They buy drugs from only registered pharmacies and patent medicines shops. iv) They obtained and retain receipts of payment for items purchased in case there is a problem. v) They report all cases of counterfeit products to NAFDAC's anti-counterfeit desk in Pharmaco-vigilance and Post Marketing Surveillance Directorate, and report other complaints relating to the scheme through a free text message to the PRASCOR number - 20543. This paper aims to investigate the extent of public utilisation of MAS service scheme and its influence on the control and eradication of the consumption of counterfeit drugs in South-east Nigeria.

1.1 Fake/Counterfeit Drugs

The definition of fake or counterfeit drugs differ from country to country (World Health Organisation, 2013) although WHO Member States seem to share similar definition. They emphasize deliberate and fraudulent mislabelling of drugs with respect to brand and generic products as the defining indices of fake drugs. In this sense, counterfeit products include products with correct or wrong ingredients, with or without active ingredients, inadequate quantities of ingredient(s), and with fake packaging. Nigeria's Counterfeit and Fake Drugs and Unwholesome Processed Foods (Miscellaneous Provisions) Decree (1999) defines fake and counterfeit drugs as:

a) any product which is not what it purports to be: b) or any drug or drug product which is coloured, coated, powdered or polished that the damage is concealed or which is made to appear to be better or of greater therapeutic value than it really is, which is not labelled in the prescribed manner or which label or containers or anything accompanying the drug bears any statement, design or device which makes a false claim for the drug or which is false or misleading; or c) any drug or drug product whose container is so made, formed or filled as to be misleading; or d) any drug product whose label does not bear adequate direction for use and such adequate warning against use in those pathological conditions or by children where its use may be dangerous to health or against unsafe usage or methods or duration of use; or e) any drug product which is not registered by the agency in accordance with the provisions of the Food, Drugs and Related Products Decree 1993, as amended.

Similarly, Agbaraji and Ezeh (2012) defined counterfeited drugs as those drugs that are not fake and have been manufactured using inaccurate quantities, or inaccurate ingredients, to either lessen the potency, or quash the potency of drugs altogether, and the same is applicable to food counterfeit. Therefore, counterfeit or fake drugs simply refer to drugs that are produced and sold in forms that deceptively represent their origin, contents and authenticity or effectiveness.

1.2 Communication, Technology and Anti Fake Drugs Campaign

There is sufficient empirical evidence that counterfeit drugs are inimical to human existence and that governments

at all levels of the society across the world have been waging wars against their production, distribution and consumption. Predominantly, television, newspapers, radio stations, etc were earlier used to project commercials, public alert notices on banned products, phone-in programmes, talk shows, etc (Akunyili, 2005; Dike,Onah, and Onwuka, 2014). However, these instruments do not allow for mass input or response to whatever they hear or experience. Importantly, they only describe fake drugs but have no mechanism for identifying them individually in different medical shops to deter consumers from buying them.

Thus, the World Economic Forum (2010) advocated for the use of the New Media Technologies (NMTs), which are powerful forces for change and a fundamentally important way to create awareness, motivate and engage individuals in pro-health behaviours. In the words of Hauser (1998:86) the New Media provides the 'discursive space in which individuals and groups congregate to discuss matters of mutual interest and, where possible, to reach a common judgement'. Etzo and Collender (2010) recorded that Celtel and AIDS Information Centre effectively employed this in Uganda to create AIDS awareness to 15000 mobile phone subscribers. Similarly, OurMed (2015) records that Ghana introduced mPedigree - a GSM network scheme in 2007 to provide pharmaceutical consumers and patients with the means to verify if the medicines they want to purchase are original through a free two-way SMS message. India initiated a similar service scheme as instrument for managing the phenomenal growth of her pharmaceutical industry as well as suppressing the counterfeit drug market (Chandu, 2011).

Similarly, Iwokwagh (2013) noted that NAFDAC introduced a range of fake drugs detecting technologies such as Truscan, Mobile Authentication Service (MAS), using Short Message Service (SMS), Black eye, and Radio Frequency Identification (RFID) to assist NAFDAC then detect and stop fake and counterfeit drugs. Among these, NAFDAC introduced a Mobile Authentication Service (MAS) in 2010 to enable consumers check whether a drug is original or fake with the aid of mobile phone using Sproxil technology. Sproxil is a venture-backed, social enterprise that provides world-class brand protection services in emerging markets (Sproxil, 2015).The Mobile Authentication Service (MAS) programme uses Short Message Service (SMS) to create mass awareness, and provide for on the spot verification of suspected counterfeit products (NAFDAC News, 2013).

In the MAS scheme, SMS and USSD are the means of interaction through the Sproxil technology irrespective of phone capacity and data availability i.e. it does not consume the user's available data. However, the scheme was designed at a time when internet penetration was very lower than it is now. This is the reason why only rich or high level mobile applications that have unlimited access to the scheme now than others. Little or no empirical research evaluated the potency of this service in reducing the distribution and consumption of counterfeit drugs particularly in the South-east. This paper is an attempt to fill this gap.

1.2 Research Question

In pursuit of the goals of this paper, the following questions guide the inquiry:

a. Is there a high level of awareness and use of MAS scheme by drug consumers in the South-east Nigeria?
b. Has the introduction and use of MAS scheme reduced the distribution and consumption of counterfeit drugs in South-east Nigeria?
c. What are the major limitations of the use and effect of MAS scheme as instrument for eradicating counterfeit drugs in South-east Nigeria?

1.3 Significance of the Study

The study will enable NAFDAC and other anti-drug agencies in Nigeria to evaluate the impact of the MAS scheme policy and problems confronting its implementation. The recommendations offered by the paper shall enable these bodies review and modernise the mechanisms of MAS scheme operation to enhance its effectiveness. The study shall equally highlight the potency and the need for the use of mobile applications in social marketing communications and anticrime campaigns. The study equally explicates the role of ICT in re-engineering behaviour modification and social change in South-east Nigeria.

1.4 Framework of Analysis

This study adopts the ACADA model or framework of analysis as espoused by the United Nations Children Fund (UNICEF). The framework holds that for any development or social change or behaviour modification to occur, there must be advocacy, social mobilization, and programme communications (UNICEF, 2000). People's acceptance of change leads to development. The framework emphasizes thorough, practical and sustained approach to the evolution, design and delivery of social change campaigns. Thus, advocacy, social mobilization, and programme communications enable people to accept change. The primary goal of ACADA model/framework

of analysis is behavioural change, and the processes that lead to it. This framework enables the researchers to investigate the MAS scheme as instrument of change or strategy adapted to effect people's behaviour modification in matters of distributing and consuming counterfeit drugs in the South-east. It highlights MAS as important variable for study and a dependent variable that shapes or alters the pattern of counterfeit drugs consumption. It enables the researchers concentrate on the impact of MAS on drug consumers' behaviour.

2. Methods

The study was restricted in geographical scope to the South-east Nigeria, and thematically to the application or use of MAS scheme to detect counterfeit drugs. Periodically, the study is restricted from 2010 (when the MAS scheme was introduced by NAFDAC) to 2017, which is the period of inquiry.

This paper adopts a cross-sectional survey of the five states of the South-east Nigeria. Considering their enormous landmass and population of people, the capitals of these states, i.e. Abakiliki, Awka, Enugu, Owerri, and Umuahia are selected as the areas of study. A structured questionnaire in five-point Likert scale format was used to generate data from a sample of 1000 respondents randomly selected from registered pharmacists and patent medicine shops, and their customers in the various state capitals of the South-east. Two hundred questionnaires were distributed in each of the five study areas. To complement the primary data, the researchers consulted published books, journals, conference and workshop papers, newspapers, magazines, and government gazettes as can be found in public and private libraries, and the internet for secondary data. Experts in the Faculties of Social Sciences and Arts, University of Nigeria who were asked to assess the relevance of the contents and tools used, and to ensure their potency, tested the validity of the instrument used. On the other hand, a test-retest method was carried out within an interval of two weeks in the capital Rivers state to test its reliability. An analysis of the reliability coefficient of the research instrument was estimated to be 0.954 using Cronbach's Alpha technique. The data generated during the research was analyzed using percentage and analysis of variance (ANOVA) (with SPSS, version 20.0 package).

3. Results

An analysis of the demographic data of respondents reveals that 444 respondents out of 1000 (i.e. 44.9%) are males while 556 respondents representing 55.1% are females. Thus, the inquiry is gender sensitive, while the inferences drawn are gender inclusive. Further, 312 respondents representing 31.2% falls within the age bracket of 18 -28 years, 403 respondents representing 40.3% falls within 29-38 years, 188 respondents representing 18.8% are between the ages of 39 and 48 years, while 97 respondents representing 9.7% are 49 years and above. This statistics shows that respondents to this study are people that have acquired relevant technology and knowledge to apply or participate in the MAS scheme. Educationally, 899 respondents (i.e. 89.9%) are graduates of one tertiary institution or the other, while 101 respondents representing 10.1% are high school graduates. Therefore, none of the respondents is handicapped from participating in the MAS scheme.

The SPSS univariate analysis of responses to questions that interrogated if there were high-level awareness of NAFDAC MAS scheme by drug consumers in the South-east Nigeria reveals a total grand mean of 2.23 with a standard error of .053 and a standard deviation of .762. Its Tests of Between-Subjects Effects reveal that the confidence interval of the responses lies between 2.183and 2.273, which is within the 95% confidence interval of the difference. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .000). Further analysis of the respondents' regular use of the NAFDAC MAS scheme to detect and report the sale of counterfeit drugs while purchasing drugs reveals a total grand mean of 2.23 with a standard error of .056, and a standard deviation of .808. Its Tests of Between-Subjects Effects reveals that the confidence interval of the responses lies between 2.178 and 2.276. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .000).

The SPSS univariate analysis of responses to the question that investigated if the NAFDAC MAS scheme reduced the distribution, sale, and consumption of fake/counterfeit drugs in the South-east in Nigeria reveals a total grand mean of 2.20 with a standard error of .023 and a standard deviation of .716. Its Tests of Between-Subjects Effects reveals that the confidence interval of the responses lies between 2.157 and 2.245. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .006).

The univariate analysis of responses to the statement that lack of Will to use the MAS scheme is responsible for MAS failure to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria reveals a total grand mean of 2.23 with a standard error of .052, and a standard deviation of .762. Its Tests of Between-Subjects Effects reveals that the confidence interval of the responses lies between 2.183 and 2.273. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .000).

The analysis of responses to the statement that people's inability to procure efficient phone technology and poor network services contributed to MAS scheme inability to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east in Nigeria reveals a total grand mean of 4.04 with a standard error of .038, and a standard deviation of 1.264. Its Tests of Between-Subjects Effects reveal that the confidence interval of the responses lies between 3.969 and 4.119. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .000).

Further analysis of responses to the statement that low level of MAS media awareness campaign contributed to MAS scheme inability to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria reveals a total grand mean of 4.21 with a standard error of .071, and a standard deviation of 1.063.Its Tests of Between-Subjects Effects reveals that the confidence interval of the responses lies between 4.152 and 4.276. In addition, it reveals that the mean differences of the entire responses shows a significant difference (P = .000).

4. Discussion

This paper studied the impact of MAS scheme on the eradication of fake/counterfeit drug distribution and consumption in South-east Nigeria. In furtherance of this objective, the paper investigated the level of people's awareness of NAFDAC MAS scheme in the South-east Nigeria. Findings showed that the majority of the respondents are not aware of NAFDAC MAS scheme. Further analysis of their responses on their regular use of the NAFDAC MAS scheme to detect and report the sale of counterfeit drugs while purchasing drugs also reveals that the majority of the respondents do not use the NAFDAC MAS scheme when purchasing drugs to detect fake/counterfeit drugs.

An analysis of responses to the statement that the NAFDAC MAS scheme reduced the distribution, sale, and consumption of fake/counterfeit drugs in the South-east Nigeria reveals that MAS scheme has not reduced the distribution, sale, and consumption of fake/counterfeit drugs in the South-east Nigeria. Attempt to find out the factors that are responsible for MAS scheme inability to reduce the distribution, sale, and consumption of fake/counterfeit drugs in the Southeast Nigeria reveals that lack of will to use the MAS scheme has no impact. Thus, lack of will to use the MAS scheme did not contribute to its inability to reduce the distribution, sale, and consumption of fake/counterfeit drugs in the South-east Nigeria.

However, one of the results of the analysis reveals that people's inability to procure efficient phone technology and poor network services contributed to MAS scheme inability to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria. This implies that people's inability to procure efficient phone technology and poor network services required to operate the MAS scheme contributed to its inability to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria. Further analysis of responses to the statement that low level of MAS media awareness campaign contributed to low application and the inability of MAS scheme to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria reveals that low level of MAS media awareness campaign contributed to low application and the inability of MAS scheme to reduce or eliminate the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria.

5. Conclusions and Recommendations

This research evaluated the impact of NAFDAC MAS scheme on the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria. After due consideration of these findings, this paper concludes that NAFDAC MAS scheme has not reduced or eliminated the production, distribution and consumption of fake/counterfeit drugs in the South-east Nigeria. This is because of inappropriate media awareness campaign, people's inability to procure the appropriate phone technology and access good network services required to operate the MAS scheme. This paper, therefore, recommends appropriate massive media awareness campaign on the introduction, mechanism, and importance of MAS Scheme. The software for the operation of MAS scheme should be modified to accommodate wider and lower level of phone technology. Network providers should extend or establish their reception masks across the country to improve their access. These will improve the efficaciousness of MAS scheme in eliminating fake drugs production, distribution and consumption in South-east Nigeria.

Ethics Approval and Consent to Participate

Appropriate Ethics approval and Consent of the respondents to participate in the research were obtained after detailed explanation of the intent of the research, guarantee of individual anonymity were given. We hereby authorise and consent to the publication of this paper if accepted.

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Authors' Contributions

Authors contributed equally in all aspect of this research.

Competing Interests Statement

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

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Yoga Therapy for Chronic Tension-Type Headache

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Abstract

Objective: To evaluate the clinical efficacy of yoga therapy for Chronic Tension-Type Headache.

Method: 68 patients diagnosed with chronic tension-type headache were included in 12- week yoga therapy program. All patients completed baseline assessments before starting the intervention and at 4, 8 and 12 weeks completing the yoga therapy. Headache frequency, duration, intensity and analgesics use were recorded through headache diaries.

Result: Compared with baseline values, mean headache days reduced 51% after 4-week of intervention which continued to reduce by 78% by end of 12 weeks. Comparing from baseline, at 12-week, duration of each headache attack also significantly ($P < 0.0001$) shortened as well as headache intensity ($p < 0.0001$). Days with medication per four weeks at post intervention were lower than those at the baseline.

Conclusion: The study provided preliminary evidence that yoga therapy can be clinically useful for chronic tension-type headache. Further randomised controlled trial is needed.

Clinical Trials.gov Identifier: NCT03862638

Keywords: Yoga therapy, chronic tension type headache, frequency, analgesics use, headache, Yoga

1. Introduction

Chronic Tension-Type Headache (CTTH) is primary headache disorder affecting 2% of population worldwide. It evolves from episodic tension-type headache, to more frequent headaches (15 or more days a month) lasting few minutes to several days (IHS, 2013). Chronic tension headache not only imposes significant social and economic burden (WHO, 2004; Schwartz et al., 1997) but negatively impacts daily life and overall quality of life (Linde et al., 2012; Stovner et al., 2007). Chronic tension headaches often lead to overuse of analgesic and change to rebound headaches. Due to associated risk factors, analgesics overuse and comorbid psychiatric issues, Chronic tension headache become more difficult to manage in primary care (Holroyd et al., 2000). Guidelines recommend antidepressants such as amitriptyline (Bendtsen et al., 1996). However, recent trials reported little or no improvements with amitriptyline in CCTH (Pfaffenrath et al., 1994, Gobel, 1994).

In addition to, or instead of drug therapy, behavioural interventions such as relaxation or biofeedback have been shown to be beneficial (Holroyd et al., 2005; Holroyd et al., 2001; Holroyd et al., 2002). However, additional effective intervention tools with self-management, feasibility and tolerability are desirable. Yoga therapy could possibly be one approach to manage CCTH.

Yoga therapy is a combination of physical postures, breathing exercises, guided meditation, relaxation, and cleansing practices (Kriyas). Yoga has been reported as a safe and cost-effective intervention for managing pain (Nespore, 1991; Evan et al., 2008; Sharma et al., 2013; Büssing et al., 2012; Latha et al., 1987). Recent evidences interlink the physical and psychological benefits of yoga through the mechanisms of down-regulation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system (Damodaran et al., 2012; Vural et al., 2014; Bae et al., 2013). Benefit of yoga in reducing headache frequency, severity and duration of migraine without aura (Wells et al., 2014; Peter et al., 2013; John et al., 2007) and tension type headache (Menon, 2013) has been

documented. One study reported highly significant reduction in severity, duration and frequency of headaches in CCTH with raja yoga meditation (Kirn et al., 2014).

Effectiveness of yoga therapy in the management of chronic tension type headache is limited. Therefore, present study was undertaken to assess the effect of yoga as an intervention in chronic tension type headache.

2. Methods

Study used pre-post design to assess the clinical efficacy of yoga therapy in reducing the incidence, duration and severity of pain in CCTH patients.

2.1 Study Setting and Participants

The study was carried out in outpatient clinic of NMP medical Research Institute, India, from April 2010, to December 2012. The study protocol was approved by the Institutional Ethics Committee (Approval no. 20897)

Initially, patients were screened and recruited by the neurologists in the clinic. Patients with chronic tension-type headache diagnosed by criteria of International Headache Society (IHS, 2004) having not received any treatment in the previous week, besides symptomatic medication. Eligible patients aged 18-55 years, with CTTH for more than a year, suffering from TTH for at least 15 days a month during the previous 3 months, and agreed to provide informed consent were included.

Patients were excluded if having secondary headache disorder or systemic disorders; pregnancy; and patients with psychiatric conditions, drug and substance abuse, having any other complementary and alternative medicines.

2.2 Outcome Measures

Following the inclusion and exclusion criteria, neurologist referred eligible participants to yoga intervention. Those who were eligible and willing to participate were assessed and followed by an independent physician during the study period. Study protocol was explained to participants, and written informed consents were obtained after a detailed explanation of the study purpose and methods.

Baseline assessment included a detailed history, physical examination, and collection of baseline data. All patients filled in headache questionnaire at baseline and 4, 8, and 12 weeks of yoga intervention. As the main outcome measures, the headache diaries were given to record headache score on visual analogue scale from zero (no pain) to 10 (most severe pain), duration of each attack (in hours), the number of days on which headaches occurred per four weeks and analgesics use per four weeks.

2.3 Intervention

Completed baseline assessment, 12-week yoga therapy sessions were started. Participants were asked to attend group therapy session thrice a week alternate days and remaining days to practice at home. Each session lasted for 60 minutes consisting physical posture, breathing exercise, relaxation techniques, guided meditation, chants and combination techniques for groups sessions. Home practice were given as handouts to chart practices for each participant to follow at the same way.

2.4 Statistical Analysis

Statistical methods used included paired t-tests for comparison of mean values. All analyses were carried out using SPSS Statistics 19.0. $P < 0.05$ was considered statistically significant.

3. Results

A total of seventy patients with chronic tension-type headache, mean age of 34.5, who met the inclusion criteria, were included (Figure 1). Two patients did not complete therapy. One moved out of city and another started anti-depressant.

The baseline characteristics are shown in Table 1. Table 2 summarizes the results for medical outcomes for patients completing 12 weeks of intervention; at baseline and 4, 8, and 12 weeks post intervention.

There were significant changes over time after starting yoga therapy. In the primary outcome analysis, mean headache frequency was significantly lower in the group. Scores fell by 51%% at the end of 4-week intervention. At the end of 12-week therapy, frequency reduced 78% comparing from baseline. Effect of yoga therapy was consistent by 12-week. Duration of each attack also significantly ($P < 0.0001$)

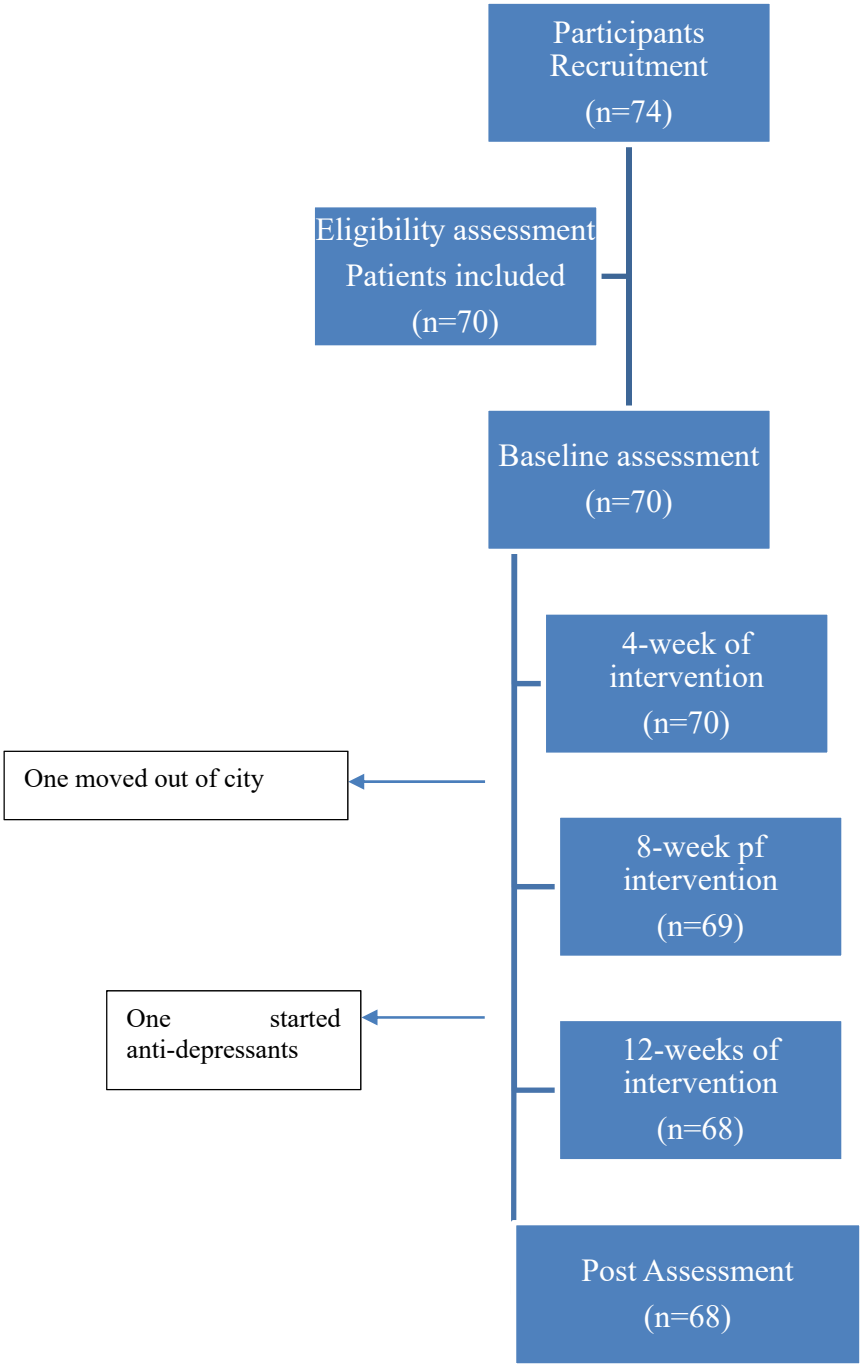

Figure 1. Flow chart of entry and discontinuation by patients during the study

Table 1. Baseline characteristics of Patients

All patients	N= 68
Gender, Male (%)	23 (33.8%)
Age mean (SD)	34.5 (11.1)
Years having headache, mean (SD)	7.9 (3.1)
Days with headache per four weeks mean (SD)	18.7 (2.7)
Duration of each attack (hours)mean (SD)	13.0 (4.8)
Headache score mean (SD)	6.4 (0.7)
Days with medication per four weeks mean (SD)	13.7 (3.8)

Table 2. Change over 4, 8 and 12 weeks of yoga therapy

Outcome measures- Mean (SE)

	Baseline	**4 weeks**	**8 weeks**	**12 weeks**
Headache score	6.4 (0.09)	4.1 (0.08)*	3.4 (0.06)*	3.5 (0.06)
Duration of each attack (hours)	13.0 (3.5)	6.9 (0.59)*	5.4 (0.06)*	5.1 (0.07)
Days with headache/four weeks	18.7 (0.3)	9.11 (0.2)*	4.9 (0.1)*	4.0 (0.09) *
Days with medication/ four weeks	13.7 (0.46)	8.5 (0.20)*	4.6 (0.11)*	3.7 (0.11) *

Paired t-tests: *$P < 0.0001$.

4. Discussion

To best of our knowledge, this is the first clinical study to assess the key variables of headache in patients with chronic tension-type headache given yoga therapy. Results indicate that yoga therapy was found to have a beneficial effect with significant reduction in headache frequency, intensity, duration of pain and medication score.

Despite this fact that yoga cannot prevent or treat diseases itself, it relaxes muscles, regulate blood circulation and help patients feeling better in general. Yoga has been widely used for treating medical conditions, and special sets of practices used in combinations for therapeutic purpose defines yoga therapy. Our study used the specific yoga sets and combinations including physical posture, breathing and relaxation practices, which had not been studied previously in CCTH.

Yoga practices helps to reduce sympathetic nervous system activity (Streeter et al., 2012) whereas regulated breath work (pranayama) balances the autonomic nervous system (Telles et al., 1993; Bhattacharya et al., 2002) and has a powerful influence on stress release (Chong et al., 2011), as a significant risk factors of tension type headache. This explains the possible mechanism of yoga efficacy in our patients.

Yoga therapy produced clinically significant improvement compared to the baseline for each 4 weeks of intervals assessed. Symptoms of chronic tension-type headache abated significantly, and the effects were sustained through the period of 12 weeks. Methodological strengths of our study include a large sample size and high follow-up rates. There had been no safety concerns raised nor any issue of tolerability. Patients recorded the use of analgesics for headache during the study, which were lower after therapy, indicating that the superior results were not due to influence of effective cointerventions.

Study had major limitations of no having comparison group, randomisation and follow up data. Results thus cannot generalised to CCTH. Further studies are required using randomised controlled settings with. Longer follow up periods. However, present study does provide preliminary support the clinical efficacy of yoga therapy in CCTH.

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Competing Interests Statement

All the authors declare that they do not have no financial or personal interest, relationship or ties with people or

organizations that can inappropriately influence research work; there is no interest of any kind, professional or personal of any nature or kind in any product, service, and/or company that could be the review, results or data presented in the paper.

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Attention-Deficit and Hyperactivity Disorder: A Disorder or a Fraud?

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Abstract

Attention Deficit Hyperactivity Disorder is a psychiatric and behavioral disorder marked by chronic inattention and/or hyperactivity-impulsivity that interferes with functioning or development. This disorder is caused by many dysfunctions in the brain especially in the prefrontal cortex. To date, numerous studies have attempted to unravel the biological pathways behind ADHD. Many environmental risk factors have been identified including lead exposure and prenatal alcohol and tobacco exposure. Specific mutations in genes affecting dopamine and norepinephrine release are also under investigation. Moreover, around three thousand papers have been published showing that ADHD is due to an abnormal dopamine and norepinephrine neurotransmitters secretion in the prefrontal cortex (PFC). This paper aims to provide an updated review of the biological causes of ADHD with an unprecedented focus on different cellular pathways involving catecholamine secretion in the prefrontal cortex. A well rounded and comprehensive review of the etiology of ADHD would prevent its misdiagnosis by health professionals and consequently restrict its malpractice by the use of unnecessary treatments and medications. The ADHD controversy still remains: a disorder or a fraud?

Keywords: attention deficit hyperactivity disorder, dopamine, fraud, hyperactivity, impulsivity, inattention, misdiagnosis, norepinephrine, prefrontal cortex

1. Introduction

ADHD is a behavioral condition characterized by a short attention span; it can be accompanied by hyperactivity (Barkley, 1981). The Diagnostic and Statistical Manual DSM-5 of the American Association describes 3 basic types of ADHD: inattentive; hyperactive-impulsive; and combined. The percentage of children diagnosed with ADHD increased over the last few years by 10%, especially in the United States, meanwhile other studies suggest that the worldwide prevalence of ADHD is between 8% and 12% (Pediatrics, 2000). This disorder is mostly diagnosed in school-aged children between 5 and 17 years of age, and its prevalence is 3 to 5 times more common in boys than girls. While boys tend to be more hyperactive and impulsive, girls are inclined to be more inattentive (Gaub & Carlson, 1997). ADHD in children may lead to academic-social difficulties and challenges: their inattentive behavior prevents them from receiving and processing information properly and following instructions becomes challenging due their impulsive conduct (Association, 1980). The disorder has different symptoms and causes which are rooted in a neuro-chemical dysfunction in the brain.

Research about ADHD in children has exponentially grown during the last decade. Around three thousand articles can be retrieved from scientific databases using “ADHD” and “etiology” as keywords; and the latest review on the pathophysiology, etiology, and treatment of ADHD was published in 2014 (Sharma & Couture, 2014).

To date, most research has focused on the biological pathway of ADHD involving the pathophysiology of catecholamine secretion in the brain (A. F. Arnsten, 2007). However, there were no recent reports with an updated review concerning the other biological aspects of ADHD such as the pathophysiology of dopamine secretion and the role of signaling pathways involving Guanylyl Cyclase-C receptor and the Akt-mTOR signaling pathway.

Furthermore, opposing viewpoints appear between studies that dismiss ADHD as a fictitious disorder while others approve ADHD’s classification as a legitimate disorder caused by dysfunctions in the brain and/or environmental factors. ADHD is thus sometimes considered to be a myth rather than a disorder (Kagan, 2009). This review paper will expand on the different types of ADHD, delineate its evolution from 1902 until recent times, and attempt to

reach a consensus regarding the legitimacy of ADHD.

2. Method

We used three databases: PubMed, Science Direct and Google Scholar. Search restrictions were based on the English language, year of publication between 2003 and 2019, type of publication set to journal, and human and rodent experimental models. We excluded all the articles and reviews that researched ADHD and Autism together in the same study.

No review work was found to determine ADHD as fake or a real biological disorder at the same time. The only review paper found on PubMed that linked controversy of the disorder involved only one epidemiological study (Pena & Montiel-Nava, 2003) and did not tackle all the biological aspects of ADHD.

The selected reports detailing cellular pathways were collected in an EndNote library and further checked for full screen of titles and abstracts. We intially started by analyzing reports defining ADHD in children and elaborating its symptoms, causes and most importantly its biological pathways. Moreover, we examined papers involving different treatments for ADHD and found it interesting to include new treatment approaches away from pharmaceutical drug use, such as physical exercise. Finally, we connected all pertinent information in an attempt to bring about an answer to the title of our paper.

3. Results

3.1 What is ADHD?

Attention Deficit Hyperactivity Disorder abbreviated as ADHD is a brain disorder marked by an inability to maintain attention and/or hyperactivity-impulsivity that disrupt functioning or development (Biederman, 1998). Inattention occurs when children have difficulty in maintaining focus. They wander off during tasks, lack persistence and determination, and are disorganized. Hyperactivity is observed by a frequent restlessness when children move about constantly especially in situations in which it is not appropriate. Moreover, hyperactivity is also characterized by excessive fidgets, taps or talks, and extreme restlessness. On the other hand, impulsivity is when children produce rapid actions without even thinking about them and that may pose high potential for harm. They may excessively interrupt others making them socially intrusive. In addition to that, children may jump to important decisions without considering the long-term consequences (Association, 1980).

The disorder was first mentioned in 1902 by a British pediatrician, Sir George Still, who found that some children could not control their behavior the way a normal child could, but they were still intelligent. This behavior was described as “an abnormal defect of moral control in children” (Still, 1902). In 1952, the “Diagnostic and Statistical Manual of Mental Disorders” (DSM) issued for the first time (Association, 1952) summarized a list of all universally recognized mental disorders with their causes, risk factors, and treatments; among which ADHD was absent. It was not until 16 years later that the second DSM included hyperactivity impulse disorder in the list (Association, 1968). The name of the disorder changed from “hyperkinetic impulse disorder” to “Attention Deficit Disorder” or ADD in the third edition of the DSM (Association, 1980). At that time, the “H” was not there because psychologists believed that hyperactivity was not a common symptom of the disorder, hence they created two subtypes of ADD: ADD with hyperactivity and ADD without hyperactivity (Barkley, 1981). ADHD was still known as ADD until 1987 when they released a revised version of the DSM-III: scientists removed the hyperactivity distinction and changed the name into Attention Deficit Hyperactivity (Association, 2000). They believed that the disorder had no subtypes and combined the three distinctive symptoms of inattentiveness, impulsivity, and hyperactivity. Finally, the APA released the fourth edition of DSM in 2000 by recognizing that ADHD has three subtypes: combined ADHD, predominantly inattentive type of ADHD, and predominantly hyperactive-impulsive type of ADHD (Association, 2000).

3.2 Symptoms of ADHD

ADHD subtypes can be distinguished by inattention or hyperactivity/impulsivity. While some children with the disorder experience problems with one of these behaviors, others experience both in what is termed the combined type of ADHD. Nonetheless, taking into consideration the age of the child and their surrounding, a small degree of inattention, uncoordinated motor activity and careless impulsivity may seem relatively normal. The difference from ADHD children lies in the severity and frequency of these behaviors. The World Health Organization (WHO) initially reported that children with inattention problems often have difficulties in sustaining attention during tasks or play, including conversations, lectures or lengthy readings. They often fail to keep close attention to details and commit careless mistakes in their responsibilities or during other mundane activities. They often have difficulties following instructions and fail to finish schoolwork on time; they are sometimes able to start tasks but quickly lose focus and get easily sidetracked. On the other hand, organizing tasks and activities are challenging for them: they

do not know what to do in sequence and lose things necessary for the completion of the tasks or activities. Inattention is diagnosed when a child has at least 6 of the previous symptoms of inattention that must have persisted for at least 6 months (Association, 2013). Children with ADHD get easily distracted by external stimuli because of a lack of sensory filtration at the level of the caudate nucleus; nerve cells in the brain that process all sensory input before directing it to conscious awareness. This nucleus acts as a gatekeeper that allows only relevant stimuli to reach conscious awareness (Barkley, 1997). Gupta (2005) showed that children with ADHD have a relatively smaller right-sided caudate nucleus than normal children; thus every stimulus that arrives to it is brought to conscious awareness without proper processing; that is why ADHD patients are easily distracted (Gupta, 2005).

Who describes hyperactive-impulsive children with excessive fidgeting or tapping of hands or feet or squirming in their seats. They leave their seats in classroom or other situations in which staying seated is expected. Moreover, they run or climb in situations where this behavior is inappropriate. They have difficulties in playing or engaging in hobbies quietly. On the other hand, hyperactive children tend to be in a constant motion or "on the go", or act as if they are driven by a motor. They keep on talking all the time and blurt out answers before a question has been completed asked. They tend to finish other people's sentences and speak without waiting for their turn. In order to diagnose hyperactivity and impulsivity, a child must have at least 6 of the previous symptoms of hyperactivity/impulsivity that must have persisted for at least 6 months (Association, 2000). Hyperactivity stems from deficits in the brain's executive functions which involve organization, self-monitoring and self-regulation (Barkley, 1997). Children with ADHD are not able to organize their space and time well; their desks and rooms are disorganized, and they cannot self-monitor and self-regulate their actions (Gupta, 2005). Moreover, impulsive children have a short circuit in their nerve-cell wiring, causing them to act impulsively and to have poor working memory, resulting in poor processing of incoming information (Barkley, 1997).

A European study surveyed parents of children aged 6 to 18 years old by the completion of an online questionnaire. Children were divided into two groups: ADHD group and normative population group. This study included n= 910 parents of ADHD group and n= 995 parents of normative population group. Compared with the normative population sample, parents reported that ADHD children consistently displayed more demanding, noisy, disruptive, disorganized and impulsive behavior in addition to an exaggerated conduct (Coghill et al., 2008).

3.3 Pathophysiology of ADHD

ADHD is associated with alterations in the Prefrontal cortex (PFC) and its connections to the striatum and cerebellum (Giedd, Blumenthal, Molloy, & Castellanos, 2001). The PFC, especially the right one, plays an important role in regulating behavior and attention, and more importantly maintaining attention over a delay by inhibiting distraction (Goldman-Rakic, 1987). Lesions to the PFC will lead to distractibility, forgetfulness, impulsivity, poor planning, and locomotor hyperactivity (Itami & Uno, 2002). A child with ADHD has impaired behavioral inhibition, increased motor activity, and inattention. All these ADHD symptoms arise from disruptions in brain circuits regulating attention and action (Aron, Robbins, & Poldrack, 2004). The PFC is connected to several areas in the brain including sensory and motor cortices, cerebellum and basal ganglia. These structures communicate by means of catecholamine (Norepinephrine NE and Dopamine DA) secretions which enhance the regulation of behaviors and attention. Both DA and NE exhibit an inverted U influence on the PFC cognitive functions, where either too little or too much of their secretion impairs PFC function (A. F. Arnsten, 2007).

3.3.1 Role of Norepinephrine

Norepinephrine (NE) is a neurotransmitter that acts on three general families of adrenoceptors α1, α2 and β1, 2, and 3 (Mouradian, Sessler, & Waterhouse, 1991). This neurotransmitter is secreted by locus coeruleus of the brain and targets all parts of the brain especially the PFC. NE release in the PFC improves working memory which helps in controlling behavior and attention through action at postsynaptic α2A receptors on PFC dendritic spines (A. Arnsten & Goldman-Rakic, 1985). The latter will be activated upon binding to α2A receptors, and in turn will activate inhibitory Gi membrane protein which inhibits cAMP, closing nearby HCN channels and allowing the network to connect. However, in ADHD cases, the G protein on the postsynaptic membrane enhances cAMP production in the cytosol which opens HCN channels that are localized on the PFC dendritic spines. When HCN channels open, the postsynaptic membrane resistance lowers and inputs to the spine are shunted (M. Wang et al., 2007). Conversely, blocked α2A receptors in the PFC will impair working memory, impulse control and attention, and induce locomotor hyperactivity (C.-L. Ma, Arnsten, & Li, 2005) (Figure 1).

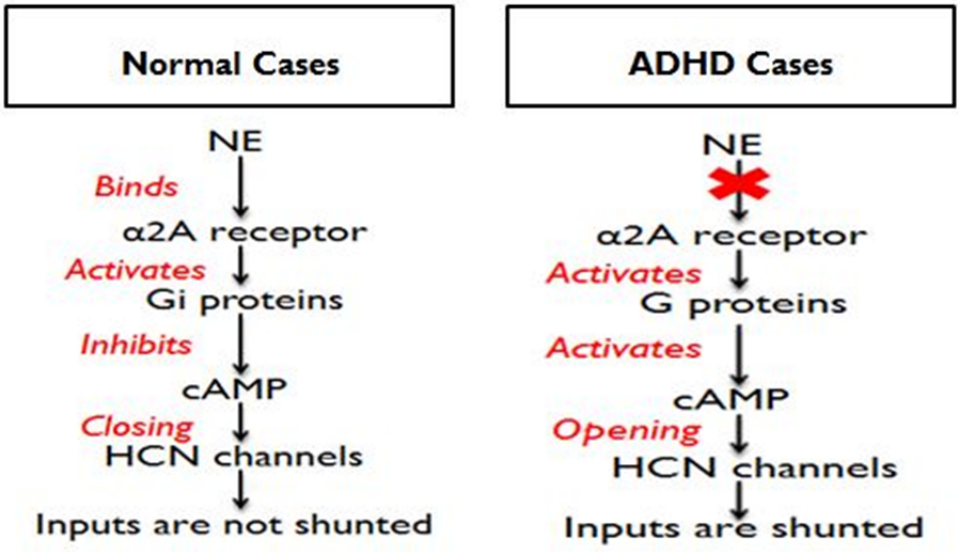

Figure 1. Norepinephrine (NE) mode of action in Normal vs. ADHD cases

3.3.2 Role of Dopamine

Dopamine (DA) is a neurotransmitter that acts on two families of receptors: the D1 family including D1 and D5 (Sawaguchi & Goldman-Rakic, 1991), and the D2 family composed of D2, D3, and D4 (M. Wang, Vijayraghavan, & Goldman-Rakic, 2004). This neurotransmitter is secreted by the substantia nigra and ventral tegmental area of the brain, and targets all parts of the brain especially the PFC. DA receptors are found in the PFC on dendritic spines (Smiley, Levey, Ciliax, & Goldman-Rakic, 1994). Stimulation by DA enhances the working memory and the attention regulation processes of the PFC (Granon et al., 2000); nonetheless, only a modest amount of secreted DA is required to enhance behaviors, attention and working memory. Very high or very low levels of DA will impair working memory and lead to ADHD symptoms (Vijayraghavan, Wang, Birnbaum, Williams, & Arnsten, 2007). D1/D2 receptors activated by very high or very low DA release will increase cAMP production and shunt inputs onto spines by opening HCN channels (Zahrt, Taylor, Mathew, & Arnsten, 1997) (Figure 2). DA may also act on D4 receptors. These receptors are concentrated on GABAergic interneurons and upon stimulation they inhibit GABA transmission via Gi-mediated reduction of cAMP signaling. Weaker D4 receptor actions thus lead to excessive GABA transmission and suppression of cell firing (X. Wang, Zhong, & Yan, 2002). In the case of ADHD, the expression of DRD4 7 repeat polymorphism allele would weaken D4 receptor efficacy and lead to insufficient D4 inhibition of GABA, and thus insufficient PFC cell firing to the other parts of the brain (Sunohara et al., 2000).

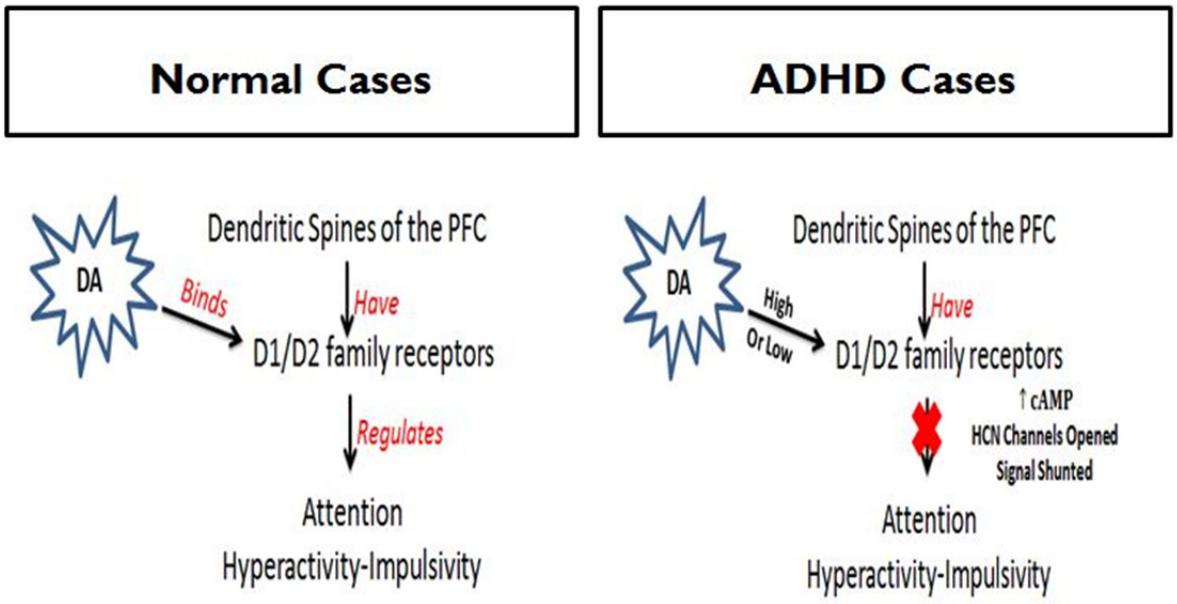

Figure 2. Dopamine (DA) mode of action in Normal vs. ADHD cases

3.3.3 Role for the Membrane Receptor Guanylyl Cyclase-C

DA neurons located in the midbrain ventral tegmental area and substantia nigra compacta (VTA/SNc) release DA to regulate behavioral processes such as motor activity, cognition, motivation, and learning (Emilien, Maloteaux, Geurts, Hoogenberg, & Cragg, 1999). The membrane receptor Guanylyl Cyclase-C (GC-C) is observed to be strongly expressed throughout the VTA/SNc of the brain (Lein et al., 2007). An experiment proved that expression in the VTA/SNc in TH-GFP transgenic mice. A dual-color immunostaining revealed that GC-C stains in red, while TH (critical enzyme for DA synthesis) stains in green (Matsushita et al., 2002). VTA/SNc DA neurons appeared both red and green under the microscope after dual-color immunostaining indicating the presence of GC-C receptor on the presynaptic membrane of DA neurons (Gong et al., 2011). An activated GC-C receptor will activate Protein Kinase G (PKG) which will stimulate DA secretion to the prefrontal cortex (Figure 3A). Moreover, GC-C potentiates the excitatory responses by the mediation of glutamate and acetylcholine receptors via the activity of PKG. G and UG are ligands for GC-C, and upon binding, PKG will be activated and will potentiate the response evoked by DHPG (a ligand of glutamate receptors which excites DA neurons) (Lucas et al., 2000). An application of G ligand dramatically increased the firing frequency of action potentials evoked by DHPG. Moreover, GC-C KO mice were used in this experiment to study the importance of GC-C in DA neurons. In these mice, GC-C was knocked out and after addition of the ligand UG, no potentiation of the action potential was detected (Gong et al., 2011).

3.3.4 Importance of PKG in DA secretion

As mentioned before, upon activation of GC-C receptor, PKG will be activated and will potentiate the excitatory response of DA neurons mediated by glutamate and acetylcholine receptors (Lucas et al., 2000). To prove the importance of PKG in DA secretion, two PKG inhibitors were used: Rp-8-pCPT-cGMPs and KT5823 (Kwan, Huang, & Yao, 2004). After activation of membrane GC-C by G ligand, no amplification in the action potential of DA neurons was detected, thus PKG is critical in the potentiation of the action potential (Gong et al., 2011). As additional proof, 8-Br-cGMP was used as a PKG activator in GC-C KO mice (Lucas et al., 2000). Upon activation by 8-Br-cGMP, PKG amplified the action potentials evoked by DHPG (Gong et al., 2011).

3.3.5 GC-C/PKG signaling pathway and ADHD

Other experiments were conducted to prove that GC-C/PKG signaling pathway affects behavior by modulating brain dopamine levels. Attention and hyperactivity were both analyzed in GC-C KO mice and wild-type normal mice (Mann, Jump, Wu, Yee, & Giannella, 1997) by placing them in an open field to study their locomotor activity. GC-C KO mice proved to be more hyperactive when they traveled a higher distance as opposed to Wt mice. Hence,

GC-C/PKG signaling is important in DA secretion and behavior regulation especially hyperactivity behaviors (Gong et al., 2011).

Attention was tested with an olfactory habituation test to examine whether GC-C KO mice had impaired response habituation in behaviors other than locomotion. Wt mice reduced their interest when the same odorant was presented repetitively but increased again in response to a novel odor. GC-C KO mice spent more time investigating odorant stimuli and displayed impairment in olfactory habituation after repetitive presentation of the same odorant (Gong et al., 2011). Hence, reduced response habituation in GC-C KO mice is associated with impaired attention (Zhuang et al., 2001).

To sum up, GC-C receptors found on DA neurons in VTA/SNc affect DA secretion and behavior regulations (Emilien et al., 1999). Active GC-C receptor by bound ligand (UG/G) stimulates PKG which further potentiates the excitatory responses mediated by glutamate and acetylcholine receptors (Lucas et al., 2000). Potentiation of the excitatory response means more DA neurotransmitters are being released from VTA/SNc to other parts of the brain especially to the prefrontal cortex where behaviors such as hyperactivity (Mann et al., 1997) and attention (Zhuang et al., 2001) are regulated. In ADHD cases, GC-C is knocked out, hence abnormal DA secretions render children hyperactive and inattentive (Gong et al., 2011) (Figure 3B).

3.3.6 Role of Dopamine on Post-Synaptic Membrane

DA neurotransmitters secreted in the PFC bind and activate D2R on the post-synaptic membrane (Smiley et al., 1994). Upon activation, the receptor will phosphorylate Akt, an intracellular signaling protein that targets mTOR (Beaulieu et al., 2004). The latter activates S6K, a transcription factor initiating transcription and translation of certain genes in the PFC, allowing the synthesis of certain proteins that play a role in neuroplasticity (Ma and Blenis 2009). Such proteins increase the connection between the PFC and other parts of the brain and thus improve attention, and reduce hyperactivity and impulsivity. However, very low or very high DA secretions in ADHD cases will prevent D2R from phosphorylating Akt. Deactivated Akt will prevent mTOR from phosphorylating S6K, and will increase the hypophosphorylated level of 4E-BP1 which is an intracellular signaling protein that blocks the synthesis of proteins responsible for neuroplasticity (Gingrich & Caron, 1993; X. M. Ma & Blenis, 2009). This in turn will increase cAMP production in the post-synaptic neuron and shunt inputs onto spines by opening HCN channels (Zahrt et al., 1997).

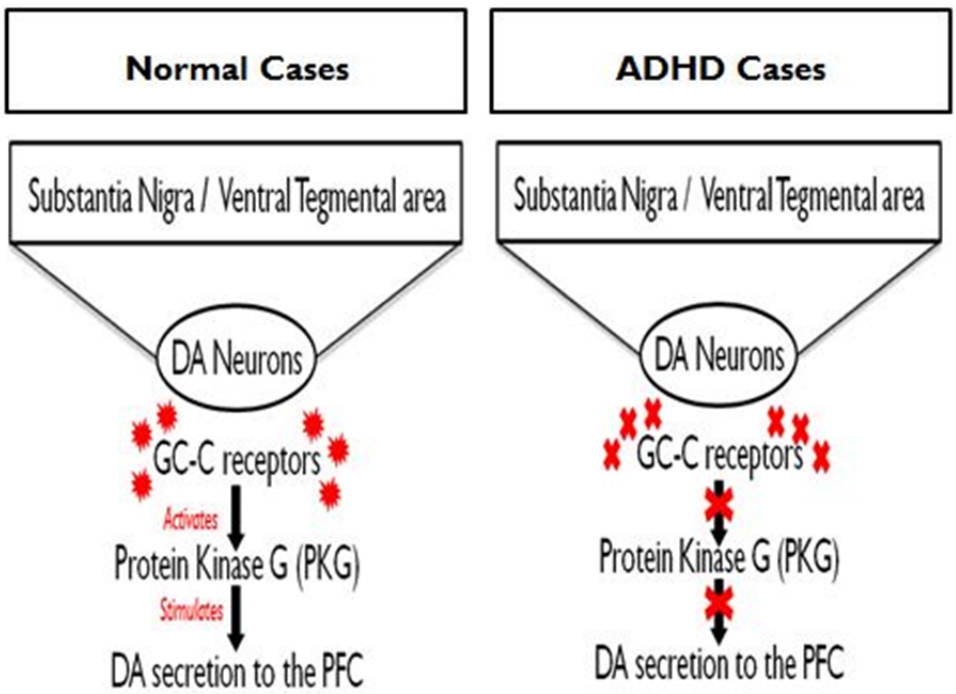

Figure 3. Role of membrane GC-C receptors in Normal cases vs. ADHD cases

3.4 Genetic and Environmental Causes Behind ADHD

ADHD tends to run in families. When one family member is diagnosed with ADHD, there is a 25% to 35% chance that another will also have the condition; compared to 4% to 6% in the general public (Biederman et al., 1994). Genetic and environmental interactions can cause severe inattention, hyperactivity, or both. Researchers found that the stimulant Ritaline® (drug) calms rather than excites children with ADHD (Dyme, Sahakian, Golinko, & Rabe, 1982). Since these drugs work by indirectly regulating dopamine levels in the brain, then dopamine secretion in the brain is one of the major causes leading to ADHD in children. Studies were done to seek out genes that affect dopamine communication and decrease its secretion in the brain such as receptor DRD4, transporter DAT, and protein SNAP-25, which help in releasing dopamine neurotransmitter from nerve cells (Li, Sham, Owen, & He, 2006). DRD4 7R, a variety of the DRD4 gene associated with ADHD could affect dopamine secretion in the brain. Inheritance of this gene gave kids faster reaction times and different attention spans, which are symptoms related to the disorder (Sunohara et al., 2000). On the other hand, Susan Smalley from the University of California, Los Angeles, led the first ADHD genome scans, and found hints of ADHD genes on chromosome 5, 6, 16 and 17, and several of these gene regions overlap with those implicated in autism and dyslexia. Hence, these disorders may share neurological glitches that disrupt the brain's executive function system and the neural network that governs tasks such as problem-solving, planning, and attention (Brown, 2003).

ADHD is not only caused by genetic dysfunctions; the environment also plays an important role in inducing such a disorder in children. Studies have shown that exposing children to environmental toxicants such as prenatal cigarette smoke (Milberger, Biederman, Faraone, Chen, & Jones, 1996), alcohol (Coles et al., 1997) and lead (Wasserman, Staghezza-Jaramillo, Shrout, Popovac, & Graziano, 1998) put them at a higher risk for developing ADHD.

Blood lead concentrations in ADHD children and normal children in the US showed that children with blood lead concentration in the fifth quintile were at a significantly higher risk for developing ADHD (Braun, Kahn, Froehlich, Auinger, & Lanphear, 2006).

Moreover, a significant association between prenatal environmental tobacco smoke (ETS) exposure and ADHD was found in an experiment where interactions between sex and prenatal exposure to ETS were tested. Females who were prenatally exposed to ETS were at a 4.6 fold higher risk of ADHD compared to unexposed females, whereas exposed males were at an almost significant 2 fold higher risk for ADHD than unexposed males (Braun et al., 2006).

Futhermore, prenatal exposures to tobacco smoke and alcohol cause a decrease in the cerebral as well as the cerebellum volume of ADHD cases. The effect of maternal smoking and alcohol use during pregnancy on global brain volumes in children with ADHD and normal children was studied with MRI. ADHD subjects who had been prenatally exposed to cigarettes or alcohol, unexposed ADHD subject, exposed control subjects and unexposed control subjects, were all included in the study. The MRI clearly showed that the cerebral and cerebellum volumes were the smallest in ADHD exposed children, showing that cigarette smoke and alcohol use during pregnancy decrease the volume of the brain in ADHD children and worsen the symptoms of the disorder (Mackie et al., 2007). Hence, prenatal exposure to cigarette smoke and alcohol decreases the cerebral volume especially the volume of the cerebellum grey matter in children with ADHD (De Zeeuw, Zwart, Schrama, Van Engeland, & Durston, 2012).

3.5 Treatments of ADHD

In 1936, the U.S. Food and Drug Administration (FDA) approved that the stimulant drug Benzedrine® which contains amphetamine is an efficient in treating ADHD; young patients' behavior and performance in school improved after taking this drug (Barkley, 1981). In 1955, the FDA discovered a new psychostimulant known as Ritalin®, which contains methylphenidate (Greenhill & Osman, 2000). This drug is efficient in treating ADHD, and it is still used to treat children suffering from the disorder. These pharmacological treatments of ADHD all target catecholamine signaling in the prefrontal cortex. They can be divided as stimulants or non-stimulants. Stimulant drugs work by increasing brain chemicals such as dopamine and norepinephrine, which play essential roles in thinking, attention and other behavioral regulations (Elliott et al., 1997). However, WHO reports that stimulant drugs are not all safe and may cause side effects in ADHD children such as decreased appetite, sleep complications, personality changes, increased anxiety and irritability, stomachaches, and headaches. Hence, doctors may prescribe non-stimulant drugs when patient experience the side effects from stimulant drugs; although they take longer to start working but at the end they improve focus, attention, and impulsivity in persons with ADHD (Spencer & Biederman, 2002).

3.5.1 Effect of Exercise and Methylphenidate® on ADHD

Physical exercises could have therapeutic effects on ADHD symptoms such as hyperactivity and impulsivity (Verret, Guay, Berthiaume, Gardiner, & Béliveau, 2012) and these effects were evident in an experiment that used two categories of rats: spontaneously hypertensive rats (SHR) and Wistar-Kyoto (WKY) rats (Sagvolden, 2000). These rats were divided into groups of four: the control group (WKY rats), the the ADHD group (SHR rats), the ADHD and exercise group (physical exercise done by SHR rats), and the fourth one was the ADHD and methylphenidate-treated group (SHR rats treated with methylphenidate®). Rats in the exercise group were forced to run on a treadmill for 30 minutes once a day at a speed of 2 meters per minute, and rats in group 4 were treated with methylphenidate® which is a stimulant drug that enhances the secretion of catecholamine neurotransmitters (Kim et al., 2011). All four groups were tested for their hyperactivity in an open-field arena (Open-field test) which is a large white square inside which rats are placed (Cho, Baek, & Baek, 2014). Results showed that ADHD rats were more hypertensive than control rats. Consequently, hyperactivity was measured again after finishing their physical exercise (group 3) and after treating rats in group 4 by placing all rats in the open-field arena (3 times). A change in hyperactivity was detected the most in the exercising rats and treated rats (Archer & Kostrzewa, 2012); every time they were placed in the open-field arena, their hyperactivity decreased. Thus, both exercise and methylphenidate® are efficient in reducing hyperactivity behaviors in ADHD cases (Cho et al., 2014).

Physical exercises do not only regulate hypertensive behaviors, but also impulsivity in ADHD rats. All four groups of rats were placed on an elevated plus maze consisting of 2 open arms and 2 closed arms. Normally, once placed on the elevated maze, non-impulsive rats would go directly towards the closed arms and away from the open arms to avoid falling over. The latency time measured in this experiment represents the latency of staying in the open arm in the elevated plus maze task. Results showed that exercising and treatment with methylphenidate® were both efficient in decreasing impulsivity in ADHD rats since they passed less time in the open arm compared to untreated ADHD rats. ADHD group demonstrated a significant increase in the latency time and the number of entrances into the open arm, as compared with the control group (Cho et al., 2014).

At the neurological level of ADHD cases, the activated D2-like receptor decreases the excitability of DA neurons and its release (Wu, Xiao, Sun, Zou, & Zhu, 2012). This receptor is expressed on the presynaptic and postsynaptic neurons of the subtantia nigra, and plays an important role in the regulation of DA neuronal activity, synthesis, release and uptake (Negyessy & Goldman Rakic, 2005). However, physical activity stimulates dopamine release in the central nerve system and suppresses the expression of D2-like receptor in the subtantia nigra (O'dell et al., 2007). After ADHD rats were allowed to run on a treadmill for 30 minutes (Cho et al., 2014), hyperactivity in rats was suppressed and their DA levels increased (Ji, Kim, Park, & Bahn, 2014). Thus, treadmill exercise suppresses hyperactivity and D2 receptor expression in ADHD rats and enhances the secretion of DA neurotransmitter which alleviates hyperactivity, impulsivity, and controls attention, movement, cognition, mood and reward (Negyessy & Goldman Rakic, 2005). Hence, physical exercise might be of great value in the treatment of ADHD in children, along with the use of drugs such as methylphenidate® (Cho et al., 2014).

3.5.2 SK609: another treatment for ADHD

Low doses of methylphenidate® increase DA and NE levels in the PFC leading to cognitive enhancement (C. Berridge et al., 2006; Rowley et al., 2014). Recently, SK609 was designed as a D3R agonist, and characterized for its effects on monoamine transporters (Nakajima et al., 2013; Sokoloff, Giros, Martres, Bouthenet, & Schwartz, 1990). Results demonstrate that SK609, in addition to its D3R agonist effects, plays the role of NE transporters' (NET) substrate and blocks its action in the uptake of NE (Marshall et al., 2019). To validate SK609 effects on catecholamine secretion in the PFC, DA and NE efflux levels were measured using microdialysis assays. A peak dose of SK609 (4 mg/kg) significantly increased both DA and NE levels in the PFC (Marshall et al., 2019). From here, SK609's actions on DA and NE secretion raise the question about its effect on PFC-mediated cognitive tasks. Thus, the molecule was tested for its effect on attention in low performing rats (Marshall et al., 2019). Results showed that SK609 significantly improved performance in a dose-dependent manner with peak effects at 4 mg/kg. Further, SK609 produced an inverted-U shaped dose response, similar to that of methylphenidate® (C. W. Berridge et al., 2012). Specifically, 6 of the 7 low performing rats significantly improved in performance when treated with SK609 by responding correctly to a task, thereby transitioning into high performers (Marshall et al., 2019). Moreover, SK609's peak effect was blocked by a pre-treatment with either the D2/D3R antagonist 'raclopride' (0.05 mg/kg) or the alpha-1 adrenergic receptor antagonist 'prazosin' (0.25 mg/kg). Both D2/D3R antagonists impaired sustained attention performance in rats, confirming a role for both DA and NE in promoting sustained attention (Bari & Robbins, 2013; Hillhouse & Prus, 2013; Puumala, Riekkinen SR, & Sirviö, 1997; Shoaib & Bizarro, 2005). On the other hand, NET inhibitors 'desipramine' and 'atomoxetine' were used, leading to

an elevation in DA levels in addition to NE in the PFC, suggesting that prefrontal NET plays a role in the uptake of both DA and NE (Carboni, Tanda, Frau, & Chiara, 1990; Higashino et al., 2014). Usually, methylphenidate® blocks NET and DAT: it improves attention, but as a side effect also increases locomotor activity by increasing the extracellular DA level in the PFC (Rowley et al., 2014). However, SK609 (2, 4, and 8 mg/kg) did not induce spontaneous locomotor activity in an open field task, proving that SK609 lacks inhibitory effects on DAT (Marshall et al., 2019). Studies suggest SK609 may be better suited for treating attention deficit than other psychostimulants like methylphenidate®. In conclusion, SK609 is a novel D3R agonist with selective inhibitory effects at NET. It penetrates the brain and increases DA and NE levels in the PFC. This increase in extracellular catecholamine concentrations is responsible for the significant improvement of attention. The peak effect of SK609 was similar to the improvement observed with methylphenidate®. Most importantly, SK609 has a low affinity for DAT, as it did not trigger hyperlocomotion in rats. These unique properties of SK609 differentiate it from existing therapies for ADHD, many of which are misused for their cognitive and performance-enhancing properties.

4. Discussion

Nowadays, heated debates around the ADHD controversy, questioning the disorder as being real or incorrectly diagnosed and thus "fraudulent". After being classified as a psychiatric disorder in the DSM, ADHD cannot be dismissed as a complete myth. However, ADHD is currently receiving the "fraud" reputation following misdiagnosis/overdiagosis/overtreatment by doctors and parents. Every misbehaving child is sent to visit a pediatrician, who claims: "It's ADHD, here's methylphenidate®". Thus, children are wrongly diagnosed with ADHD every time they demonstrate an "active" behavior while 90% of these 4.5 million kids do not have any abnormal DA metabolism or biological basis (Kagan, 2009). This exponential increase in methylphenidate® prescriptions in recent years has worried researchers about its misuse among individuals who do not meet the full diagnostic criteria for ADHD such as young children and students in search of cognitive improvement (Schmitz, Chao, & Wyse, 2019). Hence, the answer for "ADHD: a disorder?" would be YES only when health professionals diagnose their patients correctly and ethically. Similarly, the answer for "ADHD a fraud?" would also be YES in the case where doctors and parents diagnose their misbehaving children as having ADHD, without even thinking of the main reasons behind these abnormal behaviors (Figure 4). Fatigue (insufficient catecholamines) or stress (excessive catecholamine) may produce changes in attention and behavioral regulation that resemble ADHD symptoms. This may be problematic in children exposed to stressors such as families experiencing divorce, illness, or death, or social stressors at school. Every child is at risk of being exposed to such stressors leading to attention problems and behavioral deregulations, but it does not imply that this child suffers from ADHD (Brennan & Arnsten, 2008). In addition to that, 53% of children in the US are being diagnosed as having ADHD and are being treated pharmaceutically; a significant number when compared to the 0.5% of children diagnosed as having ADHD in France. The main cause behind that difference is that health professionals and parents in the US misdiagnose children as suffering from ADHD by prescribing drugs to treat them instead of searching for the real psychological causes behind their abnormal behavior. However, in France, psychiatrists treat misbehaving children by looking to the underlying issues causing the misbehavior: they search for the causes behind the child's misbehavior before prescribing any drug (Molland, 2013).

To show the effect of methylphenidate® on misdiagnosed children, studies have shown that this drug influences protein kinase B-mammalian target of rapamycin complex 1 signaling pathways (Akt-mTOR). PC12 cells, a cell line derived from a pheochromocytoma of the rat adrenal medulla, have been widely used as an *in vitro* experimental model to study ADHD (Grünblatt, Bartl, Marinova, & Walitza, 2013). These cells are also used to study the effects of methylphenidate® (Bartl et al., 2010; Grünblatt et al., 2013), since it is a dopaminergic neuronal cell that can synthesize, store, secrete, and take up DA (Pan, Zhu, Hwu, & Jankovic, 2012). Based on that, the PC12 cells' response to methylphenidate® treatment was studied by analyzing Akt-mTOR pathway, as well as the mTOR substrates, 4E-BP1 and S6K kinase (Schmitz et al., 2019). Results show that short term methylphenidate® treatment decreased phosphorylated Akt, mTOR, and S6K ratio in PC12 cells. On the other hand, long term treatment increased phosphorylated Akt and mTOR ratio. Moreover, phosphorylation levels of 4E-BP1 were decreased at 15 and 30 min (short term treatment) and increased at 1 and 6 h (long term treatment). These findings prove that methylphenidate® alters cell signaling in PC12 cells and its responses differ according to the time of exposure to this psychostimulant (Schmitz et al., 2019).

As mentioned before, methylphenidate® increases DA levels in various brain regions through DAT blocking (Reinoso, Undie, & Levitt, 1996; Todd, 1992). Activation of D2R by excess dopamine secretion inhibits Akt by dephosphorylating its regulatory threonine 308 residue (Beaulieu et al., 2004). Akt phosphorylation in PC12 cells decreased following administration of methylphenidate®. This is probably because of D2R activation promoted

by a further increase in DA levels triggered by methylphenidate® treatment in a short term treatment. However, phosphorylated Akt level was increased after a long methylphenidate® treatment (1 h) in PC12 cells (Schmitz et al., 2019); most likely due to an increase in the extracellular DA metabolites DOPAC and HVA levels which break DA after methylphenidate® treatment (Bartl et al., 2010). Based on this, it was deduced that the decrease in Akt phosphorylation in the first minutes followed by its increase in PC12 cells after long term methylphenidate® treatment, may be associated with increased DA levels and D2R activation in the first place, followed by its increased degradation decrease and the eventual D2R inactivation (Schmitz et al., 2019).

Furthermore, mTOR kinase is targeted by D2R/Akt pathway that plays important roles in neuronal functions, including control of synaptic plasticity, long term potentiation, axonal growth, and regeneration (Lin & Holt, 2008; Richter & Klann, 2009; Willis & Twiss, 2006). These processes require protein synthesis, which can be potentially regulated by the mTOR substrates: S6K and 4E-BPs (X. M. Ma & Blenis, 2009). S6K is activated upon phosphorylation by mTOR and stimulates translation elongation. Whereas 4E-BP1 selectively represses cap-dependent translation and is inhibited by mTOR (Gingrich & Caron, 1993; X. M. Ma & Blenis, 2009). Results show that methylphenidate® decreases phosphorylated mTOR ratio, as well as phosphorylation of S6K in PC12 cells after a short term treatment. Moreover 4E-BP1 hyperphosphorylated levels were decreased, whereas 4E-BP1 hypophosphorylated levels increased in PC12 cells after a short term treatment (Schmitz et al., 2019). Hence, the decreased Akt phosphorylation observed after short treatment with methylphenidate®, as well as the decreased phosphorylation of mTOR induced translation impairment, affecting processes which require protein synthesis as synaptic plasticity, axonal growth, and regeneration. On the other hand, after a long methylphenidate® treatment, phosphorylated Akt leads to mTOR activation. Upon activation, 4E-BP1 hyperphosphorylated levels increase and protein synthesis is activated (Schmitz et al., 2019) leading to an increase in branching, spine number (Bowling et al., 2014) and morphological complexity (Benes, Paskevich, & Domesick, 1983; Meredith et al., 2000; Navari & Dazzan, 2009).

Summing up, Akt-mTOR pathway in PC12 cells, as well as other important pathways involved in translation, protein synthesis, cell growth, survival, proliferation, neurogenesis, and neuroplasticity respond to methylphenidate® according to exposure duration (Schmitz et al., 2019).

A drug such as methylphenidate® is widely misused by children and adolescents who do not meet the full diagnostic criteria for ADHD (Akay et al., 2006; Dafny & Yang, 2006; Gonçalves, Baptista, & Silva, 2014; Loureiro-Vieira, Costa, de Lourdes Bastos, Carvalho, & Capela, 2017). 90% of these 4.5 million kids do not have an abnormal DA metabolism (Kagan, 2009). Taking psychostimulants like methylphenidate® would enhance the secretion of DA in the PFC (Reinoso et al., 1996; Todd, 1992), but its Excess will activate D2R which will dephosphorylate Akt (Beaulieu et al., 2004). The latter is deactivated and will prevent mTOR from phosphorylating S6K. Deactivated S6K will cause hypophosphorylated 4E-BP1 ratio to increase, preventing the synthesis of some proteins responsible for neuroplasticity, an essential mechanism allowing the PFC to connect with other parts of the brain in order to propagate catecholamine signals that control attention, hyperactivity and impulsivity (Lin & Holt, 2008; Richter & Klann, 2009; Willis & Twiss, 2006). After a long treatment with methylphenidate®, DA metabolites levels will increase in the PFC and will destroy all the available dopamine (Bartl et al., 2010). This will allow methylphenidate® to bind to D2R, which will phosphorylate and activate Akt, which in turn will phosphorylate mTOR inducing the activation of S6K and the blockage of 4E-BP1 by phosphorylation. Hence, long term treatment with methylphenidate® will allow the synthesis of proteins responsible for neuroplasticity (Schmitz et al., 2019). In these cases, ADHD is considered a hoax because parents and health professionals think that methylphenidate® is the only solution to adjust attention problems in misbehaving children: the drug will only show efficacy after long term treatment and will eventually solve attention-related problems; but the unfortunate hidden part is that their normal DA levels in the PFC is getting destroyed by metabolites.

5. Conclusion

All ADHD symptoms do not occur without a reason. This disorder is caused by many dysfunctions in the brain especially the prefrontal cortex area: the site of attention regulation, hyperactivity regulation and working memory improvement. ADHD children are inattentive, impulsive and sometimes hyperactive, and this is due to a decline in the cerebral volume, a decrease in the connectivity between several parts of the brain and the prefrontal cortex, and most importantly to an abnormal secretion of DA and NE in the PFC. All these biological factors are enough to understand the reasons behind ADHD symptoms and to classify it as a legitimate disorder. Children may be also exposed to environmental factors worsening ADHD symptoms. Lead, prenatal alcohol and tobacco exposure are all environmental toxicants making children more inattentive, hyperactive and impulsive. As for the treatments,

drug treatments for ADHD are efficient, but not as important as psychotherapy: parents and peers should get an education on how to treat ADHD children in a way to reduce their symptoms. In conclusion, ADHD is a psychiatric disorder, but its legitimacy was doubted when physicians began to over-diagnose and over-treat children by giving them drugs without looking to the underlying causes behind their abnormal behavior. A longer period of assessment and observation may decrease the odds of a misdiagnosis. During this period, the child should be encouraged to have a healthier lifestyle including a regular physical activity and a balanced diet containing less processed food and refined sugars. Nevertheless, more research using a single-subject design approach is needed to rule out biological versus environmental origins of ADHD type symptoms.

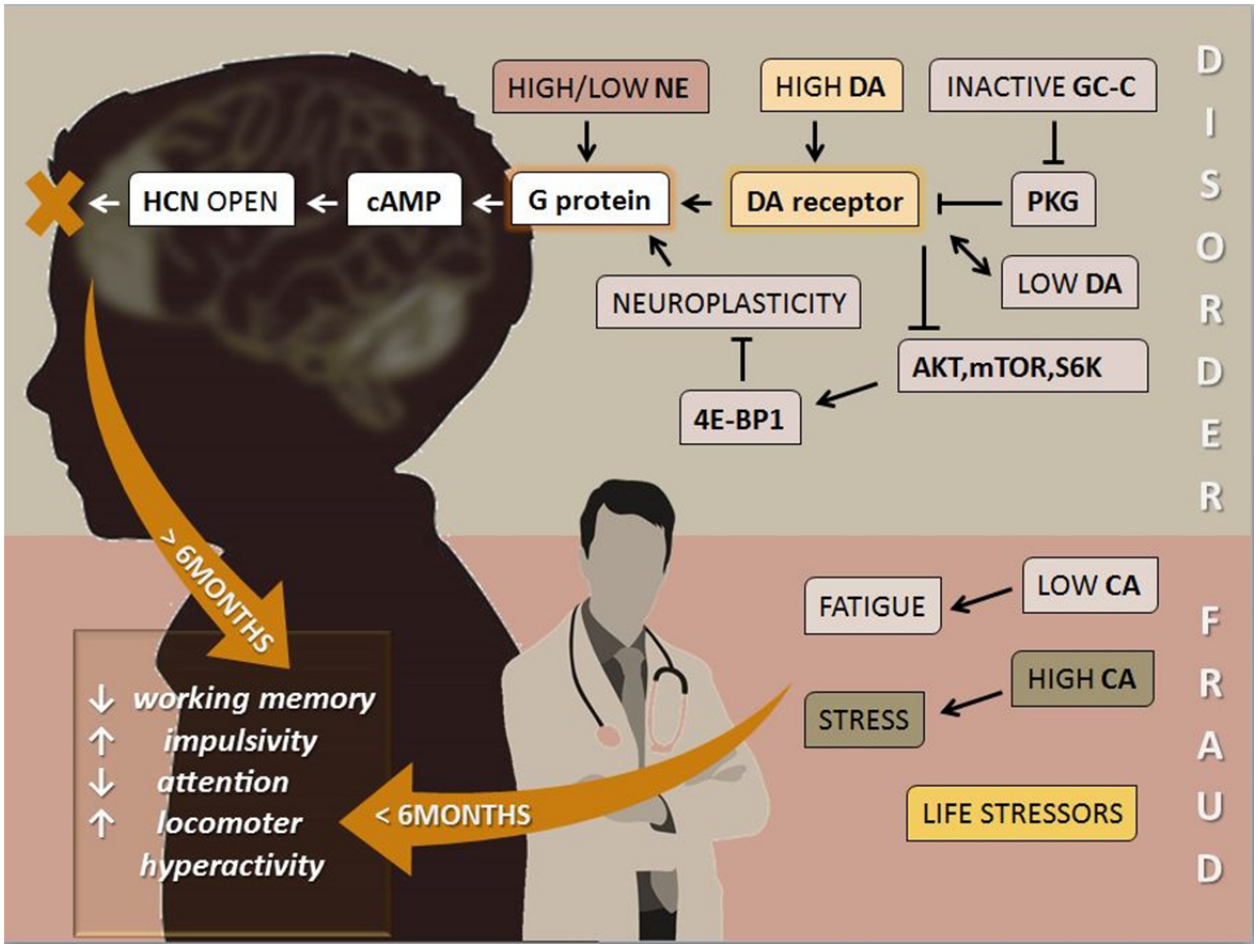

Figure 4. Summative diagram showing ADHD caused by biological dysfunctions ("Disorder" panel) or as misdiagnosed when caused by life stressors ("Fraud" panel)

Competing Interests Statement

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

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The Impact of Soil Transmitted Helminth (Sth) Towards Anemia Case in Elementary School Student in the District of Northwest Sumba

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Abstract

Background: Anemia is a condition where body is having less eritrosit. Worms is an infectious sickness caused by worms' parasite that endanger health. Worms sickness that usually infects and gives very bad affect is worms infection transmitted through soil or usually called "*Soil Transmited Helmintes* (STH)*."* In directly STH could affects supply and absorption and food metabolism to human body. Cumulatively, STH caused disadvantages like decreasing in calori and protein and loss of blood. This research aims to analysis impact factors of *The Infection of Soil Transmitted Helminth (STH)* towards.

Subjek and Method: This is a quantitative research with *cross sectional study* design. This research is done in the District of Northwest Sumba, East Nusa Tenggara Province. Subject of this research is elementary schoold students with number of sampels are 105 students chosen by using Multistage Random Sampling Technique. Independent Variabel is the *Infektion of Soil Transmitted Helminth* and dependent variabel is Anemia. Data collecting technique is by checking the faeces using *direct method* and by checking capiler blood using strip test method, continued by interviewing using quisionaire and analyzed using simple Logistic Regresion.

Result: Number of Infektion of *Soil Transmitted Helminth* (STH) cases in elementary school students in the District of Northwest Sumba is 40%. Worms' egg found majority are *Ascaris lumbricoides* and *Trichuris trichiura* (38.1%), in a single infection was found *Ascaris lumbricoides* (31%) and *Trichuris trichiura* (21%), and the minority worms found were *Hookworm Ancylostoma duodenale* (2.4%). Number of anemia cases in Elementary School students is 57.1%. Statictic examination test shows that the infection of *Soil Transmitted Helminth* (STH) positively and significantly affects the anemia cases with (OR= 27,3; 95% CI = 13,1-57,0; p = 0.001).

Conclusion: The probability of infection of *Soil Transmitted Helminth* (STH) positively and significantly affects the anemia cases in Elementary School Students.

Keywords: soil, transmitted, helminth, Anemia, elementary school students

1. Introduction

Anemia is a condition where a human body suffers lack of eritrosit. Anemia could happen due to less haemoglobin which means less oxygen throughout the body. When oxygen is less then that person will feel weak. This sickness' indication could be known through the checking of lower eyelid, hands' and feet's nail tip and mouth mucous. According to WHO a person could be diagnosed with anemia when haemoglobin content in men's < 13 g/dl, children aged 12–13 and women not pregnant < 12 g/dl, children aged 6 months to 5 years and pregnant women < 11 g/dl. Children aged 5-11 years < 11.5 g/dl. (Departemen Kesehatan Republik Indonesia, 2006)

Kasuma's research result (2016) prevalence of anemia in Elementary School Students in SDN Oetona Kupang City shows 56.2%, according to gents, anemia cases are more in boys (60.3%) and girls 39.7%. This result goes hand in hand with the result from Aryani in Local Government Clinic in Bajarakan II, where anemia prevalence in Elementary School Students is 51.8% and it happens more in boys (55.2%). (Departemen Kesehatan Republik Indonesia. 2007)

Research of Sirajudin, cs (2015) with majority participants are male students and students aged 10-11 years shows that anemia cases are prominent in students with worms (51.6%) that students without worms (27.6%). (Depkes,

2010)

Worms is an infectious sickness caused by worms' parasites that endangers health. Worms sickness that usually infects and gives very bad affect is worms infection transmitted through soil or usually called *Soil Transmited Helmintes* (STH). Regarding STH, people still find it unimportant, since it can't cause death. Although in reality the impact of STH can cause health decreament even death. (Direktorat Jenderal & PL Kemenkes, 2013)

Worms mainly found in territory with high humidity especially in society with bad personal hygiene and environment's sanitation. Kinds of worms that dangerous are roundworms *(Ascaris lumbricoides),* hookworm *(Ancylostoma duodenale* and *Necutor americanus)* and *Trichuris trichiura*. (Kartini, 2016)

STH's infection can give a grave impact on health both directly and indirectly. Directly, STH could affects supply and absorption and food metabolism to human body. Cumulatively, STH caused disadvantages like decreasing in calori and protein and lost of blood. Besides, decreasing nutritious, STH can impede physical growth, intelligence, working productivity, and decrease body's immunity which makes body is susceptible to disease and other infections. (Kartini, 2016)

According to data of WHO worms cases in the world are still high where 1 billion people are infected by *Ascaris lumbricoides,* 795 million are infected by *Trichuris trihiura* and 740 million are infected by *Hookworm*. (Mardiana, 2014)

While according to data of Health Ministry of Indonesia in 2006, based on survey done by sub-unit diarrhea on 2002 and 2003 in 40 elementary schools in 10 provinces, STH's prevalence is about 2.2%–96.3%. Another survey done by Yayasan Kusuma Bangsa (YKB) in 2006-2007, average prevalence number of worms in East Jakarta is 2.5% and in North Jakarta 7.8%. Another Survey on 2009-2010 done in the Province of South Sulawesi showed that average worms' prevalence is 27.28%. In 2011 data collected through survey done in several Districts/Cities, got various numbers: District of Lebak and Pandeglang has high average that is 62% and 43.78%, in the District of Sleman in Jogjakarta the prevalence is 21,78%, in the District of West Lombok and Mataram City shows the prevalences 29.47% and 24,53%. And the last, in the District of West Sumba, the prevalence is 29.56%. (Kasuma, 2016). According to those data, it means that Indonesia is an endemic region with STH.

In the provionce of NTT itseld, according to the research done by Fridolina Mau in 2017 in the District of West Sumba and Central Sumba, stated that 568 students of Elementary School (91.0%) infected by STH. The highest prevalence is infectious of A. Lumbricoides 28.5%, followed by T. Trichiura 5.9% and mixed infection 65.6% in the district of West Sumba, and in Central Sumba the highest prevalence is A. Lumbricoides 30.0%, followed by T. Trichiura 17.1% and mixed infection 46.8%. (Mau, 2017)

Factors that encourage endemic of hookworm is nature factor: tropical weather that supports the growth of worms' eggs and larva. Clay is a kind of soil that suitable for the growth of roundworms and hookworms, while sandy soil is suitable for T. Trichiura. High humidity also supports the growth of worms' eggs. While sunshine and wind could fasten the drying and spread the eggs of T. Trichiura in dust [9]. Another factor is household environment. School children are members of family that still need control in their everyday activity. Regarding health, playing behaviour should be put full attention especially in regards to sanitation condition of household environment. A good household sanitation will surely give safe and comfy for the children to play. In rural society, it is common when children play with their friends' in house yard and garden. In this case, there should be vigilance of possibility for children get in touch with hookworms that in fact needs soil to get multiplied. (Sumanto, 2010)

Infection can happen to all age, whether it is to babies, children, or even adults. Most of infection cases happen to school chidren because in that age there are many contacts with soil. (Syahrir & Sukfitrianty dan, 2016)

2. Subject and Method

This research uses analytical research with quantitative approach by using cross sectional study design. This research is done in Government and Privat Elementary School in 3 subdistricts in the District of Northwest Sumba. The number of samples is 105 students from 1^{st} – 6^{th} grade which consists of 48 samples from government and privat Elementary School in the Subdistrict of West Wewewa, 16 samples from government and privat Elementary School in the Subdistricts in Waitabula City, and 41 samples from government and privat Elementary School in the Subdistrict of Kodi. Each sample is chosen through *Multi Stage Random Sampling* technique. To every sample child, it is done faeces check microschopically by direct checking method using NaCl, and interview.

3. Research's Result

Tabel 1. Distribution of respondents' characteristics

School Childres's Characteristics			Amount	%
Age	-	6- 12 years	104	99
	-	> 12 years	1	1
Gender	-	Male	35	33,3
	-	Female	70	66,7
Fathers' education	-	None	3	2,9
	-	elementary school	23	21,9
	-	junior high school	25	23,8
	-	senior high school	39	37,1
	-	college	15	14,3
Mothers' education	-	None	4	3,8
	-	elementary school	20	19,0
	-	junior high school	22	21,0
	-	senior high school	37	35,2
	-	college	22	21,0
Fathers' Occupation	-	None	4	3,8
	-	Farmer/Labourer/Fisherman	68	64,8
	-	Entrepreneur	18	17,1
	-	Civil Officer	15	14,3
Mothers' Occupation	-	None	47	44,8
	-	Farmer/Labourer/Fisherman	33	31,4
	-	Entrepreneur	4	3,8
	-	Civil Officer	21	20
Family Income	-	< 1.500.000	75	71,4
	-	1.500.00- 2.000.000	8	7,6
	-	2.000.000-3.000.000	14	13,3
	-	> 3.000.000	8	7,6
School's Status	-	Privat	72	68,6
	-	Government	33	31,4
Class/Grade	-	First	24	22,9
	-	Second	30	28,6
	-	Third	26	24,8
	-	Fourth	15	14,3
	-	Fifth	10	9,5

The characteristics of the most Elementary School Children is 6–12 years old (99%) and female gender (66.7%) while the rest are male. Most of the fathers' last education grade are Senior High School (37.1%), and so are the mothers' (35.2%). Fathers' occupations are farmer (64.8%), mothers' occupations are none (44.8%) with few are entrepreneur (3.8%). Most of family income amount is < 1.500.000/month and few are > 3.000.000/month 7.8%). Most of the schools' status are privat (68.6%) and the rest are government. Number of students are almost the same

in each grade although students in 1st, 2nd, and 3rd grade are more than other grade.

Tabel 2. Distribution of elementary school children with STH cases in the district of Northwest Sumba

Number of Cases			Amount	%
STH Cases	-	Postive	42	40,0
	-	Negative	63	60,0
Kinds of STH	-	Ascaris lumbricoides	13	31,0
	-	Trichuris trichiura	9	21,4
	-	Hookworm Ancylostoma duodenale	1	2,4
	-	Hookworm Necator americanus	3	7,1
	-	Mix AL and TT	16	38,1
Total			42	100

Research's result shows that 40% of Elementary School Children in the District of Northwest Sumba are infected by *Soil Transmitted Helminth* (STH). Based on check-up results, kinds of worms found most is *Ascaris lumbricoides* (31%), *Trichuris trichiura* (21.4%) and mixed A*scaris lumbricoides* and *Trichuris trichiura* 38.1%.

Tabel 3. Distibution of Anemia Cases in Elementary School Children in the District of Northwest Sumba

Number of Cases	Amount	%
Anemia	60	57.1
Non-anemia	45	42.9
Total	105	100

Research's result shows that 57.1% Elementary School Children in the District of Northwest Sumba are infected by anemia.

Tabel 4. The Impact of STH Infection to Anemia Cases in Elementary School Children

No	**STH**	**Anemia**		**Total (%)**
		Anemia	**Not**	
1	Positive	33 (31.4%)	9 (8.6%)	42 (40.0%)
2	Negative	27 (25.7%)	36 (34.3%)	63 (60.0%)
Total		60 (57.1%)	45 (42.9%)	105 (100.0%)

B = -1.299;

P Value = 0.001;

Exp. B = 27.3;

CI 95% = 13.1-57.0.

The result shows that infection of *Soil Transmitted Helminth* (STH) 31.4% is in children with anemia. Statistic test shows that STH infection significantly affects anemia cases with p value = 0.001. Exp. B (OR) = 27.3, this shows that children infected with *Soil Transmitted Helminth* (STH) is risked 27.3 times with anemia than children without STH infection.

4. Discussion

Worms is an infectious sickness caused by worms' parasites that endangers health. Worms sickness that usually infects and gives very bad affect is worms infection transmitted through soil or usually called *Soil Transmited*

Helmintes (STH). Regarding STH, people still find it unimportant, since it can't cause death. Although in reality the impact of STH can cause health decreament even death (Depkes, 2010).

This research result shows that 40% of Elementary School Children in the District of Nortwest Sumba infected by *Soil Transmitted Helminth* (STH). This is different from the research done by Mau (2017) that stated 91.0% of Elementary School Children in the Districts of Northwest Sumba and Central Sumba are infected with *Soil Transmitted Helminth* (STH). The research of Kartini Sri (2016) in Sumbdistrict of Rumbai Pesisir Pekanbaru shows 16.3% infected with STH. (Surajuddin & Masni, 2015)

While research of Syahrir, Sukfitrianty cs in Subdistrict of Wera Bima Nusa Tenggara Barat shows that infection of STH in Elementary School Children is 59.5%. (World Health Organization, 2011)

The most variety of worms' eggs are miced of *A. Lumbricoides* and *T. Trichiura*, compare to research's result of Fridolina (2017), the highest prevalence is infection of *A. Lumbricoides* 28.5%, followed by *T. Trichiura* 5.9%. (Mau, 2017). The difference of STH's infections numbers between district of Northwest Sumba, West Sumba, and Central Sumba are caused by school children in Nortwest Sumba are regularly get anti-*helminth* medicine from Central Government Clinic, although still some are infected with it. Other factor that affect high number of STH's infection is lack of personal hygiene such as not using footwear when doing outdoor activities, not washing hands and feet after direct concat with soil, the habits of playing with mud, finger nails not regularly cut and direct contact with friends that makes worms' eggs easily move.

Anemia is a condition where a human body suffers lack of eritrosit. Anemia could happen due to less haemoglobin which means less oxygen throughout the body. When oxygen is less then that person will feel weak. This sickness' indication could be known through the checking of lower eyelid, hands' and feet's nail tip and mouth mucous. According to WHO a person could be diagnosed with anemia when haemoglobin content in men's < 13 g/dl, children aged 12–13 and women not pregnant < 12 g/dl, children aged 6 months to 5 years and pregnant women < 11 g/dl. Children aged 5–11 years < 11.5 g/dl. (Departemen Kesehatan Republik Indonesia, 2006)

This research's result shows that 57.1% of Elementary School children in the district of Northwest Sumba are infected with anemia. This result is almost similar with research done by Kasuma (2016) about prevalence of anemia in Elementary School Children in SDN Oetona Kupang City that showed 56.2%. (Departemen Kesehatan Republik Indonesia, 2007) This can be caused by various factors, among which eating and sleeping pattern, kinds of food consumed, and other sickness that triggers anemia. According to Sarjuddin S (2015), the habit of eating breakfast and food consumed significantly affected to anemia cases. (Depkes, 2010)

Worms is an infectious sickness caused by worms' parasites that endangers health. Worms sickness that usually infects and gives very bad affect is worms infection transmitted through soil or usually called *Soil Transmited Helmintes* (STH). Regarding STH, people still find it unimportant, since it can't cause death. Although in reality the impact of STH can cause health decreament even death (Depkes, 2010).

The result shows that there is effect of *Soil Transmited Helmintes* (STH) infection towards anemia cases in Elementary School Children. This result is similar to Sarjudin S that stated 51.6% of Elementary School children suffer from anemia. Statistic test shows that there is relation between worm's infection with anemia cases in Elementary School children. Usually, infection of *Soil Transmitted Helminth* (STH) is found in children with anemia. This caused by in case of STH infection worms do not only take the nutrition in intestines, but also absorps blood cells in children's body that makes the body suffers anemia.

4.1 Research's Ethic

Explain to parents and school children and ask parents' agreement on taking specimen of faeces and blood. Guarantee the privacy and anonymity.

4.2 Appreciation

Researchers' gratitude is for the Director of Health Polytechnic of Health Ministry in Kupang, the Government of Northwest Sumba District, and scool children's parents whoo gave their full support in this research.

5. Conclusion

1) Number of soil transmitted helminth (STH) infection cases in elementary school children in the District of Northwest Sumba in 2018 is 40%. Most of worms' eggs found were *Ascaris lumbricoides* and *Trichuris trichiura* (38.1%).
2) Number of anemia cases in elementary school children in the District of Northwest Sumba in 2018 is 57.1%

3) Infektion of soil transmitted helminth (STH) 31.4% in elementary school children suffer from anemia.
4) There is a significant and positive effect of soil transmitted helminth (STH) infection to anemia cases in elementary school children in the District of Northwest Sumba.

5.1 Recommendation

To reduce number of anemia cases in elementary school children in Northwest Sumba, it is suggested to Regional Government through the Department of Health so that in can be proceeded by givinganti-Hermith medication massively at least once in 6 months to elementary school children dan keep the promotion of health regularly in schools about STH effect to anemia in children.

Competing Interests Statement

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

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Does the Payment Method Affect Patient Satisfaction? An Analytical Study in 10 Hospitals in Central Sulawesi

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Abstract

Indonesia has started reforms in the health system over the past five years, aiming to increase access of all people to health services. At present, there is public concern about quality health services, where the success of hospitals in meeting patient expectations is a major determinant in increasing patient satisfaction and trust. Patient satisfaction is an important measure for the process of evaluating the quality of services to patients in hospitals. However, the evaluation of patient satisfaction based on their payment methods is still very limited. The purpose of this study was to measure differences in hospital service satisfaction based on payment methods in Central Sulawesi.

This an analytical observational study with a cross-sectional approach. Samples were taken using purposive sampling technique from 10 hospitals in Center Sulawesi. The samples were 107 respondents for each hospital or 1,070 respondents overall.

The highest overall level of patient satisfaction on all elements was experienced by respondents who paid using NHIS (77.50%) while the lowest was felt by respondents who paid with KIS (70.74%). The Kruskal Wallis test results for all elements indicated that there were significant differences in satisfaction levels based on the payment methods in all elements with p-value = 0.000, (p-value <0.05). The results of this study indicated that there were significant differences in satisfaction levels based on the payment methods in all elements of service.

Keywords: patient satisfaction, payment methods, hospital

1. Introduction

The World Health Organization (WHO) framework has recommended that, in the health sector, all member countries of the United Nations around the world have to organize the Universal Health Coverage (UHC). The UHC achievement target is valid until 2030 as part of sustainable health development goals. This framework has three main dimensions: coverage of the health care system, financial risk protection, and population. The health services department aims to monitor the progress of services such as promotive, preventive, curative, rehabilitative, and palliative health services (Chan, 2014; WHO, 2017). All of these are dynamic, synergies, and continuous processes in the midst of the enormous changes taking place in the health system today.

Health services must be provided with the best quality and the most economical price possible. Each country faces challenges in controlling the cost of health services and each country have its own policies in applying health insurance methods (Ellis et al., 2014). In some countries, the national health insurance scheme plays an important role in achieving UHC despite many challenges and problems that arise in its application. The success in dealing with these challenges depends on the efforts of key stakeholders, service providers, insurance members, and health policy makers (Alhassan et al., 2016).

The implementation of UHC in Indonesia has been carried out since January 1, 2019, with the concept similar to that in other countries, namely that the state guarantees that all Indonesian citizens have access to the health care system needed with effective and affordable service quality. The Indonesian government hopes they can improve access for the poor and disadvantaged, in accordance with the mandate of the 1945 Constitution and Law Number 40 of 2004 concerning the National Social Security System (NSSS).

In the NSSS, a public legal entity to implement a social security program called the National Health Insurance Scheme (NHIS) was formed and officially operated on January 1, 2014. Since the implementation of NHIS, there have been many complaints from all health stakeholders and the community as users, including doctors as one of the professional caregivers. Poor socialization to the public regarding the system of using NHIS affects the service process, service quality, and patient satisfaction.

Patient satisfaction is a very important component for service in the hospital and is one of the main indicators that can bring an impact on the health service process given to patients, where, in the NSSS era, the method of service delivery is called "patient center care". The higher level of patient satisfaction will increase the number of patients who are loyal to the hospital so that it indirectly increases the operating income of the hospital. Patient satisfaction is also influenced by the payment method. Patients think that there are still differences in services obtained through personal funds, NHIS, and other commercial insurances. Based on this background, the researchers believe that it is very necessary to evaluate services in hospitals so that they can find out the level of satisfaction of patients based on their payment methods.

2. Research Methods

2.1 Population and Sampling

The study was conducted in 8 public hospitals (Anutapura Public Hospital, Undata Regional Public Hospital, Wirabuana Hospital, Kabelota Regional Public Hospital, Anuntaloko Regional Public Hospital, Bungku Regional Public Hospital, Mokopido Regional Public Hospital, and Luwuk Regional Public Hospital and 2 private hospitals (Budi Agung Hospital and The Salvation Army's Woodward Hospital) in Central Sulawesi Indonesia.

The subjects in this study were both outpatients and inpatients in 2016. The samples were selected using a purposive sampling technique. The minimum number of samples is calculated based on two proportion sample size formula with 95% CI and 10% precision. By calculating the 10% drop out, the number of samples is 107 respondents for each hospital, so that the minimum number of samples for the 10 hospitals studied is 1070 people.

2.2 Data Collection

The data was collected using the Community Satisfaction Indexes (CSI) Questionnaire to measure the level of patient satisfaction. There were 38 closed questions that were arranged in accordance with the nine elements of the community satisfaction survey based on Ministry of Administrative and Bureaucratic Reform, namely (1) Element A: **Requirements**, which includes everything that must be met in the management of services, both in the form of technical and administrative requirements; (2) Element B: **Procedure**, which is a standardized service measure for providers and recipients of services, including complaints; (3) Element C: **Service time**, which is the period of time needed to complete the entire service process of each type of service; (4) Element D: **Fees/rates**, which includes fees charged to recipients of services to administer and/or obtain services from the service providers, the amount of which is determined by agreement between the service providers and the community; (5) Element E: **Product specifications of the type of service**, which includes the results of services provided and received in accordance with predetermined provisions and the results of each type of service specification; (6) Element F: **Implementing competency**, which is an ability that includes knowledge, expertise, skills, and experience that must be possessed by service providers; (7) Element G: **Implementing attitudes,** which includes the attitude of officers in providing services; (8) Element H: **Notice of service**, which is in the form of a statement on the ability and obligation of service providers in carrying out services in accordance with the service standards; and (9) Element I: **Handling complaints, suggestions, and input**, which is the procedure for implementing complaints handling and follow-up. [5] The questionnaire used a Likert scale score 1 to 4 with the following descriptions: value 4 for "very satisfied" answers, value 3 for "satisfied" answers, value 2 for "dissatisfied" answers, and value 1 for "very dissatisfied" answers.

The questionnaire was completed by outpatients while waiting for drugs purchased in the pharmacist. On the other hand, it was fill in by inpatients who were taken care in the hospital for 3 days or more and those who have recovered and will go home while waiting for the hospital's administration.

2.3 Data Analysis

The level of patients' satisfaction was converse into a scale of 100 and categorized as follows:

Table 1. Service quality category

No	Service quality	Scale	
		Scale of 100	Scale of 1-4
1.	A (Very good)	81.26 – 100.00	3.26 – 4.00
2.	B (Good)	62.51 – 81.25	2.51 – 3.25
3.	C (Average)	43.76 – 62.50	1.76 – 2.50
4.	D (Bad)	25.00 - 43.75	1.00 – 1.75

Furthermore, the data were analyzed by Kruskal Wallis test to compare the differences in patients' satisfaction based on payment methods.

3. Results

3.1 Characteristics of the Respondents

Out of 1070 respondents, a total of 711 (66.5%) were outpatients and 359 (33.5%) were inpatients. The number of female respondents (654 people) was higher than male respondents (415 people). The highest age range of respondents was 26-35 years old (25.9%) and the least was at age >65 years (6.8%). Occupations of respondents varied, most of which were other occupations (56.2%), which included housewives, students, farmers, or even unemployed people. Meanwhile, jobs as private employees had the least percentage (8.0%). Most respondents had the latest education equivalent to high school, which was as many as 403 people (37.3%), while the respondents who had attended post-graduate programs had the least number of only 13 people (1.2%). More than half of the sample made payments using BPJS/NHIS, as many as 643 people (60.09%), while those using other insurance payments (private insurance) were at least 31 people (2.89%).

Table 2. Characteristics of the respondents

Characteristics	**Total (n=1070)**
Gender	
Male	416 (38.9%)
Female	654 (61.1%)
Age	
< 17 years old	95 (8.9%)
17 – 25 years old	164 (15.3%)
26 – 35 years old	278 (25.9%)
36 – 45 years old	212 (19.8%)
46 – 55 years old	145 (13.5%)
56 – 65 years old	103 (9.6%)
> 65 years old	73(6.8%)
Occupation	
Civil servant	180 (16.8%)
Private employees	85 (7.9%)
Entrepreneur	204 (19.1%)
Others	601 (56.2%)
Education	
Elementary school	149 (13.9%)
Junior high school	238 (22.2%)
Senior high school	403(37.3%)
Undergraduate/Diploma	267 (24.9$%)
Master's/Doctorate	13(1.2%)

Payment Method	
Self-funded	179 (16.73%)
NHIS (National Health Insurance Scheme)	643 (60.09%)
KIS (Healthy Indonesian Card)	118(11.03%)
JAMKESDA(Local Health Security)	99 (9.25%)
Other insurance	31(2.89%)
Types of Healthcare	
Outpatient care	711(66.5%)
Inpatient care	359 (33.5%)

3.2 Patients' Satisfaction

The means of overall satisfaction level was 75.99 (± 11.28), which fell into category B for service quality and "Good" for service performance[5]. The highest level of satisfaction was in element F of Implementing Competencies, reaching 78.25 (± 13.48) and the lowest was in the element I Handling Complaints, Suggestions service quality and "Good" for service performance.

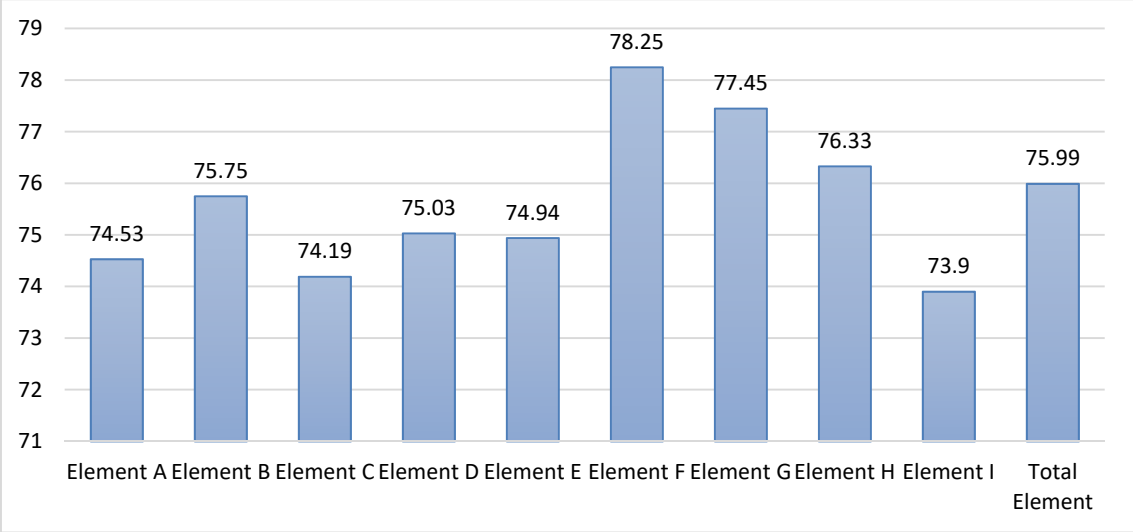

Figure 1. The overall satisfaction level

Moreover, patients' who paid using NHIS had the highest satisfaction, while those who used KIS had the least on all element. Except for element C Service Time, those who were self-funded had the highest satisfaction, on the other hand, patients with other insurances had the lowest score.

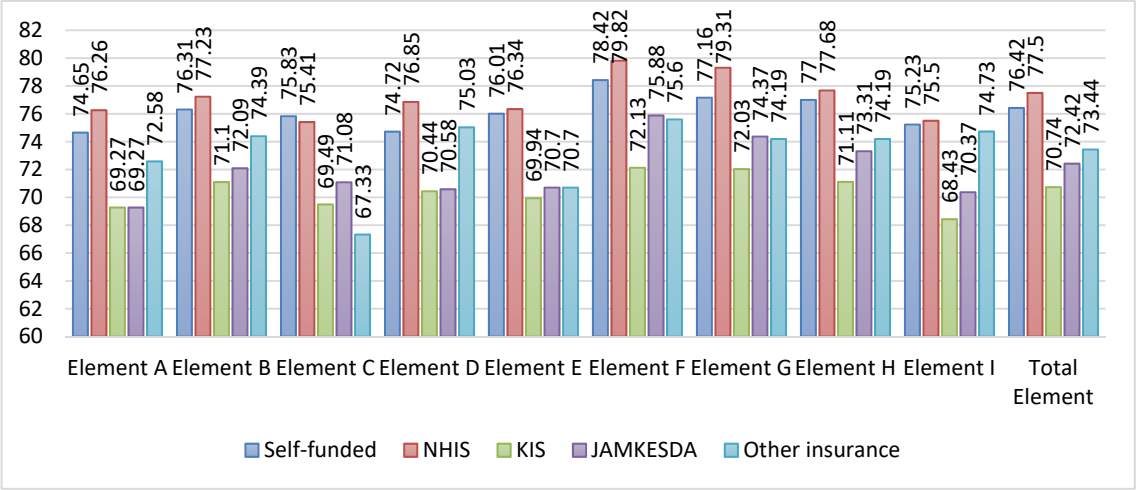

Figure 2. The level of satisfaction based on the payment methods

3.3 Statistical Analysis

The statistical analysis of Kruskal Wallis result showed that the p-value for all elements was below 0.05, which means that there were differences between patients' satisfaction and payment methods in hospitals at Center Sulawesi. Besides, NHIS had the highest mean rank for all element, except for the element C Service Time and I Handling Complaints. On the other hand, KIS had the lowest mean rank for all element, except for the element C Service Time.

Table 3. The statistical analysis (Kruskal Wallis Test)

Element	A	B	C	D	E	F	G	H	I	Total
Mean Ranks										
Self-funded (N= 179)	530.31	535.42	560.65	531.50	558.68	523.73	506.49	538.50	563.09	531.91
NHIS (N=643)	565.13	560.37	553.61	564.86	560.51	561.97	569.00	557.50	551.73	566.75
KIS (N=118)	447.28	430.69	458.59	457.32	440.18	423.84	424.55	439.41	439.16	422.65
JAMKESDA (N=99)	468.48	500.67	498.51	468.31	469.57	533.75	513.51	511.94	482.99	489.22
Other insurance (N=31)	500.65	530.27	425.45	461.76	456.26	485.08	500.74	502.79	573.89	485.32
P value (CI 95%)	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000

4. Discussion of Results

This study was conducted to compare patient satisfaction levels based on their payment methods in 10 hospitals in Central Sulawesi Province. CSI (Community Satisfaction Index) research results on service quality showed that all elements of service, which were based on indicators described in the Decree of the Minister of Administrative and Bureaucratic Reform No. 25/M.PAN/2/2004 concerning General Guidelines for the Creation of the Community Satisfaction Index (CSI), fell into category B for service quality and "Good" for service performance, with the total satisfaction of 75.99 (11.28) in all elements. Increasing elements of service speed, service certainty, and service costs were very priority to support the National Health Insurance program with quality control and cost control (Astiena et al., 2014). The results of a study in Bangladesh found that the overall level of satisfaction with health services by means of an insurance scheme payment was satisfactory with an average satisfaction score of 4.17 ± 0.04 (95% CI: 4.08-4.26) of 5.00, but this satisfaction rate could still be improved. The most satisfying components were regarding diagnostic services, prescribed drugs explanation, environments around health facilities, and behavior of health workers towards patients. Studies related to patient satisfaction can contribute to the design of the health system with an insurance scheme accompanied by a public health financing strategy to develop health insurance as part of achieving UHC (Sarker et al., 2018).

The results of this study indicated that the highest level of patient satisfaction in all elements was from the respondents who paid using NHIS and the lowest was from the respondents who paid with KIS, except for element C Service Time, in which the highest level of satisfaction was from the respondents with his own funding and the smallest was from the respondents with other insurance payments. In addition, the Kruskal Wallis test for all elements showed that there were significant differences in satisfaction levels based on the payment methods for all elements (p-value <0.05). Similarly, the results of Fenny et al., (2014) study indicated that a higher proportion of patients expressed satisfaction was from those who used insurance as the payment method. Patients were satisfied with the waiting time, the staff friendliness, and the consultation process. The results of this study indicated that prioritizing quality in treating a patient in health facilities was important. In contrast, Tangcharoensathien et al., (1999) research suggested that self-pay patients who paid normal rates were more satisfied than those who paid using social security. Patients who used social security in Thai hospitals did not get enough attention when consulting with a doctor.

The results of the study on the element of requirements and service procedure showed that patients with NHIS payment method were more satisfied with the conditions that must be met for managing services, both technical, administrative requirements and service procedures in the hospitals, compared to patients with non- NHIS payment methods. It was supported by the opinion of the respondents (patients) that most of them were satisfied with the service at the Central Sulawesi Provincial Hospitals in Indonesia, where the hospitals already had an information system regarding the registration administrative requirements for its patients and clear service flow. Additionally, the hospital also facilitated the service procedures and complaints, and the medical personnel provided an informed consent form to a patient for every medical treatment that would be taken. In Indonesia, NHIS routinely held socialization to the community since it had been implemented five years ago. It was socialized to the government and the private institutions at the provincial, district and sub-district levels through printed and electronic media, face-to-face interaction and presentations in each seminar. Those socialization techniques were done to make people understand the terms and procedures of hospital services in Indonesia. Ariningtyas (2017) research found similar results, stating that patients with the NHIS payment method were more satisfied with the ease of requirements with a mean of 4.0 (satisfactory). The ease of administration procedure was very important because patients who had been allowed to go home wanted to return home immediately to get a comfortable environment and ease of administration, including the manifestation of one of the effective efforts to improve patient satisfaction. In contrast, research carried out by Quynh & Dhar (2014) showed that patients who paid using insurance were completely dissatisfied with health care procedures, especially during registration and consultation.

The results of the research on the element of service time showed that self-pay patients were more satisfied than patients with health insurance. It shows that the majority of patients who paid by themselves got a very well served, especially in the emergency department (ED). The response time to emergency patients was handled for a maximum of 5 minutes from their arrival time at the emergency room and the doctor gave sufficient time to the patient. Moreover, the waiting time in hospital pharmacy was less than 60 minutes for compounding medicine and less than 30 minutes for patent medicine. It is in accordance with the minimum service standards issued by the Indonesian Ministry of Health. In line with Tangcharoensathien et al., (1999) study which showed that self-pay patients received more service time from the doctor, including having complete medical history data. In contrast, Garba et al., (2018) research found that patients with more insurance at Aminu Kano Education Hospital were satisfied at the time of consultation with the doctor (88.7%), compared to non-insurance patients. Chairunnisa & Puspita (2017) research revealed that the majority of NHIS patients were satisfied with the attributes of service time at Jakarta Islamic Hospital in Indonesia, which reached 56.4%.

The results of the research on the cost element indicated that NHIS patients were more satisfied than self-pay patients or those who paid using other health insurance. This is in line with one of NSSS principles in Indonesia called mutual cooperation that the NHIS collects contributions paid by the community and they are used for financing the operational costs of its members who are sick. This principle is applied because there are still many underprivileged Indonesians who need treatment in health facilities. The Indonesian government regained the community culture and character of mutual cooperation in its health system. The Data from NHIS states that 1 patient diagnosed with dengue hemorrhagic fever was financed by 80 healthy participants, 1 patient with caesarian section was funded by 135 healthy participants, and 1 patient diagnosed with cancer was paid by 1,253 healthy participants. The concept of mutual cooperation not only belongs to NHIS but also belongs to Indonesians. By applying this principle, most people/patients are very satisfied to the insurance payments strategy. In addition, the cost paid by patients is relevant with the costs set by each hospital and the cost is relatively affordable by Indonesians in all levels of society. This finding was supported by the Garba et al., (2018) study, showing that

patients with an insurance payment method were more satisfied with the costs once the patient had finished the treatment (90.0%) than non-insurance patients and the results of multivariable logistic regression of satisfaction with the payment of costs once the patient had finished the treatment (adjusted OR; 95% CI: 0.40; 0.21, 0.83) determined the satisfaction at the hospital. Increasing coverage of the NHIS can improve patient access to and satisfaction with health services in hospitals. In contrast, Rahmayanti & Ariguntar (2017) found that most patients received health services by paying using their own money (77.9%). This showed that the existence of the NHIS program had little effect on service rates because the NHIS administration process required a long time and a long process.

The results of the research on the product specifications of the type of service indicated that NHIS patients were more satisfied with the types of health services provided and received in accordance with applicable regulations in the hospital compared to non- NHIS patients. In addition, other supporting facilities such as buildings are clean and waiting rooms are quite comfortable. Each room in a hospital has complete and standardized equipment. It makes patients feel comfortable while getting their treatments. The NHIS involvement in maintaining the provision of quality services is strongly supported by the hospitals. It routinely monitors and evaluates the hospitals to ensure that NHIS participants in Indonesia have received appropriate services. This was supported by Sarker et al., (2018) research which mentioned the satisfaction with comprehensive services provided by health facilities from patients using the insurance scheme, with a mean of 4.09 ± 0.85 (95% CI: 3.98-4.20) of 5.00.

The results of the study on the elements of implementing competency showed that NHIS patients were satisfied with the competencies of health workers which included knowledge, skills, expertise, and experience in each hospital. In this case, doctors in Indonesia have sufficient knowledge and skills in providing appropriate, fast and accurate services to patients. The patients in this study were satisfied because each question during the consultation was able to be well and clearly answered by the doctors. As a result, they felt comfortable, safe and confident about the treatment they would receive. This was supported by Hidayah (2015) research which found that NHIS patients stated that one of the attributes that were very important and very satisfying and that could influence patient satisfaction was the ability of the doctor. In growing and applying medical ethics, especially when forming good relations between doctors and patients, communication skills are very necessary. Improving the effective communication skills of hospital officials is a major concern of hospital management because good communication can be the most effective way to improve patient satisfaction with services.

The results of the study on the elements of implementing behavior showed that NHIS patients were more satisfied with the behavior of health workers. In general, most of the hospitals' health workers treat all patients in the same manner. Doctors, nurses, and other officers are appropriately dressed, polite and friendly. They respect all patients. Moreover, NHIS applied a prior health care system with the concept of Patient-Centered Care (PCC) with integrated patient care. Each hospital employee's treatment in providing patient services is based on patients' needs prioritizing service quality and safety, and evidence based medicine. Indonesians are satisfied with the changes in officer behavior and consistency in providing care to the patients. This was supported by Fenny et al., (2014) research which found that patients with insurance payments were very satisfied (32.8%) and satisfied (57.5%) with the hospitality of hospital medical staff compared to patients with the non-insurance payment method. Following the Donabedian process-structure model, the results showed a significant difference between groups of patients with insurance and non-insurance methods related to perceptions of hospitality of the medical staff. Logistic regression test results of patient satisfaction with friendliness showed p-value = 0.000 and OR; 95% CI: 3.02; 2.19, 3.85. The results of this test showed that the hospitality of the medical staff was one of the predictors of overall patient satisfaction with service quality. In addition, interpersonal relationships held the key to success in increasing patient satisfaction. In another study, Garba et al., (2018) showed that patients with insurance payments were more satisfied with the behavior of doctors who would listen attentively, spend enough time with patients, explain what patients need to know about the course of their illness, and provide advice and input during patient treatment well compared to non-insurance patients. According to patients with insurance, overall they were satisfied with all services received from doctors, with P value = 0.004.

The results of the study on the elements of the notice of service, patients were more satisfied with the payment method using NHIS compared to other payment methods. This is in accordance with the mandate of the Republic of Indonesia Law Number 4 of 2018 concerning hospital obligations and patient obligations, that the hospitals to provide safe, quality, anti-discriminatory, and effective health services for patients according to hospital service standards

The results of the study on the elements of handling complaint, suggestions, and feedback indicated that patients who paid with NHIS were more satisfied than non- NHIS patients. It is because any hospital that intends to

collaborate with NHIS must fulfill one of the hospital credential requirements. The hospital must have a special room to receive complaints, suggestions, and feedbacks from NHIS patients. Their satisfaction in getting hospital services has always been a priority for NHIS. In addition, special staff is appointed to manage any patient's complaint at the hospital. It is to facilitate good coordination between the three parties (NHIS, hospital, and patients). This was supported by Chairunnisa & Puspita (2017) research which found that, based on their payment status, most patients used NHIS (70.9%). In this study, health workers, especially doctors and nurses, were quick to respond to patient complaints and suggestion boxes were available in hospitals. The attitude of hospital staff played an important role in providing health services to patients and could affect and even reduce the patient satisfaction rate (Fenny et al., 2014).

The hope of the Indonesian Government in the world of health is that there is no difference in the provision of good health services for NHIS and non- NHIS patients. Whatever form of insurance the Indonesian people use, they will all get the same treatment for services, namely getting the same fast and appropriate service, getting the same facilities and infrastructure in accordance with the treatment class, obtaining drugs according to disease diagnosis, and giving the same friendly service to all patients, so they can support the NSSS in achieving the UHC target, where all Indonesians have health insurance to obtain the benefits of maintenance and protection in meeting basic health needs. Thus, there is no difference in patient satisfaction in receiving quality services in accordance with health service standards and accreditation service standards (Ariningtyas, 2017; Hidayah, 2015).

The hospital as one of the health facilities is expected to be able to provide effective and efficient services. The problem that is often faced in general by hospitals is that it has not been able to provide services that are in accordance with the service standards and the established legislation. Thus, it affects the level of patient satisfaction when patients do not get services according to their expectations. Various efforts can be made to increase patient satisfaction with hospital services, namely (1) at the individual level, each professional caregiver improves professional proficiency, communication and empathy skills to patients and applies medical standards and medical professional ethics in daily practice, (2) at the institutional level, the hospital prioritizes patients' safety and security, supports resources in hospital operations, gives manageable workload to employees, provides remuneration based on skills and accountability, and improves the hospital administration system with innovative approaches, (3) at the national level, improvement is needed in health system policies both in terms of benefits and equality in obtaining health services for people registered as users of social security (Woldeyohane et al., 2015; Shan et al., 2016; Salesman et al., 2018; Nkwinda et al., 2019). In addition, the government must also ensure that all health facilities, especially hospitals, have complied legislation and guidelines for national health insurance through monitoring, evaluating, and maintaining the quality of service on a regular basis (Daramola et al., 2018). The Indonesian government also stipulates that each hospital must be accredited by the hospital accreditation committee, so it is hoped that if the hospital is standardized, the quality of service and patient safety can be sustainable.

5. Conclusion

There were significant differences in satisfaction levels based on the method of payments. The level of satisfaction of patient with NHIS was higher than those with other insurance or without insurance. This is because access to health services for poor people is easier, services are the same as non-insurance, and low fees. The condition indicates that there is an increased awareness of the importance of health so that the target of achieving UHC in the NSSS in Indonesia can be considered successful.

5.1 Ethical Considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

5.2 Limitation

Some limitation of this study is the number of subjects that are not evenly distributed according to the method of payment. Subjects with the NHIS are far more than other payment methods. In addition, there are too many questions that making the subject get bored quickly. So that it can affect the validity of answers from the subject.

5.3 Recommendations

1. Carry out "service excellent" training in hospitals, so that there are no differences in the types and quality of services provided to patients, except based on treatment classes.
2. Monitor and evaluate at the level of patient satisfaction at the hospital continuously and periodically.

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Competing Interests Statement

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

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Views of Teachers and Hostel Matrons on the Landscape of Substance Abuse Amongst the Youth in the Northern Region of Namibia

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Abstract

Aim: This research project aimed at exploring the views of secondary school teachers and hostel matrons on the landscape of substance abuse amongst the youth at a border town situated in the northern region of Namibia.

Method: In this qualitative study, in-depth interviews were conducted with secondary school teachers and hostel matrons, selected by means of a purposive sampling method from five schools representing state schools and private schools. Ethical approval was obtained from the University of Namibia's ethical approval committee, whilst permission to conduct the study was obtained from the Ministry of Education, Arts and Culture, Namibia. Participation was voluntary and based on informed consent.

Findings: The themes identified in the study were amongst others; the types of substances used by the youth, the use of substances on school premises and easy access/availability of substances.

Conclusion: The study concluded that substance abuse seems to be normalised in the community because of the excessive availability of alcohol in the community. The need for law enforcement and law reform as well as prevention programmes at all levels of society is highlighted.

Keywords: substance abuse, youth, secondary school teacher, learner, hostel matron

1. Introduction

Substance abuse is a growing global concern, causing 12% of deaths worldwide (Nowak, Papiermik, Mikulska, & Czarkowska-Paczek, 2018). The use of substances amongst the youth is of particular concern in Namibia as it relates to many social problems such as crime and violence in society, affecting the academic performance of learners, involvement in motor vehicle accidents and leads to school dropout (Kauaria, Kaundjua & Mufune, 2015; Chibaya, 2016). The most commonly used substances worldwide, are according to UNESCO/UNODC/WHO (2017) and Moss, Chen and Yi (2014) are alcohol, tobacco and cannabis.

The World Health Organization (WHO) estimates that there are about 2 billion people worldwide who consume alcoholic beverages, of whom 76.3 million are affected by alcohol-related disorders (WHO, 2018). The European School Survey on Alcohol and Drugs (ESPAD, 2015) revealed that nearly half of the students (47 %) reported alcohol use at the age of 13 or younger, while a total of 13 % of the students reported having been intoxicated during the previous 30 days. In terms of alcohol abuse by young people, the WHO (2018) adds that more than a quarter of all 15 to 19 year olds worldwide are current drinkers and this amounts to 155 million adolescents (WHO, 2018). Lightfoot, Maree and Ananias (2009) argue that alcohol abuse in Namibian communities is also extremely high. A nationwide survey conducted by SIAPAC (2002), found that 55 % of Namibian adults consumed more than 10 litres of alcohol per week. The Namibia Demographic and Health Survey carried out some years later in 2013 showed that Namibians continue to drink excessively, as the survey indicated that half of the women and 57 % of men have drunk alcohol at some point in their lives (Ministry of Health and Social Services /Namibia Statistics Agency, 2014).

According to the Namibia Human Development report, the level of alcohol abuse amongst the young people in Namibia is quite high, with half of the 13 to 16 year old Namibians experimenting with alcohol (United Nations

Development Programme [UNDP], 1999). The same pattern of excessive alcohol consumption also appears amongst the Namibian school children and youth, with a school based global survey data from UNESCO UNODC/WHO (2017) showing that one in four children between the ages of 13 and 15 years having used alcohol during the previous month. The types of alcohol consumed by Namibians include both bottled alcohol, such as wine, beer, vodka as well as traditional home brewed drinks such as *tombo, ombike* and *omalovu* (Lightfoot, Maree & Ananias, 2009). Moreover, the global status report on alcohol and health in Namibia found that the preferred types of alcoholic beverages for Namibians are store-purchased beer (15%), store-purchased liquor (6%), and wine (2%) (WHO, 2018). In addition, homemade brew seems to be the most significant type of alcoholic beverage in Namibia, which accounts for 67% of the total consumption (WHO, 2004). In line with more than one hundred countries worldwide that are have banned the purchase of alcohol by children (Morleo, Cook, Elliott, & Phillips-Howard, 2013), the Namibian Liquor Act No 6 of 1998 also prohibits the selling of liquor to children younger than 18 years. A critical analysis of the Namibian Liquor Act by Barth and Hubbard (2009), implies that 18-year olds may be present at a licenced establishment, and they may drink or possess alcohol, except that the act of purchasing alcohol by children younger than 18 years would be an illegal act. This therefore, is a grey area in the Namibian legislation that needs to be relooked at.

The European School Survey on Alcohol and Drugs (ESPAD, 2015) pointed out that smoking cigarettes is common amongst students, as more than one in five students smoked cigarettes at the age of 13 or younger. The ESPAD (2015) survey further highlighted the addictive nature of cigarettes and found that an average of 4 % of students began to smoke cigarettes on a daily basis at the age of 13 or younger.

The use of tobacco is controlled by the Tobacco Control Act (Act No. 1 of 2010) of Namibia. The Namibian population shows some patterns where more men smoke cigarettes than women, as according to the Namibia Demographic and Health Survey (2013) it was found that 4 % of women and 19 % of men between the ages of 15 and 49 in Namibia smoke cigarettes. A UNESCO/ UNODC/WHO (2017) survey further revealed that tobacco is one of the first substances used by children and young people.

The most prevalent illicit drug used in most of the countries is cannabis (ESPAD, 2015; UNESCO/ UNODC/WHO, 2017). The European School Survey on Alcohol and Drugs (ESPAD, 2015) has found that on average 16 % of the students had used cannabis at least once in their lifetime. The same survey found that about three in ten students (30 %) rated cannabis to be easily available. On average, 3 % of the students reported that they had first used cannabis at the age of 13 or younger. In addition to cannabis, other illicit drugs used by students in the ESPAD survey (2015) are ecstasy, amphetamine, cocaine and LSD or other hallucinogens. Namibia is not a significant producer of cannabis, or of other illegal drugs, yet illegal drugs find their way into the country (Kazembe & Neema, 2015). However, the use of cannabis amongst the Namibian school going children was rated as low (UNESCO /UNODC/WHO, 2017).

A legitimate concern around the use of substances amongst the youth is the age of initiation. School going learners seem to start using substances at a very tender age. In Zimbabwe, the mean age of alcohol initiation has been recorded as 12.86 years, while the average age for first tobacco use was 13. 13 years, and that for cannabis stood at 14.6 years (Mudhovozi, Maunganidze, Maseko, Ngwenya, & Netshikweta, 2014). Similar findings were found in the Namibian context in a UNICEF (2006) study, where a focus group of 10 to 14 year olds revealed that one in ten children had already used alcohol. According to UNICEF (2006), ten years is the average age that children start experimenting with alcohol in Namibia. Alcohol consumption seems to be on the increase amongst the Namibian school children. In 1992, only 19.8% of 13 to 16 year olds had experimented with alcohol. Six years later, in 1998, that number had risen to 50 % (Strijdom & Angell, 1998). The real threat about substance abuse amongst the youth is the gateway hypothesis, which according to Moss, Chen, and Yi (2014) and Nowak, Papiernik, Mikulska and Czarkowska-Paczek (2018), refers to the tendency amongst adolescents to start using legal substances such as alcohol and cigarettes, but to eventually cross over and progress to the use of illegal drugs such as cannabis.

This point of view is supported by a survey done in Poland by Nowak et al. (2018), and another study done in the Sub Saharan African region by Olawole-Isaac, Ogundipe, Amoo, Adeloye (2018), which found that alcohol use and cigarette smoking are more prevalent amongst adolescents, while the use of illegal substances are rather low. Although evidence exists that substance abuse amongst school going youth is on the increase, little research has been done on substance abuse amongst the youth in rural communities in general and border towns in particular. Prevention programmes and interventions may exist in urban areas whilst the same are non-existent in rural border town communities. Therefore, this paper aimed at exploring the views of secondary school teachers and hostel matrons on the landscape of substance abuse amongst the school going youth.

2. Methodology

This qualitative study aimed at exploring the perceptions of secondary school teachers and hostel matrons on the landscape of substance abuse amongst secondary school learners from a rural community at a border town in northern Namibia. This paper was part of a bigger mixed method study that examined risk and prevalence factors of substance abuse amongst the youth in this particular border town. The study population consisted of secondary school teachers and hostel matrons from secondary schools in the border town. The researchers collected data through in-depth interviews with seven secondary school teachers and hostel matrons from five different schools. The teachers and matrons were purposefully selected based on their likelihood to have contact with a bigger learner population from their school.

The schools selected in this study were representative of both state schools and private schools. Ethical approval for this study was obtained from the ethical review committee of the University of Namibia. Furthermore, permission to conduct the study was obtained from the Ministry of Education, Arts and Culture. All the participants voluntarily consented to the interview by means of signing an informed consent form. To ensure confidentiality, the names and identity of the participants are not stated in this paper. A semi-structured interview schedule was used for the interviews, and the interviews were conducted at a convenient time during class free period from 3 to 7 September 2018. At least two to three members of the research team were present at all the interviews. Interviews were conducted in English, but participants were free to express themselves in Oshiwambo, a local language predominantly spoken in the area the research was undertaken. At least one member of the research team could speak the local language and translated back to English. Open-ended questions in the interview focussed on participants' understanding of the extent of substance abuse amongst the youth. All interviews were digitally recorded and transcribed verbatim. Participants' biographies varied in terms of management position held at the school and gender as well since three of the participants were male and four were female. The thematic analysis approach was used to analyse the data. Transcriptions were read in a line by line and word by word manner, to identify the preliminary themes and subthemes.

3. Findings

Data analysis identified three main themes, namely; types of substances used by the youth; use of substances on school premises, and excessive presence of liquor outlets.

3.1 Types of Substances Used by Youth

A major theme identified in this study described the various types of substances most likely used by the youth. Participants were asked about their knowledge on the various substances used by young people and they indicated that there are a variety of locally produced and imported types of beer, and a wide variety of wine, whiskey and brandy that the young people are using. One participant listed the types of alcohol used by the youth as follows:

"Beer is the first one, and then they also drink, Castle Lager,… wine,…iya, the one in the green bottle and Capenheimer. Those are some… even the bottles we found on the school premises. Sometimes we can pick them up." (sic)

Another participant added:

"*on the types of alcoholic beverages that are consumed by the youth, you know most of them they like beers, for the South African beer, there is Carling Black Label and Tafel Lager and ee…and Navaras. Navaras is a castle wine, it is sort of sparkling wine iya, and Tassenberg, this is a red dry wine. Those are the most, most aaa.."* (sic)

The alcoholic beverages indicated by the two participants can be bottled, but some participants mentioned that some alcoholic beverages that are packaged in small plastic sachets and sold at a cheaper price are also available in the community. One participant brought along to the interview setting some empty plastic sachets to demonstrate that the alcoholic liquor in the plastic sachets can be of different kinds of brandy, whiskey and wine. The participants further indicated that school children are also exposed to a traditional brew called *tombo* and that some of the learners even brought tombo to school. The Liquor Act No 6 of 1998 of Namibia defines *tombo* as "the traditional or home-brewed alcoholic drink, also known as sorghum beer, made from a fermentation of mahango, sorghum or other cereal or vegetable matter, with or without additives". One participant explained:

"we have this traditional drink, this homebrew like omahoongo (amarula homebrewed) you know ee. When omahongo is prepared the first part of it apparently is not sooo…alcoholic kind of, like even the parents themselves they are the one who offer this omahoongo to.. to learners and to them maybe it is seen as a not a problem, but as for me alcohol is just alcohol, even if maybe is a little concentrated or too much concentrated." (sic)

According to Shikoyeni (2017), the production of home-brewed beverages is closely connected to food production in urban and rural areas in Namibia. This can be ascribed to the difficulty for some people in the community to make a distinction as to the stage the homebrew is no longer a nutritional drink but an alcoholic beverage. Different from the alcoholic beverages that school going youth are exposed to, children as young as those at the toddler phase, may have been fed *tombo* by a mother or other caregiver. One participant stated:

"Teen mothers give their small children tombo."

Most of the participants were of the view that traditional brews are not the preferred alcoholic drink for school going children but these are rather taken by out of school youth and school dropouts. One participant said:

"It is normally consumed by the dropout youth. You won't find easily a school going child drinking tombo. At school this moment in fulltime? No no. you won't find them drinking tombo easily like that. But those who will find on those bars are those have left school." (sic)

Another participant corroborated this by stating:

"Tombo is consumed by school dropouts."

The findings align with the results of Maree et al. (2008) who found that younger people will prefer to take alcoholic drinks in bottled format, while traditional brews are mostly taken by older people instead of the young people. The Namibia Human Development report also found that traditional brews are not the preferred choice of drink for children between the ages of 13 to 16 years, while men between 25 and 30 years have shown a steady increase in showing interests to drink traditional brews (UNDP, 1999). The use of tobacco was not a very prominent issue raised in the study but smoking of cigarettes by young people was mentioned by a few participants. A specific tobacco product named *Yes* is a very cheap cigarette which is most likely sneaked in from across the borders and its distribution is thus not controlled by the Namibian legislation. One participant stated:

"*kids are smoking ehhhh... these cigarettes called "YES" when you go to other countries or any other town."*

Another participant added:

"Like, a Yes cigarette only cost 1 NAM dollar.

A UNESCO/ UNODC/WHO (2017) survey revealed that tobacco is one of the first substances used by children and young people. The use of illegal drugs amongst the youth has also been stated as a matter of concern. Some description was provided about the illegal drugs that were found in the possession of learners. One participant said:

"*it is like a powder or dry leaves, iya, those ones they will put in a plastic and then they will share with others.…. Yes, sometime they are the ones who bring these to school.*

Cannabis, also called as dagga, was found to be the most common illegal substance used in Namibia (Maree et al., 2008; Chibaya, 2016). Kazembe and Neema (2015), claim that Namibia is a drug transit haven for drugs that are destined for other lucrative markets particularly in the SADC region and in Africa in general. Thus, cheap alcohol in plastic sachets, cheap cigarettes that are imported illegally and illegal drugs have found their way into the Namibian territory and they are being used by the youth. Being found in possession of illegal drugs is a criminal offence which can lead to prosecution in Namibia. Incidences of learners smoking cannabis at school were reported by one secondary school teacher, who said the following:

"*They (learners) smoke cannabis in the toilets. We caught them* (learners), *we took the stuff (drugs)*

Another participant stated:

"we are currently having two learners who are in prison. They are using marijuana,"

According to Chibaya (2016), a direct consequence of using illegal substances such as cannabis is getting into conflict with the law, which was indeed confirmed in the present study. Except for cannabis, other types of drugs were not mentioned in this study. Perhaps this is because of the rural community where the study was conducted, and that perceptions of adults and not the children themselves were taken.

3.2 Use of Substances on School Premises

The school management has to ensure that school learners are protected from substance abuse by creating a conducive educational environment that is free from tobacco, alcohol and other drugs (UNESCO/UNODC/WHO, 2017). However, participants reported with dismay that some learners are taking substances to school and that they are also using substances at specific locations at school. Participants mentioned in particular that learners bring traditional brews to school which they drink during break time at school. Poverty, lack of food at home and also ignorance on the actual alcohol content of traditional brews seem to be the reasons why parents may send their

children to school with traditional brews with potential alcohol content. One participant stated:

I identified containers having tombo for example, you do not get to get the reasons why the person comes with tombo, maybe there is no food at home, maybe it is just a drink like any other drink, one may not really tell like in case of home aa.. brew drinks."

Participants reported that children are introduced to alcohol when adults who are consuming alcohol send their children to buy alcoholic drinks at drinking outlets. These grownups may then also reward the children with alcoholic drinks.

This is supported by one participant that stated:

"*...and our elders they are the ones that are consuming tombo. Sometime they are too weak to move to a cuca shop and they send children to go and pick for them. Once they put in a container and the container is full then…the…the…the…the cup is left halfway then the remaining will be given to the child who came to pick*."

Participants explained that *tombo* is not sold in a sealed container but it is served in an open jug. Some children who are sent to buy *tombo* may taste it while carrying it after they have been sent to buy the *tombo* by grownups. One participant averred:

"*parents should not send children to go collect tombo for them. Because in the process some children will be tempted too…to test and once you test that one, you are gone into the ditch for the rest of their life*."

In the absence of any mechanisms to control traditional homemade brews (WHO, 2018); offering traditional brews for children's consumption could pose a threat to the health and wellbeing of children. According to the nationwide HIV and AIDS study on the knowledge, attitudes and practices (KAP study 2002), 57 % of the respondents believed that it was easy for the youth to get access to home brewed alcohol in their community, while 49 % of the respondents agreed that very young children were given home brewed alcohol to ease their hunger or to stop them from crying (SIAPAC, 2002). Participants reported that some learners may be using substances during school hours. The study revealed that learners may request to be excused from a class or from school to use substances at locations out of sight of the public, such as toilets. One of the participants echoed:

"You will believe that if the school gate is not locked you will see them giving excuses no…no…I am sick. Grannies said I must go back. But if you research very well they don't, they are not sick they go and get alcohol"

In the event that school management may suspect that learners are bringing substances to school, the school bags of learners may be inspected for any substances or other restricted objects. The school management has to be cautious whenever they inspect the school bags of learners. The findings revealed that school going youth carry substances in their school bags to school. This was stated by one participant:

"*At my school we do an uninformed search, but every time you do this uninformed search like you search all the bags you know try to see all things which are not good there in the bags, and we always get alcohol there iya…especially those in small sachets, always. So, one may say no…it is not…not common but why do we always get alcohol when we search the bags.*

These findings are corroborated by Ndondo (2016), who reported that learners in South African schools are offered, sold and given illegal drugs which are used on school premises or before learners attend school. Findings in a Namibian study done by Chibaya (2016), also confirm that secondary school learners are taking illegal drugs on school premises during break times. Findings by Alhyas et al. (2015) in a study on the perceptions of adolescents on substance abuse in Dubai confirmed that learners hide cigarettes and other drugs in their school bags, and Alhyas et al. (2015) thus suggested that regular inspections of school bags should be carried out. In a comparative analysis between South Africa and the United States of America by Joubert, Sughrue and Alexander (2013) on the search and seizure of drugs, it was found that secondary school learners' teachers and principals have frequently found it necessary to search learners and to remove from their possession items which might be harmful to them or other learners. Participants reported that some learners may have abused substances to such an extent that they have reached the level of addiction where they have reached the level where they cannot live without alcohol or drugs. One participant indicated:

"There are kids who cannot even live without taking these substances, like addicted. You will find learners in the class shaking yes…. and even sneak out to go and take this substance - yes."

Schools have a code of conduct and policies in place to deal with learners who may be found in possession of substances. Less punitive measures may involve referring learners for counselling and treatment by social workers and psychologists. If a learner is found intoxicated at the school gate, he or she may not be allowed into the school premises. In extreme cases, learners may be suspended from school as explained by the participant whose

explanation is indicated below:

"the school always suspends those learners if you are seen that you are really drunk. Then the school will send you home, suspend you. The suspension can be for a term or for the whole year. And, ehhh if it is detected from the gate that this person is drunk or intoxicated the person will not be allowed to come in the school.

3.3 Easy Access /Availability of Too Many Liquor Outlets

The consensus and concern raised by all the participants of the study was the liquor outlets that are found all over the community within the residential areas, which makes alcohol and other substances easily accessible to school going youth. One participant explained:

"Like every place where you go you find a bar, and the schools are also close to the bars and houses are close to the bars…sometimes it is very easy for these children to drown in because of the accessibility"

In support of that, another respondent added:

"*you find a house with a cuca shop and then parents, they allow their children to hang around at the bar there"*

A cucashop is a term used in northern Namibia to refer to drinking outlets and it is a synonym for a shebeen. This finding was confirmed by SIAPAC (2002), Shikoyeni (2017), Kauaria, Kaundjua and Mufune (2015), and Nowak et al. (2018) who confirmed that alcohol is easily accessible all over the country which increases drinking behaviour of Namibians. These findings are a serious contravention of the Liquor Act No 6 of 1998 of Namibia which stipulates the need to avoid, as far as possible, the establishment of licensed premises in the vicinity of schools or places of worship (Government of the Republic of Namibia, 1998, 16 A iii). The Namibia Human Development report states that the alcohol industry is the third largest employer, after government services, agriculture and fisheries in Namibia, and thus liquor outlets are readily available in the communities (UNDP, 1999). The report added that alcohol is also easily available at liquor stores and restaurants in Namibia. There are therefore, more liquor outlets compared to other types of business in many Namibian towns. A qualitative study by Chibaya (2016) focussed on the availability of illegal drugs in Namibia and found that the availability of illegal drugs to secondary school learners in Namibia is a major concern. Most of the participants complained that schools are located next to the bars and children can easily buy alcohol from these liquor outlets close to the school. One participant commented:

"*our school is surrounded by shebeens."*

Ndondo (2016) supports the findings by asserting that the availability of alcohol in close proximity of schools may be tempting to learners to take into school premises. Because of the close proximity of bars, some school going learners drink alcohol and other substances while they are on their way to school in the mornings or in the afternoon when they return from school. Another participant said:

"*after school, on their way to home they start* (drinking), *or even on the way to come to school early morning they do have."*

The findings align with the results of Milam, Lindstrom-Johnson, Furr-Holden & Bradshaw (2016), who state that the presence of alcohol outlets in communities to and from school routes as well as in close proximity of schools provides an opportunity to school going children to experiment with alcohol and substances. Consequently, some children may end up drinking alcohol excessively or using other substances to the point of habitual behaviour. Moreover, some parents seem to condone and even support the presence of shebeens. Participants reported that some parents are owners of the business of shebeens themselves and they expect their children to work in the shebeens selling liquor after school. The parents who are not owners of shebeens also support shebeens as customers. One participant stated that:

"Those parents own shebeens. Sometime, after school, these learners are the one that run shebeens and they tend to misuse alcohol."

The findings are consistent with a UNICEF evaluation report on the "My Future is my Choice" life skills programme for adolescents in Namibian schools, which indicated that parents' drinking behaviour and the sending of their children to buy alcohol is a risk factor to substance abuse amongst the youth (UNICEF, 2008). Respondents also reported that some parents are poor role models as they drink alcohol with their children. One participant indicated that:

"You will find parents in a cuca shop with their children drinking together yes, like in cuca shop they will be drinking tombo and sharing."

The findings are consistent with literature (Maree et al., 2008; Mudhovozi et al., 2014; Ndondo, 2016) which reports that youth tend to imitate inadequate role models such as parents, guardians and caregivers who are using substances. The Namibian Human Development report also confirmed that the way children are brought up, the drinking habits of families and the communities, and parents sending children to shebeen outlets at a tender age result in children seeing alcohol consumption as a normal way of life (UNDP, 1999). In line with more than one hundred countries worldwide that are banning the purchasing of alcohol by children (Morleo et al., 2013), the Namibian Liquor Act No 6 of 1998 also prohibits the selling of liquor to children younger than 18 years. Participants reported that alcohol outlets seem to ignore the legal provisions and end up selling alcohol to children under 18 years, which increases the chances of underage drinking. One participant stated:

"In bars and bottles stores and pubs at least there are regulations that prevent children from entering, but in shebeens in the locations and shantytowns and in villages anybody could come and enter and get alcohol. Everybody is free. So, the shebeens play a much important role in distributing alcohol to minors."

The findings are consistent with Chibaya (2016) who argue that children are unfortunately allowed in shebeens because they may attract more business and support the business financially. The Namibian Human Development report indeed confirmed that contrary to the legislation that prohibits the selling of alcohol to children younger than 18 years, minor children in fact have easy access to alcohol at shebeens and even at licenced liquor outlets (UNDP, 1999). In a mobile based study by Keulder (2009) that aimed at seeking the views of children on issues that affect them in the community, children between the ages of 10 and 13 years strongly expressed their opinion that stricter laws should be passed against selling alcohol to children less than 18 years of age in Namibia. Liquor outlets are controlled by the liquor act which stipulates the business operating hours of liquor outlets. Participants shared a concern about the operating hours as some businesses ignore the prescribed operating hours by remaining open day and night. As a result, there is no time for communities finds little time to rest at night which could be disturbing for school going children who needs proper rest at night to concentrate on academic work. One participant explained:

"The operations hours and licences are…are challenges. Iya…ten o clock, I think is a reasonable time. But now you will find some bars that have got licenses that go up to 2 o'clock in the morning ehh…if it was 10 o'clock across that would have been better, and the police would have been very much effective in regulating that. But for now, others will regulating until 10 o'clock. What will you do if 10'o clock is closing time for this shebeen, he will proceed to another one that will operate until 4 o'clock and 2 o'clock in the morning and then ee…ee…it woundn't serve any purpose any longer because once this one is close he will go to the other one and it is between that time you will find lots of accidents taking place. Because lot of accident take place between 10 and 11 and 2, between 10 and 2. Because those people commute between places to go and look for alcohol, but if it was flat 10 o'clock 22 hours in the evening that would been better."

These findings are supported by Maree et al. (2008) whose findings have confirmed that alcohol outlets in Namibia, especially the unlicensed ones, open day and night. The Namibian Human Development report also confirmed that some shebeens in Namibia offer alcoholic beverages to its customers on a 24-hour basis (UNDP, 1999). The Liquor Act of Namibia provides for the regulations and standards that need to be in place before a licence can be issued to liquor outlets. Participants explained the difficulties prospective business people encounter to acquire a liquor licence, which leave some shebeen owners with no option but to run the shebeen without any license. One participant stated

"O*btaining a licence to open a shebeen is not easy, because people should follow the strict regulations. Perhaps some shebeens are opened illegally and have not been following the regulations and are also not hindered from operating either*."

Contrary to these findings on the difficulties to obtain a liquor licence, both Maree et al. (2008) and (UNDP, 1999) claim that the sale of alcohol has become uncontrollable as many people possess trade licences and shebeens in Namibia. The Namibian Police is tasked by the Liquor Act 1998 to monitor liquor outlets, and to ensure that they are operating within the prescribed limits. Participants reported the challenge and resistance that the police officers encounter from the community members to exercise law and order. One participant claimed:

"*the police is trying their level best to control the operation of shebeens but sometimes community members, business people themselves they try too…fight them back."*

Except for law enforcement, Namibian communities have already existing cultural norms to control the opening and closing of businesses, including shebeens, to ensure that agricultural activities must first be carried out before other business activities are considered. One participant explained how traditional authorities stipulate business

hours in the community:

"*At our village, it is a law of the village that the earlier one could open during the summer time when there is no work is 10 o'clock after watering the animals, iya, 10 o'clock in the morning. And then when it harvesting time, cultivation and harvesting is 11 o'clock iya*"

A desire was further expressed to have the number of liquor reduced in the community, and to completely separate liquor outlets from residential areas in the community. One participant stated:

"*if the location could be made just for houses, that will be good and shebeens on the other side that would be possible"*

As much as the issue of many liquor outlets in the community is of concern, some participants complained that substances are even found on the streets, especially the unlicensed alcohol, cigarettes and the illegal drugs that are smuggled illegally in the country. Certainly, a different type of measure has to be considered for substances that are available on the streets. One participant stated:

"*those whiskies and "Yes" cigarettes, ... those illicit drugs…they are in the streets, people are selling them mobile,.... they are not as such at the bar or certain people who are selling these, people are just selling in the streets*."

These items sold on the street are the substances such as the unrecorded cigarettes, alcohol and drugs that were smuggled into the country due to poor border controls. This is confirmed by Peltzer, Ramlagan, Johnson and Phaswana-Mafuya (2010) who claim that poorly controlled border posts that also have a large number of people crossing a border offer opportunities for smuggling illegal substances.

4. Discussion

This qualitative study explored the views of secondary school teachers and hostel matrons on the landscape of substance abuse amongst the youth at a border town community in northern Namibia. It was the first study of this nature to be conducted in a border town within a rural community, and the findings may be useful for programme, policy and law reform.

The findings of this study confirmed that learners and young people are using a variety of alcoholic beverages. Legislation on the legal age limit of selling alcohol to children under the age of 18 does not seem to be a deterrence to the youth to obtain alcohol. The study found that little children may already be offered traditional brews by caregivers with the intention of feeding the children, but with complete ignorance of the alcohol content of the traditional brew. The study further indicated that traditional brews are also taken to school to be taken during school breaks. However, the taking of traditional brews is not a preference by the youth, but rather due to hunger and starvation of the learners and poverty. It appears that drinking of traditional brews becomes acceptable at a much older age of young adulthood. The smoking of cigarettes by the youth in this study seems to be based on the availability of very cheap cigarettes imported into the country. Thus, under circumstances where normal prizes of cigarettes apply, school learners might have been hesitant to use cigarettes. School going youths in this study are exposed to cannabis and as such they come into conflict with the law. A surprising observation of this study is that law enforcement was more efficient in the situation of cannabis as an illegal substance used by the youth. However, law enforcement of the legislation related to alcohol seems to be low. The study found that there is a low response by the police and law enforcement on matters pertaining to alcohol such as drinking outlets in close proximity to schools, selling of alcohol to children under 18 years of age and the operating hours of shebeens that seems not to be under any control.

Furthermore, learners taking alcohol to school and using it on secluded school premises was the second theme in this study. Attempts by school administrators to ensure that the school environment is free from substances by testing learners for alcohol and drugs were found amongst the measures at the schools. The third theme of this paper focussed on the easy accessibility and availability of substances in the community. Despite the prohibition in the Liquor Act of Namibia, drinking outlets were found to be in close proximity of schools, which is indeed a temptation for school going youth, and this increases the likelihood of substance abuse by the youth. The role of parents as shebeen owners and their expectation for children to work in shebeens and even sending children to buy alcohol at shebeens also exposes children to the culture of drinking. A worrisome finding that is probably unique to border town communities is the availability of substances smuggled from across the borders into the Namibian streets.

5. Conclusion

One of the implications flowing from this research is the need for advocacy and stricter law enforcement on the

selling of alcohol to the youth, the close proximity of shebeens to schools and residential hours and the operating hours of shebeens. Parental education needs to be introduced to raise awareness about the negative influences of shebeens to school going children. Moreover, drastic measures need to be considered to completely remove liquor outlets from residential areas and schools. The community at large may also need to be educated and to take a firmer stand against the presence of shebeens near schools and within the community. However, the results of the study cannot be generalized to a larger population because the study was conducted at a single border town in northern Namibia, hence the study did not include the other border towns. Furthermore, the study only focussed on the views of secondary school teachers and hostel matrons from selected schools at the border town. Therefore, this study can be replicated in other border towns with a larger sample size. In this study, the views of educators on substance abuse amongst youth were examined. Future research could focus on the views of learners themselves or the views of parents on substance abuse.

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Competing Interests Statement

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Clinical Survey of Pseudoexfoliation Syndrome

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Abstract

Objective: Assess the prevalence of PEX and identify the associated glaucoma and cataract.

Study Design and Methodology: A sample of 6,650 patients (age ≥40 years) that attended the single ophthalmic private clinic for different complaints, for five years (January 2013 until January 2018), those diagnosed with PEX enrolled in this study, with a total number of 296 patients.

Results: 14 (4.7%) patients with age from 40-49 years, 54(18.2%) from 50-59 years, 102 (34.5%) from 60-69 years, and 126(42.6%) equal or older than 70 years. Close sex frequencies were observed, with 153(51.7%) males, and 143(48.3%) females. In the current study, the prevalence of PEX was 4.45% (95% confidence interval (CI), 3.98-4.97). There was a statistically insignificant relationship between PEG or advanced glaucoma with age or sex, but cataract was significantly associated with older age and male sex.

Conclusion: The prevalence of Pseudoexfoliation syndrome was 4.45%, with a sharp increase after the age of 50 years. Although the prevalence of PEG and advanced glaucoma increased with age, it was neither statistically associated with it, nor with sex. Cataract prevalence was associated with increased age and male sex.

Keywords: pseudoexfoliation, glaucoma, cataract, age, gender

1. Introduction

Pseudoexfoliation (PEX) syndrome is defined as an age-related disorder of the extracellular matrix with characteristic production with an accumulation of a fibrillary material progressively in different intraocular and extraocular tissues (Anastasopoulos, Founti, & Topouzis, 2015). PEX is strongly associated with developing glaucoma (Ritch & Schlotzer-Schrehardt, 2001). Pseudoexfoliative glaucoma (PEG) regarded as the commonest type of secondary open-angle glaucoma (Ritch, 2001), and usually with higher intraocular pressure, more clinically serious course and worse prognosis compared to primary open-angle glaucoma (POAG) (Heijl, Bengtsson, Hyman, & Leske, 2009; Hyman, Heijl, Leske, Bengtsson, & Yang, 2010; Leske et al., 2007).

Some population-based studies have shown a cross-sectional association of cataract with PEX, this could be due to alterations in the vasculature of iris and blood-aqueous barrier, and this affects the aqueous composition and subsequently could affect the lens metabolism, resulting in the formation of cataract (Kanthan, Mitchell, Burlutsky, Rochtchina, & Wang, 2013). In the current study, the aim was to assess the prevalence of Pseudoexfoliation syndrome and to identify its associated complications; namely glaucoma and cataract.

2. Method

2.1 Study Design and Setting

The total sample of patients was 6,650 patients who attended a private ophthalmic center, for a period of 5 years, from January 2013 until January 2018, all undergone full ocular examination with slit-lamp biomicroscopy examination before and after full pupillary dilatation and then there were 296 patients diagnosed with ocular Pseudoexfoliation, which were enrolled in this study.

2.2 Eye Examination

Further ocular examination included; applanation tonometry, standard visual field perimetry, and optical coherence tomography for assessment of functional and structural changes. The presence of cataract, glaucoma (Pseudoexfoliation and advanced), history of diabetes, hypertension, or ischemic heart disease were all

documented.

Advanced glaucoma defined as optic nerve near total cupping with/without severe loss of visual field within 10° of point of fixation, indicating a scotoma encroaching on fixation or splitting it (Gessesse & Damji, 2013).

2.3 Ethical Clearance

All of the participants provided their written consent to participate in this research after they were fully educated about the nature of the study. This study was approved by the scientific, ethical committee of the Fayha General Hospital. The study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000.

2.4 Statistical Analysis

The data was handled and analyzed by IBM© SPSS© (Statistical Package for the Social Sciences) Statistics Version 22. Chi-square (with 95% Confidence Interval) was the test used for categorical data, and *P-values* less than 0.05 were considered statistically significant throughout this study.

3. Results

In the current study, the prevalence of Pseudoexfoliation syndrome was 4.45% (95% confidence interval (CI), 3.98-4.97). The most common age group was ≥70 years which is slightly higher than 60-69 years, similar distribution of gender observed, in this sample of patients DM, hypertension and IHD frequency was low as illustrated in Table 1.

Table 1. Demographic and clinical characteristic

Variables		**Number**	**%**
Age groups	40-49	14	4.7
	50-59	54	18.2
	60-69	102	34.5
	≥70	126	42.6
Sex	Male	153	51.7
	Female	143	48.3
Diabetes mellitus		22	7.4
Hypertension		35	11.8
Ischemic heart diseases		3	1.0

There was no significant association between Pseudoexfoliative glaucoma (PEG) and advanced glaucoma with age, while cataract show statistically significant association with age in which advanced age group association with higher frequency of cataract, as illustrated in Table 2.

Table 2. Association between age groups with Pseudoexfoliative glaucoma, advanced glaucoma, and Cataract

Age groups	**40-49**	**50-59**	**60-69**	**≥70**	**p-value**
Pseudoexfoliative glaucoma, n (%)					
Present (110)	5 (35.7)	18 (33.3)	42 (41.2)	45 (35.7)	0.761
Absent (186)	9 (64.3)	36 (66.7)	60 (58.8)	81 (64.3)	
Advanced glaucoma, n (%)					
Present (84)	4 (28.6)	12 (22.2)	34 (33.3)	34 (27.0)	0.501
Absent (212)	10 (71.4)	42 (77.8)	68 (66.7)	92 (73.0)	
Cataract, n (%)					
Present (127)	0 (0.0)	12 (22.2)	48 (47.1)	67 (53.2)	<0.001
Absent (169)	14 (100.0)	42 (77.8)	54 (52.9)	59 (46.8)	

There was no significant association between Pseudoexfoliative glaucoma (PEG) and advanced glaucoma with gender, while cataract show statistically significant association with gender in which male show higher association with cataract, as illustrated in Table 3.

Table 3. Association between gender with Pseudoexfoliative glaucoma, advanced glaucoma, and Cataract

Gender	Male	Female	p-value
Pseudoexfoliative glaucoma, n (%)			
Present (110)	60 (54.5)	50 (45.5)	0.450
Absent (186)	93 (50.0%)	93 (50.0)	
Advanced glaucoma, n (%)			
Present (84)	48 (57.1)	36 (42.9)	0.237
Absent (212)	105 (49.5)	107 (50.5)	
Cataract, n (%)			
Present (127)	120 (94.5)	33 (19.5)	<0.001
Absent (169)	7 (5.5)	136 (80.5)	

4. Discussion

In the current study the prevalence of Pseudoexfoliation syndrome was 4.45% (95% confidence interval (CI), 3.98-4.97), this prevalence was comparable to results reported by Vijaya et al. (2015) (Vijaya et al., 2015) who examined 7774 subjects in south India, then followed them for six years, and found the prevalence of Pseudoexfoliation syndrome among that population to be 3.73% (95% CI, 3.73-4.2), also in another study done by Jasna Pavičić-Astaloš, et al. (2016) in north-west Croatia (Pavičić-Astaloš et al., 2016), which included 5349 subjects and found the prevalence of Pseudoexfoliation syndrome among them to be 3.6%, it's well known that the prevalence differs with age, sex, and more importantly with the geographic location of a population and ethnicity, also genetic predisposition like LOLX1 variants (Anastasopoulos, Founti & Topouzis, 2015).

In the current study the prevalence of Pseudoexfoliation syndrome clearly increased with age, and this was compared to results of Jonas et al. (2013) (Jonas et al., 2013) in central India, who enrolled 4646 subjects and detected PES in 87 patients, and found that the prevalence was significantly related to age, although it's proven from the definition of the disease itself that it is age-related, but consistency of this proved that there was no shift of the disease to involve a lower age population.

In the current study, sex distribution of PEX was very similar with males forming 51.7% compared to 48.3% females, similar results were reported by Vijaya et al. (2015), with 44.7% male and 55.4% female, but Raşit Kılıç (2014) in Turkey (Kılıç et al., 2014) reported more male predominance with 66.04% male compared to 33.96% females, in their study which identified PEX in 212 (10.1%) of the total 2103 participant, but another earlier Turkish study done by Cumurcu et al. (2010) (Cumurcu, Kilic, & Yologlu, 2010) reported no sex difference in PEX prevalence.

The prevalence of diabetes mellitus, hypertension, and IHD was relatively low in the current study, and these findings supported the results of Thessaloniki Eye Study, done by Anastasopoulos, et al. (2011) (Anastasopoulos et al., 2011) who found no relationship between these diseases and PEX, but in a review done by Andrikopoulos, et al. (2014) (Andrikopoulos, Alexopoulos, & Gartaganis, 2014) they mentioned that PEX could by a risk factor for developing cardiovascular disease or they are different manifestations of the same pathologic condition.

In the current study the prevalence of PEG was 110(37.2%), and the prevalence of advanced glaucoma cases from them was 84(28.4%), and although showed statistically insignificant relationship with age and with sex, there was an increase in prevalence of PEG and advanced glaucoma with increasing age and slightly more in males, this result was comparable to results of Jasna Pavičić-Astaloš, et al. (Pavičić-Astaloš et al., 2016) who showed the prevalence of PEG to be 23.6% with no sex difference, also the result of Seng Lee (2015) in Singapore (Lee, Wong, & Ho, 2015) showed that the mean age for PEX patients with or without PEG had no statistically significant difference, and there were statistically significant more males having PEG than females, on the other hand, Jonas, et al., (Jonas et al., 2013) reported that after age adjustment for a multivariate analysis; PEX was not related to open-angle glaucoma. Another study was done by Tanushree and Gowda, (2014) in India, they examined 100

patients diagnosed with PEX and screened them for glaucoma, 17.0% of them had PEG, 10 (58.8%) was male and 7(41.2%) were females, who also reported that, although the prevalence of PEX was higher in females, PEG was more in male. In contrast to this, a large cohort study in the USA done by Kang et al. (2012) (Kang, Loomis, Wiggs, Stein, & Pasquale, 2012) showed that male was 68% less likely to develop PEG than women, this varying reports about sex and PEG indicates that there are still undiscovered confounder factors that bias the results of each study toward a certain sex.

The prevalence of cataract among patients with PEX in the current study was 42.9%, which was comparable to the results of Yildirim, et al. (2017) (Yildirim, Yasar, Gursoy, & Colak, 2017) in Turkey, who reported that 55.0% of the 100 patients with PEX suffered cataract compared to 35.0% of the 1909 other subjects without PEX. The current study showed that there was a statistically significant association between older age groups and male sex with cataract. It known that cataract prevalence increases with age in patients with PEX or without it (Plateroti, Plateroti, Abdolrahimzadeh, & Scuderi, 2015). In the current study males with cataract were the majority 120(94.5%) compared to females 7(5.5%), a less than this male predominance was reported by Gelaw et al. (2012) in south-east Ethiopia (Gelaw & Tibebu, 2012) with 68.7% male compared to 31.3% of females suffering from cataract and Pseudoexfoliation, this higher male ratio might be explained as male are usually independent and can have access to medical care easier than female in such societies.

5. Conclusion

The prevalence of Pseudoexfoliation syndrome was 4.45% (95% confidence interval (CI), 3.98-4.97), with a sharp increase after the age of 50 years. Although the prevalence of PEG and advanced glaucoma increased with age, it was neither statistically associated with it, nor with sex. Cataract prevalence was associated with increased age and male sex.

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Competing Interests Statement

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

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Recording Data Labour With Documentation Midwifery Based on Word Electric Browser (WEB)

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Abstract

Introduction: Midwifery documentation is a proof of recording and reporting possessed by midwives in carrying out records in documenting care provided.

Material and Methods: The research method used was the comparative study with the comparative descriptive design. The total subjects of 30 mothers in labor were chosen using the purposive sampling technique. The subjects were divided into two groups: 15 of the mothers used the conventional midwifery documentation and 15 of them used the WEB-based. The data were analyzed using the univariate analysis in order to look at the median value, and the bivariate analysis with Mann-Whitney test.

Results: The study results indicated the the highest frequency was found in the WEB-based partograph, namely he filling speed was 26 (86.7%), the highest frequency of partograph filling truth was that of the WEB-based partograph = 25 (83.3%), while the highest Relevance of the data frequency was found in the WEB-based partograph with the data Relevance = 27 (90%). The result of the statistical test had the p value of 0.000, 0.000, and 0.000 ($< \alpha = 0.05$) meaning there was a difference of the WEB-based midwifery documentation compared to the conventional midwifery documentation.

Conclusion: Thus it can be concluded that web-based midwifery documentation is more effective than conventional midwifery documentation. There are differences in the aspects of ease, speed, security and relevance of data to recording labor history data so that it needs to be applied in documenting midwifery care.

Keywords: WEB-based midwifery documentation, conventional

1. Introduction

Midwifery documentation is a proof of recording and reporting possessed by midwives in carrying out records in documenting care provided. According to WHO, the use of partographs will reduce long labor 6.4% to 3.4% of cases of caesarea 44% to 21%. Some of the things that affect the low recording in partographs are the level of knowledge of midwives about partographs which is not very influential in monitoring labor, recording documents and reporting partographs, making clinical decisions and planning future actions. During this time reporting and documentation by midwives was based on recording in partographs on paper, however, based on several studies said that there were still many midwives who did not complete the data in the partograph well and systematically, therefore a recording system, faster reporting and documentation of partographs in a computer and web-based data storage to facilitate the work of midwives in storing and re-accessing current and past labor history so as to prevent the accumulation of partograph files (Baillie, Chadwick, Mann, & Brooke-Read, 2013; Kitila, Gmariam, Molla, & Nemera, 2014; Asibong et al., 2014; Okokon, Oku, Agan, Asibong, Essien, & Monjok, 2014; Anita, 2016; Andrianto, 2017; Balikuddembe, Tumwesigye, Wakholi, & Tylleskär, 2017; Bedwell, Levin, Pett, & Lavender,

2017; Erawantini et al., 2017; Mandiwa & Zamawe, 2017; Fatusi, Makinde, Adeyemi, Orji, & Onwudiegwu, 2008; Nugroho, Fitriasih, & Widada, 2015; Ramdhani, Isnanto, & Windasari, 2015; Sovia & Febio, 2011; Sundari, 2016; Widyaningsih & Astutingsih, 2016; Fahdhy & Chongsuvivatwong, 2005; Yisma, Dessalegn, Astatkie, & Fesseha, 2013a, 2013b; Baillie et al., 2013; Gans-Lartey, O'Brien, Gyekye, & Schopflocher, 2013; Ollerhead and Osrin, 2014; Aliona Masika, Peter Katongole, & Govule, 2015; Mathews, Rajaratnam, George, & Mathai, 2007; JNPK-KR, 2012; Bailey, Wilson, & Yoong, 2015; Opoku & Nguah, 2015; Fatouh, 2015; Vidyashri & Nagarathna, 2015; Nugroho, Fitriasih, & Widada, 2015; Byukusenge et al., 2016; Kwast, 1994; Yisma et al., 2013a; Opoku & Nguah, 2015; Sinaga, 2016; Susilowati & Sulistiyaningsih, 2011; Tayade & Jadhao, 2012; WHO, 2011; 2014).

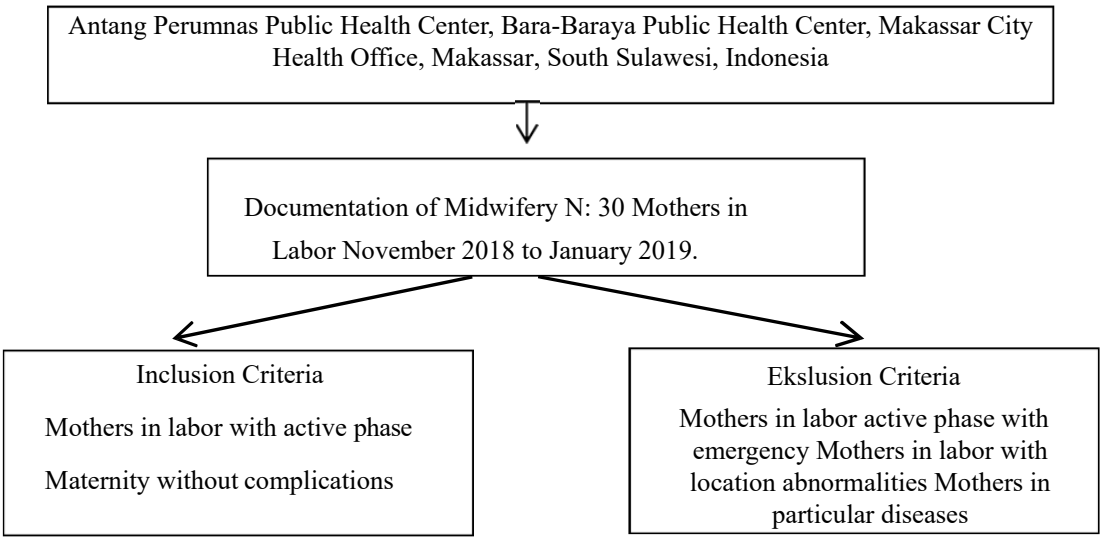
The study obtained a total of 1070 partograph reviewed, 58.6% of the partograph had no record of maternal blood pressure, 65.3% had no documentation of temperature, 25.4% Molding was not recorded, 14.9% of fetal heart rate was not recorded and 12.0% of the decrease in fetal head is not recorded so that there are still many shortcomings in systematic recording and documentation (Balikuddembe et al., 2017; Mandiwa & Zamawe, 2017; Nurmiyati, 2011).

Based on the description above, the author was motivated to develop a web-based partograph midwifery documentation database research system. This is intended to streamline the process of recording, reporting and documenting partograph in aspects of speed, convenience, security, and convenience by using the Subjective, Objective, Analysis and Management (SOAP) methods. And in accessing again and seeing the recording of labor history and actions taken by the midwife so that it can accelerate clinical decisions, plan actions taken and streamline reporting, documentation in midwifery and prevent the accumulation of partograph files (Bhatt, Kar, Shashank, & Somarajan, 2004; Chaturvedi et al., 2015; Erawantini et al., 2017; Hadi et al., 2017; Hasan, Hossain, Arafat, Khan, Ahmed, & Shabnam, 2017; Underwood, Sterling, & Bennett, 2012; Schweers, Khalid, Underwood, Bishnoi, & Chhugani, 2016; Jennifer, 2012; Souza et al., 2015; Lavender, Hart, & Smyth, 2013; Mathibe-Neke, Lebeko, & Motupa, 2013; Kitila et al., 2014; Kamath, Nagarathna, & Sharanya, 2015; Mandiwa & Zamawe, 2017; Lew & Ghassemzadeh, 2018; Nursing and Midwifery Council 2010a; 2010b; Sama et al., 2017; Seo et al., 2016; Sinha, S. Shrivastava, & S. Shrivastava, 2016; Sudarti, 2011; Varney, 2008).

2. Materials and Methods

2.1 Design of the Study and Sample Population

The research design used was quasi-experimental using a treatment group on web-based partograph midwifery documentation and control groups in conventional partograph midwifery documentation. This research was conducted at the Bara-Barayya Health Center, Antang Community Health Center and Makassar City Health Office, Makassar, South Sulawesi, Indonesia from November 2018 to January 2019. The research tools here are hardware components and software used as tools in supporting research conducted, this tool will be used as a data processing tool and the making of the system to be designed. The research method used is a comparative study with a descriptive comparative design. The total subjects of 30 mothers in labor were selected using purposive sampling technique. Subjects were divided into two groups: 15 mothers of labor records using conventional midwifery documentation and 15 mothers of labor records using WEB-based midwifery documentation. Data were analyzed using univariate analysis to see the median value and bivariate analysis with the Mann-Whitney test. Sampling from the study population was carried out by purposive sampling, where populations that met the inclusion criteria were included as sample members. The number of subjects was 30 patient data, 30 labor patients were documented using conventional partograph midwifery documentation and web-based partograph midwifery documentation. Samples were divided into 2 groups of data, 15 patient data filled using conventional partograph (manual) and 15 patient data filled using computer-based partograph Further more, 30 mothers in the delivery process will be filled by 9 midwives in the delivery room of Antang Perumnas Health Center, 8 midwives in the delivery room of the Bara-Baraya Makassar Health Center and 1 midwife at the Makassar City Health Office will see partograph documentation as data reporting, 17 of these midwives will fill 30 data patients used conventional partograph midwifery documentation (manual) and patient data was filled using web-based partograph midwifery documentation. Midwives from the Publich Health Center who are used as subjects are categorized by age, length of work, training that has been attended. The results of the filling will be assessed using an observation sheet that contains a column of the number of speeds in seconds with measurements using a stopwatch, the correctness of filling with the standard midwifery documentation format reference, and the relevance of the appropriate data from the results of the examination and the results inputted on the website. The primary data obtained directly on the data source is when conducting interviews with midwives and maternity mothers, making observations on filling partograph documentation carried out by midwives about the progress of labor, care provided and results obtained.



Ficture 1. The Flowchart of the Study

2.2 Data Collection

The primary data obtained directly on the data source is when observing the actions taken by the midwife and the results recorded, namely at the Antang Perumnas Health Center, Makassar Bara-Barayya Health Center and Makassar City Health Office Makassar, South Sulawesi, Indonesia. Secondary data obtained indirectly to support writing in this study through documents or records of medical records of mothers who have given birth at the research site, The total subjects of 30 mothers in labor mothers were chosen using the purposive sampling technique. The subjects were divided into two groups: 15 of the mothers used the conventional midwifery documentation and 15 of them used the WEB-based midwifery documentation namely at the Antang Perumnas Public Health Center, Makassar Bara-Barayya Public Health Center and Makassar City Health Office, South Sulawesi, Indonesia.

2.3 Ethical Considerations

This study received ethical clearance from the Research and Ethics Committee of Faculty of Medicine, Hasanuddin University and was registered in 972/h4.8.4.5.31/PP36-KOMETIK/2018. And protocol number: UH18100691.

2.4 Data Management and Analysis

Descriptive analyses were presented as mean ± standard deviation and frequencies for categorical variables. Bivariate analyses were analyzed and processed using independent t-test in pairs, Mann-Whitney to determine the differences between all groups at 5% level of significance. Spearman's correlation was used to determine further correlations. Data were analyzed using the Statistical Package for Social Science (SPSS) version 24 for Windows.

3. Results

Sampling from the study population was carried out by purposive sampling, where the population that met the inclusion criteria was included as sample members. The number of subjects was 30 patient data, 30 deliveries were documented using conventional partograph midwifery documentation and web-based partograph midwifery documentation. Samples are divided into 2 groups of data, 15 patient data filled using conventional partograph (manual) and 15 patient data filled using computer-based partograph.

3.1 Univariate Analysis

Midwifery Documentation Comparison From Time Speed Aspects, Truths Charging, Data Security and Data Relevance Midwifery Documentation Website-Based Partographs.

Table 1. Characteritics of filling in website system partograph midwifery documentation and conventional partograph midwifery documentation from aspects of ease of filling, time speed, data security, data relevance

Characteristics	Midwifery Documentation	
	Website Based	Conventional
	F %	F %
Time Speed		
Hurry up	26 (86.7)	
Long	4 (13.3)	30 (100)
Truth of Charging		
Right	25 (83.3)	9 (30)
Not exactly	5 (16.7)	21 (70)
Data Relevance		
Right	27 (90)	9 (30)
Not right	3 (10)	21 (70)
Total	100	100

Source : Primary Data, Paired t test.

Table 2. Average scores for filling website-based partograph documentation and conventional partographs from the speed aspect of charging time

Characteristics	**Mean**	**SD**	**Min – Maks**
Charging time			
Website-based partograph documentation	21.7	1	19-24
Conventional Partographical Documentation	31.1	1	29-34

Source: Primary Data, Paired t test.

3.2 Bivariate Analysis

Analysis of differences in website-based partograph midwifery documentation and conventional partograph midwifery documentation against.

Table 3. Differences in midwifery partographies of websites based on websites and midwifery documentation of conventional partographs on recording of childbirth history data

Test Statistics[a]

	Truth Time	Speed Charging	Data Relevance
Mann-Whitney U	60.000	210.000	180.000
Wilcoxon W	525.000	675.000	645.000
Z	-6.717	-4.134	-4.704
Asymp. Sig. (2-tailed)	.000	.000	.000

Source: Primary Data, [a]*Mann-Withney Test*.

4. Discussion

Table 1 The results obtained the speed of time needed for filling Website-based partograph and conventional partograph, the highest frequency was found on web-based partograph, namely fast charging 26 (86.7%), while the

truth of the highest frequency partograph filling was website-based partograph, 25 (83.3%) . Data security obtained the highest frequency, namely on website-based partograph, which is 30 (100%), while the highest frequency data relevance is website-based partograph with data relevance of 27 (90%). The results of this study indicate that the use of website-based partograph midwifery documentation will make it easier for midwives to process the recording, reporting and recording of labor history data, website-based partograph midwifery documentation will minimize errors and have a good level of truth. This is in line with the research conducted by Heather et al., 2012, Heather et al., 2014 which found that the use of electronic partograph was more effective and efficient with the use of hardware and software as a documentation and recording of labor history that could be used as a tool to train labor health about how to use the correct partograph with limited human resources so that it has an impact on the completeness of partograph filling, reducing the error rate (Qureshi, Sekadde-Kigondu, & Mutiso, 2010; Pirie, 2011; Ontario, 2013; Maureen D, et al., 2015; Muslihatun et al., 2013; Ollerhead & Osrin, 2014; Sharma, Deka, & Das, 2015).

Table 2 gaining from the speed of filling the website-based partograph midwifery documentation and conventional midwifery documentation, the average time required for filling in website-based partograph midwifery documentation was 21.7 minutes, with a standard deviation of ± 1 second, while documentation of conventional partograph midwifery time needed to fill more that is 31.1 minutes with a standard deviation of ± 1 second.

The results of research conducted by Yulianti et al. (2018) got the use of electronic partograms in recording and reporting partograph documentation with incoming data speeds of 82% with an error rate of 18%, in the process of recording and reporting the time used for charging is relatively shorter 8.6 hours, so it can be concluded that the use of electronic partograms allows data to enter faster with a lower error rate than conventional partograms

Table 3 shows the analysis of data using Test, obtaining a p value of 0.000 (<0.05) means that there are differences in website-based partograph midwifery documentation and conventional partograph midwifery documentation on recording delivery history data from aspects of filling filling truth, data security and data relevance (Sugiyono, 2014; Wildan dan Hidayat, 2009).

The statistical test results require an average time of 21.7 minutes, ease of filling is also seen in the correct level of charging that is true 83.3%. The ease of filling will have an effect on the time needed to be shorter, the human resources needed are more simple and the quality of midwifery services is more optimal. This is in accordance with the research conducted stating that for facilitation aspects in the process of documenting midwifery and care provided, it gives information to officers on what has been recorded so that it makes it easier in the process of managing subsequent actions (Lavender, Hart, & Smyth, 2013; Fatouh & Ramadan, 2015; Ontario, C. of M. of 2013; Toemandoek, Wagey, & Loho, 2015).

5. Conclusion

Website-based partograph midwifery documentation is better than conventional midwifery documentation seen from the aspect of a short time velocity of 21.7 minutes using web-based partograph midwifery documentation and obtaining a 31.1 minute filling time speed in using conventional partograph midwifery documentation, the correct aspect of filling with columns filled with complete, systematic and appropriate, and relevant data relevance because it is stored in digital form. A web-based partograph midwifery documentation database effectively re-accesses labor history records and actions that have been given.

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Competing Interests Statement

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

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