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Assessment of Risk Factors Associated with Hypertension in Adult Population in Letlhakane, Botswana

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Abstract

Hypertension is an important public health challenge because of its associated morbidity, mortality, and the cost globally. Hypertension is the leading cause for cardiovascular disease in both developed and developing countries including Botswana. Only 3 population-based studies of hypertension have been conducted in Botswana and the latest 2010 STEPS survey reported a prevalence rate of 28.6%. This study was the first of its type to examine the prevalence of Hypertension and its associated risk factors among adults in Central Botswana. The objectives of this study were to estimate the prevalence of hypertension and assess the associated risk factors among adults in Letlhakane, Boteti Sub District-Botswana. A community based descriptive cross-sectional study was carried out on 377 participants (149 males and 228 females) aged 18 years and above, using simple random sampling method. The overall prevalence of hypertension among the study population was 38.5%. Females had a higher prevalence of hypertension (55.2%) as compared to males (44.8%). Age, body mass index, waist circumference, alcohol consumption and tobacco use were found significantly associated with hypertension ($p<0.05$). Regular screening for hypertension among adults should be done throughout the community for knowledge regarding their individual blood pressure status. Among those who already have hypertension and are on anti -hypertensive drugs; timely blood pressure check-up, screening for cardio vascular diseases and proper self-care management need to be promoted. Intervention measures should be undertaken at the community level; particular emphasis should be placed on primary prevention through adherence to healthy life style.

Keywords: *hypertension, risk factors, prevalence, cross sectional, community-based, blood pressure*

Acronyms

BP	:	Blood Pressure
CVDs	:	Cardiovascular Diseases
BMI	:	Body Mass Index
LMICs	:	Low-income and Middle-income countries
WHO	:	World Health Organization

Introduction

Hypertension is an important public health challenge because of its associated morbidity, mortality, and the cost globally. Hypertension is one of the main leading causes of cardiovascular disease (CVD) worldwide. Kearney et al. (2005)[10] describes the disease as a silent threat to the health of a population because records indicate that about 1 billion adult population worldwide had hypertension in 2000 and, this figure is expected to increase to about 1.56 billion by 2025. According to global health viewpoint the overall prevalence of raised blood pressure was 40% in adults aged 25years and over in 2008 globally. Drivers of the hypertension epidemic are urbanization and changes in lifestyle associated with economic development. These include changes in diet, alcohol consumption, tobacco use, obesity, family history, body fat, increased stress and decreased physical exercise.

An increase in hypertension prevalence will invariably lead to dramatic rises in the incidence of CVDs and their consequences, which has the potential to overwhelm health care systems. It will also have financial implications for national and local treatment plans because there is increasing evidence that the majority of patients with hypertension will require two or more drugs to achieve blood pressure control (Twagirumukiza et al 2001)[24].

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The burden of hypertension is high in Africa, and due to rapid population growth and ageing, the exact burden on the continent is still far from being known. A report from the World Bank (2012)[29] indicates that in Africa, about 80 million people had hypertension in 2000 and this figure is expected to rise by 2025. More than one-third of adults in Africa are hypertensive; as in the urban populations of most developing countries.

In Botswana, the Ministry of Health and Wellness STEPS 2007 report showed that the national prevalence of hypertension was estimated to be 16.9 %, whereas the 2010 STEPS report showed an increase in prevalence at 28.6%. According to the latest WHO data published in May 2014 Hypertension Deaths in Botswana reached 472 or 3.16% of total deaths. The age adjusted Death Rate is 49.18 per 100,000 of population, which ranks Botswana number 4 in the world.

The present study was undertaken to estimate the prevalence of hypertension and to assess the associated risk factors among adults of Letlhakane village. It was my observation that many people in Letlhakane follow unhealthy life styles such as eating lots of fast foods, alcohol abuse, tobacco smoking and physical inactivity that could predispose to the Hypertension disease.

Methods

A community based descriptive cross-sectional study was conducted to estimate the prevalence and associated risk factors of hypertension among adults of Letlhakane village during the period of August and November 2018. A cross-sectional study was selected considering cost and the limited time to complete the study. Letlhakane village is situated in Boteti Sub District in Central District, Botswana and it is comprised of 9 clusters called wards (catchment areas within the village). According to the 2011 census the population size of Letlhakane was 19, 539. The sampling frame was all adults aged 18 years and older who consented to be recruited. Individuals who rejected the recruitment process, pregnant women; those who were unable to give response due to serious physical or mental illnesses and with whom anthropometry measurements could not be performed were excluded from the study. Known cases of hypertension, those individuals who were already on medication for hypertension and those who were found to have high BP on this study were included in the sample.

The study used multiple variables at a time and the findings of this study can be used to explore further studies required. In this study a multi-stage sampling technique was applied to select study subjects. Sample size was 377 which was calculated using the Epi-info version 6 at 95 % Confidence interval and a margin of error (5% or 0.05). A Simple Random Sampling technique was used to select 3 wards from the total of 9. The sampling fraction from each of the selected wards was determined proportionate to the total households of each selected ward. Then systematic sampling method was employed to select the households from each wards where the sampling interval was the total number of households in each wards divided by the corresponding number of households to be interviewed in the respective wards. The first household to be interviewed was determined from the ward house number using simple random sampling method. The next household was identified systematically (H/hth) household by going clockwise direction. Eligible respondents aged 18 years and above were then selected as study subjects. Whenever more than one eligible respondent was found in the same selected household, only one respondent was chosen by lottery method (simple random sampling). In case no eligible was identified in the selected household, the interviewer would go to the next household in the clockwise direction until an eligible participant is obtained.

The WHO STEPS survey questionnaire tool for non-communicable diseases was adopted for data collection from the eligible subjects. During data collection the Expanded Demographic information (education level, marital status, income etc) and Biochemical Measurements section was excluded as the information was not needed to fulfill the purpose of the study but this did not compromise the reliability or validity of the study in any way. This questionnaire was administered by the principal investigator to one participant at a time and pretested. Data collected includes demographic characteristics, anthropometric data, blood pressure readings, history about smoking, alcohol consumption, dietary habit and physical activity. During the data collection process, subjects were administered the questionnaire. Height, weight, waist circumference and blood pressure were

measured and recorded. For anthropometric data, a tape measure, standardized weighing scale and a flexible non-stretchable tailor's tape were used.

Blood pressure was measured in (mmHg) using a standardized calibrated electronic Sphygmomanometer device. This device was reset after every measurements of each individual to ensure the authenticity and calibration of the tool. Three sitting BP readings were taken on the left upper arm in a sitting posture of the subject after having a sitting rest period of about 5-10minutes. The first reading was discarded and the average of the last two BP readings was used for analysis. BP for adults aged 18 years or older was classified as follows: (i) Normotensive: Systolic <120 mmHg, Diastolic< 80 mmHg; (ii) Pre-hypertension: Systolic from 120-139 mm Hg, Diastolic from 80-89 mm Hg; (iii) Hypertensive: Systolic from 140-179 mm Hg, Diastolic from 90-120 mmHg; (iv) Hypertensive Crisis: Systolic ≥180 mmHg, diastolic≥120 mmHg.

Hypertension was defined as a subject that had an average systolic blood pressure equal to or greater than 140 mmHg and/or an average diastolic blood pressure equal to or greater than 90 mmHg or a self-report of being treated for hypertension. Body Mass Index (BMI) was calculated using the following formula: BMI = weight (kg)/height (meters) ^{2}. Normal BMI was defined as between 18 to 25kg/m^2; below 18 kg/ m^2 is underweight and above 25km/m^2 is overweight. Data on dietary practices was defined by intake of fruits and vegetables in a period of 7 days. Data on physical activity was defined by its intensity and frequency in a period of 7 days.

An informed and written consent was taken from the individuals who were willing to participate in the study. Epi-info version 6 and IBM SPSS 22.0 were used for data processing, collection and analysis. Percentages were calculated for categorical variables, while mean and standard deviations were calculated for continuous variables. Chi – square test was used to ascertain significant differences in categorical variables. A p-value of less than 0.05 was considered as being statistically significant.

Ethical clearance for the study was obtained from the Committee on Human Research Publication and Ethics of the School of Public Health, Texila American University (TAU). Ethical clearance was also acquired from Ministry of Health and Wellness Botswana, Health Research Unit and further clearance was acquired from the local research committee of Boteti District Health Management Team in Letlhakane. Informed verbal and written consent was obtained from the subjects who volunteered to participate in the study before interview and the purpose of the interview was explained in detail to each participant. Confidentiality was assured through anonymous recording and coding of questionnaire and placed them in safe place after they have been collected and was used for the purpose of the study only. Identified hypertensive subjects were referred to the nearby clinic for treatment.

Results

Among the 377 participants 145 (38.5%), were found to be hypertensive, of which 122(84.1%) are known cases of hypertension and 23(15.9%) were newly diagnosed as hypertensive. 105(27.9%) were found to be pre-hypertensive and 126 (33.4%) were normotensives. In **Figure 1** though females had a higher prevalence of hypertension (55.2%) compared with males (44.8%), it was not statistically significant (p>0.05), **Table 1.**

The study result indicates that there is statistically significant association between age and being hypertensive p<0.05. Prevalence of hypertension was highest among age group 50-64 years (26.1%); this group also recorded the highest prevalence of hypertensive crisis, BP> 180/120 mmHg at 37.5%. Individuals aged between 18 and 30years old had the lowest frequency of hypertension at 6.5 %(**Figure 2**). There was also a significant increase in systolic BP with age.

The prevalence of hypertension was higher among those who were in the habit of smoking tobacco (62.5%) and alcohol consumption (48.3%). These differences were found to be statistically significant p<0.05 (**Table 1**). Statistical significant difference (p<0.05) was found in the prevalence of hypertension between individuals with a high BMI, 36.3% Overweight, 54.2% Obese compared to 1.4% in underweight and 8.1% in normal BMI participants.

Among participants who were hypertensive, 73.1% were physically inactive and only 26.9% were physically active. From these findings, there was statistically significant association between physical

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activity and hypertension (p<0.005). There was no statistical significant difference between fruits and vegetables consumption and hypertension, p=0.773 and p=0.767 respectively as shown in **Table 1**.

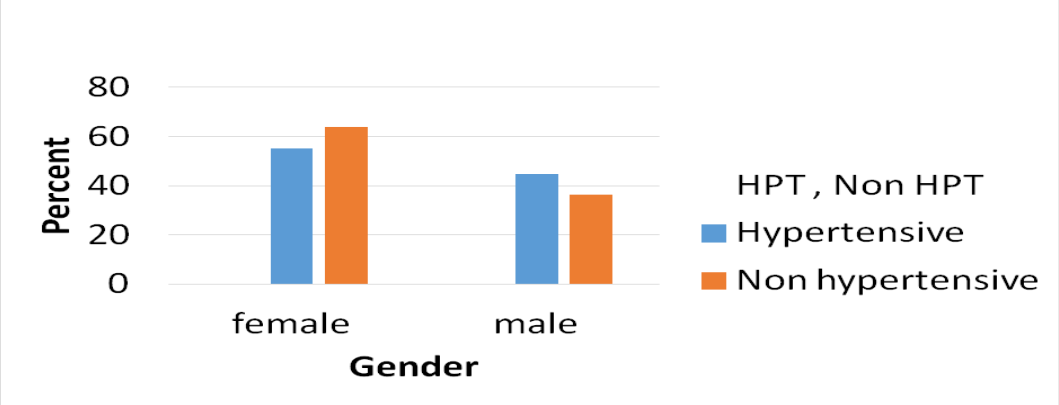


Figure 1. Prevalence of hypertension defined by gender

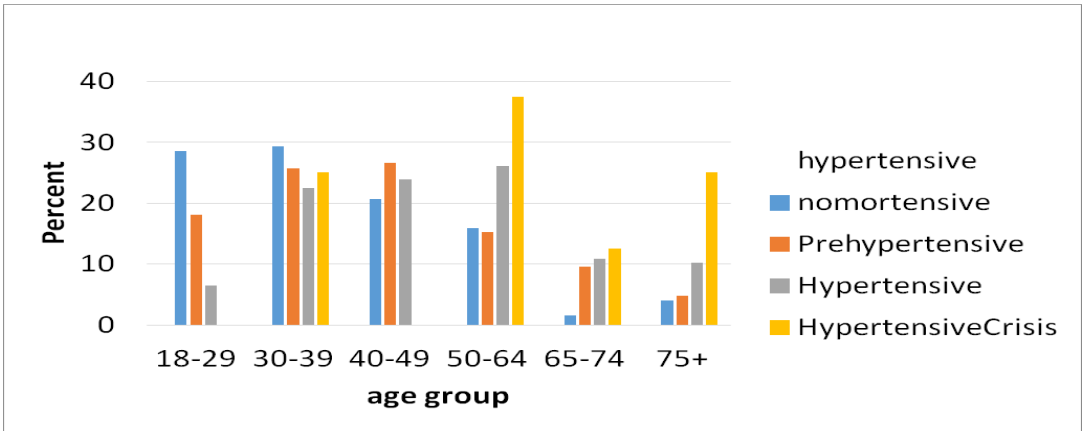


Figure 2. Distribution of Hypertension defined by Age Groups

Table 1. Hypertension risk factors in different blood pressure statuses

	Hypertensive %				Chi-Square Test
	Normotensive	Pre-hypertensive	Hypertensive	Hypertensive Crisis	
Gender: Male	40(26.8%)	43(28.9%)	64(43.0%)	2(1.3%)	p=0.79
Gender: Female	86(37.7%)	62(27.2%)	74(32.5%)	6(2.6%)	p=0.82
Tobacco Use	10(13.9%)	17(23.6%)	43(59.7%)	2(2.8%)	p=0.00
Alcohol consumption	20(20.4%)	13(13.3%)	61(44.2)	4(4.1%)	p=0.00
Physical activity	29(37.7%)	9(11.7%)	38(49.4%)	1(91.3%)	p=0.03
BMI - Overweight	41(33.1%)	38(30.6%)	43(34.7%)	2(1.6%)	p=0.00
BMI- Obese	15(15.6%)	29(30.2%)	48(50.0%)	4(4.2%)	p=0.00
Diabetic	10(19.2%)	14(26.9%)	27(51.9%)	1(1.9%)	p=0.57

Discussion

According to Addo et al (2007)[1], whereas high blood pressure was almost non-existent in African societies in the first half of the twentieth century, estimates now show that the prevalence of hypertension in Africa ranges from 40% to 50 % of adults and several of these are undiagnosed. The overall prevalence of hypertension in this study was found to be 38.5 % i.e. 145 participants among 377 study participants. Report by Tollman et al (2008)[22] also depicts high prevalence of hypertension ranges from 15% in the west of southern Africa; 25% in the east of southern Africa; between 42% and 54% in South Africa. Out of the 145 hypertensive patients 84.1% of them were aware of their hypertensive status while the remaining 15.9% were not. Findings of this study show that pre-hypertension has a prevalence of 27.9% and normotensive 33.4%, similarly Khanam et al (2015)[11] conducted a study following the WHO STEPS approach, and observed a prevalence of 31.9% pre hypertensive.

The prevalence of hypertension among females was (55.2%) which was higher compared to that of males (44.8%), however this study failed to show significant association between hypertension and sex ($p>0.05$) which is in line with a study by Tshitenge & Mabuza (2015)[23] which reported no significance in sex difference and the prevalence rate in men (28%) versus women (34%). Steve van de Vijver et al (2013)[20] however stated that in Africa, hypertension is usually more pronounced in males than in females.

Positive statistical significance was found with risk factors such as increasing age, higher BMI, larger waist circumference, tobacco use and alcohol consumption to hypertension. It was found that participants with these risk factors had higher prevalence of hypertension than participants without these characteristics. In this study, the frequency of hypertension increased with age, with a more steep increase at the age 50 years and older (47.1%). Though undocumented participants reported high levels of stress to be the cause of their increased hypertensive state as they grow older. This age group also recorded the highest prevalence of hypertensive crisis, BP> 180/120 at 75%. On another note, individuals aged between 18 and 30years old had the lowest frequency of hypertension (6.5%). Similar findings were reported in a population based study conducted in South Africa, by Van Rooyen et al (2000)[26] and Wiysonge et al (2004)[28] who found that age was positively correlated with blood pressure.

Elevated systolic blood pressure is a leading global health risk responsible for 14% of total deaths and 143 million disability-associated life-years (Huffman 2017)[8]. There was also a significant increase in Systolic BP with age in this study. From 50 years and above systolic blood pressure (≥140 mmHg) had a prevalence of 51.4%, whereas there was no significant increase in Diastolic BP among this age group. These findings are supported by Halley et al (2007)[7] and Shah et al. (2001)[18] who reported that after the age of 50, the diastolic blood pressure tends to fall or remain constant, whereas the systolic blood pressure rises consistently with age. Chobanian et al (2003)[4] stated that in those older than age 50, systolic blood pressure (BP) of greater than 140 mmHg is a more important CVD risk factor than diastolic BP; beginning at 115/75 mmHg, CVD risk doubles for each increment of 20/10 mmHg. Those who are normotensive at 55 years of age will have a 90% lifetime risk of developing hypertension; pre-hypertensive individuals (systolic BP 120–139 mmHg or diastolic BP 80–89 mmHg) require health-promoting lifestyle modifications to prevent the progressive rise in BP and CVD. (Chobanian et al 2003)[4]

The use of tobacco products was shown to be associated with an increase in prevalence of hypertension. Elevated blood pressure and tobacco smoking are, respectively, the first and second leading causes of preventable mortality worldwide (Danaei et al 2009)[5]. A person's risk of hypertension greatly increases with how frequent they use tobacco. The more frequent the use of tobacco, the greater their risk of being hypertensive. However, the chronic effects of tobacco smoking on blood pressure and the development of hypertension are uncertain. (Appel et al 2017)[2]. The prevalence of hypertension was observed to be higher (27.6%) among those who were in the habit of daily tobacco use than those that did not at 1.4% ($p<0.05$). Men show an insignificant higher prevalence of tobacco use 24.8% than females 15.4%, $p>0.05$ and smokeless tobacco i.e. snuff reported 31% among tobacco users. Similar prevalence of tobacco use was reported by Hunt et al (2005)[9], that there was a high prevalence of tobacco use for men (57%) and women (35.4%), with

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women (28.1%) predominantly using smokeless tobacco. Unlike other study findings, Tadesse and Alemu (2014)[21], found no relationship between cigarette smoking and alcohol with hypertension.

In this study there was a strong association (p=0.00) of the prevalence of hypertension with alcohol consumption. Out of 377 individuals, 98 (25.9%) were found to be consuming alcohol. Among those who consume alcohol 64(44.1%) had hypertension. The association between alcohol and high blood pressure is particularly noticeable in participants who drink weekly with a prevalence of 17.2%. Men show a significantly higher prevalence of alcohol consumption 38.9% than females 17.5 %. Raja & Muthukumar (2017)[17], in their study observed alcohol consumption as one of the major risk factor for hypertension and the alcohol consumption among hypertensive participants varied from 13 to 54%. According to Macmahon (1987)[12], of 30 cross-sectional population studies reviewed, the majority reported small but significant elevations in blood pressure in those consuming three drinks or more per day in comparison with nondrinkers. Other studies such as Pileggiet et al (2005)[16], Nielsen and Anderson (2003)[14], Monego and Jardim (2006)[13] however found no relationship between alcohol intake and hypertension.

There was no positive association and statistical significance between fruits and vegetables consumption and hypertension in the present study. A study by Utsugi et al (2007)[25], however suggested that high-level consumptions of fruits and vegetables is potentially associated with a lower risk of hypertension.

Physical inactivity was not a statistically significant risk factor as reported in this study. The overall prevalence of physical inactivity was 79.6% which means most of the participants live a sedentary lifestyle. A study by Beunza *et al.* (2007)[3] however showed that sedentary behavior was associated with likelihood of developing hypertension, independent of leisure-time physical activity. Diaz and Shimbo (2013)[6], further pronounced one of the recommended guidelines in preventing the risk of hypertension as increasing physical activity levels.

In this study, BMI contributed significantly to the hypertension status of participants. The hypertension prevalence increased with increase in BMI, BMI of <18.9 had 1.4% hypertensive and BMI of between 25 and 30kg/m^2 had 36.3% (Table 11). Similarly, a study by Wilson et al (2002)[27] and Pang et al (2008)[15] showed participants with a BMI $\geq$ 24.9 were more likely to be hypertensive compared to those with a BMI of 24.9 or lower, which is consistent with multiple previous studies that have reported a strong association between hypertension and BMI. A study conducted at Ajman also revealed that there is 14% increased chance for hypertension due to increase in BMI (Sreedharan et al., 2010)[19]

Conclusion

Findings of this study indicated that a significant proportion of adults aged 18 years and above had Hypertension in Letlhakane village with an overall prevalence rate of 38.5% of which 15.9% of the hypertensive did not know they had hypertension. Consequently the newly diagnosed hypertensives were not on treatments who are likely to be predisposed to all known outcomes of untreated hypertension. Moreover significant proportions of the participants (27.9%) were found to be in pre hypertensive state. The study also indicated that factors such as increased age, over weight and obesity, tobacco & alcohol consumption are associated with being hypertensive. This study will help in setting the baseline by which the risk factor can be ranked and specific control strategies can be planned to promote healthy life style among the adult population.

Recommendations

The following recommendations are given for the prevention and control of the Disease. There is an urgent need to design programs that increase access to Blood pressure Screening services to all age groups of 15years and above, through intensifying routine screening of all clients visiting the health facilities for any reason. Periodic Awareness creation campaigns with BP screening need to be conducted in the district that can subsequently enhance prompt care and treatment to those diagnosed with hypertension. Intensify promoting healthy lifestyle practices among community members with behavior for regular screening.

Lifestyle modification is the main strategy of preventing hypertension, thus particular emphasis on discouraging alcohol abuse, tobacco smoking and obesity is essential. Ensure consistent adherence to prescribed regimen of treatment to those who already have developed hypertension to prevent complications. Further study is required to assess the cause effect relationship of identified risk factors to the development of hypertension in the community and the nation as a whole ., it is important for the government to accelerate efforts and increase investments and resources to address this disease, in order to reduce the health and socioeconomic burden of the disease.

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Assessment of Patient Satisfaction in an Out Patient Department of Rumbek East County, South Sudan

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Abstract

Patient satisfaction surveys are essential in obtaining a comprehensive understanding of the patient's need and their opinion of the service received. It is a vital tool in evaluating the quality of healthcare delivery service in Primary Health Care. The current study is a cross-sectional descriptive research about assessment of patient satisfaction in Medicine Outpatient Department of Rumbek East, South Sudan. Systemic sampling technique was employed and 76 respondents were statistically calculated. Only respondents whose ages were from 18 years old were included in this study. The research tool was a pre-structured questionnaire and data collection was conducted from December 19th, 2018 to January 5th, 2019. The components of satisfaction study were the socio-demographic characteristics, the patients' experience with medicine outpatient services, accessibility to Primary Health Care services, and patient satisfaction. This study aimed to find the levels of patients' satisfaction and the significant relationship between independent and dependent variables. A total of 76 outpatient clients were enrolled in the assessment, all of them were showed interest to participate on the interview. Out of the 76 clients (60.5%) of them were female predominance and (84.2.5%) of the clients were age above 18 years. Considerable number of clients (76.3%) was new first visit within past 3 month. Based on the result of the study, training of code of conduct and courtesy should be given to both clinical and office staffs.

Keywords*: Patient Satisfaction; Outpatient Department (OPD); Rumbek East, South Sudan, Outpatient Station.*

Introduction

Patient satisfaction assessments are essential in obtaining a comprehensive understanding of the patient's need and their opinion of the service received. It is a vital tool in evaluating the quality of healthcare delivery service in PHCU and PHCC.

Client satisfaction is the level of satisfaction that clients experience having used a service. It therefore reflects the gap between the expected service and the experience of the service, from the client's point of view. Measuring client or patient satisfaction has become an integral part of PHC management strategies across the globe. Moreover, the quality assurance and accreditation process in most countries requires that the satisfaction of clients be measured on a regular basis (1). Asking patients what they think about the care and treatment they have received is an important step towards improving the quality of care, and ensure local health services are meeting patients' needs (2). It is an established fact that satisfaction influences whether a person seeks medical advice, complies with treatment and maintains a continuing relationship with practitioners (3, 4). Client satisfaction is of fundamental importance as a measure of the quality of care because it gives information on the provider's success at meeting those client values and expectations, which are matters on which the client is the ultimate authority (5, 6).

This assessment would have an important input in assessing the level of clients' satisfaction on outpatient services delivered and provide a recommendation on an improved health service delivery and to enhance quality of patient services in the PHCU/ PHCC and improve the level of clients' satisfaction.

Methods

A cross sectional descriptive assessment was conducted to assess the perceived levels of clients' satisfaction of the outpatient clients with health services rendered at Rumbek East County, the PHCU

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and PHCC. All clients visiting the PHCU /PHCC for outpatient services from 19 Dec 2018 to 5th Jan 2019 were the source population. Sample size determined purposively

Structured questionnaire was developed in English and the interview was conducted by County coordinator and CHD Team who can speak Denka and Arabic fluently, orientation was given to data collectors on purpose of the assessment and discussed on the quaternaries. The questionnaire was designed to obtain information on basic socio demographic characteristics of respondents and their satisfaction level with the different components of the PHCU/PHC outpatient services which included accessibility, cleanse of PHCU/PHCC, comfort of waiting area, speed and readiness of staff, time spent with Clinical officer, Nurse/CHW staff keeping information waiting time to get the services and respect of the health workers.

Data were coded and entered into computer using **Excel** sheet. In the analysis of client satisfaction, the very satisfied and very dissatisfied were categorized to satisfied and dissatisfied groups because the numbers of the respondents in the very satisfied and dissatisfied were small.

Results

A total of 76 outpatient clients were enrolled in the assessment, all of them were showed interest to participate on the interview. Out of the 76 clients (60.5%) of them were female predominance and (84.2.5%) of the clients were age above 18 years. Considerable number of clients (76.3%) was new first visit within past 3 month.

Discussion

All clients visiting the PHCU /PHCC for outpatient services from 19, Dec/2018 to 5th Jan, 2019 were the source population. Sample size determined purposively Structured questionnaire was developed in English and the interview was conducted by County coordinator and CHD Team who can speak Denka and Arabic fluently, orientation was given to data collectors on purpose of the assessment and discussed on the quaternaries. The questionnaire was designed to obtain information on basic socio demographic characteristics of respondents and their satisfaction level with the different components of the PHCU/PHC outpatient services which included accessibility, cleanse of PHCU/PHCC, comfort of waiting area, speed and readiness of staff, time spent with Clinical officer, Nurse/CHW staff keeping information waiting time to get the services and respect of the health workers.

Conclusion

Securing high satisfaction of patients attending the PHCU/PHCC is equally important for a CHD management team. Many studies about outpatient services have revealed some problem like overcrowding; long waiting time, and lack of good well come face, etc. In in this assessment, it was found that the majority of the respondents were dissatisfied with accessibility of the PHCU/PHCC, Comfort of waiting and examination room, time spent with clinical officer/Nurse/CHW to seek medical service, and readiness of the staff to support patients.

It is beneficial to understand that there is opportunity for the improvement of the outpatient Department services through conducting client satisfaction assessment. It can be concluded that the outpatient department services need further support and improvement.

Table 1. Socio-demographic characteristics of respondents

Age	%	Sex	%
<18 years	(12)15.8%	Male	(30)39.5%
>18 Years	(64)84.2%	Female	(46)60.5%

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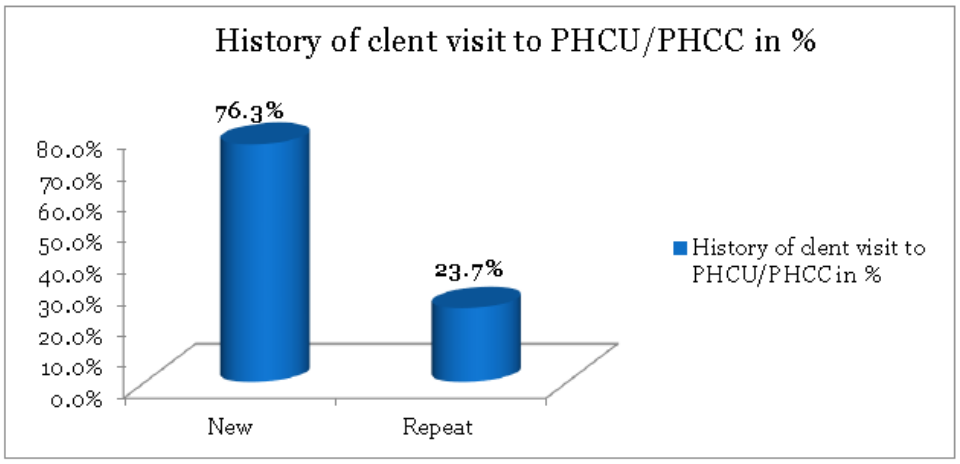


Figure 1. History of client visit for the PHCU and PHCC

Cleanse and accessibility to healthcare service

Among the 76 outpatient clients who were asked to explain their level of satisfaction on PHCU/PHCC cleans 57% of them are dissatisfied and 43% satisfied. Regarding accessibility of the state PHCC and PHCU to get services 46% are dissatisfied and 43 satisfied those who are satisfied for the accessibility it can be because of their residence near to the PHCU/PHCC.

It is well known greetings and well come of the staff for the patient gives comfort and build confidence upon the service provider

Out of the 76-outpatient respondents included in the assessment (8%), (33%), (45%), (14%) are very satisfied, satisfied, dissatisfied and very dissatisfied respectively, almost 60% of them are dissatisfied and very dissatisfied

Comfort of waiting and examination room

Out of 76 outpatient clients responded for the questions comfort of the client waiting space and examination room 69.7 % of them were dissatisfied for the outpatient waiting room and 68.4% for comfort of examination room.as the result indicates above near to seventy percent of clients are not fell comfort for waiting area and examination rooms, CUAMM in collaboration with the PHCU/PHCC management expected to improve the status of waiting area and examination room, the waiting area has not shelter and adequate benches and chairs as well the examination room is not fulfill the standard.

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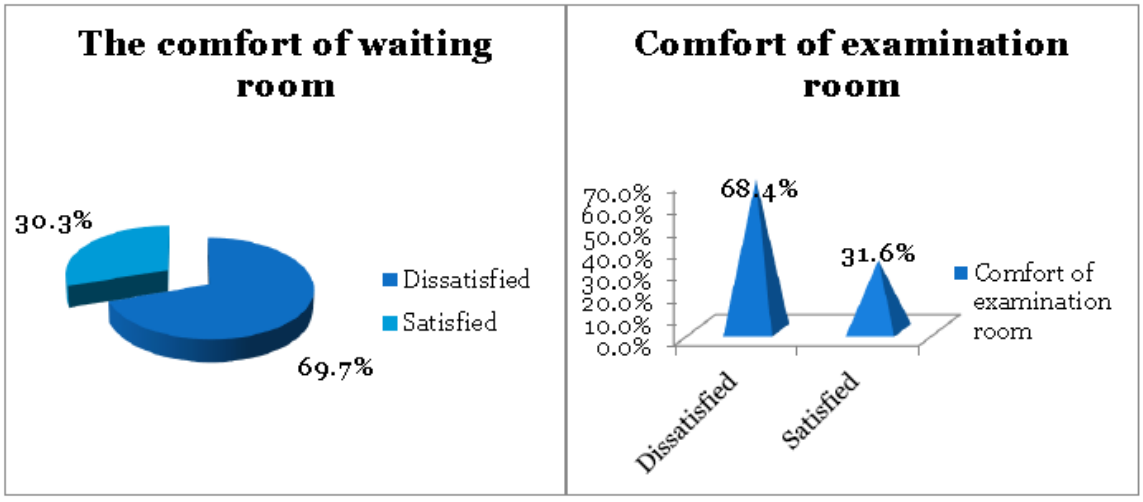


Figure 2. The comfort of waiting examination room

Time spent with clinical officer, Nurse/CHW to seek medical service

Out of 76 outpatients clients included in the assessment 38(50%) were satisfied with the time spent with the clinical officer/CHW and 53 (70%) were dissatisfied for the total time spent in the PHCU/PHCC to get PHC services rendered by the PHCU/PHCC this result indicate the overall time spent to seek medical services from registration to dispensary is 70% which is very high needs attention to improve the system and decrease client waiting time.

Care provided by PHC staffs

Out of the 76 outpatient clients asked about their satisfaction on care provided by PHCU/PHCC staff nearly (50%) respondents responded they were not satisfied with care provided by the PHC staffs.

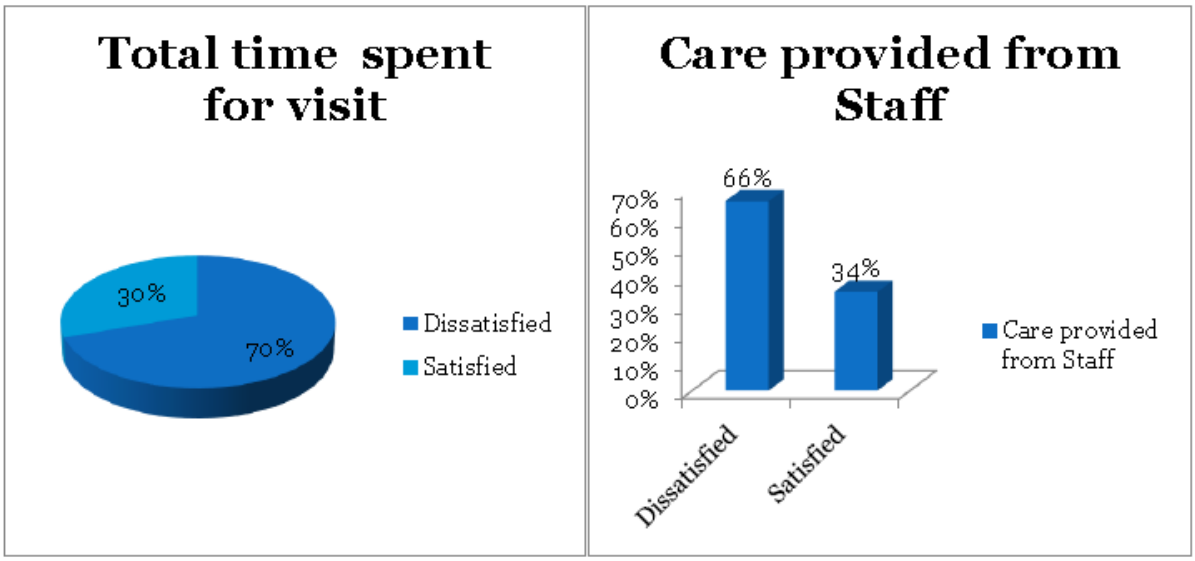


Figure 3. Total time spent for visit and care provided from staff

Out of 76 outpatients clients included in the assessment 52.6% of the clients were satisfied with the readiness of the staff to support the patient and 34(44.7%) of the respondents were dissatisfied with lack of drugs and supplies in the hospital, availability of essential and emergency drugs without stock out.

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Figure 4. The helpfulness of staff and availability of drugs in Pharmacy

The helpfulness of staff	
Dissatisfied	47.40%
Satisfied	52.60%
Availability of the drug in the PHCU, PHCC pharmacy	
Dissatisfied	44.7%
Satisfied	55.3%

Aims and Objectives

To assess the level of patient satisfaction with outpatient department (OPD) services the present study was conducted with the objective to assess the level of satisfaction in patients attending the OPD of Rumbek East PHCC/PHCU, regarding waiting time, professional care and facilities available at OPDs.

Objective

- To assess the level of patient satisfaction with outpatient department (OPD) services.
- **Specific objective**
- To assesses the level of patient satisfaction on cleanse and accessibility of the PHC,
- To assess the level of patient satisfaction on clinical officers, Nurses/CHW and patient interactions
- To assesses the level of patient satisfaction on waiting time and comfort in waiting area and examination room.
- To assesses the level of patient satisfaction on availability of drug in the pharmacy.

Significance of the assessment

The result from this assessment will presented to CHD and CHD management for outpatient department service improvement

Definition

Patient waiting time: The interval between departure from the proceeding outpatient station and receiving service at the next outpatient station.

Outpatient station: The different part of outpatient department, registration station, weighing station, examination room, laboratory and dispensary.

Consultation time: The time spent discussing health matter with one's clinical officer

Satisfaction: Attaining one's need or desire.

Very satisfactory: Above one's expectation.

Satisfactory: Just one's expectation.

Dissatisfactory: Below one's expectation.

Very dissatisfactory: Fail to meet one's expectation usually leading to disappointment.

Assessment: Is the process by which the characteristics and needs of clients, groups or situations are evaluated or determined so that they can be addressed. The assessment forms the basis of a plan for service or actions.

Service: any activity undertaken to meet the social needs

Quality: User based quality is defined as “fitness for use”, which means the consumer's perception of quality. It is also defined as meeting the desires and expectations of customers”

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Qualitative Study on Barriers and Supportive Factors of Maternal, Neonatal and Child Health (MNCH) Services in Homa Bay County, Kenya

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Abstract

Introduction: *Despite overall global progress and concerted efforts, MDGs 4 (reduce child mortality) and 5 (improve maternal and new born health) have been and are seriously off target for many countries. In Africa, south of the Sahara a woman has a 1 in 39 chance of dying in pregnancy or childbirth, compared to a 1 in 3,800 similar risk in developed countries. The leading causes of maternal deaths are related to obstetric complications around the time of childbirth, with three-quarters of those deaths and significant morbidity being preventable through access to a full continuum of quality reproductive health services. Evidence shows that Africa still has the highest proportion of under-five deaths, with 1 in 91 children dying before their fifth birthday (UNICEF, 2016).*

Aim: *To explore experiences, knowledge, beliefs, practices and attitudes of caregivers and community members associated with the causes of common childhood illnesses, prevention and treatment options.*

Materials and Methods: *The study adopted qualitative approaches grounded in social and health promotion theories (Berkowitz, 2004; Rosenstock, 1966; Bradley et al., 2009). Maximum variability, in combination with sampling designs employed to capture a diversity of perspectives.*

Results: *The study findings identified the most common childhood illnesses as; malaria, diarrhoea, measles, coughs, and colds related to increased cases of child and infant mortality. Pneumonia was rarely cited, the fear of HIV and cancer tests mentioned as key barriers of early initiation and continued use of ANC services. Side effects of vaccines prevent mothers from having their children vaccinated.*

Conclusion: *This study provides a contextual and evidence-based approach for the design of MNCH interventions that are effective, user-friendly and more likely to elicit optimum participation from the targeted community members in Homa Bay County.*

Keywords: *MNCH services, MDG 4 and 5, uptake, barriers, children/pregnant women, Homa Bay.*

Introduction

Maternal mortality and child mortality rates in Kenya are very high. Reports indicate that Maternal Mortality Rate (MMR) stands at approximately 488 maternal deaths per 100,000 live births (KNBS 2010). The unacceptably high rate of maternal deaths has not significantly improved in over 15 years. The MDG 5 target of reducing maternal mortality to 175 maternal deaths per 100,000 live births or less by 2015 remained distant and unlikely to be achieved in Kenya. While under-five child survival improved, neonatal survival has not. Kenya's neonatal mortality rate, estimated at 31 per 1,000 live births, comprises 60% of infant mortality rate (IMR) up from 45% in 2003; the infant and child mortality rates are 52 and 74 per 1,000 live births respectively. Many factors continue to contribute to this high level of maternal mortality, including malaria, diarrhoea and pneumonia (KNBS 2010; KDHS 2003, 2009). The government of Kenya worked with all the teams on implementing the study. Nevertheless, access to and utilization of services such as family planning, antenatal care and skilled delivery at birth is still low in most of these settings (Birmeta 2013; Zureick-Brown et al., 2013; AU Report 2012; WHO, UNICEF, UNFPA and the World Bank,2012 ; Lozano et al.,2011 ; UNDP 2010; UNICEF 2010; Kirkwood et al., 2008). The leading causes of under-five mortality include preventable illnesses such as pneumonia, diarrhoea, malaria, and neonatal complications.

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Barriers to Seeking ANC Services at Health Facilities: Access and utilization of ANC services is a complex phenomenon that is explained by a compendium of factors including economic, cultural, social, geographic, organizational, and psychological attributes of the woman such as, poor communication between women and Health Facility (HF) staff; fear of screening tests for HIV and Cancer; travel and waiting time at HFs; fear of public condemnation for the young mothers; operation hours of facility; perceived lack of privacy and confidentiality; gender of the health provider and not being in possession of a clinic card are some of the barriers that remain.

Methods

Description of site: The study was conducted in three sub counties of Homa Bay County: Ndhiwa, Mbita and Homa Bay. The sub counties were selected as representative of the county following a thorough review of relevant indicators. Data was generated mainly from a total of 38 FGDs involving mothers of under-fives, married men and Community Health Workers). In addition, 20 Key Informants (KIs) including County health staff and Health facility in-charges were included in the study to gather their views on access to MNCH services and underlying challenges.

Complimented by a series of In-depth Interviews (49) involving Community Health Extension Workers, religious leaders (11), Chiefs/village elders (12), opinion leaders (7) and poor users of healthcare services (8) were carried out. The data was captured by use of written notes and tape recording. For analysis, data captured by voice recorders were transcribed and the written notes organized thematically. The transcribed data was imported into NVivo software and analysed guided by a framework approach.

Study design

A cluster sampling is being designed to be comparative, and analytical in nature to determine the UNICEF coverage of maternal, newborn and child health services in Homa Bay County. The study methods included a combination of focus group discussions (38 FGDs), In-depth Interviews (49 IDIs) and Key Informant Interviews (20 KIIs) aimed to understand the socio-cultural and behavioural factors influencing the uptake of MNCH services: immunization; treatment of pneumonia, diarrhoea, and malaria (IMCI/ICCM) and skilled delivery including in-depth analysis to the poor MNCH indicators. Performance of immunization indicators was particularly central to this process. This was replicated multi-stage wise to the sub-location level, where the actual study subjects were identified and recruited.

Choice of design

The Multi-stage purposive sampling designs were adopted in this study. Three sub-counties - Homa Bay, Ndhiwa and Mbita - out of six were purposively selected to represent about 50% of the area covered by the study. Performance of relevant MNCH indicators particularly immunization underpinned the sampling process study design focused on evaluating specific interventions and allows for reduced economy study. However, cluster sampling makes blinding more likely and minimizes the chances of selection and informed bias.

Data source

We used a combination of focus group discussions (FGDs), In-depth Interviews (IDIs) and Key Informant Interviews (KIIs). Set reading of published research material including both present and historical information on MNCH services.

Data collection method

Community members mainly women between 18-49 years and married men comprised the primary study population. The secondary population was composed of community elders and opinion leaders, Community Health Workers, County government health officials (including county and sub county health management teams), health facility in charges community, and health extension workers.

Statistical method

Data collected through voice recorded data; thematic analysis was the major framework for analysis. Transcribed, and notes organized for purposes of comparison. Emerging trends were analysed according

to the research objectives (Ritchie and Lewis 2008; Lock and Scheper-Hughes, 1990). As part of triangulation process, the transcribed data was imported into NVivo software and the analysis guided by a thematic approach. The transcripts further cross-referenced with field notes and complemented by KII and IDI data. The client exit interviews were entered in SPSS, processed appropriately and used only where applicable to corroborate qualitative data.

Ethical consideration

The fact that this work involved legal adult participants implies limited ethical issues, secondary data meant no written consent was sought but as a public health professional, we kept secret all information and due ethical requirement process followed including confidentiality rights. We also kept results available in the study area. All FGD involvement was optional and voluntary.

Results

With the help of the Homa Bay county and UNICEF Kenya team, data collectors, we consulted records, registers and conducted interviews. The analysis below highlights the barriers and supportive factors in the uptake of Maternal and Child Health (MNCH) services in Homa Bay County. The findings are based on 38 focus group discussions with men, mothers of under-fives and CHWs, 20 Key Informant Interviews, 250 exit interviews, 6 in-depth interviews with women who had limited contact with Health facilities (HFs) as well as observations recorded at facilities and opinions sourced from 8 community leaders.

Key study findings

Common childhood illnesses, perception of risk and health seeking behaviour

Most participants mentioned measles, diarrhoea, coughs, malaria and colds as the illnesses that are commonly experienced in the area. Other illnesses such as pneumonia, HIV and AIDS were rarely mentioned except on further probing. Malaria was repeatedly mentioned as the most feared and main killer disease of children. Many respondents attributed causes of childhood illnesses to both biomedical and socio-cultural factors. Actions taken to mitigate the effects of the illnesses range from seeking help from faith healers/religious leaders, herbalists, CHWs to health facilities. Many participants preferred seeking care from both biomedical and traditional sources of care. Many discussants attributed causes of childhood illnesses to socio-cultural and environmental factors. While discussing this topic with men in Mbita, it was argued that most of childhood illnesses are a result of poor hygiene and sanitation practices. Other illnesses could be attributed to breach of community taboos and witchcraft. As one respondent observed, *'It could be a result of breaking taboos, or even witchcraft. For example if the child's father sleeps with other women then comes back to that house, he is not supposed to touch the child before bathing. Breach of this result in the child becoming ill' (*Men FGD in Mbita*).*

Prevention and treatment of malaria, diarrhoea, and pneumonia

Malaria

Discussion with study subjects revealed that malaria is a term used to encompass a wider range of feverish illnesses. Most study participants associated malaria with mosquito bites. Traditional beliefs around causes were also discussed. A few approaches were mentioned as preventive measures. These included the use of treated nets, ensuring a clean environment and keeping the children warm. Seeking help from religious leaders for divine intervention was also mentioned. The common sources of care cited included community health workers, private providers, shopkeepers and use of herbal preparations. Health facilities were used either after initial attempts at household level or in combination with other methods.

Diarrhoea

Diarrhoea was associated mainly with consumption of dirty food. In some cases, unremitting symptoms are associated with witchcraft or breach of taboos. Maintaining high standards of personal and household hygiene were mentioned as key methods in diarrhoea prevention. Vaccination was rarely mentioned as another preventive measure. On suspicion of symptoms, a mixture of approaches such as

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use of herbs, consultation with neighbours and other family members are adopted. A child is only taken to health facilities when initial home-based actions fail to overcome the symptoms. Consultation with herbalists and religious leaders occurs when symptoms fail to respond.

Pneumonia

Study participants associated pneumonia with symptoms such as breathing difficulties. It was perceived to be caused mainly by exposure to cold and in some cases, witchcraft. Most community members were not sure whether pneumonia could be prevented or not. The measures mentioned to prevent pneumonia aimed at behaviour modification. Vaccination was rarely mentioned. Most of the female focus group discussants explained that fear of side effects of vaccines prevent mothers from having their children vaccinated.

In all the FGDs, the fear of HIV and cancer tests was mentioned as key determinants/barriers of early initiation and continued use of ANC services. Information from the health providers indicated deeply rooted religious and cultural beliefs. The perceived causes of childhood illnesses were mainly socio-environmental, and biomedical factors. Whereas the health facilities were mentioned as the first option during illness, most community members sought help after several home treatment attempts.

Benefits of Health Facility Delivery

Over the years, a wide body of knowledge has demonstrated that proper medical attention and hygienic conditions during delivery can reduce the risks of complications and infection that can cause morbidity and mortality to either the mother or the baby. Even though most deliveries occur at home, health facilities (HFs) were associated with a host of benefits. Well-equipped and staffed facilities were rated highly for being able to effectively tackle complications associated with delivery.

Discussion

Designing effective interventions that inspire confidence among women and the community at large to adopt positive behaviour requires an in depth understanding of the prevalent cultural beliefs, attitudes, risk perception and the knowledge they have about what actions to take in the face of an emergency or serious illness incident. The study participants had diverse explanations for the causes of childhood illnesses.

Access and Use of ANC Services and Skilled Birth Attendants

The study revealed several factors at health facility, community and family levels that promote or hinder use of skilled care during pregnancy, and childbirth. Several studies and more recently one conducted by Population Council have pointed out how handling women without respect and dignity drives them away from health facilities.

Immunization

Studies have shown that non-uptake of immunization can be a consequence of acceptance or willingness, cultural/religious beliefs and inability to access immunization services due to attend costs. Even in a system where immunization is free, the indirect costs such as transport and opportunity costs can be a deterrent for some mothers to get their children immunized, despite general acceptance and robust provision of immunization services (Canavatiet al. 2011; Cassellet al. 2006).

Information, Communication and Education Issues

This study explored the sources of information on treatment and vaccination. Community Health Workers emerged as the leading source of information. Other sources mentioned included health facilities, TBAs and community groups. Several channels were mentioned for dissemination of information. Announcements channelled through mobile, community meetings, public service announcements in villages were considered quite effective. Other channels included radio, Information Education and Communication (IEC) materials. The challenge around this is literacy levels among young mothers. Most of them stop at primary level education but use of user-friendly innovative tools to reach remains critical.

Male Involvement in Health Care

In recent years male involvement in the care of women during pregnancy and delivery continues to draw a lot of interest as its connected to better health outcomes. During the FGDs, discussions on help offered by men during pregnancy, delivery and child illness focused mainly on financial support. Overall, while men can be involved at different stages of care seeking, their role remains marginal except when the condition becomes critical. A host of studies have raised concern over the unenthusiastic participation of men in care seeking, Community management childhood illnesses, leading to unchanging poor MNCH indicators (Kimathi 2014; Robbles et al 2010; Baggaley et al., 2000; Drennan, 1998). This needs to be addressed.

Policy Implications

The Government of Kenya is committed to achieving MDGs 4 (reduce child mortality) and 5 (improve maternal and newborn health) and SDGs and has incorporated them into its maternal and newborns health framework for development and multi-sectoral collaboration. Kenya and other African Union members have adopted the road map for accelerating the attainment of MDGs 4 and 5; a health sector strategy to provide efficient and high quality newborns services based on six pillars of maternal and newborns health. Operational policies and plans for SDGs are at implementation stages for reducing maternal, prenatal and neonatal morbidity and mortality.

Insights from Global Evidence

Overwhelming evidence from more recent meta-analysis and systematic review by O'Mara-Eves et al., (2015)71 identified trends in the effectiveness of interventions that can be considered in designing interventions; Interventions that engage community members in the delivery of the intervention are particularly effective (compared with interventions that empower the community or involve members in the design of intervention); Single component interventions tend to be more effective than multi-component interventions for health behaviour outcomes.

Both universal and targeted interventions are effective, although universal interventions tend to have higher effect size estimates for health behaviour outcomes; Interventions that employed skill development or training strategies, or which offered contingent incentives, tended to be more effective than those employing educational strategies for health behaviour outcomes.

Interventions involving peers, community members, or education professionals tended to be more effective than those involving health professionals for health behaviour outcomes; Shorter interventions tended to be more effective than longer interventions for health behaviour outcomes, although this is probably confounded by levels of exposure or intensity of contact with the intervention deliverer and interventions tended to be most effective in adult populations and less effective in general populations (i.e. those that included all age groups) for health behaviour outcomes.

Opportunities for future scope of study

The research work provides a contextual and evidence-based approach for the design of a robust MNCH intervention and tools to create demand for services and will be an important source of literature for future scholars. Creating awareness and changing attitudes is reason for this baseline study, the study has several advantages as it contains vital information regarding the response of the people towards the uptake of MNCH services in Homa Bay County.

Conclusion

At the end of the study, we attained most of our objectives; the study concluded that Malaria, diarrhoea and pneumonia are some of the common illnesses that contribute to suffering among the study subjects. While most study subjects displayed better understanding of causes and prevention of malaria and diarrhoea, this was not the case for pneumonia. Malaria was reported as the main child killer disease. Health facilities are used when several initial attempts to alleviate symptoms fail to work. Increased use of immunization services is inhibited by a host of socio-cultural and religious factors, in addition to accessibility barriers.

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Most community members are not aware of diseases targeted by vaccination including recently launched vaccines for pneumonia and diarrhoea. Socio-religious and traditional methods are applied to curb unremitting symptoms and threats to child health and pregnancy that are perceived to have a social origin. Most women do not attend ANC owing to reasons such as fear of being tested for HIV and AIDS; accessibility barriers and poor health provider-client interactions. Preparations for child birth among the study subjects conform to prevalent socio-cultural beliefs; that this could invite misfortune

Most health facilities in the county do not have the requisite equipment, supplies, and personnel to offer timely and adequate services. Whereas women play a role in decision making when a child is unwell or around delivery time, men still hold power over matters of finances. For most of the community members, CHWs constitute a key source of information on MNCH services. Similarly, there appears to be lack of knowledge about basic MNCH prevention options.

Difficulties

This study encountered a few challenges during data collection and efforts were made to overcome these bottlenecks. For instance, owing to low literacy most of the data was collected in local language. The main challenge we faced was security limitations to access remote locations; Unavailability of study participants in the households.

Limits of the study

To minimize data errors, this was mitigated through careful tool translation to dholuo; pre-testing of the data collection tools; and use of local Research Assistants and transcribers competent in local language. Used triangulation approach provided the rigor required to obtain reliable results. The study was carried during rainy season which made some of the sturdy sites inaccessible. To overcome this problem, study subjects were selected in such a way that a point of saturation was achieved.

Recommendations

The following recommendation is for the improvement of the MNCH services in Homa Bay Country. Kenya Ministry of Health (SRHB) need to invest in health intervention strategies that rely on robust evidence base, and knowledge management to best inform programme policy. There is need to develop as well as support sustainable referral system policies at the county level that foster smooth relationships between level 1 clinics and other levels to increase access and use of MNCH services.

To design interventions that promote hygiene, sanitation, safe drinking water, and the importance of ORT in the management of diarrhoea in under-fives, use of insecticides treated nets and HIV prevention.

For better management of diarrhoea there is need for HFs to establish well equipped ORT corners. Design interventions that target to increase capacity of community members to recognise danger signs in pregnancy, newborns and children including Infant and Young Child Feeding. Target Community leaders to mobilize women for appropriate care; Develop interventions that promote culturally sensitive forms of birth preparedness and to allow free discussion at family/community levels.

Design interventions that counter myths, religious and cultural beliefs. Promote interventions that address the benefits of immunization timing of different vaccines. County Health Management Teams needs to invest not only in quantitative, routine data collection systems but also in continuous qualitative and other forms of research to determine context specific factors that catalyse or continue to stall improvements in key indicators.

Results from monitoring and evaluation of performance among key indicators needs to be shared in appropriate forums that bring together key stakeholders and partners in the county to inform policy direction; identify high impact activities and scale-up best practices on MNCH services including carefully designed and a culturally sensitive communication strategy to facilitate information flow through relevant local forums such as public barazas, funerals, dialogue groups should be an investment. The data generated was used to generate baseline report to inform MNCH response plans and implementation for government, partners and NGOs. In addition, findings were used to inform the SBCC strategy development and Information, Education and Communication (IEC) resource materials for creating demand on MNCH services.

Figures, charts, and tables

The descriptions of the charts and tables below represent the selected MNCH indicators for Homa Bay County both baseline and Target at study.

Table 1.0. Types and number of interviews and FGDs

Data collection technique	**Category of participants**	**Number of participants / Groups**
Health Facility/county/sub county level		
Exit surveys*	Mothers attending MNCH services	252
KII	County/sub county/facility in charges staff	20
In depth interviews	CHEWs	11
Community level		
FGDs	Older mothers (over 26 yrs.)	10
	Young mothers (between 18-26 years)	12
	Men	8
	CHW	8
In-depth interviews	Non-users of MNCH Opinion leaders Chiefs/village elders Religious leaders	8 7 12 11

Sample size for Exit Interviews was determined using Fisher et al., 2003 using immunization coverage for Homa Bay (67%) - ICCM/KEMRI/UNICEF 2013 Report

Table 2.0. Selected Sub-Counties (Highlighted)

Homa –Bay County		
	Sub-county	**Full Immunisation Coverage**
1	Homa Bay	67.9
2	Rachuonyo South	72.5
3	Mbita	63.0
4	Suba	65.8
5	Rachuonyo North	70.7
6	Ndhiwa	59.3

Source: Homa Bay- ICCM/KEMRI/UNICEF 2013.

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Table 3.0. Comparison of selected national and county indicators (KDHS, 2014)

No.	Indicator	Homa Bay County	National
1	Fertility	5.2%	3.9%
2	CPR (Any Method)	46.7%	58%
3	Infant Mortality	-	39 per 1,000
4	Under five Mortality	-	52 per 1,000
5	Skilled birth attendance	(42)60.4%	62%
6	Health facility delivery	61.9%	61%
7	Full Immunization Coverage (FIC)	(74%) 53.7	68

Table 4.0. Selected MNCH Indicators

Indicator	Baseline -2013	Target- 2018
ANC- 4 visits	40.9%	80%
SBA	42%	65%
Fully Immunized Children	76%	90%
Exclusive Breast Feeding	35%	Not indicated
LLINs coverage	87%	100%
Diarrhoea treatment in children in under fives	20%	70%
Pneumonia treatment in under fives	45%	70%
HIV testing in HFs	48%	100%
Cancer Screening	1%	50%

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Influence of Family Structure on Recent Trends of Ageing Process

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Abstract

The demographic background of the elderly plays a pivotal role in the health and health related aspects of the old age population. In India, where the family has an obligation to care for the elderly, the consequences of rapid declines in fertility and mortality on elderly makes living arrangements an important issue in the field of population and development. The study was conducted in the context of Kerala with the purpose of finding out the influence of family structure on the health of the aged. The data was collected through field work and it was a descriptive type of study. The analysis was carried out with definite dependent and independent variables. The study shows that the family size plays an important role in the deterioration health of the aged, the perception about their health condition, the care during their illness. It was also clear from the study that feeling of loneliness and ability of adjustment with the family members varies significantly with the family size. The analysis shows that the disease structure particularly the prevalence of both communicable, non-communicable diseases and occurrence of multiple diseases are more prone to those who belong to large families.

Keywords: *Family structure, Ageing process, Geriatric health, Elderly, Old age, Living arrangements.*

Introduction

One of the major features of demographic transition in the world has been the considerable increase in the absolute and relative numbers of elderly people. This has been true especially in the case of developing countries like India, where ageing is occurring more rapidly due to the decline in fertility rates combined by the increase in life expectancy of people achieved through medical interventions. Geriatric health is influenced by many factors like age, gender, lifestyle habits, education, food habits, residence, marital status, financial wellbeing, family size and structure, as well as cultural traditions such as kinship patterns, the availability of social services and social support and the physical features like housing structure and also that of local communities.

Methods

The main objective of the study was to understand the influence of family structure on the recent trends of ageing process with special emphasis on health problems in Kerala context. The hypothesis formulated was family size influences the occurrence of psychological problems among the aged. Feeling of loneliness among the old is felt more among those with smaller family sizes. The study was mainly extended over the relevant areas in the State of Kerala. Population of the study consists of individuals 60 plus and who are permanent residents of Kerala both males and females. By way of sampling procedure, systematic sampling method was adopted in the study. Sample item was selected at random from different strata (districts) so as to have adequate representation from all areas with the help of Census reports. Random number table was used for randomization. Sample size was suitably fixed as 710.A pre-test was conducted among 53 items from among the population of the study based. An interview guide was prepared for the purpose. The final interview schedule or research tool was prepared on the basis of the observations obtained from the pre-test which was finally used for data collection proper. Both primary and secondary were collected for the study. Primary data were obtained from the sample items located for data collection proper. Secondary data was collected from all available sources relevant to the problem of study like the already published work in the field, reports, and official documents available as well as individual cases. The collected data is processed with respect to definite dependent and independent variables identified for the study. The analysis is

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carried out to bring out the results of the study. Chi square test adopted for testing the hypothesis selected.

Results

While considering the family size and general health condition, those who have a smaller family size, higher is the perception about their health condition. It is 69.9% who are having a family size less than 5 and 30.06% who are having a family size 5 and above. It is clear from the study that higher the family size, higher is the deterioration of health among the aged. Observation on activities during old age and family size reveals that those who belong to the smaller family size less than 5 (37.4%) go for regular walks and only 6.7% are spending their time in conversing with others while those who belong to the large family size of 5 and above 38.3% spend their time mostly for watching TV and 26.4% go to visit worship places / tourist places and relatives. On enquiring about the care during illness during old age with respect to the family size it has been found that the majority (76.2%) of those who belong to the larger family size of 5 and above are getting adequate care during their illness. While examining the influence on the number of family members on the ability to adjust at home it is seen that slightly less than the majority (48.37%) who family size is smaller than 5 are always able to adjust well at home. Only 10.5% among those who are not able to adjust well at home are having a larger family size of 5 and above. The feeling of loneliness is higher (77.5%) among those who are having a smaller family size. Chi-square test also shows that the two variables are significantly related. While assessing the influence of family size on the occurrence of diseases 96.7% having diseases with the smaller family size of under 5 and 95.45% having diseases belong to the larger family size of 5 and above. The communicable diseases are more among the old and those who belong to the larger family size of above 5 (94.3%). In the smaller family group non, communicable diseases are present among 96.7% of the study sample. The prevalence of multiple diseases is more among (94.3%) with those who belong to the larger family size of above 5. In both cases the major health problems present is cardiac / hypertension related followed by diabetes and gastro-intestinal problems. It is 97.2%, 96%, and 90.2% respectively in the case of the sample whose family size of less than 5. It is 88.7%, 87%, and 68.6% respectively in the case of the sample with the larger family size of 5 and above.

Discussion

During the later years the number of members in the family affects many factors including health and wellbeing. Here in the current study on examining the influence of family structure on the perception of their own general health condition, among the respondents it was found that most of them (63.12%), of those whose family size is less than 5 think that their general health is good and only 19.2% among them perceive it as bad. While 48.5% of the respondents whose family size is more than 5 reported that their general health is bad and 24.7% among them think of it as good. On the other point of view those who perceive their health condition as good (43.09%), a great majority (69.9%) having family size of less than 5. So, the study reveals that smaller the family size, higher is the perception about their health condition as being better (Table 1).

Table 1. Family Structure & General Health

General Health / Family Size	Good	Average	Bad	Total
Less Than 5	214[63.12%] [69.9%]	60[17.7%] [37.7%]	65[19.2%] [26.5%]	339 [47.7%]
5 And Above	92[24.7%] [30.06%]	99[26.7%] [62.26%]	180[48.5%] [73.4%]	371 [52.2%]
Total	306[43.09%]	159[22.39%]	245[34.5%]	710

While considering the relationship between number of family members and deterioration of health among the aged, it was evident from the study that the majority 61.6% of the sample, whose family size is less than 5 reported that there is no deterioration of their health condition while 12.6% reported that their health is deteriorating. 46.9% of the sample whose family size is greater than 5 thinks that

their health is deteriorating, but only 35.5% of them think that there is no deterioration. Again a closer look at the data suggest that those who reported that there is no deterioration in their health condition, the majority 61.2% belongs to those who are having family sizes of less than 5 and those who reported that deterioration is higher, the majority 80.2% belongs to those whose family size is greater than 5. So higher the family size, higher is the deterioration to their health among the aged. (Table 2).

Table 2. Family structure & deterioration of health

Deterioration Of Health / Family Size	No	To Some Extent	Very Much	Total
Less Than 5	209[61%] [61.2%]	87[25.%] [57.2%]	43[12.6%] [19.8%]	339 [47.7]
5 And Above	132[35%] [38.7%]	65[17.%] [42.7%]	174[46.%] [80.2%]	371 [52.2]
Total	341[48%]	152[2%]	217[30.%]	710

On enquiring about the care, they are receiving during their illness in their old age with respect to the family size it was observed that 67.74% of the respondents who reported that the care they are getting during illness is adequate, 58.8% belongs to the larger family sized group. So higher the family size, higher is the care they are getting during their illness. (Figure1)

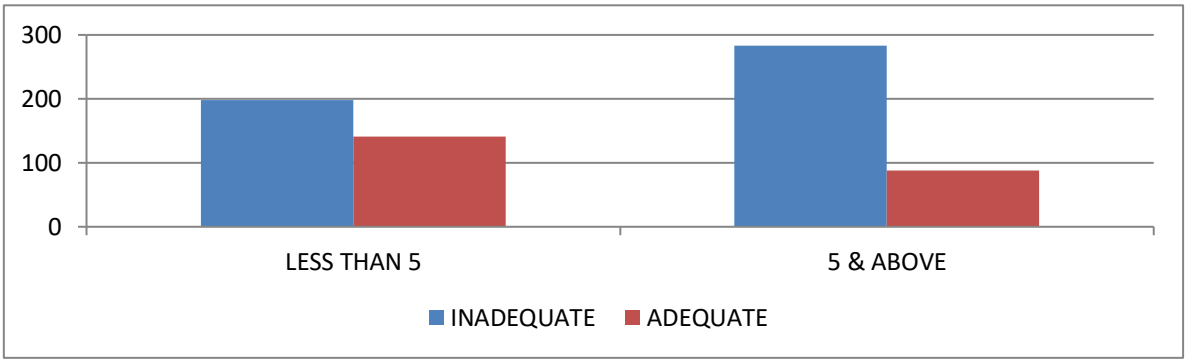


Figure 1. Family structure & care during illness

During old age, factors like social isolation, low income and depression affect their health. Loneliness is a common problem in old age and leads to health-related problems. Table 3 explains the various activities that they are engaged during their free time. During this time, it becomes all the more important for seniors to take on some activity that occupy their time. Study based on the activities during old age and family structure revealed that among the lower family sized groups, 37.4% are going for regular walks, 33.03% are visiting such as worship, tourist places or their relatives, and 22.7% spend their time watching TV and only 6.7% spend their time conversing with others. While those who belong to the larger family size the majority 38.3% spend their time watching TV, 26.4% by visiting worship, tourist places or relatives, 19.4% spend their time in conversations with others, and 15.9% of them by going for walks. (Table 3).

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Table 3. Family Structure & Activities

Activities / Family Size	Visiting Worship Places / Tourist Places / Relatives	Going For Walks	Watching Tv	Conver-Sation With Others	Total
Less Than 5	112[33.03%] [53.3%]	127[37.4%] [68.3%]	77[22.7%] [35.1%]	23[6.7%] [24.2%]	339 [47.7 %]
5 And Above	98[26.4%] [46.6%]	59[[15.9%] [31.7%]	142[38.3%] [64.8%]	72[19.4%] [75.7%]	371 [52.2 %]
Total	210[29.57%]	186[26.19%]	219[30.8%]	95[13.4%]	710

On examining the degree of feeling of loneliness based on the present study, it is seen that feeling of loneliness is far higher (77.5%) in the smaller family size and only a far smaller percentage (4.4%), of those with a smaller family size do not have any feeling of loneliness. Among those who feel loneliness very much, the majority (67.6%) belongs to the smaller family size and those who are not at all feeling loneliness; the majority (82.7%) belongs to the larger family size. So higher the family size, the lower is the feeling of loneliness among the aged. The chi-square test also shows that the observation on feeling of loneliness and the family size of the respondents are significantly related. (Table 4) (Chi-square value = 138.6, Degrees of Freedom=2, Table value at 5% level=5.99).

Table 4. Family Structure & Feeling of Loneliness

Feeling of Loneliness / Family Size	Very Much	To Some Extent	Not at All	Total
Less Than 5	263[77.5%] [67.6%]	61[17.9%] [26.1%]	15[4.4%] [17.2%]	339 [47.7%]
5 And Above	126[33.9%] [32.3%]	173[46.6%] [73.9%]	72[19.4%] [82.7%]	371 [52.2%]
Total	389[54.7%]	234[32.9%]	87[12.25%]	710

On an examination of the influence of the family on the ability to adjust well at home it was found that 48.37% of the respondents whose family size is less than 5 reported that they are always able to adjust well at home and only 24.7% reported they are having difficulty adjusting while for the larger sized families 49.8% of them were having difficulties adjusting and only 10.5% reported they are well adjusted. On examining those who are always well adjusted, the majority 80.7% belongs to the family size of less than 5. So, the study reveals that the sample which belongs to the lower family size is able to adjust better at home than those who are living with a larger sized family. (Table 5).

Table 5. Family Size &Ability for Adjustment

Ability to Adjust Well at Home / Family Size	Always	Some-Times	Never	Total
Less Than 5	164[48.37%] [80.7%]	91[26.8%] [38.2%]	84[24.7%] [31.22%]	339 [47.7%]
5 And Above	39[10.5%] [19.2%]	147[39.6%] [61.7%]	185[49.8%] [68.7%]	371 [52.2%]

Total	203[28.59%]	238[33.5%]	269[37.88%]	710

On examining the disease pattern, it was seen that 96.7% of those having diseases belong to the smaller family sized group and 95.4% of those having diseases belong to the larger family size. (Table 6).

Table 6. Family structure & disease

Disease / Family Size	Present	Absent	Total
Less Than 5	328[96.75%]	11[3.2%]	339 [47.7%]
5 And Above	354[95.41%]	17[4.5%]	371 [52.2%]
Total	682[96.05%]	28[3.9%]	710

Among those who are having family size less than 5, non- communicable diseases are present among 96.7% of the sample and in the larger family size of 5 and above it is 95.4%. But in the case of communicable disease it is higher among the larger family size 94.3%. (Table 7).

Table 7. Family Structure & Disease (Communicable & Non- Communicable)

Disease / Family Size	Communicable Disease	Non-Communicable Disease	No Disease	Total
Less Than 5	299[88.2%]	328[96.7%]	11[3.2%]	339[47.7%]
5 And Above	350[94.3%]	354[95.4%]	17[4.5%]	371[52.2%]
Total	649[91.4%]	682[96.05%]	28[3.9%]	710

The study shows that multiple diseases are more prevalent (94.3%) among those who belong to the larger family size compared to those who have small family size (88.2%). Multiple diseases are absent among 11.7% in the case of the smaller family sized group and only 5.6% in the case in the larger family size. It is evident from the study that higher the number of members in the family, the greater the risk of getting multiple diseases. (Figure 2).

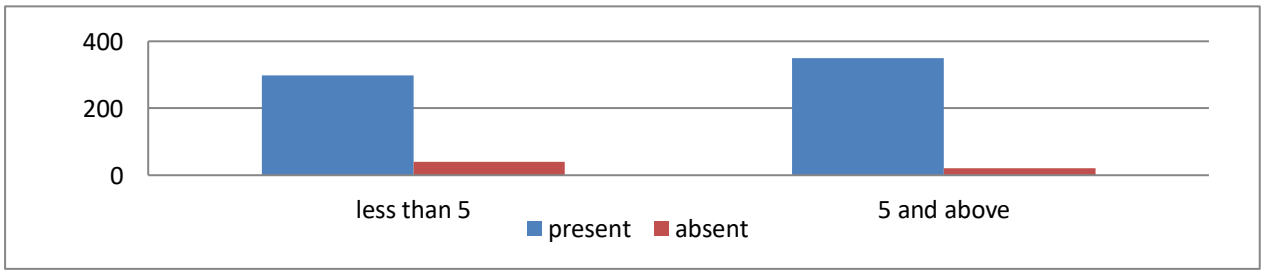


Figure 2. Family Structure & Multiple Diseases

Furthermore, it was observed that among those that were having family size less than 5, 97.2% are having cardiac / hypertension related problems, 96% are having diabetes and 90.2% are having gastrointestinal problems. But in the case of those who are having larger family size, 88.7% are having cardiac or hypertension related problems, 87% are having diabetes and 68.6% are having gastro- intestinal problems. Among those who are having family size less than 5, 86.5% are having respiratory problems, 80.1% are having metabolic / hormonal complaints, 75% are having urology related complaints, 61.8% are having neurological ailments and 12.5% are cancer patients. Among those who are in the larger family size, 52.25% have respiratory illness, 51.6% are having neurological problems, 44.9% are having urological problems 41.2% are having metabolic / hormonal problems and 7.3% are cancer patients, in all these cases, the higher prevalence is among those who have family size less than 5. (Table 8).

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Table 8. Family Structure & Types of Diseases

Disease / Family Size	Sub-Total	Res-piratory	Gastro-Intestinal	Urolo-gical	Neuro-logical	Metabo-lic/Hormonal	Cardiac/ Hyper-tension	Diabetes	Cancer	No Disease	Total
Less Than 5	328[96.75]	284[86.5]	296[90.2]	246[75]	203[61.8]	263[80.1]	319[97.2]	315[96.03]	41[12.5]	11[3.2]	339[47.7]
5 And Above	354[95.4]	185[52.25]	243[68.6]	159[44.9]	183[51.6]	146[41.2]	314[88.7]	308[87.01]	26[7.3]	17[4.5]	371[52.2]
Total	682[96.05]	469[68.76]	539[79.03]	405[59.4]	386[56.59]	409[59.9]	633[92.8]	623[91.34]	67[9.8]	28[3.9]	710

Conclusion

This study is mainly focused on the health problems including physical and mental abilities in the context of Kerala with special emphasis on the influence of family structure. It revealed that the variables selected for the study has significantly related with the health status of elderly. As family plays an important role in maintaining health condition, the lack of awareness among the family members regarding the changing behavioral pattern of the elderly leads to their life more problematic. So, it is the duty of the members to understand their needs and concerns thus ensuring their good health and also by providing emotional support makes them jovial which is inevitable an ideal way to make their life happy.

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Influence of Subject Characteristics on Adoption of Multiple Preventive Health Behaviours against Noncommunicable Diseases: A survey of Female Students at Makerere University

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Abstract

Many researchers worldwide report that health behaviours tend to be highly clustered, and can be addressed simultaneously. Yet, more remains unknown than known about how to optimize multiple preventive health behaviour change to mitigate health risks associated with noncommunicable diseases, which currently presents major public health concerns, and represents the greatest global health security threats in the future. There are emerging shifts in epidemiology of these chronic diseases, not only by gender, socio-economic status, disability, ethnicity, but most recently by age- albeit subject characteristics, as they are increasingly causing premature deaths. Nevertheless, the problem remains a neglected public health issue in Uganda, and at Makerere University in particular.

A cross-sectional sample of 381 undergraduate female students completed the self-administered questionnaire, whose results were subjected to binary logistic regression modeling to determine extents to which subject characteristics influenced adoption of preventive health behaviours.

Multivariate regression models suggest that course of study significantly (p=.013) influenced physician visits, with adjusted odds ratio of 0.32. Pentecostal (p=.018) and Anglican (p=.002) affiliations significantly influenced screening behaviour, with corresponding odd ratios of 0.37 and 0.34. Pentecostal (p= .021), like Science course (p=.030) significantly influenced physical activity, with corresponding odds ratios of 0.34 and 0.44. With respect to multiple preventive health behaviours, only course of study showed significant (p=.036) influence on adoption of all three desired behaviours, with adjusted odds ratio of 3.15.

The study contributes to body of knowledge on multiple health behavioral change and the healthy Universities concept. Future health promotions should consider issues around equitable access to essential information, and take advantage of religious places of worship and leaders to channel messaging.

Keywords*: Noncommunicable diseases, subject characteristics, multiple preventive health behavior.*

Background

Scientific evidence from studies around the world suggest that lifestyle behaviours of sick, healthy, and at-risk populations tend to be highly clustered due to external social influence. These findings were upheld by Meader et al. (2016) in their systematic review on the clustering and co-occurrence of multiple health risk behaviours and their predictors. Moreover, empirical studies continue to report similar results, for instance, the research by Champion et al. (2018) and de Souza Dantas et al. (2018) among Australian and Brazilian youths respectively. Consequently, literature reveals that behavioral researchers hold the consensus that health risk behaviours co-occur and most people display more than one behaviour.

The implication of these findings is that if clustered aka bundled health risk behaviours and their drivers are known, they can be addressed simultaneously (Spring, Moller & Coons, 2012) rather than one at a time sequentially, and so allow public health to enjoy the benefits associated with economies of scope- and thus presents a possible strategy for reducing the bottlenecks that constrain efforts on elimination of major noncommunicable diseases (NCDs). Yet according to Spring et al. (2012), more

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remains unknown than known about how to optimize multiple preventive health behaviour change at the individual or the population level, which calls for further research- towards addressing the scourge of NCDs.

Noncommunicable diseases like cancer, diabetes, cardiovascular disease, and chronic respiratory diseases currently present a major public health concern globally, and represent the greatest threats to global health security in the future (Jamison et al., 2013). Their prevalence continues to persist, and to surge globally, and yet disproportionately among low- and middle-income countries, as well as within populations in any single country. An estimated 71% of all deaths in 2012 (WHO, 2014) were attributed to NCDs alone, which represents increase of about 5.7% in just a period of two years (Lozano et al., 2010).

The four major NCDs were responsible for about 82% of all the case mortalities in 2012 (WHO, 2014). Moreover, these chronic diseases are no longer a problem of the rich nor of the elderly only. At least some 42% of all deaths due to these diseases- globally occurred before the age of seventy years, of which 82% were in low- and middle-income countries, according to the 2014 World Health Organization's status report on NCDs. Moreover, the role of gender inequality in perpetuating the menace of these preventable lifestyle diseases is not questionable (Marmot et al., 2008; WHO, 2009). These trends depict an emerging shift in occurrence and distribution of these chronic diseases that are posing increased public health risks to younger people and poorer populations worldwide.

In Uganda, the probability of premature death between the age of thirty and seventy years reduced only slightly from 21.3% in 2010 to 21.2% (WHO, 2014) yet it remains comparatively higher than for her neighboring States like Kenya, Rwanda and South Sudan. And, though premature death rates were significantly higher in males than females for most countries worldwide, there was only a small marginal difference of about 5.5% in Uganda (p.160)- implying that as nearly as many women (64.0%) as men (69.5%) die prematurely from these preventable lifestyle diseases.

These new paradigms call for an urgent need to re-focus socio-behavioral health research, and generate empirical evidence that can be used to communicate and influence policy and decisions in favor of younger people and women so as to be able to mitigate the associated health risks, and prevent individuals from developing these lifestyle conditions. Unfortunately, until now, it appears to be a neglected public health issue in Uganda, and in particular at Makerere University, despite the institution being a regional research hub and an academic destination for several thousands of young people across the country and the region. Our most recent research (accepted for publishing) only documented public health concerns and risk perceptions of the undergraduate female students, from a qualitative viewpoint, yet it provides insights for the current study (Asaku, Kiguli & Agaba, 2019). There is evidence that NCDs continue to receive less political attention than emerging infectious diseases (Saha & Alleyne, 2018), which in turn tends to hinder progress on prevention and elimination efforts, hence the need to strengthen the knowledge evidence base.

Anyhow, there appears to be a unique window of opportunity that public health must exploit. Studies have revealed that adopting as few as only three preventative health behaviours (PHBs), without any other interventions, is capable of reducing health risks associated with any given NCD by up to 68% to 71% (Harrington et al., 2010). Throughout this article, we use health risk behaviour clustering and bundling interchangeably, as well as to infer multiple- though we recognize that these terms could differ epidemiologically. So, by multiple PHBs, we restrict the context of the current study to the adoption of three bundled health behaviours; screening behaviour, physician visit and physical activity routine.

But what are preventive health behavoiurs? They are actions undertaken voluntarily by apparently healthy persons, for the purpose of preventing disease or detecting illness at the earliest possible asymptomatic stage (Kasl & Cobb, 1966). This differs from the illness behaviour and sick-role behaviour described by the same authors, but have received more consideration from researchers over the past couple of decades.

Further to that, Marmot and Bell (2019) in one of their most recent articles, emphasize the need to adopt integrated preventive approaches, which in turn are in line with the aim of multiple PHBs- to address bundled unhealthy behavoiurs simultaneously. The current study sought to investigate the extent to which individual characteristics- specifically the respondents' hall of residence, age, religious

affiliation, educational level, course of study, programme of study, and the year of study were likely to influence the probability of adoption of multiple PHBs by the undergraduate female students.

Moreover, Arah (2008) argues that the concept of individual health must emphasize the role of the persons' circumstances in health maintenance or even in disease causation, and maintains that the health of a population is more than just the sum of the parts (Arah, 2008; Reidpath, 2005). The link between individual behaviours and the individual's health, and that of the health of the population (Arah, 2008) - is no longer a question of doubt, since most of the health choices that people make in life are shaped by their societies. Besides, Marmot et al. (2008) maintain that drivers for health inequality are rooted in social stratifications among which subject characteristics like gender, ethnicity, education level, age, religion etc., are key. These observations underline the importance of subject characteristics as social determinants of health - thus underpins the relevance of the current study.

It was hoped that results from the current study would harness multiple behavioral change deign and interventions as applauded by Amato, Park and Nigg (2016) among other behavioral change researchers. In short, understanding how these subject characteristics influence adoption of multiple PHBs as primary prevention measures- is an essential step towards achieving a healthy university, universal health, global health security agenda, and the corresponding Sustainable Development Goals (SDGs).

Methods

This was a cross-sectional study aimed at describing the extents of associations between subject characteristics and adoption of bundled multiple PHBs among undergraduate female students at Makerere University. The institution had a total enrolment of an estimated 36,000 undergraduate students, of which at least 45% were females. There were three on-compass halls of residence for the undergraduate female students. We considered each of these halls as a stratum, with assumed high between stratum heterogeneity and low within stratum homogeneity, and so applied the stratified random sampling method. We adopted stratified sampling because it permits a fair representation of views of respondents across all subgroups unlike cluster sampling that concentrates a study in only a few subgroups (Amin, 2005). None resident students were excluded from the study because they would not be accessed readily.

The study sample size (n= 384, at 95% confidence level) was calculated using the formula adopted from Mugenda and Mugenda (2003), and Charan and Biswas (2013) for cross-sectional studies, and on the assumption that 50% of the target population exhibits the desired behaviours- we assumed the maximum because there was no reliable yardstick data on adoption of multiple PHBs by young people in Uganda, and in particular the context of current study. The method of proportional sample size allocation, whose results have been included on **Table -** was adopted to allocate the study sample across the three strata.

Table 1. Sample size allocation by halls of residence

Female Hall of residence	Stratum size	Number of rooms	Students-Room ratio	Sample Size	Number of rooms sampled
Africa Hall	N_1= 498	198	2.515	n_1= 121	61
Mary Stuart Hall	N_2= 556	298	1.866	n_2= 135	68
Complex Hall	N_3= 530	252	2.103	n_3= 128	64
Total	**N= 1,584**	**748**	**2.117**	**n= 384**	**193**

Source: Makerere University Planning and Development Department (2016).

The three female halls of residence constituted the sampling units for the current study, while the dwellers were the sampling elements that make up the sampling frame drawn from the list of room numbers. All undergraduate female students residing in those halls in the 2018/2019 academic year, irrespective of their year, course or time of study were eligible to participate. Undergraduate, as used in this study refers to students pursing various Bachelor degree, Diploma and Certificate courses- irrespective of year of study.

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The simple random lottery sampling method was used to select survey respondents from within each stratum. There were just above two dwellers per room on average. The questionnaire was administered to either (not both) of the students in the sampled rooms. Paper-based structured questionnaire with a set of pre-coded closed-ended fixed alternative questions (FAQs) was used, and were self-administered. The research assistants delivered the questionnaires to the target respondents, and returned the following day to collect completed questionnaires. Some extra five questionnaires were provided per stratum to cater for lost to follow-ups and those that would be deemed invalid. The questionnaire was pre-tested and adjusted for validity and reliability. We obtained an adjusted mean content validity index (CVI) of .97, and reliability of .79 and internal consistency aka Cronbach's coefficient alpha (α=.92), which were generally above the recommended thresholds for epidemiological surveys.

The current study operationalized and measured PHBs in terms of three dimensions: 1) often/very often voluntary physician visit or contact with health facility in last six month- as was measured by a 4-point unbalanced Likert scale; 2) voluntary screening for at least one NCD (breast cancer, cervical cancer, other cancer types, obesity and/or high blood pressure) in last six month prior to the study- measured by the yes/no dichotomous scale; and 3) often/very often engaging in at least one physical activity (PA), also measured by a 4-point unbalanced Likert scale. Respondents were characterized into Doers and Non-Doers.

By way of definition, Doers (the YES category) refers to those respondents who exhibited all the three desired PHBs in the previous six calendar months prior to the study- precisely: 1) screened for at least one of the listed target NCDs; 2) had at least one physician contact; and 3) often/very often spent their leisure time outside class on at least one of the listed physical activities. Respondents who had none or less than three of these desired bundled behaviours were categorized as Non-Doers (the NO category respondents).

Raw data was entered in EpiData, edited, and some variables transformed before it was exported to StataSE. Frequencies and percentages were used to describe subject characteristics. Then, the binary logistic regression model was employed to predict adoption of a single desired PHB. Regressors whose p- values were less than .20 in bivariate analysis, were considered for multivariate analysis, to determine the extents to which they influenced adoption of the desired multiple PHBs. The odds ratios were used as the measure of association and the p-values of less than .05 at 95% confidence level- suggested statistical significance. The assumptions of linearity and multicollinearity[1] were tested in the regression model building, and so was interaction and confounding of factors. The regression models were also assessed for goodness of fit of data, and the model was considered fit when the p-value was high (p >.05).

Results

Participants

First, three questionnaires were excluded from statistical analysis because they were incomplete. The results presented hereafter, therefore, are based on 381 respondents, which translates in an overall valid response rate of 99.2%. Among the valid questionnaires, Africa hall was less the target by only 0.3%, Marry Stuart was less by 1.6%, while Complex hall exceeded by 1.9%. All the descriptive statistics were based on actual number of valid responses to corresponding items. The demographic characteristics for survey respondents are summarized on **Table** .

Table 2a. Demographic characteristics of respondents

Characteristic		**Frequency**	**Percentage**
Hall of Residence	Africa	119	31.2
	Complex	134	35.2
	Mary Stuart	128	33.6
Age Group	18-24	349	91.6
	25yrs+	30	7.9

[1] Variables that are strongly correlated. Tested in the model using vif (variance inflating factor) and tolerance (1/vif). If vif<10 and 1/vif>0.1, then there is no multicollinearity

	Not specified	2	0.5
Religious Affiliation	Roman Catholic	112	29.4
	Pentecostal	53	13.9
	Anglican	129	33.9
	Moslem	39	10.2
	Seventh-day Adventist	7	1.8
	Others**	41	10.8
**Orthodox, Baptist, Traditional, not specified Source: Primary Data			

It was evident from the table above, that majority of respondents (91.6%) were of the age 18 to 24 years. And, since only a few respondents were older than 25 years, those age brackets were collapsed. This was an expected normal distribution since participants are undergraduate students. The proportion of Anglicans was highest (33.9%), above the Roman Catholic by 4.5%. Nonetheless, the distribution of religious affiliations was not too far from the normal Uganda demographic profile[2].

Table 2b. Demographic characteristics of respondents

Characteristic		**Frequency**	**Percentage**
Education Level	Undergraduate Degree	368	96.6
	Undergraduate Diploma	12	3.2
	Undergraduate Certificate	1	0.2
Course Category	Arts	277	72.7
	Sciences	104	27.3
Programme of Study	Day	188	49.3
	Evening	187	49.1
	Weekend	6	1.6
Year of Study	New Entrants (year1)	163	42.8
	Continuing students	43	11.3
	Final year students	175	45.9

Further, just above 3% of all respondents were not undergraduate Degree students. This was not unexpected result because the University was gradually phasing out Diploma and Certificate courses. Yet, the proportion of respondents pursuing the Arts courses (72.7%) was about thrice greater than their Science counterparts. Furthermore, about equal proportions of respondents were Day (49.3%) or Evening (49.1%) scholars. Finally, students in their final year of study constituted 45.9% of total respondents, followed by new entrants (42.8%), while the proportion of continuing students (those not in their first or final year) was unexpectedly lower (11.3%) - possibly because most continuing students prefer to reside in private hostels.

Preventive health behaviours

Preferred choice of first contact

Respondents were asked to indicate their LIKELY **(Table a)** preferred choice of first contact, and ACTUAL **(Table b)** first contact preferences, if they needed health related help. These results were suggestive of the levels of trust that respondents had in their social networks and institutions.

[2] https://www.indexmundi.com/uganda/demographics_profile.html

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Table 3a. Likely preferred choice of first contacts for health-related help

	Percentage of Respondents			
	Very Unlikely	**Unlikely**	**Likely**	**Very Likely**
Close friend (n=336)	8.63	9.82	41.96	39.59
Close nuclear family member (n=315)	13.65	15.24	26.35	44.76
Close extended family member (n=301)	33.55	29.90	23.92	12.63
Private Clinic (n=310)	12.90	20.32	39.68	27.10
Private Pharmacy (n=311)	14.79	19.29	39.87	26.05
Private Hospital (n=295)	11.18	17.63	36.95	34.24
Government Hospital (n=298)	33.23	23.15	29.19	14.43
Makerere University Hospital (n=309)	30.42	22.66	30.74	16.18
Traditional Herbalist (n=293)	77.82	13.31	4.43	4.44
Spiritual/religious leader (n=309)	40.13	16.18	25.24	18.45

Table 3b. Actual preferred choices of first contacts for health-related help

	Percentage of Respondents			
	Never	**Rarely**	**Often**	**Very Often**
Close friend (n=331)	12.69	20.24	30.51	36.56
Close nuclear family member (n=310)	14.84	19.03	28.06	38.07
Close extended family member (n=298)	42.95	32.21	16.11	8.73
Private Clinic (n=300)	21.00	32.33	30.33	16.34
Private Pharmacy (n=292)	21.58	31.85	33.56	13.01
Private Hospital (n=293)	23.21	35.15	26.62	15.02
Government Hospital (n=289)	47.06	33.22	14.19	5.53
Makerere University Hospital (n=302)	55.96	27.48	10.60	5.96
Traditional Herbalist (n=295)	85.76	11.53	1.69	1.02
Spiritual/religious leader (n=303)	55.12	21.12	13.20	10.56

Overall, consistency was evident in the trend of responses between corresponding matched items on the tables shown above, though actual contacts were generally lower than corresponding preferred likely contacts. This may suggest that whilst the wish and will were there, taking the desired action still remains challenging. It was evident from the tables that close friend, and close nuclear family member were most preferred choices of first contact for health-related help. For instance, over 81% of respondents were likely/very likely to contact a close friend, and at least 71% contacted them often/very often, in the last six months. It was also evident that private health facilities were preferred to public ones. Just above 16% of total respondents often/very often visited the Makerere University hospital, yet it is closest to them. This could be translating in underutilization of services available at the University hospital. Lastly, smaller proportion of respondents were likely/very likely (8.9%) to contact, or actually contacted (2.7%) traditional herbalists, while spiritual leaders recorded slightly higher contacts.

Physical activity routines

Again, respondents were asked to indicate how LIKELY **(Table a)** they would spend their leisure time outside class, and how they ACTUALLY **(Table b)** spent their leisure time in the last six months. The response options comprised array of sedentary and physical activities as shown on tables below.

Table 4a. Likelihood of spending leisure time outside class

	Percentage of Respondents			
	Very unlikely	**Unlikely**	**Likely**	**Very likely**
Cooking (n=317)	16.09	17.98	40.38	25.55
Walking to visit a friend (n=316)	11.08	22.78	42.41	23.73
Shopping in supermarkets (n=301)	12.29	27.24	39.20	21.27
Sleeping (n=314)	6.05	14.01	32.17	47.77
Watching television (n=308)	13.31	15.26	27.60	43.83
Playing video games (n=302)	45.36	21.19	20.20	13.25
Playing board games (n=301)	41.86	28.24	15.61	14.29
Browsing internet (n=303)	7.27	6.27	35.31	51.15
Reading novels, news, magazines etc., (n=310)	12.25	15.81	33.23	38.71
Charting with friends on social media (n=307)	3.91	6.51	31.92	57.66
Jogging, running or aerobic activity (n=299)	30.10	30.43	27.42	12.05
Swimming (n=299)	35.45	24.75	21.74	18.06
Other physical games (n=293)	28.67	21.50	32.76	17.07

Table 4b. How respondents spent their leisure time

	Percentage of Respondents			
	Never	**Rarely**	**Often**	**Very Often**
Cooking (n=340)	16.18	30.88	30.88	22.06
Walking to visit a friend (n=344)	9.01	38.08	32.56	20.35
Shopping in supermarkets (n=330)	13.64	42.12	30.91	13.33
Sleeping (n=338)	3.55	15.98	31.95	48.52
Watching television (n=338)	9.76	23.96	26.04	40.24
Playing video games (n=325)	48.31	25.23	14.46	12.00
Playing board games (n=327)	50.15	28.44	11.01	10.40
Browsing internet (n=327)	7.34	13.15	30.58	48.93
Reading novels, news, magazines etc., (n=331)	13.90	29.31	26.88	29.91
Charting with friends on social media (n=328)	4.57	11.28	26.52	57.63
Jogging, running or aerobic activity (n=338)	38.74	33.63	18.32	9.31
Swimming (n=311)	48.94	26.44	13.07	11.55
Other physical games (n=311)	39.87	29.90	15.44	14.79

With exception of playing video games or board games, higher proportions of respondents were likely/very likely to spend their leisure time, and actually did spend their leisure time on sedentary activities, as opposed to physical activities (PA). Video games and board games are considered mannish games.

For instance, a combined 80.5% expressed that they were likely/very likely to spend their leisure time on sleeping, as compared to jogging, running, aerobics, swimming and other PAs, which had much lower proportions of respondents in favor of them. This presents increased risks for obesity and associated chronic conditions.

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Voluntary screening behaviour

Table 5. How likely are you to undertake screening tests for NCDs below in the next six months?

	Percentage of Respondents			
	Very unlikely	**Unlikely**	**Likely**	**Very likely**
Breast Cancer (n=343)	29.45	15.45	35.86	19.24
Cervical Cancer (n=329)	32.52	19.76	26.44	21.28
Other Cancer types (n=319)	36.99	23.82	23.82	15.37
Weight/Obesity (n=317)	28.08	17.03	27.44	27.45
Pressure (n=323)	31.89	20.43	28.48	19.20
Diabetes (n=316)	34.81	22.15	25.63	17.41
Others (n=304)	28.62	18.42	28.95	24.01

The table above reveals that at least over 52% of total respondents expressed that they were very unlikely/unlikely to screen for cervical cancer (52.3%), pressure (52.3%), diabetes (57.0%), and other cancer types (60.8%) in the following six months. Corresponding proportions for obesity and breast cancer were even less than 50%. **Figure** shows proportions of respondents who screened (YES or NO) for the same NCDs in the previous six months.

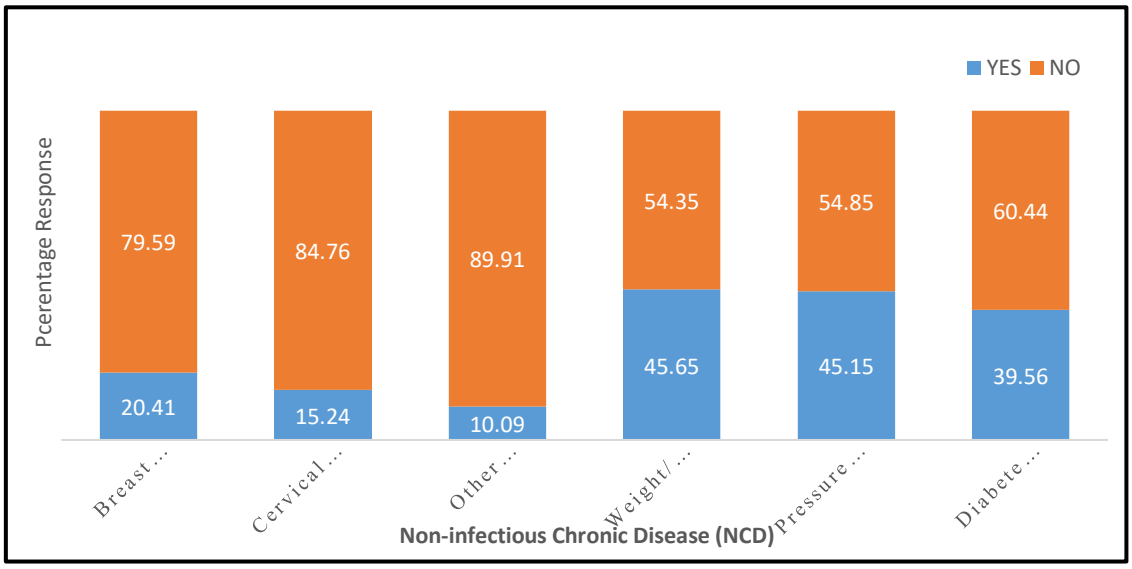


Figure 1. Shows proportions of respondents who voluntarily screened for NCDs in the last six months

Higher proportions of respondents did not screen for the listed NCDs. For instance, about 80% did not screen for breast cancer and cervical cancer in the last six months. The question as to why uptake of voluntary screening for NCDs remains low requires to be investigated further.

Subject characteristics and adoption of preventive health behaviours

We present here results from the two-step sequential binary logistic regression models, beginning with the associations between each of subject characteristic (predictor or regressor) and adoption of a single desired PHBs, then results for adoption of the bundled PHBs. We have combined bivariate and multivariate results on same tables. We did not look at gender as a subject characteristic because the study focuses on only female. Among the 381 survey respondents, up to 82.8% were categorized as Non-Doers, compared to only 17.2% Doers.

Table 6. Subject characteristic and adoption of physician visit

		Bivariate			Multivariate		
Characteristic		**OR**	**95%CI**	**P-value**	**AOR**	**95%CI**	**P-value**
Hall of Residence	Africa	Ref*					
	Complex	1.39	0.50- 3.88	0.527			
	Mary Stuart	1.61	0.55- 4.69	0.383			
Age Group	18-24	Ref*					
	25year+	0.91	0.20- 4.10	0.898			
Religious Affiliation	Roman Catholic	Ref*					
	Pentecostal	0.47	0.11- 1.96	0.297			
	Anglican	0.45	0.13- 1.48	0.189			
Course of Study	Others	0.77	0.19- 3.17	0.714			
	Arts	Ref*			Ref*		
	Sciences	0.32	0.13-0.79	0.013	0.32	0.13-0.79	**0.013**
Education Level	Undergraduate Degree	Ref*					
	Undergraduate Diploma	0.21	0.02- 2.15	0.190			
Programme of Study	Day	Ref*					
	Evening/Weekend	1.13	0.47- 2.70	0.783			
Year of Study	New Entrants	Ref*					
	Continuing Students	1.67	0.20-13.68	0.632			
	Final Year Students	1.91	0.76- 4.81	0.172			

*Reference Variable

Source: Primary Data

The multivariate regression model, whose results are presented on **Table** above suggests that the course of study significantly (p=.013) influenced the frequency of physician visits with an adjusted odds ratio of 0.32. The result suggests that female students offering the Arts courses were over thrice more likely to visit a health facility and make contact with a health worker or physician, than their Science counterparts.

Table 7. Subject characteristic and adoption of voluntary screening behaviour

		Bivariate			Multivariate		
Characteristic		**OR**	**95%CI**	**P-value**	**AOR**	**95%CI**	**P-value**
Hall of Residence	Africa	Ref*					
	Complex	1.30	0.73- 2.33	0.373			
	Mary Stuart	1.29	0.72- 2.32	0.398			
Age Group	18-24	Ref*					
Religious Affiliation	25year+	0.73	0.32- 1.69	0.466			
	Roman Catholic	Ref*			Ref*		
	Pentecostal	0.39	0.17- 0.88	0.023	0.37	0.16-0.84	**0.018**
	Anglican	0.36	0.19- 0.69	0.002	0.34	0.18-0.67	**0.002**

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	Moslem	0.55	0.20-0.70	0.090	0.35	0.19-0.68	0.065
	Others	0.53	0.25- 1.10	0.089	0.49	0.23-1.04	0.064
Course of Study	Arts	Ref*					
	Sciences	0.93	0.49- 1.77	0.828			
Education Level	Undergraduate Degree	Ref*					
	Undergraduate Diploma	0.36	0.05- 2.62	0.315			
Programme of Study	Day	Ref*			Ref*		
	Evening/Weekend	0.59	0.36-0.96	0.033	0.61	0.37-1.01	0.054
Year of Study	New Entrants	Ref*					
	Continuing Students	1.96	0.54- 7.09	0.304			
	Final Year Students	0.88	0.53- 1.45	0.606			

The multivariate logistic regression model, whose results are presented on **Table** above suggests that the Pentecostal (p=.018) and Anglican (p=.002) religious affiliations significantly influenced adoption of voluntary screening behaviour of the respondents, with adjusted odd ratios of 0.37 and 0.34 respectively. The results suggest that Catholic affiliated respondents were 2.7 times more likely than their Pentecostal counterparts, and 2.9 times more likely than Anglicans, to adopt a voluntary screening behaviour. The other subject characteristics tested in the model had to significant influence on screening behaviour of the female students. However, evening/weekend programmes of study (p=.054) was quite close to being significant with an adjusted odds ratio of 0.61, which suggests that students offering day programme were about 1.6 times more likely to adopt voluntary screening than their evening/weekend counterparts. This result could be explained by the fact that most day programmes were science courses, and students offering sciences courses are most likely to be better informed on the benefits of screening than their Arts counterparts.

Table 8. Subject characteristic and adoption of physical activity routine

		Bivariate			**Multivariate**		
Characteristic		**OR**	**95%CI**	**P-value**	**AOR**	**95%CI**	**P-value**
Hall of Residence	Africa	Ref*					
	Complex	0.75	0.418-1.340	0.329			
	Mary Stuart	0.69	0.374-1.234	0.204			
Age Group	18-24	Ref*					
	25year+	0.58	0.208-1.648	0.311			
Religious Affiliation	Roman Catholic	Ref*			Ref*		
	Pentecostal	0.33	0.138-0.817	0.016	0.34	0.14-0.85	**0.021**
	Anglican	0.58	0.318-1.061	0.077	0.66	0.34-1.26	0.205
	Moslem	0.89	0.450-1.671	0.651	0.89	0.33-1.28	0.982

	Others	0.84	0.432-1.631	0.605	0.99	0.48-2.03	0.971
Course of Study	Arts	Ref*			Ref*		
	Sciences	0.45	0.22- 0.94	0.033	0.44	0.21-0.92	**0.030**
Education Level	Undergraduate Degree	Ref*					
	Undergraduate Diploma	0.65	0.066-6.293	0.707			
Programme of Study	Day	Ref*					
	Evening/Weekend	1.23	0.761-2.006	0.393			
Year of Study	New Entrants	Ref*					
	Continuing Students	1.04	0.37- 2.93	0.940			
	Final Year Students	1.41	0.84- 2.37	0.193			

The multivariate regression model, whose results are presented on **Table** above suggests that Pentecostal religious affiliation (p= .021) and Science course of study (p=.030) significantly influenced the respondents' adoption of PA routines, with corresponding adjusted odds ratios of 0.34 and 0.44 respectively. These ratios imply that Catholic religious affiliated respondents were 2.9 times more likely to adopt physical leisure activities than their Pentecostal counterparts, and that respondents offering Arts courses were about 2.3 times more likely to adopt the behaviour than their Science counterparts. This result may be explained in terms of time barrier since over 69% of None-Doers agree/strongly agree that their course of study would not allow time for them to try something else for themselves, majority of whom are anticipated to be Science students. Science courses at the University are generally considered to be more time demanding than Arts. The other subject characteristics investigated in the model had no statistically significant influence on adoption of this desired health behaviour.

Table 9. Subject characteristics and adoption of multiple PHBs

		Bivariate			**Multivariate**		
Characteristic		**OR**	**95%CI**	**P-value**	**AOR**	**95%CI**	**P-value**
Hall of Residence	Africa	Ref*					
	Complex	0.90	0.47-1.70	0.735			
	Mary Stuart	0.66	0.33-1.31	0.238			
Age Group	18-24	Ref*					
	25year+	0.32	0.74-1.38	0.127	0.37	0.08-1.64	0.191
Religious Affiliation	Roman Catholic	Ref*			Ref*		
	Pentecostal	0.41	0.14-1.14	0.087	0.47	0.16-1.37	0.167
	Anglican	0.67	0.35-1.32	0.254	0.87	0.43-1.81	0.740
	Moslem	0.90	0.49-1.87	0.850	0.99	0.48-2.10	0.888
	Others	0.93	0.48-1.91	0.853	1.06	0.48-2.31	0.781

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Course of Study	Arts	Ref *			Ref *		
	Sciences	0.31	0.11-0.90	0.037	3.15	1.07-9.26	**0.036**
Education Level	Undergraduate Degree	Ref *					
	Undergraduate Diploma	1.60	0.16-15.70	0.684			
Programme of Study	Day	Ref *					
	Evening/Weekend	0.72	0.42-1.25	0.241			
Year of Study	New Entrants	Ref *					
	Continuing Students	0.89	0.51-1.55	0.687			
	Final Year Students	2.98	0.94-4.75	0.427			

*reference variable

Source: primary Data

The multivariate regression model whose results are presented on **Table** above suggests that the Science course of study (p=.036) significantly influenced adoption of a combination of the three desired behaviours that were associated with being a Doer. The adjusted odds ratio to that respect was 3.15, which implies that Science students were over thrice more likely to adopt multiple PHBs than their Arts counterparts. This result differs from earlier results in which Arts students were more likely to adopt a single desired PHB. The difference may be due to differences in level of knowledge on benefits associated with adopting multiple PHBs, the fact that higher proportions of Doers were Science students.

Discussion

Direct influence of subject characteristics was examined on the selected PHBs. The most noted and statistically significant findings were that; 1) undergraduate female students offering Arts courses were more likely to make contact with physicians or formal health facility, as well as adopt PA routines than their science counterparts; 2) Catholic religion affiliated undergraduate female students were more likely to adopt voluntary screening behaviour, as well as PA routines than their counterparts; 3) undergraduate female students offering Science courses were more likely to adopt voluntary screening behaviour than their Arts counterparts; and 4) undergraduate female students offering Science courses were more likely to adopt the desired multiple PHBs than their Arts counterparts.

We discuss these results to attempt put the current study on context of other researchers on similar topics. Specifically, to highlight areas of agreements and disagreements with the statistically significant results, enrich what is already known with what the current paper adds to the existing body of knowledge, explain potential implications of these results and suggest possible recommendations, as well as highlight potential areas of the study limitations.

There is consistent evidence that insufficient[3] PA, both in terms of frequency and duration, has emerged as the most leading factor for global mortality, causing some 3.2 million deaths every year (Lim et al, 2012; WHO, 2014). Regular PA is known to reduce health risks associated with developing Ischaemic heart disease, stroke, diabetes, breast cancer and colon cancer, and is a key determinant of energy expenditure, which is a critical role in maintaining body energy balance, weight control and prevention of obesity (WHO, 2010). While there is no valid gender disaggregated data on prevalence of insufficient PA in Uganda (WHO, 2014), globally, more women (27%) than men (20%) were not

[3] Less than 60 minutes of PA of moderate vigorous intensity per daily or 150 minutes of moderate PA per week or 75 minutes of vigorous PA per week (WHO, 2010).

reaching the desired levels of PA (p.33). Moreover, there is substantial evidence that University study is often accompanied by decline in levels of PA (Kwan et al., 2012; Sigmundova et al., 2013; Masselli, Ward & Gobbi, 2018). Fagaras, Radu and Vanu (2015) maintain that female students are physically less active than their male counterparts, while Bray and Born (2004) earlier reported that at least one-third of active students in high school become insufficiently inactive upon joining University life. Hence, the preference for sedentary activities reported by the current studies in not new.

Notwithstanding, scientific evidence to link religious affiliation and course of study with desired levels of PA among University students remains vague. While a wealth of existing scientific literature, including a meta-analysis by McCullough, Hoyt et al. (2000) generally and consistently support that religiosity aka spirituality is associated with reduced risks of NCD mortalities, healthy behaviours, and better health outcomes across a number of populations, Schlundt et al. (2008) contends that the positive associations might be a result of failure to sufficiently control for individual differences in demographics. Moreover, we could not readily cite literature that specifically demonstrated statistically significant associations between a particular religious denomination and desired levels of PA among female University students or even in the general populations. So, further research might be required to that effect.

Nonetheless, we objectively support the arguments by researchers that religions (be it the Catholic, Anglican, Moslem etc.,) have the ability to influence the distribution of advantages and disadvantages in the social determinants of health, which in turn might influence the health of its congregation. For instance, some may host sporting events, while others do not. This school of thought becomes even clearer, if the comparison is made in the contexts of rural and urban settings- in rural areas for instance, believers often walk several distances as opposed to cities where the use of vehicles is dominant as means of transport. Lastly, scientists have proposed other mechanisms by which religion impacts positively on the health of its congregation; provision of social support to its members, regulation of stress pathways and promotion of healthy lifestyles (Levin, 1994).

Positive religious coping has been associated with reduced stress levels, leading to better physical and mental health and well-being of the individuals (Koenig, Dana &Carson, 2011). The current study therefore maintains and recommends active engagements of places of worship and religious leaders in health promotion to increase adoption of desired PHBs. Additionally, in awake of the strong desire by University female students to lose weight and keep slim, as was reported by de-Franca and Colares (2008) in Brazil, it is prudent that administrators exploit this positive will, as an opportunity to promote adoption of PA routines by providing a supportive policy environment.

In fact, the WHO (2014) recommends that, if countries are to accelerate attainment of the 10% global target on reduction in prevalence of insufficient PA, leaders must address bottlenecks in the physical and policy environments- for instance, for instance provision of walkways and non-motorized cycling initiatives, accompanied with displaying health massages on stairs and walkways, as an incentive for students to use them. Most female students at Makerere University shy away from living in Mary Stuart hall because of its stairs. In addition, the use of hostel shuttles is rampant among most female students.

We could not readily cite studies that dispute or support the observation form the current study that undergraduate female students offering Arts courses were more likely to adopt PA routines than their Science counterparts. However, we objectively think that it is related to perceived academic load differences between Arts and Science students. Indeed, some researchers elsewhere like DiDomenico and Nussbaum (2011) and Brighenti-Zogg et al. (2016) among others have demonstrated the effects of physical workload on mental workload and performance. These studies suggest that individuals who perceive themselves to have heavy mental workload are more likely to shun physical activities on perception that it negatively affects their cognitive performance. Moreover, Kelloway and Gottlieb (1998) earlier affirmed that arrangements that permit flexibility increased women's perceived control over time, and reduce a feeling of having overload. Generally, Arts students are considered to have less academic load, and are therefore more likely to have time to try something different than their Science counterparts.

In view of the above, the authors hereby suggest that the University adopts approaches to learning that increase students' confidence on control over time. Further, we suggest that linking PA to academic excellence through positive messaging like ''More physical activity each day improves your academic

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performance'', placed at strategic locations within the University like in the lecture rooms, libraries, halls of residences, walkways, and other strategic locations could increase uptake and adoption of PA routines across both Arts and Science based courses of study. This is particularly important owing to the fact that off all subject characteristic variables investigated by the current study- only the course of study showed a statistically significant association with adoption of all the three desired health behaviours simultaneously, yet the proportion of respondents (17.2%) categorized as Doers (adopting all three behaviors) was small. In particular, our study suggests that students offering Science courses were more likely to adopt multiple PHBs than their Arts counterparts. We anticipate this to be an issue of knowledge differences on perceptions of risks and benefits associated with multiple PHBs.

A greater proportion of respondents (57.2%) in the current study were either continuing (11.3%) or final year (45.9%) students, which give an insight to explain the low probability of being a reported by the study. This argument is rooted on findings by de-Franca and Colares (2008) that students who are approaching the end of their courses are more associated with multiple unhealthy behaviours that could lead to them developing NCDs. In our view, having graduates leave a University with unhealthy behaviours would be disastrous trend to health and well-being of the wider society since they are the immediate generation of future parents- worse for females ''potential mothers'' considering their societal ascribed roles in upbringing of children. This in our viewpoint, perpetuates the cycle, hence the need to strengthen targeted awareness among new entrants in order to reduce uptake and adoption of unhealthy behaviours.

Further, descriptive results from the current study suggest that significantly higher proportions of undergraduate female students did not screen for the selected NCDs within the previous six months prior to the study, though the proportion of those who expressed willingness to screen staggered around 50%. Yet, at least two variables- religion & course of study had statistically significant influence on adoption of voluntary screening behaviour. Precisely, affiliation to Catholic religion as well as offering Science course was likely to increase uptake and adoption of voluntary screening behaviour. Although the current study did not attempt to investigate reasons neither could the authors readily cite evidence to explain the differences observed among religious affiliations and adoption of voluntary screening behaviour- because only a few studies, such as by Schiller and Levin (1988), and Levin (1994) have attempted to investigate the influence of a particular religious denomination on health and health outcomes. Unfortunately, those studies focused on only a particular denomination, making it not possible to compare differences among religious groups. A few studies that have investigated differences across religious affiliations- have for instance found significant differences in body weight (Kim et al., 2003), use of preventive healthcare (Benjamins 2004) and breast cancer survival (Van Ness et al., 2003). Considering the increasing number of emergent religious sects around the world, this could be apposable area for future research- to be able to address health holistically since it has become increasingly evident these groups play a critical role in influencing decisions and health behaviours of their followers.

However, what we found to be broadly known, accepted, and consistent in scientific literature is the belief that religion gives meaning to life and that religious beliefs affect individuals' perceptions of pain, symptoms, and beliefs about the causes of illness and its course (Walsh 1999). There is further evidence that religion serves as a source of meaning and purpose, and shapes the framework within which people interpret their lives and experiences. As such differences in terms of religious doctrines, norms, and values are expected to influence individuals' choices on health behaviours in general, including voluntary seeking behaviour in particular.

Study limitations

Although these findings give valuable insights on how subject characteristics influence adoption of PHBs, a couple of intrinsic design limitations warrant taking note off. The use of self-administered structured questionnaires limits in-depth exploration of the research problem. Further a cross-sectional design, does not in any way infer causality despite significant associations. Besides, the study targeted resident undergraduate female students, which constitute only a small proportion of the total University enrollment. This limits the extent with which the results can be generalized to the wider student population. Finally, with respect to PA routines, the current study did not investigate if respondents

who said they engaged on PA activities, met the required levels in line with the recommendations from WHO. The study only asked if respondents were engaged on the physical activities.

Conclusions

Only the course of study exerted statistically significant influence on adoption of the three desired PHBs combined- specifically, offering a Science course favors adoption of multiple PHBs. So, we recommend that measures to increase accessibility of essential knowledge about this behavioral prevention of these major NCDs should be harnessed to ensure equitable access across different sections of the University. Secondly, the results from the current study uphold the importance of religion and spirituality in promoting adoption of desired PHBs. For instance, religious affiliation had positive influence on adoption of voluntary screening behaviour, as well as PA routines. However, further studies will be required to investigate if participants were meeting sufficient levels of PA since we did not attempt to investigate that. We therefore recommend that places of worship and religious leaders should be used to disseminate behavioral change messages. Further, only the course of study had significant association with adoption of all the three desired PHBs, which suggests its potential importance in facilitating the uptake and adoption of healthy behaviours, and so we recommend the University to adopt learning approaches that builds students' confidence on control over time. We conclude that these results contribute to the body of knowledge on multiple behavioral change design, and is a positive step towards addressing public health concerns of the undergraduate female students, and achieving health equity in order to curtail the scourge of major NCDs among young people.

List of Abbreviations

NCD	Noncommunicable Disease
WHO	World Health Organization
FAQs	Fixed Alternative Questions
CVI	Content Validity Index
PHB	Preventive Health Behaviours
PA	Physical Activity
UNCST	Uganda National Council for Science and Technology

Declarations

Ethical approvals and consent

The research proposal was initially vetted by the Texila American University School of Public Health, after which it was reviewed and approved by the Makerere University College of Health Sciences Ethical Review Committee **(Ref, 2018-033)**. Further approval was obtained from the Uganda National Council of Science and Technology (UNCST) - **Ref, HS229ES**. These measures were aimed at ensuring that the study was fully compliant with the basic ethical principles of research (Beauchamp & Childress, 2013) and the Uganda National guidelines for involving human participants in social research (UNCST, 2014). Informed consent was obtained from participants, including permission to publish the data on peer reviewed open access journals. The consent form used was reviewed and approved by the research ethics committee and the UNCST as an annex to the main research protocol.

Availability of data and materials

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

Authors' contributions

STA, JK and JKA contributed to study design and implementation, and data analysis. STA drafted the manuscript that was critically reviewed by JK and JKA. All authors read and approved the final version before it submitted for publishing.

Competing interests

The authors declare that they have no competing interests in the current research.

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Evaluating Clients' Satisfaction with National Health Insurance Scheme in Jigawa State, Nigeria

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Abstract

***Background**: Health insurance scheme have been introduced with the aim of providing health insurance and making health services accessible and affordable to the average citizen in the country. Our objective is to evaluate clients' satisfaction with National Health Insurance Scheme in Jigawa State, Nigeria.* ***Method**: This study used a mixed method (both qualitative and quantitative designs) approach and was conducted between May 2016 and September 2017. Three hundred and twenty-one (321) enrollees filled questionnaires while 8 participated in face to face interview. The questionnaires were analysed using Statistical Package for Social Science (SPSS) and descriptive statistics was used to summarize the quantitative data using means, proportions and frequencies. Qualitative data were analyzed using themes.* ***Results:** The overall satisfaction score of the respondents was 80.6%). Specifically expressed satisfaction with the associated services (e.g. lab, radiology, pharmacy) (92.2%), agreed to have easy access to the medical specialist (77.9%), agreed to get prescribed drugs in the hospital (74.1%), agreed that the amount they pay during each visit before they got drug is reasonable (85.7%), satisfied with surgical procedure under NHIS (69.8%), satisfied with the referral arrangement (77%), satisfied with the overall NHIS services in this hospital (87.3%).* ***Conclusion:** More than three quarter (80.6%) of the clients are satisfied with healthcare services provided under NHIS in the hospital.* ***Recommendations:** NHIS scheme can be improved by 24 hours availability of designated doctors for NHIS clients, regular supply of drugs and by reducing waiting time.*

***Keywords:** Universal Coverage, Health Insurance, National health insurance scheme, Patient satisfaction, Client satisfaction.*

Background

The way a country is financing its health care system is a key determinant of the health status of that country and selection of an adequate and efficient method of financing for health services is essential if a country is set to achieve its objective of providing health for all.

According to Onyedibe, Goyit and Nnadi (2012) there are several ways in financing health care, these include fees for service to private insurance, general taxation, social insurance, community financing, loans and grants. Combination of all these different health financing has been practiced in Nigeria for decade but the most basic one is that of fees for service in which a fee is charged to cover all or part of the cost of the services provided. In some countries especially the low and middle income, a fixed fee for service, known as a user charge, is used by government health facilities, both as a means of raising funds and as a means of discouraging what may be viewed as 'unnecessary demand'. The direct payment of fees for service causes the greatest hardship for the poor.

Nigerian Government continues to search for ways to restructure the welfare of changing population to meet the demand and expectation. Poor state of the nation's healthcare services, Poor integration of private health facilities in delivery of services, dependence on government provided facilities, declining funding of healthcare services and dependence on out-of-pocket expenses to purchase health informed the establishment of health insurance scheme. Health insurance is an alternative source of healthcare financing that has become very important in the developing countries.

One of the main aims of universal health coverage (UHC) is to ensure that everybody have adequate access to their health care needs without making significant out-of-pocket payments

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(OOPs) at the point of receiving services. One way to achieve this is through tax funded or social health insurance scheme (SHI) such as National Health Insurance Scheme (NHIS).

National Health Insurance Scheme (NHIS) is set up by Decree 35, of 1999 (now Act 35) operating as Public Private Partnership and directed to accessible, affordable and qualitative healthcare for all Nigerians (NHIS 2012). Through the NHIS, the Nigerian Government implemented Tertiary Institutions Social Health Insurance Programme (TISHIP) which aim to response to health need for students of tertiary institution in terms of quality healthcare so that parents are protected from financial hardship of medical bills. This will ensure equitable distribution among different student's health care cost and also ensure that the distribution of healthcare facilities within the nation tertiary institution of learning is equitable (National Health Insurance Operational Guidelines 2005; in Shagaya 2015).

Nigeria started implementing National Health Insurance Scheme in 2005 with the aim of provision of accessible and affordable health care services to all Nigerians but till date the coverage is still not encouraging. In 2010, the Jigawa State Government paid the sum of three hundred million naira (N300 million) to NHIS as its 50 percent contribution to improve maternal and child health services (Vanguard 2010). All this time there was no published study/Research on NHIS conducted in Jigawa State to evaluate the clients' satisfaction with NHIS in the state. The only literature available is unpublished study of Adamu and Mukhtar (2015) on understanding clients' satisfaction with NHIS in Gumel General Hospital of Jigawa State.

Consequently, the need to evaluate clients' satisfaction with National Health Insurance Scheme in Jigawa State Nigeria has become even more compelling. Findings of this study would help in improving the scheme.

Objective of the study

The objective of this study was to evaluate the extent to which clients are satisfied with National Health Insurance Scheme in Jigawa State. The present study was planned as given below:

- To assess the level of knowledge about NHIS among the enrollees in Jigawa State.
- To determine the level of satisfaction of NHIS clients' with National Health Insurance Scheme in Jigawa State.
- To explore the opinions of clients regarding improvement of NHIS in the state.
- To make recommendations using the research findings for the improvement of the scheme in the study area.

Review of literature

Although the NHIS was introduced with the aim of providing health insurance and making health services accessible and affordable to the average citizen in any country, sustainability is one of the big problems facing the scheme.

Challenges that hinder sustainability include:

- Inadequate human resources
- Adverse selection
- Delay in reimbursement of claims
- Lack of drugs & other supplies
- Corruption.

Tolu-Kusimo, 2013 (in Vonke and Sunday, 2014) identified problems in the Nigerian NHIS:

(i) Many corporate bodies are withdrawing from the scheme because their staff are not getting the required treatment from the NHIS facilities.
(ii) Doctors cannot be blamed for this programme because apart from the fact that HMOs do not pay capitation as and when due, the poor capitation and other incentives paid to these hospitals limit patients care.
(iii) Many hospitals complain of non-payment of the bills of patients that they have treated for HMOs.
(iv) Enrollees complain that many diseases are not covered and they are given substandard drugs.
(v) Many of the clients still spend out-of-pocket to finance their health bills.

Since from 2005 when NHIS was implemented, the coverage is still not encouraging. Kujenya, 2009 (in Agba 2010) pointed that over 4 million federal civil servants and their dependents were registered by the scheme as at February 2009. This means that only 3 percent of the Nigerian population are befitting from the scheme. He added that about 23 billion naira has been disbursed to all the 7850 accredited health facilities in the country for the scheme.

According to Chima (2010) as of 2010, despite efforts made to encourage enrolment across the country by various organizations only 4% of the populations (mainly federal government employees) have been enrolled in the scheme. Following the enrolment of federal civil servants, state governments were expected to adopt the program for all its employees and their dependents, an action which would have greatly expanded the coverage. However, 10 years after the launch of the program, two states Cross River State (in 2007) and Enugu State (June 2010) have adopted the scheme while the remaining 34 states of the federation have not.

This is not only in Nigeria, but in most countries especially the developing countries, the implementation of health insurance is not done overnight. It is a gradual process which needs patience and commitment from all parties involved.

Yusuf, Gbadamosi and Hamadu (2009) conducted a study in Lagos (a metropolitan city in Nigeria) with 500 respondents using structured questionnaire as a data collection tool. The aim of the study was to investigate the attitude of Nigerians towards NHIS. Findings of the study showed that age, marital and educational status, income, profession – all have impact on attitudes towards insurance. The study concluded that there is a negative attitude of Nigerians to insurance services.

Based on the reviewed literatures, there was no published study/research on NHIS conducted in Jigawa State to evaluate the clients' satisfaction with NHIS in the state. The only literature available is unpublished study of Adamu and Mukhtar (2016) on understanding clients' satisfaction with NHIS in Gumel General Hospital of Jigawa State. Consequently, the need to evaluate clients' satisfaction with National Health Insurance Scheme in Jigawa State Nigeria has become even more compelling.

Research methodology

Study site

The study was conducted in Dutse General Hospital which is located in Dutse LGA (the Jigawa State capital). It is the biggest general hospital in the state and serves as a referral hospital.

Study design

This study used a mixed method (both qualitative and quantitative designs) to explore clients' satisfaction with NHIS in Dutse General Hospital, Jigawa State.

A descriptive and cross-sectional design as a quantitative approach was used in this study. The research also used qualitative approach through the use of in-depth interview as a data collection tool. It is appropriate to the research question because it is holistic in nature and recognizes the role played by the participants. The qualitative aspect of the study used an open ended semi structured interview as a data collecting method. The interview involved audio taping and then transcribing the data and reviewed them at the end of the interview

Sample/ Sampling strategy

The target population for the study was determined using the sample size formula of the previous study conducted by Adamu and Mukhtar (2015) in Gumel General Hospital which revealed that proportion of clients satisfied with NHIS services offered in the hospital were 34.5 % (0.345) and those that were not satisfied were 65.5% (0.655) as shown below:

$$N=\frac{Z^2pq}{d^2}$$

Where:

N= sample size

Z= standard deviation at 95% confidence interval = 1.96

P= Proportion of clients satisfied with services = 0.345

q= 1 – p = 1 – 0.345 = 0.655

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d= degree of accuracy = 5% (0.05).

From the above formula:

$$N = \frac{(1.96)^2 \times 0.345 \times 0.655}{(0.05)^2}$$

N= 347

The sample size was determined to be 347. Ten percent (10%) was added in case of loss of questionnaire, not responding etc. which made the final sample size to fill the questionnaire to be 382.

Data collection tool and technique:

The instruments used for data collection were:

1. Questionnaire which contained open ended questions.
2. Use of tape recorder in data collection in face-to-face interview.

Before the commencement of the interviews, participants signed consent forms and conducive atmosphere was used for the interview so that participants could reflect on their experiences and audio taping could be conducted. Some of the interviews were conducted in the morning, some in the afternoon, while others in the evening depending on the choice of the participants. Interviews were then transcribed verbatim.

Ethical issues

The study was approved by Jigawa State Ministry of Health. All participants gave informed written consent to be interviewed.

Data analysis

Quantitative and qualitative data were generated from this study. The questionnaires were later analysed using Statistical Package for Social Science (SPSS) version 20 and descriptive statistics was used to summarize the quantitative data using means, proportions and frequencies. For qualitative data narrative was used to come up with themes as given by Miles and Huberman (1994). Data from the face to face interview was analyzed using themes i.e. by using the Calaizzi's, 1978 (in Beitz and Goldberg, 2005) suggested steps.

Trustworthiness

In this study trustworthiness was ensured by member checking. Member checking was done with the participants.

Results and discussion

Demographics characteristics of respondents

Age of the participants

The table 1 below shows the age of the respondents that participated in the study by filling questionnaire.

Table 1. Age of the respondents

Variables	Subcategory	Frequency	Percent (%)
Age of respondent	18 – 20	13	4.0
	21 – 30	81	25.2
	31 – 40	151	47.0
	41 – 50	64	20.0
	51 – 60	9	2.8
	Above 61	3	1.0
	Total	**321**	**100.0**

Source: Field survey 2017

Out of the 321 participants that filled the questionnaire, majority of the respondents (47%) fall between the ages of 31 – 40 years of age. This falls within the active working-class portion of the population and it is in lined with Agba (2010). This is followed by the respondents that are seen as newly employed youth (21 – 30 years) which constituted 25.2% of the participants. Least on the list is the participant greater than 60 years of age which constituted only 1% and this may be connected to the fact that this age group are normally few in our work force as they are about retirement age. Participants' ages for the face-to-face interview ranged from 34-53 years. In Nigeria, the retirement age for civil servants is 65 years or 35 years in service.

Sex of the participants

Table 2 below represent the sex of the participants in the study.

Table 2. Sex of the respondents

Variables	Subcategory	Frequency	Percent (%)
Sex of the respondent	Male	246	76.6
	Female	75	23.4
	Total		**100.0**

Source: Field survey 2017.

Table 2 above shows that majority of the respondents were males (76.6%). The ratio of male: female is 3:1. This is not surprising as number of males is more than that of females in the Nigerian work force. This might be due to social and religious influence in the area. This is in cognizance with Agba (2010) where the result of the study showed that most of the respondents were male i.e. 94% as against 6% female and in contrast with the study Abdulrasheed (2009).

Settlements of the participants

Table 3 below show the different settlements from which the respondents live. Participants came from different settlements of Dutse LGA.

Table 3. Place of residence of the respondents

Variables	Subcategory	Frequency	Percent (%)
Place of residence	Shuwarin	7	2.2
	Kwaimawa	13	4.0
	Katangare	2	0.6
	Kiyawa	15	4.7
	Gida dubu	17	5.3
	Zai	17	5.3
	Yalwawa	18	5.6
	Sakwaya	5	1.6
	Galadimawa	6	1.9
	Mopol base	7	2.2
	Limawa	6	1.9

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	Bokoto	6	1.9
	Galadanci	6	1.9
	Kachi	9	2.8
	Burtulan	7	2.2
	Takur	15	4.7
	Kudai	6	1.9
	Kargo	8	2.5
	Galamawa	10	3.1
	Sabuwar marunjuwa	13	4.0
	NIFOR Quarters	7	2.2
	Jigawar Sarki	3	0.9
	Kandi	3	0.9
	Bayan gidan radio	4	1.2
	NDLEA	4	1.2
	Danmasara	13	4.0
	Andaza	8	2.5
	Sabon gari	4	1.2
	Sabalari	1	0.3
	Fatara	2	0.6
	Jabewa	1	0.3
	Central mosque	2	0.6
	Katanga	4	1.2
	Laraba	1	0.3
	Godiya Myetti	4	1.2
	Katurje	1	0.3
	Hamma-yayi	3	0.9
	Kasarau yadi	2	0.6
	Yadi - Dutse	21	6.5
	Fagoji	15	4.7
	Hakimi Street	14	4.4
	Garu	11	3.4
	Total	**321**	**100.0**

Source: Field survey 2017.

Yadi settlement of Dutse LGA has the highest number of participants (6.5%) while Sabalari, Jabewa, Katurje, and Laraba settlements have the least number of participants (0.3%) each. This may be connected to the fact that Yadi settlement is very close to the Dutse General Hospital. Other places with a greater number of participants are Gida Dubu, Zai and Yalwawa which have 5.3%, 5.3% and 5.6% respectively. This also may be due to the fact that they are close to the hospital and majority of the government workers are living in these areas they are low cost areas and are close to social amenities in the state capital.

Religion of the participants

Table 4. Religion of the participants:

Variables	**Subcategory**	**Frequency**	**Percent (%)**
Religion of the respondent	Islam	273	85.0
	Christianity	48	15.0
	Other (specify)	0	0
	Total	**321**	**100.0**

Source: Field survey 2017.

Majority of the participants (85%) were Muslims. This could be explained by the fact that the LGA is predominantly Muslim inhabited. Even though the majority of our participants are Muslims, a few were Christians (15%) most of whom are federal government employees transferred from other parts of the country to Jigawa State.

Ethnicity of the participants

Table 5. Ethnic group of the respondents

Variables	Subcategory	Frequency	Percent (%)
Ethnic group	Hausa	243	75.7
	Yoruba	39	12.1
	Igbo	31	9.7
	Others (specify):	5	1.6
	Igala	1	0.3
	Gwari	1	0.3
	Kanuri	1	0.3
	Fulani		
	Total	**321**	**100.0**

Source: Field survey 2017.

In terms of ethnicity, Hausa constitutes 75.5% of the respondents. Majority of the Dutse indigenes are Hausa by tribe. This may be the reason why more Hausa people registered in the programme more than other ethnic group. Other major tribe like Yoruba and Igbo constituted reasonable percentages (12.1 and 9.7 respectively).

Marital status of the participants

Table 6. Marital status of the respondents:

Variables	Subcategory	Frequency	Percent (%)
Marital status	Single	42	13.1
	Married	273	85
	Divorced	3	0.9
	Widowed	3	0.9
	Total	**321**	**100.0**

Source: Field survey 2017.

Majority of the respondents are married (85%); 13.1 percent are single and divorce & widow 0.9 percent each. This may be due to the fact that majority of northerners normally got married early, mostly after securing employment. This is in line with Agba (2010) where 88% of the participants are married, 6% singles and 6% are either widows or widowers.

Type of marriage for the participants

Table 7. Type of marriage for the respondents:

Variables	Subcategory	Frequency	Percent (%)
Type of marriage	Monogamy	254	79.1
	Polygamy	19	5.9
	Others (specify): Single	48	15.0
	Total	**321**	**100.0**

Source: Field survey 2017.

High proportions of the participants (79.1%) are married with monogamous families. This is similar to the finding in Muhammed, Sambo and Dong (2011). This may be explained by the high proportions of government workers being in a monogamous type of marriage due to Western education. Another reason may be due to the hard-economic situation in the country. People realized that marrying many women means raising a lot of children which is very difficult in this economic recession in Nigeria.

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Education status of the participants

Table 8. Education status of the respondents:

Variables	Subcategory	Frequency	Percent (%)
Education status	Primary school	25	7.8
	Secondary school	104	32.4
	Higher education	192	59.8
	Total	**321**	**100.0**

Source: Field survey 2017.

About sixty percent (59.8%) of the participants had higher education certificates, with primary school certificate holders being least on the list (7.8%). This is in line with Muhammed, Sambo and Dong (2011). This may be connected to the fact that majority of the federal government workers have higher education either from the university or other higher education institutions. The ones with the primary or secondary education are few and mostly junior workers.

All the 8 participants of the face to face interview attended both primary and secondary school. Seven of them had higher educational levels either from university or polytechnics.

Number of dependents that registered with NHIS in the hospital

Table 9. Number of respondents' dependents that registered with NHIS

Variables	Subcategory	Frequency	Percent (%)
Number of dependents registered with NHIS in the hospital	Spouse only	50	15.6
	Spouse & one child	80	24.9
	Spouse & two children	48	15.0
	Spouse & three children	51	15.9
	Spouse & four children	89	27.7
	Others (specify): Self only	3	0.9
	Total	**321**	**100.0**

Source: Field survey 2017.

Similarly, if we look at number of dependents that registered with NHIS in the hospital from the table above, 27.7% of the participants registered spouse & four children. This is in line with the NHIS guidelines. It is maximum number one is allowed to register. Other enrollees that registered less than four children may be because those are the only children they have or the remaining children are more than 18 years of age. This is another stipulation in the NHIS. Other participants that registered only themselves constitute 0.9%, and might be that the participant does not have children or all their children are above 18 years of age.

Length of employment

Length of employment here refers to duration the participant has been employed as a civil servant. The table below show the length of employment of the participants.

Table 10. Length of employment

Variables	Subcategory	Frequency	Percent (%)
Length of employment	≤ 10 years	157	48.9
	10 – 30 years	163	50.8
	Above 30 years	1	0.3
	Total	**321**	**100.0**

Source: Field survey 2017.

Participants with length of employment ranging from 11-30 years formed the majority of the respondents (50.8%). While from the face to face interview, all the 8 participants have been working with government for between 11-30 years.

Occupational status

The table below represent occupational status in terms of employment grade, cadre, and rank. Participants were categorised as either junior or senior staff.

Table 11. Occupational status of the participants

Variables	Subcategory	Frequency	Percent (%)
Occupational status	Junior staff	188	58.6
	Senior staff	133	41.4
	Total	**321**	**100.0**

Source: Field survey 2017.

Majority of the participants (58.6%) are junior staff while senior staff constituted 41.4%. This may be because the senior staffs have more money (salary) to take care of their sick ones than the junior ones. Hence more junior staffs enrolled in the NHIS.

Length of enrolment in the NHIS

The table 12 below showed the length of enrolment of the participants with NHIS.

Table 12. Length of enrolment with NHIS

Variables	Subcategory	Frequency	Percent (%)
Length of enrolment with NHIS?	≤ 5 years	141	43.9
	6 – 10 years	147	45.8
	11- 20 years	33	10.3
	21 – 30 years	0	0.0
	Others	0	0.0
	Total	**321**	**100.0**

Source: Field survey 2017.

Participants with 6 – 10 years length of enrolment with NHIS constituted 45.8%. This might constitute mostly federal workers as NHIS has been in place at the federal level much longer than at the state level.

Prior knowledge on NHIS before enrolment

The figure 2 below shows the percentage of NHIS enrollees that have prior knowledge of NHIS before they were enrolled in the programme.

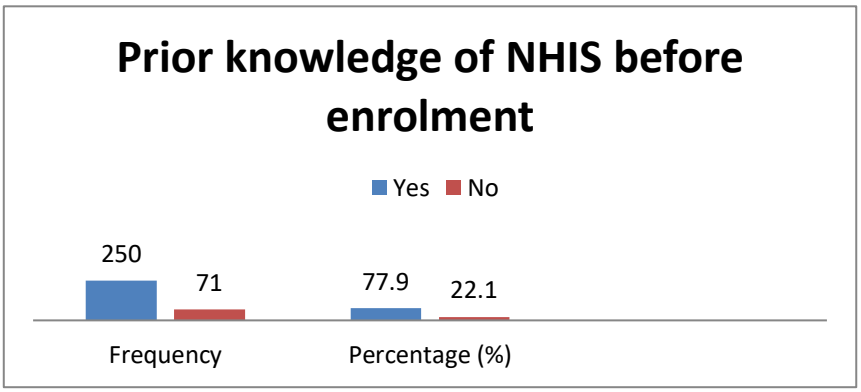


Figure 2. Proportion of participants that have prior knowledge of NHIS vs those without

Source: Researcher's computation using percentage

From the figure above, 77.9% of the clients had prior knowledge of the NHIS scheme before enrolment while 22.1% don't have prior knowledge of it. This is in line with Eboh (2008) where 90% of the participants revealed to have heard of NHIS prior to enrolling. Similarly, in the study of Owumi, Omorogbe and Raphael (2013) there is high level of awareness of NHIS among the enrollees and that they perceived their health status as good after using the health care services under

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the scheme. This is also in keeping with the study of Agba (2010) where 100 percent of the respondents indicated they are aware of the programme.

All the eight participants for the face-to-face interview proved to have prior knowledge of NHIS but different participants have different description of NHIS. In general, they all have a fair understanding of the scheme.

According to the interview conducted, one of the participants described NHIS as:

"NHIS is another programme which the government programmed in order to help the government workers. .... but this system assists us to get medicine very easy".

More so, one of the interviews opined that:

"National Health Insurance is a new system or new programme federal government introduced to assist civil servants…… when or somebody have problem or sickness, you can go to hospital to get treatment in subsidized or as low".

Awareness on money contribution

Awareness of the money contribution by enrollees and their employer is an area where something needs to be done to enlighten the NHIS clients. Majority of them do not know how much they are supposed to be contributing or is being deducted from their salary on a monthly basis. This can be seen from the result in the table below.

Table 13. Awareness on money contribution

Variables	Subcategory	Frequency	Percent (%)
How much is enrollee contributing to NHIS monthly from his/her salary?	[1]. The contribution is supposed to be 15% of total salary. [2]. The contribution is supposed to be 15% of basic salary. [3]. You are supposed to contribute 5% while your employer contribute 10% of your basic salary [4]. You are supposed to contribute 10% while your employer contributes 5% [5]. For now it is government that is only contributing 10% on your behalf while you are not contributing [6]. You pay 10% of the total cost of treatment [7]. You pay 10% of the total cost of drugs only. [8]. Unknown	78 31 56 12 5 6 2 131	24.3 9.7 17.4 3.7 1.6 1.9 0.6 40.8
	Total	**321**	**100.0**

Source: Field survey 2017.

The contribution of NHIS is that the enrolee is supposed to contribute 5% of his basic salary while his employer contributes 10% of the basic salary. This is option number 3 in the table above and it can be seen that only 17.4% are aware of the exact contribution of the scheme while the remaining were just guessing from the options given in the table.

Some years after implementation of the national health insurance scheme, you will still find that some workers (civil servants) still do not know much about the program. Some of the workers do not even know about its benefits, mode of payment, NHIS accredited centers (NHIS health facilities) etc. Some of the enrollees do not know how much is being deducted from their salary and how much government is contributing for them in the program. Chubike (2013) conducted a study on evaluation of National Health Insurance Scheme (NHIS) awareness by civil servants in Enugu and Abakaliki. The result of the study revealed that the level of awareness was very low with most of the respondents not knowing the mode of payment and benefits of the NHIS and were of the opinion that NHIS may not succeed in Nigeria.

Awareness on the area covered by NHIS

NHIS is supposed to cover enrolee, spouse and four children under the age of 18 years. The table below shows participants' responses in terms of NHIS coverage.

Table 14. Awareness on the area covered by NHIS

Variable	Subcategory	Frequency	Percent (%)
Which of the following is covered by NHIS?	1. You, your spouse and four children under the age of 18 years.	258	80.4
	2. You, your spouse and four children irrespective of age	45	14.0
	3. Your extra dependents	8	2.5
	4. Self-employed persons	0	0.0
	5. Nigerian residing abroad	0	0.0
	6. Foreigners residing in Nigeria	0	0.0
	7. Students of tertiary institution	1	0.3
	8. Rural dwellers	0	0.0
	9. Retirees/pensioners	0	0.0
	Others[ ] (specify):	6	1.9
	Spouse & 1 child	3	0.9
	Spouse & 3 children		

Source: Field survey 2017.

From the table above, it can be seen that more than eighty percent (80.4%) of the participants are aware of the NHIS coverage. This is contrary to the study of Owumi, Omorogbe and Raphael (2013) where only thirteen percent (13%) of the participants are aware of scope of coverage of the scheme.

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Satisfaction with NHIS services

The table below summarizes the level of the respondents' satisfaction with NHIS services.

Table 15. Satisfaction with NHIS services

Variable	Subcategory	Frequency	Percent (%)
I am very satisfied with the associated services (eg lab, radiology, pharmacy, maternity, emergency)	Strongly agree	81	25.2
	Agree	215	67.0
	Uncertain	22	6.9
	Disagree	3	0.9
	Strongly Disagree	0	0.0
	Total	**321**	**100.0**
I have easy access to the medical specialist I need	Strongly agree	70	21.8
	Agree	180	56.1
	Uncertain	62	19.3
	Disagree	9	2.8
	Strongly Disagree	0	0.0
	Total	**321**	**100.0**
I got all the drugs prescribed by the doctor in the hospital	Strongly agree	56	17.4
	Agree	182	56.7
	Uncertain	72	22.4
	Disagree	10	3.1
	Strongly Disagree	1	0.3
	Total	**321**	**100.0**
The amount I have to pay during each visit before I got my drugs is reasonable	Strongly agree	50	15.6
	Agree	225	70.1
	Uncertain	43	13.4
	Disagree	1	0.3
	Strongly Disagree	2	0.6
	Total	**321**	**100.0**
I am very satisfied with Surgical procedure under NHIS	Strongly agree	43	13.4
	Agree	181	56.4
	Uncertain	89	27.7
	Disagree	6	1.9
	Strongly Disagree	2	0.6
	Total	**321**	**100.0**
I am very satisfied with the referral arrangement	Strongly agree	58	18.1
	Agree	189	58.9
	Uncertain	66	20.6
	Disagree	6	1.9
	Strongly Disagree	2	0.6
	Total	**321**	**100.0**
I am very satisfied with the overall NHIS services in this hospital	Strongly agree	49	15.3
	Agree	231	72.0
	Uncertain	35	10.9
	Disagree	4	1.2
	Strongly Disagree	2	0.6
	Total	**321**	**100.0**

Source: Field survey 2017.

Sixty seven percent (67%) of the respondents agreed that they are satisfied with the associated services (e.g. lab, radiology, pharmacy, maternity and emergency) while 6.9% are uncertain whether they were satisfied with the associated services. This is in line with Onyedibe, Goyit and Nnadi

(2012) where more than sixty percent (61.5%) of the participants were satisfied with the associated services they received.

More than fifty percent (56.1%) agreed that they had easy access to the medical specialist they need while 19.3% were uncertain that they had easy access to the medical specialist they need. This is contrary to Adamu and Mukhtar (2015) where fifty four percent (54%) of the participants were uncertain that they had easy access to the medical specialist they need.

More than fifty percent (56.7%) of the respondents agreed that they got all the drugs prescribed by the doctor in the hospital. Finding of Blanchet, Fink and Osei-Akoto (2012) a study in Ghana perception of the effect of NHIS on quality of care revealed that respondents were satisfied with the drug availability under the scheme. Seventy percent (70.1%) of the respondents agreed that the amount they paid during each visit before they got drugs and this is in lined with Osungbade, Obembe and Oludoyi (2014) done in in South Western Nigeria.

More than fifty percent (56.4%) of the respondents agreed that they are very satisfied with surgical procedures under NHIS while 27.7% are uncertain that they were very satisfied with the surgical procedure. More than fifty eight percent (58.9%) of the respondents agreed that they were very satisfied with the referral arrangement while 20.6% uncertain that they were very satisfied with the referral arrangement. Seventy two percent (72%) of the participants were very satisfied with the overall NHIS services in the hospital while 10% were uncertain with this.

The table below (table 16) depicts the respondents satisfaction with NHIS services (Table 15 was collapsed). It represents the average where in the Likert scale the first 2 categories strongly agree and agree were collapsed and average was taken. Similarly on the same scale uncertain, disagree and strongly disagree were collapsed and the average was taken.

Table 16. Average satisfaction with services

Attribute	**Satisfied with NHIS services**	**Not satisfied with NHIS services**	**Total**
I am very satisfied with the associated services (eg lab, radiology, pharmacy, maternity, emergency)	296 (92.2%)	25 (7.8%)	321 (100%)
I have easy access to the medical specialist I need	250 (77.9%)	71 (%21.8)	321 (100%)
I got all the drugs prescribed by the doctor in the hospital	238 (74.1%)	83 (25.9%)	321 (100%)
The amount I have to pay during each visit before I got my drugs is reasonable	275 (85.7%)	46 (14.3%)	321 (100%)
I am very satisfied with Surgical procedure under NHIS	224 (69.8%)	97 (30.2%)	321 (100%)
I am very satisfied with the referral arrangement	247 (77%)	74 (23%)	321 (100%)
I am very satisfied with the overall NHIS services in this hospital	280 (87.3%)	41 (12.7%)	321 (100%)
Average	**258.6 (80.6%)**	**62.4 (19.4%)**	**321 (100%)**

Source: Field survey 2017.

From the table above it can be seen that clients are satisfied with the NHIS services in the hospital. Overall satisfaction with NHIS services in the hospital is 87.3% and average for all attributes is 80.6%. This is in line with Alabi et al. (2017) where 99.1% of the respondents were satisfied with the scheme but contrary to Agba (2010) where 48 percent of the respondents rated the services as poor due to absence of drugs, poor attention and prescriptions.

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From the table above it can be clearly seen that there is significant changes in clients' access to quality health services if one look at satisfaction with the associated services (e.g. lab, radiology, pharmacy, maternity, emergency) which is 92.2%; easy access to the medical specialist (77.9%); satisfaction with drugs prescribed by the doctor in the hospital (74.1%); satisfaction with Surgical procedure under NHIS (69.8%) and satisfaction with the referral arrangement (77%).

From the result of the face-to-face interview, participants revealed that NHIS is a very important programme and is beneficial to them but there are some challenges in its implementation in the hospital which are given below:

1. Long Waiting Time
2. Shortage of drugs
3. Overcharging for drugs
4. Non availability of NHIS services 24*7
5. Some services not included in the NHIS package.
6. No designated doctor for NHIS clients.

One of the participants revealed that there is long waiting time in the card room where NHIS enrollees collect their folder before going to see a doctor. Doctor's office is another area where the enrollees also spend time before they see a doctor. This is in line with study of Glory and Dr. Kevin (2014) where the enrollees perceived that delay in attending patient is the second biggest problem observed in the programme

"……when we went before we will receive our folder card, sometimes we use to spend more time before you get it".

Another alleged:

" You will go to hospital since 8' O clock….. you will not see any one of the doctor….. after 11 before you see the doctor".

He added that sometimes the drugs are not available in the health facility and they were asked to go and buy them outside and at that time they don't have money to buy the drugs:

"Sometimes they use to say we went out and buy another medicine…. by that time we don't have money".

It is not right for a facility to ask enrollees to buy drugs outside the facility especially towards the end of the months when the enrollees have almost spent their salary. Again, even if they have money, it is not proper for the facility to do so since government is deducting NHIS funds from enrollees' salary on monthly basis regardless of whether they use the services or not.

Another participant opined that service points such as pharmacy, laboratory and others in the facility do sometimes overcharged enrollees during payment:

"General hospital as I know Dutse, the problem is not from the doctors or management of the hospital. The problem is from those that are serving medicine (pharmacist) and cashiers and laboratory. .....when I go to the cashier or pharmacy on the way to calculate or to estimate the amount you are going to pay, they will double or tripled the amount".

One of the participants argued that drugs are sometimes available and sometimes not available in the facility:

"Our problem is that there is no drug and sometimes there are".

Another participant said:

"Also sometimes even with your NHIS, they will write a medicine to you maybe that cost more than N10, 000 or N20, 000 and definitely they will either tell you that they don't have that drugs, you will have to buy it outside. Instead of them to buy for you they will refuse. But anything N2, 000 down ward or N5, 000 downward sometimes if you are lucky, they will be able to give you the drug".

On the other hand, another participant asserted sometimes all the prescribed drugs are there available in the facility:

"The issue of drugs, sometimes if you come you can get the drugs. All of them without any problem".

The NHIS services in the facility are not 24 hours as revealed by one of the participants:

"So, we are only having this NHIS during working days from 7'O clock in the morning to maybe 4'O clock".

The NHIS services in any facility are supposed to be 24 hours services. In those facilities where the services are not 24 hours, enrollees sometimes find themselves in a very difficult situation because their folders are locked up in a room that is provided for safe keeping of NHIS folders. In this situation, the enrollee has to buy another folder or card before seeing a doctor and this cause them to spend more money as out of pocket expenditure.

Proportion of participants that indicated some services need improvement

From the figure below 77.6% of the clients revealed that some aspects of the NHIS services need improvement while 22.4% do not have any opinion on it.

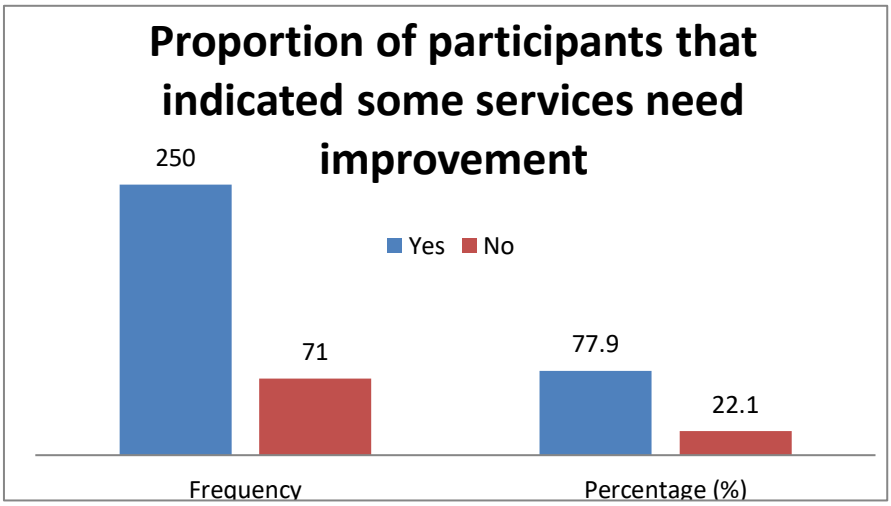


Figure 3. Proportion of participants that revealed that some services need improvement vs that think no improvement needed

Source: Researcher's computation using percentage

Aspects of the care that needs improvement

The table below showed that more than thirty percent of the participants indicated that having separate doctor for NHIS enrollees will improve the NHIS services in the hospital. This is followed by 27.2% which indicated the need for separate unit for NHIS enrollees. Then 18.8% emphasized on the need to have all drugs prescribed by the doctor to be available. Then 14.4% which advocated having 24hour doctor and the least are of the opinion that the government should employ more staff and make referral system easier (3.2% each).

Table 17. Aspect of care that needs improvement

Variable	Subcategory	Frequency	Percent (%)
What do you think can be done to improve NHIS services in this hospital?	Have separate Doctor for NHIS enrollee	83	33.2
	Have separate unit for NHIS enrollees	68	27.2
	Have all drugs prescribed by doctor available	47	18.8
	Employ more staff	8	3.2
	Make referral system easier	8	3.2
	Have 24 hours services	36	14.4
	Others (specify)……	0	0
	Total	**250**	**100.0**

Source: Field survey 2017

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Concerning the issue of what can be done to improve NHIS services in the hospital, all the participants of the face-to-face interview pointed out some aspect of the NHIS that needs improvement.

One of the participants said that:

"Government …have to assist doctors…. give them anything they want like working materials and medicine and if they want, give them some allowances to do their work effectively".

Another participant opined that:

"Put more effort to the management of all hospital to maintain rules and regulations governing the NHIS activities. To mention in front of each and every payment centre things that enrollees will pay".

Another participant contended that:

"If there is no drug to give to beneficiary, they give him money or to buy him at chemist to give him. If they do that, it will improve health insurance".

Another participant opined that:

"Government to put eyes on all that is happening in the hospital. Maybe to get another committee to check on it, what is going or happening in the hospital".

Another participant argued that:

"NHIS supposed to have permanent doctors so that they will be there 24 hours. You understand instead of maybe if you go there, they will say maybe the doctor is not around or the file or the in charge of the file are not around".

Another participant added that:

".....if we want to improve these services, at least there should be a doctor separately for the NHIS enrollees and this doctor should be 24 hours services not like after the working hours 4-5 you will come and not see the doctor". This is in line with Adamu and Mukhtar (2015).

Conclusion

Finding of the study reveals that more than three quarter (80.6%) of the clients are satisfied with healthcare services provided under NHIS in the hospital. The NHIS has improved client access to affordable and quality healthcare services in Nigeria.

Even though the level of satisfaction is high, there are some issues which need immediate attention of the hospital authority. Areas of concern include waiting time when receiving folder, drugs out of stock, over charging of some services and separate NHIS doctor & non-availability of 24 hours services. Resolving these issues will add colour to the programme and will result in more client registering with the hospital.

Recommendations

The following recommendations on NHIS services were given to the health facility based on the result of the findings:

1) Since the NHIS services in the facility is not available for 24 hours and there is no designated doctor specifically for NHIS clinic as indicated by the enrollees, there is need to appoint at least two doctors so that NHIS Unit will have at least one doctor for 24 hours.
2) The Hospital Management Committee should take measures that will ensure that no client is over charged in the pharmacy during billing.
3) Price list of all drugs and services should be pasted on wall in strategic places in the facility so as to reduce the issue of overcharging of services for the enrollees.
4) Ensure all drugs prescribed by doctor are available (especially the high value and expensive ones) in the facility pharmacy.
5) Efforts should be made by the government to capture more service to be delivered to the clients under NHIS.
6) There is also need for either suggestion box or complains channeling procedures to collect clients complains that may be used to improve the NHIS services.

Contribution to Knowledge

The author claims the following contributions to knowledge:

1) This study has contributed to the knowledge of NHIS services in Dutse General Hospital by understanding if clients are satisfied with services.
2) It has also helped in identifying barriers and expectations of clients related to the scheme so that more clients would enrol in the programme.

Limitations of study

There are some limitations to this study and therefore the findings should be used with caution. This is due to the fact that the study was conducted in only one general hospital and face-to-face interview. In future a similar research can be conducted in more general and teaching hospitals using a mixed method but this time around focus group discussion interview can be used in place of face-to-face interview. This is due to the fact that focus group interview is cheaper and not time consuming. A future research can also be conducted using only female enrollees (mothers) or more women as participants. This is because mothers frequently visit health facilities due to sickness or their children health than men.

Moreover, the perspective of health care personnel, hospital administrators should also be taken so that we can have a holistic view regarding the scheme for its improvement.

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Strengthening Data Availability for Community Health Programming - A Review of Current Practices

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Abstract

There is always a fair amount of data collected, analyzed, stored and disseminated in various formats in the national health systems. In most cases, district and national health management teams are tasked by law to generate quality data for planning, budgeting, programmatic decision making and to respond to requests and needs from stakeholders such as donors. Valuable community health data should be ready-to-use at the point of service delivery and ideally at the household and community levels for real time decision making to improve performance and outcomes. Donors need evidence to measure progress towards the achievement of their objectives, and also to advocate for additional resources. The need for community data fluctuates temporally due to environmental, behavioral, economic, social and political factors. Data collection, management and analysis should be timely, constantly updated and tailored to reflect these fluctuations. Findings from multiple demographic and health surveys (DHS) that collated and analyzed large datasets from households, have shown the importance of collecting quality data, improving their availability and dissemination to build awareness of communities about emerging health issues, and to stimulate and increase data utilization for health programming especially in areas or contexts where there is no or little relevant information. We reviewed current community data collection and management practices, analyzed various sources of data, data usage, formats and performance indicators. We noted that community data ownership is key. Communities who generate health information, should be able to use their own data their data for self monitoring, program planning and implementation in collaboration with local health facilities.

Keywords*: community data – community health -home visits – data capture - data dissemination - community health worker.*

Introduction

One of the critical principles for the institutionalization of community health is the *"integration of community data into the health information system, including investment in innovative technology*" - Institutionalization of community health conference – Johnannesburg, South Africa 2017 (11). Community data are information collected at the community level including data collected during home visits. Community data are generated in various sectors, domaines and mostly in the social sciences such as community/village mapping, demography, anthropology and socio-economy. Public health programs are collecting data for planning, monitoring, resource mobilization and accountability. Quality data are indispensable for filling knowledge gaps, but also for determining the needs for additional information necessary for action. Scott et al (33) have defined community health worker as a person with the following characteristics i) has a supportive function in health service delivery, including provision of direct health services, health advocacy, and community agency ii) is directly connected to the communities the CHW serves, living in the community and accountable to the people there iii) has a lower level of education than trained health workers such as doctors and nurses. Health information collected at the household and community levels by community health workers (CHWs) are necessary for demonstrating efficacy, success, potential for replication and scale up (33). Also, community data could be used for advocacy targeting community leaders, donors and other stakeholders. However data are not always comprehensive, detailed and granular enough for full understanding by community actors who are more often low literacy. The Malawi Health Equity Network (MHEN) has demonstrated that it is critical to disseminate and make data available at the community level for accountability purpose, but also to enable community leaders to use the power of

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data-driven interventions (9). For partners and donors' perspective, the evidence of return on investment or the possibility of leveraging promising community health interventions is attractive. However, this attractiveness is only possible if the data collected is exhaustive with full disclosure in terms accuracy, transparency and ethics. In addition, the process of obtaining valid and reliable data should be cost-effective and must reflect all the resources deployed including human and financial efforts.

There are several experiences highlighting the importance of improving data availability for decision making at the community level. Due to significant improvements in data availability and dissemination, the progress made in global health programs has gain momentum in showcasing progress and challenges especially in developing countries (15).

i) Micro and targeted data at the community level are necessary to understand the persisting hotspots of schistosomiasis (SCH) in many endemic countries where despite the declining burden of SCH following decades of mass treatments, the prevalence is still above treatment thresholds. Disaggregated data by age and gender as well as social and environmental and anthropological data are important to understand the issues of persisting hotspots and to propose local remedies. (20).

ii) Making data available implies minimizing missing opportunities to collect data. The *"systematic identification of the need of the client"* was a strategy introduced in family planning (FP) programming by *The Challenge Initiative* (TCI) in nine Francophone West African countries to systematically include questions and conversations around FP, maternal and child health to generate demand for services whenever a woman of reproductive age makes contact with primary health care facilities, community health volunteers or during outreach activities at the community level (12).

iii) In-depth data analysis and dissemination are helpful for solving key programmatic issues at the community health. For instance, maternal death audits are essential instruments for in-depth investigation of maternal deaths that could lead to understanding of root causes of maternal health issues and maternal deaths in communities. Making the maternal death audit data available through simple and user-friendly data visualization for community-led decision making has been critical for safe motherhood in Rwanda (32, 34).

iv) Lessons are learned in large multi country programs supporting the control or elimination of neglected tropical diseases. The community directed treatment with Ivermectin (CDTI) was a community driven approach initiated by the African Program for Onchocercias Control (35) which involved community led data collection, review and analysis through self-monitoring in onchocerciasis endemic villages. The CDTI data was disseminated during community meetings and the data were used to improve drug distribution, mop-up strategies and to minimize drop-outs, hard-to-reach and non-compliance.

v) To generate more data and increase the likelihood of finding Trachoma -a blinding disease affecting mostly rural communities in underserved settings – in the Democratic republic of Congo, community surveys, which included information about knowledge and practices and attitudes, were combined with a rapid field clinical assessment and a review of historical records in primary health facilities. Data were triangulated to increase data availability and quality through cross-checking and cross examination (19).

vi) Based on recent analysis of data from various sources (households/communities, schools and health facilities) in Cotonou and Porto Novo -two major cities in Benin- it was determined that tracking information about the village of origine of Lymphatic Filariasis (LF) patients living in urban areas and making the data available to the surveyors, was critical for an ecological and epidemiological assessment of the transmission of lymphatic filariasis in the two cities (8).

Methods

We conducted peer and gray literature reviews based on publication date, credibility of source (e.g., reputable journal, government signed, approved) and potential relevance to community health.

- For the peer review literature, we used iterative approach to conduct a thorough search on PubMed, Google Scholar, and e-library, including English-language articles published in the last fifteen years - inclusion criterion. The search strategy used keys words, themes and junctions to populate a data extraction matrix. We used medical subject headings (MeSH) terms: community health, community data, community health system, community health information system, and community based.

Title/abstract search were "Community-based services", "household data" and "information dissemination" AND "information system".

For the grey literature, we used a mixed approach – combining online searches in Google Scholar using similar terms with expert consultation, review of journal articles, meeting reports, other documents identified through article bibliographies. We searched both published and unpublished data, analyzed home based health prevention and care approaches (Malaria, Tuberculosis, HIV/AIDS, maternal and child health), technical briefs from the Maternal and Child Survival Program (MCSP, 2018). We analyzed information from current practices across global health and disease specific programs from non-profit organizations (IntraHealth International, CORE Group, Task Force for global Health). We scanned longer texts for relevant sections to review and noted additional references to seek out. Shorter texts were scanned for content. For all the gray literature materials chosen for use, we classified them into four categories, i) by their purpose: ii) information, iii) guidance, and iv) evidence-based. The main output from the literature reviews was a literature synthesis and key findings.

Results

Data identification

The processes of identification, collection and utilization of data are all inter related and data identification will ultimately help document specific community needs to support planning of activities. Community program data should be collected, analyzed and used within the community (29,15=6). Also, the data should feed into the local health facility data collection system and should also be interpreted/analyzed collaboratively with health workers. Data generation and utilization by community members and by health workers improve service delivery and allow regular interaction between health facilities and beneficiaries within health facilities catchments areas (29). Firstly, the determination of the information needed implies that stakeholders and community actors must undertake a detailed review of existing health interventions and related social activities involving communities (either community-based or community driven). Other data needs should be explored through community mapping, formative assessment and community dialogue. Program initiation, planning, monitoring and evaluation at the community level must be participatory for effective community engagement, smooth program implementation and for building ownership with clear expectations in terms of program delivery. Key indicators for community health interventions (table 1) should therefore be determined and proper mechanisms to improve data collection and established from the onset of any community health project.

Table 1. Illustration of community-based health indicators

Health promotion and maintenance	**Disease prevention**
• Percentage of people who have had a Primary Care Provider checkup in the past 12 months • Percentage of adults who receive regular dental checkups • Number of people in the community who own a cell phone, bicycle, radio set etc. • Number of people using latrines • Average number of prenatal care visits for pregnant women	• Condom sales, especially among teens. • Teen pregnancy rates • The percentage of schools providing sex education • The number of homeless people tested for TB and other infectious diseases
Health indicators unique to a community	**Equity and access to health services**
• Average number of children per woman • Home visits to newborn and to post-partum mothers • Number of traditional birth attendants • Number and location of sex workers • Burdeen of malnutrition in the community	• Groups with stigma/discrimination/marginalization • Distance between households and sources of potable water • Patient to primary care provider ratio • Percentage of people who have a usual primary care provider

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• The number of miscarriages, stillbirths, and birth defects, both for the community for specific populations • Infant mortality rate and low-birthweight babies. • The incidence of malnutrition in children	• Proportion of insured persons with coverage for clinical preventive services • Proportion of persons who receive appropriate evidence-based clinical preventive services • Percentage of uninsured families in the community. • Proportion of individuals who are unable to obtain or delay obtaining necessary medical care • The number of elders receiving in-home health and care services • Availability of emergency transportation in the community • Availability of ambulance and emergency medical services, particularly in rural areas

Urban communities present a special and challenging situation for data generation due to the social and cultural heterogeneity of cities; In addition, urban communities are often time self sufficient with poor receptivity to household data collection (8). Community leaders and actors do not always have the technical skills to develop data capture mechanism and strategy. In addition, the capacity to analyze data at the community level is often non-existent or weak due to low literacy (16), so regular trainings, coaching with periodic refresher courses for community actors in data collection and analysis is needed and has been successful in Kenya (16). Detailed and relevant information is needed to support program implementation, to refine, update or adapt interventions whenever needed. In general, data collection is one-time off or done on a routine basis (Box 1). Health facilities outreach and campaigns (immunization, mass deworming) are periodic or implemented irregularly, whereas routine health services -- maternal and child health, family planning reproductive health and non-communicable diseases etc. generate data to be collated and analyzed routinely.

Box 1. Routine versus one-time information collection

Routine data collection	**One-time data collection**
Regular daily/weekly/monthly interventions	Campaigns / mass events /outreach
Baseline and end line data critical	Baseline information less critical than end-line
CHW /Volunteers involvement is key	CHW /Volunteers involvement is indispensable
Ratio CHW / population covered adjustable	Ratio CHW/Population covered critical but not always adjustable
Drop out / turnover /retention a key element	Drop out / turnover /retention not critical

Better planning and proper management are required to make useful data available. Communities and health program stakeholders should assess the ressources needed for data generation in terms of time, costs, data format, and level of efforts. For example, home visits by community health workers are known to be time consuming and logistically challenging in areas where households are scattered and sometimes hard to reach. The organizational capacity of the communities and the manpower are essential for the determination of the level of investment in human and financial resources needed for self-monitoring and evaluation of health interventions.

a) Key actors for community information

Community health workers are the backbone of community health programs and they feed data into the community health system. Training and supervision of CHWs are mandatory for proper data capture at the community level. Sufficient time and resources should be deployed for capacity building, local learning and adaptation. CHWs should understand program deliverables, milestones and the expectations to engage themselves meaningfully and efficiently. It is essential for community health planners to share knowledge and information with all the community stakeholders. Anyone involved in

the community health activities should know why a specific data is needed, when and who needs the data. Likewise, it is important to avoid collecting data unnecessarily or information with no clear intention to use. Unused data put unnecessary burden on community volunteers, health workers and program beneficiaries.

b) Generating quality data

The data needs, the method of data collection and analysis for either community or health facility use, should be clearly defined (table 2,3 and 4). Data should be disaggregated by gender, age, location, socio-economic status and other demographics to allow in-depth analysis and decision making. Qualitative and quantitative data have different characteristics and separate techniques for information generation. For example, the analysis of detailed data can reveal problems related to equity, stigma and discrimination in terms of access to health services. The analysis of qualitative data is indispensable to understand the issues and barriers in their social context within the communities. Anthropological interviews for instance aim to obtain in-depth and contextual information about individuals or groups experiences, beliefs, perceptions, motivations or values. Qualitative data focus on the exploration of reasons, opinions and attitudes behind respondents' answers through asking probing questions for better understanding or to look for more information.

Quantitative data deriving from both secondary and primary sources could provide numeric, tangible and verifiable measurements that are reliable and practical for programming purpose. Points values collected at baseline, mid-term and end-line periods are critical for planning and monitoring and can be used for comparison within and between communities. Having a one-shop repository for community data is central to the availability and utilization of data for decision making. With support from WHO and NGOs working in the field of community health, indicator compendiums have been developed to ensure that key measurements are prioritized in the monitoring of community health projects (e. g tuberculosis and community-based deworming projects) (14). A compendium of community health indicators could help streamline data management and analysis and highlight priority interventions.

Table 2. Information needs

Priority Questions	Expected answers	Planning steps and Analyses
What is the focus?	List of populations to reach with prevention interventions, care and support activities	1. Understand the current community program context 2. Gathering key district, health facility and community demographic and epidemiological data
What to do?	Right combination of evidence-based interventions at the community-level	1. Determine the package of community health services and support for targeted populations 2. Analysis of key activities
Where to target activities?	List of priority geographic areas of focus	1. Assess alignment of current investments and program focus 2. Determine priority locations and populations and set targets 3. Analyze sites, volume of activities and integration
How are we doing across intervention areas?	Assessment of adherence to plans, targets, and expenditures	Project total resources required to implement strategic plan and reconcile with planned funding level
Whom to partner with?	List of community stakeholders to engage in development of collective responses	1. Make use of Civil society and external stakeholder engagement strategy 2. Set site, geographic, and mechanism targets and budgets

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Community-centered Health systems strengthening (CC-HSS) assessment	List of costed HSS activities that contribute to scale-up activities in priority locations	1. Understand the current program context 2. Determine program support at the community level 3. Determine monitoring strategy for planned activities in accordance with requirements and assess workforce capacity

Table 3. Data needs and sources

Data for strategy and advocacy	
Information needs	**Potential sources**
1. Highlights and key points in national community health 2. Strategies for communicable and non-communicable diseases	• National community health policy/strategy • National Diseases specific master plans (Maternal health, Reproductive health, family planning, Malaria national plans, HIV/AIDS etc.) • Donor supported plans • National Health Development Strategic Plans • Stakeholder engagement and consensus • Consultations with implementing partners
1. Demographics 2. Estimated size of key and priority populations	• National Statistics Bureau • National Health Information Systems • Local census data?
List of evidence-based practices for community health	• Websites (includes recent scientific evidence, and technical area) • Costing and cost-effectiveness studies
Do current community health programs adhere to their intervention models, program plans, or service standards?	• Program conceptual model • Program results or strategic framework • Program performance monitoring plan • Donors supported program reports • Quality assessments
Do community health programs remove gender barriers, close gaps, and address harmful norms?	• Gender Strategy document • Gender Analysis Frequently Asked Questions
Description of unmet need for services at the community level Gaps and bottlenecks Structural and cultural community barriers	• RHIS or HMIS • CSOs documents • Government reports (i.e., Ministry of Health) • Procurement profile for key commodities • Governance, Leadership, and Accountability documents • National Service Delivery • Strategic Investments, Efficiency, and Sustainable Financing documents • Strategic Information • Donors reports • Quality assessments
Civil society's ability to advocate and engage government Public availability of government audit information	• Governance, Leadership, and Accountability • Survey data
Health system structural and cultural barriers	• Civil society engagement process guidelines • Legal environment assessment • Stigma index

c) Improving data availability

In our review we found five main systems and platforms for strengthening data availability and usage for community health programming: i) community health workers registry, ii) community-based health information systems (CBHIS), iii) electronic data capature storage and usage iv) community databases v) community initiatives. Data availability implies accessibility in formats tailored to specific contexts – taking into consideration the level of literacy- and the intended purposes. There are variety of means and ways to make data available; usually data are collected and stored in simple registers, online databases, cloud-based platforms etc. Survey data are usually stored and managed by health facilities, NGOs and donors. There are important improvements in measurement designs, data collection, processing, storage and availability. Close collaboration between primary health care and communities allow information sharing, updates and increased utlization of data. In 2015, in the cities of Cotonou and Porto Novo (Benin), a complex and extensive survey was conducted in 191 households to assesses the transmission of lymphatic filariasis (LF) a disabling disease transmitted by mosquito species (8) - These two cities were areas with scarcity of LF data especially in terms of the detection or notification of clinical cases of LF -lymphoedema and hydroceles – known as LF morbidity cases. The questionnaires in the households yield the following statements from the participants: "*This disease does not exist in this city*"; "*You have to go to northern Benin to meet this disease*"; " *this disease is found only in marshy areas* "; etc. Although these comments revealed low awareness of urban LF even in areas where transmission is highly suspected. Also, there were few health workers (nurses) who were not informed that the disease was transmitted by mosquito bites. If health workers are unaware of the disease, they would not certainly think about testing for LF when they receive cases of edema of lower limbs, especially those that have been around for some time. furthermore, most health workers are knowledgeable about the disease and its complications but think less about it during clinical practice. Overall, the individual, the community, the Health Center staff and physician's awareness were all shown to be deficient. This could have negatively affected the ability to assess patient care as well. To compensate the low level of knowledge about LF, training of health workers in both cities about the disease and its diagnostic are necessary. According to the health workers, due to stigma, LF patients stop going to health centers when the disease progresses to the stage of elephantiasis or hydrocele. At these stages of the disease, they do not seek conventional care. They rather seek care from traditional healers. This recourse to non-conventional traditional treatment is because most of the population think that elephantiasis "*is the result of a spell and that nothing from modern medicine procedure can reverse their disfigurement*". The lack of proper care for people suffering from elephantiasis in health centers can also explain their reluctance to use modern medicine, hence the need to organize mass awareness campaigns. In all health centers, there are reporting and notification forms for documenting diseases of public health interest into the national health information system. unfortunately these reporting forms makes no mention of the LF; this could explain the lack of information on these diseases and the need to revisit the diseases -report form, collate data from traditional healers and heads of households in the community (8). These type of community data should be triangulated with institutional data (health facilities and schools) to improve availability, trackability and overall quality.

a) Community health workers registry

The WHO guideline (37) on health policy and system support to optimize community health worker programmes (WHO, 2018) suggests that *practising CHWs document the services they are providing and that they collect, collate and use health data on routine activities, including through relevant mobile health solutions. Enablers for success include minimizing the reporting burden and harmonizing data requirements; ensuring data confidentiality and security; equipping CHWs with the required competencies through training; and providing them with feedback on performance based on data collected* [Recommendation 11]. In fact, community health workers are the critical source and the channel of community health information, generating and making data available for use. CHWs require key health information to do their jobs, and their supervisors and managers require data to monitor their work. Likewise, governments and donors need information to better plan community health programs, and to monitor progress against goals (16, 5). The development of a CHW registry is critical for improving data availability. The registry is a repository of CHW information which should be updated

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regularly to provide real time information about community health activities including the number of CHWs, their profiles, contact details, trainings, drop-out rates, incentives, catchment area etc. The registry tracks critical personnel data, and its implementation is one of the first steps in a national plan to transform and professionalize community-based health workforce in a country. The registry provides health officials with the data needed to understand the size and scope of the existing community health workforce and to integrate these workers into the health system, while accounting for their contributions to health outcomes. The registry produces insights on workforce density and distribution, performance, incentives, training, and more, which help the ministry standardize the practice of community-based health care going forward. (IntraHealth Uganda, 2017) (13).

b) Community-based health information system

Community-based health information is defined as the way data are collected at the community level and how the data are managed, analyzed, flow and are used for planning and monitoring by various including CHWs, governments, partners and donors. Community health information system involves health and related services provided to communities outside of facilities (24, 26). In countries where community fora, community review meetings and other community gathering platforms are established, communities and health facilities work jointly to address data generation, review of existing information and gaps. Regular meetings and discussions among community leaders contributes to real adaptation and better utilization of community data. Data should be shared during community and health facility meetings for feedback and action in the health facilities catchment's areas to improve health programming. Data from CBHIS should enable sharing of data among community-based services and between community-based services and higher-level health facilities; for example, the *connect project* in Tanzania links community data collected by CHWs with the district and the health management information system-HMIS- (31,18). A complete integration of the CBHIS into the HMIS with harmonization of indicators would avoid redundant data and duplicative efforts in data collection, analysis, and reporting. In addition the CBHIS data should feed into national health information system to provide an opportunity for additional data generation outside the health facilities and specifically health activities, social and environmental data at the community level (21). The district health information system -DHIS2 - provides a platform to link community data to information from health facilities (22, 23). Community data should be included into the DHIS2 to create user-friendly dashboards for programmatic use at the community level. Experience from Guinea during the Ebola epidemic crisis has shown the critical need to have timely detailed data through DHIS2 dashboard for to increase preparedness and readness during before and during the outbreak at the community level (27). Overall, Community-based health information should be centered on accountability and policy change which are critical for community driven health intervention (table 4).

Tools and approaches are proven effective in data generation to support public health programs. The "My Village My Home" (MVMH) tool is a poster-sized material used by volunteers and community officials to record the births and vaccination dates of every infant in a community. It allowed community leaders, volunteers, and health workers to monitor the vaccination status of every young child in participating communities and guided reminder and motivational visits. Assessments in India where the tool was implemented suggested that it improved vaccination timeliness and coverage - 49% to 80% coverage of identified and eligible children for all vaccines. In Malawi, village heads and volunteers undertook a census of infants in their community listing every child, in order of their birth, on the MVMH tool and recorded the dates of vaccinations already received. They added new children shortly after they are born and become aware of and added new vaccinations on the tool either during regular home visits or at the end of a nearby outreach session. Official health information system coverage data, which are not very reliable, do not show the impact of the community monitoring and other actions at district level. However, immunization coverage appears to be nearly 100% in communities where infant tracking and monitoring using the MVMH tool is well implemented (an estimated 90% of the communities) (33).

Table 4. Data sources for prevention and support

Prevention, support and rehabilitation at the community level	
Information needs	**Potential sources**
Behavioral factors and environmental conditions including water, sanitation and hygiene	• Research or special studies – observation reports and surveys • DHS data especially Key Indicator Surveys and population-based surveys
Community health partners mapping analysis of stakeholders and their influence, contribution, and capacity	• Map of community stakeholders
Advocacy initiatives to promote human rights, patient rights, and community mobilization	• Operational research and/or implementation science that assesses barriers to services by key populations • Tests service delivery models that reduce barriers to service access • Outcome evaluations of programs that promote, protect, or respect human rights • Survey data on stigma and discrimination • Stakeholder engagement on RMNCH, Malaria, AIDS policies and human rights
1. Women of reproductive age 2. Pregnant women 3. Female Sex Workers 4. OVC/PLHIV	• HMIS • DHS • Special studies • Programs reports
1. Description of populations at risk of acquiring specific diseases 2. Description of populations for specific health conditions	• Government reports • National demographic and epidemiological data • HIV- and AIDS-related surveillance data • Behavioral surveillance data • Population survey data • Routine health information system (RHIS)
1. Current community-based prevention service coverage for priority populations across government and donor programs. 2. Estimated prevention targets in comparison with coverage, to determine level of unmet need for community-based prevention services	• RHIS or HMIS • Ministry of Health reports • Donors supported program reports • UN (i.e., WHO and UNAIDS) • DHS • Special studies at the community level
Cost of monitoring activities at the community level Estimated expenditures of community health activities Carrying costs of current community health activities	• Budgets and Operations • Procurements plans and reports • Costing and cost-effectiveness studies • Program and/or performance evaluations or other special studies • Implementing partner engagement
Measurable deliverables Are current community health programs targets being achieved?	• Program conceptual model • Program results and Strategic framework • Program logical framework • Program performance monitoring plan
Quality of community health programs	• Performance quality assessments • Surveys, research and special studies

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c) Electronic data capture and use

Electronic data capture and data visualization are becoming commonplace especially with advances in mobile technology permitting real-time data collection, management and analysis. Electronic data platforms enable on-the-spot data validation with the accuracy needed for data processing, quality assurance, and the facilitation of data reporting for timely use and/or dissemination. Other advantages include: i) user-friendliness by field workers, ii) cost-effectiness in terms of logistics and human resources, iii) timeliness, rapid synchronization and triangulation of data (18). In a highly functional community data management and reporting system, digital technologies are employed to make data systems more efficient, useable, or scalable and/or leverage data to improve the quality, speed, or equity of services (24). One systematic review suggested that there were cost savings of 24% when CHWs collected data using personal digital assistants compared to when they used traditional manual methods of data collection and transmission (25,26). Online libraries and platforms improve the searchability of data. They are often accessible to peripheral levels of the health systems in many developing countries. The use of GIS and mobile devices are indispensable for the generation of a large quantity of valuable information which can be collated, analyzed and made available in real time. Natural resources, demographics, water and sanitation data are important information which can be generated and managed in direct collaboration with communities through community mapping. It is necessary to help community health workers and volunteers build capacity for electronic data capture and interpretation.

d) Community health program databases

The reliability, validity and availability of community data is paramount to the success and to the sustainability of public health inyerventions. Community-led and community-based interventions must have robust and reliable information available in a trusted and constantly updated data warehouse. Health facilities should maintain a good and strong information system which includes the collection, storage and management of community data accessible to community stakeholders. Health facilities must appoint personnel to manage community data with dedicated personnel working to ensure data collected and management through standard operating procedures and data management and analysis protocols, and then link community health program databases to national health information systems. Rwanda has an established community health information systems including systematic recording of maternal deaths and audits (32). Likewise, the northern states of Kano and Kaduna in Nigeria have community based polio data collected by volunteer community mobilizers (VCM) and transmitted to program databases linked to the federal national health system (6). Ideally all the healthcare entities at the community level (private drugstores, traditional birth attendants and traditional health practitioners should provide data and information to feed into community program database.

e) Community initiatives for data generation and utilization

In Rwanda the Community Action Cycle (CAC) is an initiative that encourages community participation in the prioritization of their health problems as well as the implementation and monitoring of local action to address those issues. In the district of Nyaruguru the CAC led to the identification of 332 community groups, one per village, to oversee leading collective action plans to address key community reproductive health and child health issues. Each community went through a participatory process of analyzing health issues, prioritizing them, reflecting on barriers, and planning solutions. For example: many pregnant women not completing four antenatal care visits; low family planning prevalence; and lack of toilets. The initiative impacts an estimated 293,494 people (17).

In Mozambique, too often, community members are engaged superficially and are not integrated into the decision making around how to address the needs of their communities. Traditional birth attendants (TBAs), previously operating with no formal link to the health system, were trained in data collection by professional health workers and they reported their data directly to their own community leaders for analysis and to support decision-making. Communities tracked their own accomplishments toward: safe motherhood and institutional deliveries; water, sanitation, and hygiene; family planning; and other critical health needs. Beyond the training that TBAs received to educate women about the importance of care from and support referrals to the health system, they reported to their own community leadership councils (CLC) about their success in shepherding women under their charge from the first antenatal

care visit through to institutional delivery and immunizations. Empowered with data, TBAs and CLC members were able to recognize these barriers and changed course to make sure the women affected got the care they needed, maintaining the uptick in institutional delivery rates. Together, TBAs and CLC members used their newfound expertise in data collection and use to build a referral tracking system through which they monitored pregnant women's uptake of critical maternal health services. The TBAs described the importance of data in helping maintain success despite the underperforming health centers. In addition to TBAs' and CLCs' clear roles, responsibilities and strong relationships, it was their community-generated and -owned evidence that supported their success as leaders and stewards of their community's health. It was this data that fueled their ability to adapt when complexity struck, to solve problem, and to take ownership of the solution (1).

Discussion

The collection and use of data are essential to quality improvement and have the potential to positively impact health outcomes. New evidence suggests that CHW use of data at the community level could help to improve service delivery and ultimately result in better health outcomes (26, 30, 31); and it is generally admitted that household data belong to local communities which should be empowerd to use the data as needed for planning, self monitoring, for equity and for the application of local solutions to solve programmatic issues and other bottlenecks (32,33). Viable integrated community health platforms rely on a key function of local learning and adaption which implies availability of the data at the local level for decision making. In a review conducted by Ibe et al (4) on CHWs documents from 22 countries, it was shown that although policy and related documents provide guidance for all CHWs cadres to track data from home visits, case management and other services, document life events, manage commodities and/or monitor outbreaks in all the 22 countries, very few specific guidance on data use at the community level and how to involve the community in data analysis or decision making -16 out of 22 countries,72% - (33).

Most data repositories from public health programs are not available in primary health care facilities; neither are they available at the community level. Some data are also complex and difficult to be understoodand and used by the communities. Simple formats including data visualization -dashboards, are critical for making data user-friendly and easy to understand by community members. Empowering communities to use data for decision making is essential for identifying data needs and improving data availability. For example, in Kenya the *Omia Diere* community embraced mobile technology, consequently it became the center for visits by other communities who want to learn about it. The community unit became the center for data generation, analysis, and quality assurance, which led to improved activity reporting (11). Likewise, pilot implementations of community health projects in Guatemala, Egypt and China using a specifically developed mobile phone application to collect data, and an online expert survey were completed with community reviews to assess validity and feasibility of the indicators and their corresponding questions (22).

Communities have health needs specific to their environment and context, stemming from the prevalence of a specific disease or condition, or from a special occupational issue. The causes here may range from the environmental (for example pollution of drinking water or poor air quality), to genetic issues (for example an ethnic group that's susceptible to a certain disease). Examining some community-level data can help identify and respond to these conditions. An assessment to identify community health problems for instance, might rely on indicators such as the incidence of a disease or medical condition either in the community at large, or in a social, ethnic, or geographic group. Community data can also provide information about the effects of community projects and initiatives; for example, a reduction in the number of people who are unable to obtain or have to delay medical care due to high costs might be an evidence that the new clinic in the area is helping a previously underserved population (2).

CHWs generate a lot of data from their activities at the community level. Oftentimes, data may be reported up the channel to the formal health systems with little reference as to how it can be used to guide work or improve performance at the community level (25). An important prerequisite for making effective use of data is to institionalize the use of data for shared accountability at the community level by building the capacity of the community and the health system to undersand the importance and

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relevance of data (30). The communities should be oriented by health facility workers on the basics of the health issues and the interventions to address those issues, and how to assess progress in addressing the health problems. For instance, in the health extentsion workers program in Ethiopia, households are provided training on a package of 16 high priority health interventions, and relevant knowledge and skills are transferred to households so that they can take full responsibility for maintaining their own health and encourageing their neighbors to do the same (2). Data from community surveys could measure differences in health, education, social life, livelihood and empowerment between people with disability and other community members. The analysis of these differences yield specific information to community health managers, donors and government agencies, to help carry support advocacy activities, help improve accountability and to guide decision making. The community-based rehabilitation (CBR) indicators for instance were developped to support WHO and its member states in their efforts towards strengthening community based rehabilitation, by generating evidence on its effectiveness (24,37). It's important that the community health planners collect and analyze data that reflect current social and health conditions of local communities (10, 36). For instance, smoking is a major cause of lung cancer, so measuring lung cancer rates in a community ought to tell us about smoking rates. It does, but it tells us about smoking rates 20 or 30 years ago, because that's how long it may take many cancers to develop. The same is true for heart attacks and cholesterol -the current condition of your heart reflects eating and exercise habits of 20 years ago as much as your current ones.

Conclusion

There are several community based data collection designs, and data sources developed by countries with support from technical partners and funders. It is important to ensure that the data are constantly made available to users at the point of service delivery especially at the community level; for that purpose, interoperability, data visualization, user-friendliness and timeliness are essential requirements. For a programmatic perspective, long term investment in quality data generation and improved data availability should be addressing three key questions: What is missing at the lowest level (household) where the data is generated? What information is indispensable? and which data will make a difference from a programmatic standpoint? Responses to these questions would undubitably help communities and health planners conceive the best systems for data generation and the best platform for dissemination. The communities initiatives domonstrate how data can create a stronger and more resilient local health system, one capable of continuing to deliver positive health outcomes well into the future.

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The Factors Associated with Attrition and Their Extent in Affecting the Antiretroviral Therapy Clinic in Primary Healthcare Facilities in Anambra State Between May 2016 and May 2018

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Abstract

The success of the third ninety in UNAIDS 90-90-90 by 2020 depends on the sustainability of antiretroviral therapy by clients on therapy. The therapy is inefficient if there is poor adherence. Due to certain factors, a fraction of the clients is lost from the clinic and they contribute to transmission of new infections. The aim is to inquire into these factors and their contribution to attrition in Anambra facilities.

A quantitative experimental study using a comprehensive purposeful sampling method. From the electronic medical record data of clients who have not been seen in the clinic for 90 completed days from May 2016 to May 2018 was accessed. These clients were disaggregated according to presence of descriptive addresses and phone contacts. Traceable clients were tracked on phone at seven different times over three weeks. Data was collected in an excel sheet and analysed using SPSS version 22.

For a total ever enrolled of 852 clients, there were 12 deaths. 265 clients (31% of total enrolment) that defaulted. 141 (53.5%) were untraceable while 124 (46.5%) were traceable. 29 clients (23.8% of traceable) were on self-transfer. 39 clients (31.7%) promised to return, while 56 clients (44.5%) were uninterested in the therapy.

The defaulter rate in these facilities is high and the fact that majority of these clients cannot be tracked due to poor contact information of clients is a source of concern. The negative effects of faith and economy were as well observed. Quality counselling and dialogues with faith leaders are recommended.

Keywords: *attrition, factors, extent, anti-retroviral therapy, Anambra.*

Introduction

Attrition from HIV care which refers to the lack of continuity in accessing HIV care from a facility or program kicks seriously against the success of the three nineties as targeted by UNAIDS. It is a vicious cycle which keeps people out of sustained anti-retroviral therapy hence affecting the second 90. Because the third ninety depends on the second to record massive viral suppression, it is not left out. When the cause of attrition is such that the client discontinues treatment, then rebound viraemia could lead to transmission of new infections which therefore widens the target population within the first ninety. This means that retention in care is paramount to the success of epidemiologic elimination of HIV.

Disclosure especially for the female spouses has been very difficult for fear of gender-based violence and or loss of the home.

Forms of attrition include deaths, lost to follow up, transfer out, self-transfer without records, belief in faith healing, and poor attitude of health staff.

Presently, a lot has been done to ensure that people enrolled into care are retained in treatment to boost their clinical outcome. Some of these steps include quality adherence and pre- test counselling and post-test counselling. Some programs have provided transportation for clients to ensure retention while others have engaged in community ART where drugs are distributed in the communities. The drawbacks to the two last methods are sustainability and high rate of stigma and discrimination in the communities.

The objectives of this study are to study the causes of attrition in the ART clinics in Anambra State with the extent of their contribution with a plan to ensure that the amenable factors are worked on to ensure more retention of HIV clients.

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Method

Anambra State is located at latitude 6.2758 N and longitude 7.0068 E. in the South Eastern zone of Nigeria, West African sub region. It has a population of 4, 177, 828. (2016 Census). It has 21 Local Government split into three senatorial zones. The prevalence of HIV is 2.4 (NAIIS, 2018). HIV/AIDS response in the state is overseen by the Ministry of Health through the State AIDS and Sexually Transmitted Disease Control Program and State agency for Control of AIDS and are conducted in tertiary, secondary and primary health facilities. The selected facilities are Primary Health clinics from Orumba, Ogbaru and Ihiala Local Government Areas. The target population were patients who are receiving care, treatment and support for HIV.

A multi staged random sampling was used to select six sites. Because this was an implementation research and the principle of justice and beneficence, a comprehensive non probability method was used. The study was quantitative and cross sectional.

The total ever enrolled was accessed. All clients who have been absent from clinic appointments for ninety completed days called (lost to follow up), dead clients and transfer out between May 2016 and May 2018 were received from the electronic medical record. The available data was sent to excel. The lost to follow up clients were then disaggregated according to presence or absence of phone numbers. Those that had phone numbers were further classified based on validity of telephone numbers. This gave rise to the groups “traceable and non-traceable”.

Those in the traceable category were contacted at least seven times by phone and the results were documented on Microsoft excel and later exported to SPSS version 22 for analysis.

Results

The result of the study on the factors associated with attrition and their extent in affecting the antiretroviral therapy clinic in Primary Healthcare Facilities in Anambra State between May 2016 and May 2018 were as follows:

For a total ever enrolled of 852 clients, 370 were tested positive in the communities while 482 were tested positive in the facilities. There were 12 deaths and 265 clients (31% of total enrolment) that have not been seen for at least three completed months. More females 64% were lost, than males 36%. The most hit age group is the 16-25 group (35%), 24% for the 26-35 and 36-45 group, 12.1% for above 46 and 4.5% for 0-15 years. 180 clients (67.9% of lost) had the community outreaches as care entry point while 85 (32.1%) came in through health facility testing (OR= 4.424 95%CI 3.244- 6.036 $p<0.0001$). Single encounter lost to follow up was 108 (41% of the lost). Community tested single encounter lost to follow up was 74% (OR= 1.629 95% CI 0.9495 -2.7932, $p<0.0764$). 141 (53.5%) were untraceable because there was neither phone contacts nor descriptive addresses in the records while 124 (46.5%) were traceable. The traceable were re-tracked. None was dead. 29 clients (23.8% of traceable) were on self-transfer to other states. 39 clients (31.7%) promised to return citing reasons such as travelling and busy at work as excuses while 56 clients (44.5%) were uninterested because of faith healing (40) and lack of money for transportation (16).

Discussion

The success of any antiretroviral therapy program depends on good adherence to therapy. This includes taking the right drug, the right dosage, at the right time, at the right frequency, keeping appointments to laboratory and drug pick up.

The result showed 31% defaulter rate which is a huge gap from the 90% who are supposed to be on sustained ARVs (second ninety). This is higher than the value from previous studies at Botswana where the defaulter rate was 7.345% (Weiser S et al.,2003). But is a little lower than a Nigerian study which had 36% (Daniel et al 2004) as the defaulter rate. This high defaulter rate is mainly due to poor preparation before initiating therapy. The percentage of single encounter lost to follow up was the result that more females were lost than males stems from the fact that there were more females than males in the program. Also, male dominated culture has a role to play which is also highly affected by low rate of disclosure.

The most affected age group is the 15- 26 years. This is a very unstable age group, highly dependent in nature. Adding the 27- 45 age group to the 15-26 shows a consistency in the epidemiology of HIV; Predominance in the sexually active ages.

The proportion of community tested positives was high with an odd ratio of 4.4. The community testers usually are given targets to reach. Hence there is poor counselling and testing is done hurriedly. This is shown in the data as 74% the single encounter defaulters are from community tested clients. The clients are referred to the health facilities where they most times learn that what was conducted was an HIV test. They get enrolled but disappear thereafter.

The number of untraceable clients (53.5%) is also of great concern as further tracking is made impossible. The lack of descriptive addresses and valid phone contacts arise because the healthcare workers mostly request for such information after the client has tested positive and therefore what is received is a wrong information.

Self-transfer is a very important cause of attrition and it was clear from this study. It was lower than a study in Uganda where 61% to 80% of 111 patients lost between 2004 and 2007 and found alive were in care elsewhere (as defined by both seeing an HIV provider and continuing to obtain ART) Geng (2010). In Johannesburg, it was 41%Dalal (2008), while a second group found 66% of 260 traced patients who were alive to be in care elsewhere Rosen (2010). Usually, a transfer letter is issued to clients when they are relocating or have other concerns. However, some leave without such letters and therefore are classified as defaulters. Some of the contributing factors include relocation to other areas, incentives from implementing partners, free services (in the case that some services for instance the lab tests have user fees), and poor attitude of health staff.

Theological factors also showed up in this study. Some clerics claim to have healing powers including that of HIV. They conduct deliverances and part of the instructions after are that they should not get re-tested and that the drugs should be discontinued. Therefore, the patients decide to abandon the therapy as seen in this study.

The socio-economic status of the clients was also a factor in this study as some of the defaulters claimed that the cost of transportation was responsible for their default. This happens because of the high level of stigma and discrimination. In Nigeria and in Anambra, the HIV program has been cascaded to the primary healthcare centres such that within a few kilometres' interval, one can access care. The treatment is also largely free. But because of stigma and discrimination, people get enrolled in facilities that are very far from their homes without thinking about the sustainability of such decisions. This will later result to defaulting when clients are not able to foot the transportation bills.

The proportion that was ready to continue therapy was fair. They cited reasons such as being busy and not in the area as the cause of default. People living with HIV are human beings who are also important in the society. They also have their jobs and business to help them cater for themselves and their families. Some of the jobs involve working at same hours that the health workers also run the HIV clinics, hence they defaulting.

Conclusion and recommendation

The attrition rate of clients on anti-retroviral therapy in the facilities was high. The reasons were from poor counselling (adherence and pre-test and post-test), faith issues, self-transfer and inability to foot transportation bills.

I hereby recommend that:

a) Clients should be properly counselled before testing and also collecting valid phone numbers and descriptive addresses from patients.

b) Multi-month drug scripting (the dispensing of three months refill for the stable clients) could be a way for those that travel outside the area often.

c) Quality adherence counselling will help in personal ownership of health by patient's nay disclosure issues. This will also address issues such as the tenure of ART. Those positives from the community interventions should be counselled properly before commencement of therapy. This should also address the issues of stigma and discrimination which will make the clients to access drug at closer places.

d) The youth clinics should be segregated so that the age group would feel more comfortable during clinics.

e) Faith based organisations should be engaged in dialogues to ensure they are acquainted with the right information about HIV

f) Introducing people to income generating activities will also help the indigent ones.

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If all these measures are deployed, I believe that the retention in care will improve greatly.
Further research recommendations:
This should include: Knowledge of clerics about HIV.

Tables and figure

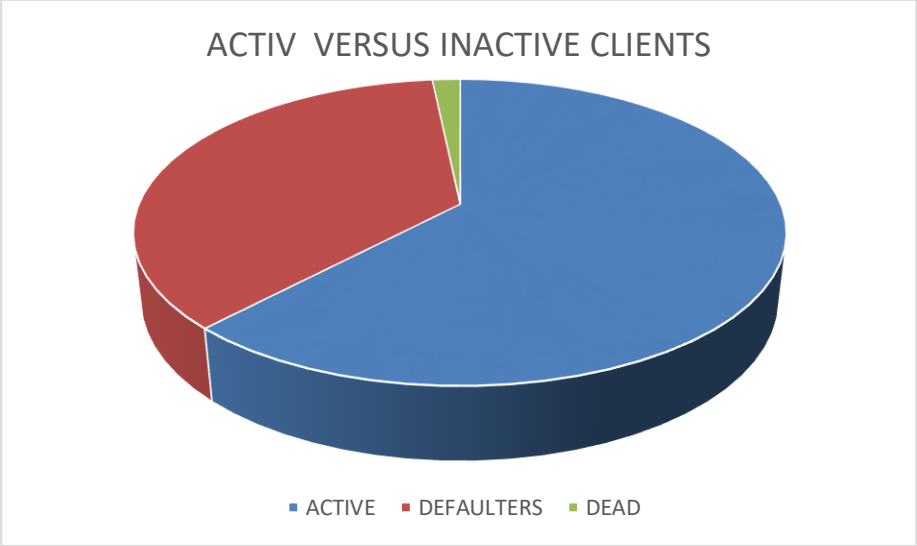


Figure 1. Showing proportion of inactive to active clients

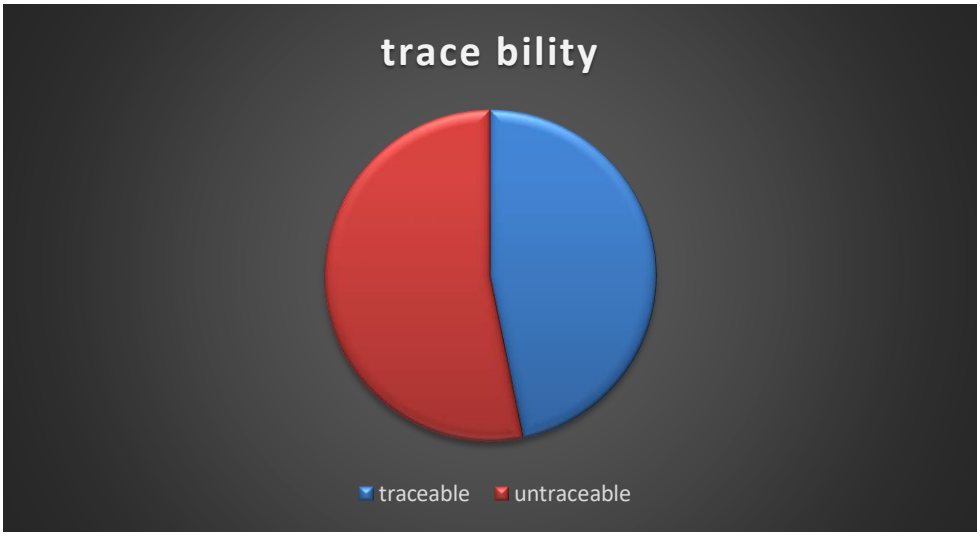


Figure 2. Shows the traceability of the lost clients.

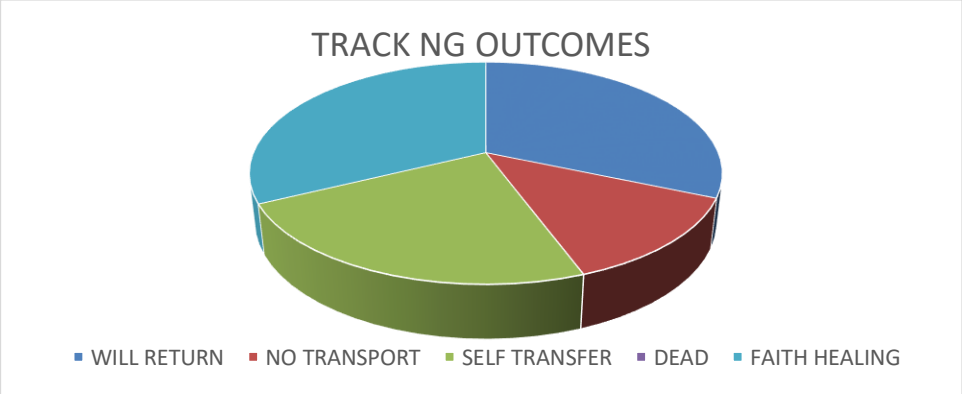


Figure 3. shows the tracking outcomes of those traceable

Table 1. showing attrition by gender

GENDER	NUMBER	%
MALE	96	36
FEMALE	169	64
TOTAL	265	100

Table 2. Showing attrition by age groups

AGE GROUP (years)	NUMBER	%
0-15	12	4.5
16-25	94	35.5
26-35	64	24.2
36-45	63	23.8
46-60	25	9.4
>60	7	2.6
TOTAL	265	100

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The Rate and Determinants of Regular Utilization of Long-lasting Insecticide-treated Nets for Malaria Prevention among Pregnant Women in Keffi, Nigeria

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Abstract

Malaria is endemic in the tropics with pregnant women at increased risk. Malaria in pregnancy causes feto-maternal morbidity and mortality. The regular use of long-lasting insecticide-treated nets is a cost-effective vector-control strategy with synergistic insecticidal and barrier-protective dual actions.

This study explored the rate and socio-demographic determinants of long-lasting insecticide-treated nets utilization in 100 randomly-selected pregnant women attending a private ultrasound center in Keffi, Nigeria. It was a quantitative cross-sectional survey using a structured interviewer-administered questionnaire. The data was analyzed using statistical package for social sciences.

The results revealed a rate of 70% of regular utilization of long-lasting insecticide-treated nets and a statistically significant association between religion and regular long-lasting insecticide-treated nets use (OR 1.51, 95% CI 0.98- 2.34, p .02). The relationship between the free distribution of long-lasting insecticide-treated nets and regular use was not significant (p .363).

Regular use of long-lasting insecticide-treated nets would prevent malaria in pregnancy, reduce feto-maternal morbidity and mortality, and improve feto-maternal survival in Nigeria and other malaria-endemic parts of the world.

Keyword: *Rate, Determinants, Utilization, Insecticide-treated-Nets, Pregnancy, Malaria.*

Introduction

The objectives of this study were to determine the rate and determinants of consistent utilization of long-lasting insecticide-treated nets among pregnant women attending Hamamah Diagnostic Services Center Keffi and to recommend ways of improving regular usage of long-lasting insecticide-treated nets among pregnant women.

Malaria is a female anopheles' mosquito-borne protozoan infection caused by Plasmodium species with falciparum (75%) and vivax (20%) being the most common infections (Dalrymple et al., 2018). Malaria is endemic in the tropics with pregnant women, under-fives, sicklers, immunosuppressed, and non-tropical immigrants having the highest risk.

Globally, 3.3 billion people are prone to Malaria; 198 million suffer from malaria annually, and ½ million dies, with 90% of deaths occurring in sub-Saharan Africa (WHO, 2018). Malaria in pregnancy causes feto-maternal morbidity and mortality. It accounts for frequent hospital visits, hospital admissions, absenteeism at work and school, and decreased productivity including house chores and care for children. The cost of treatment and opportunity cost of malaria of pregnancy are huge. Therefore, malaria in pregnancy is a public health priority.

Malarial transmission requires Plasmodium, susceptible human host, and favorable environmental factors. Hot and humid climate ensures the survival of Plasmodia in the mosquito. Overgrown grasses, stagnant waters, poor drainages, flood, and solid wastes provide breeding grounds for mosquitoes. Environmental hygiene and use of insecticides, insect repellents, and screen and clothing barriers are measures at minimizing mosquito bites. The use of long-lasting insecticide-treated nets is a cost-effective vector-control strategy with synergistic dual actions of insecticide and barrier protection.

In Nigeria, long-lasting insecticide-treated nets are expensive for ordinary citizens that live below the poverty line of $2 per day. Up to 172 Naira ($1.2) is spent daily by an individual household on malaria prevention in Nigeria (Onwujekwe et al., 2014). Fortunately, governmental and non-governmental agencies provide long-lasting insecticide-treated nets free of charge, but the rate of regular utilization in

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pregnancy reported as low as 19.2% across 18 states in Nigeria (Ezire et al., 2015) needs to be further studied.

Therefore, this study explored regular long-lasting insecticide-treated nets use in pregnant women attending the cheapest ultrasound center in Keffi, Nigeria, the Hamamah Diagnostic Services Center.

Available literature revealed only a few studies on the regular use of long-lasting insecticide-treated nets by pregnant women in Nigeria and none in Keffi, Nasarawa state, Nigeria. Additionally, no previous study explored the possible relationship between free ownership of long-lasting insecticide-treated nets and regular (everyday) use - this research principally aimed at exploring and addressing these gaps.

The limitation of this study was the exclusion of pregnant women less than 18 years old for ethical reasons in a community where early marriage is the norm. Girls can get married as early as 15 years of age. This exclusion had denied this category of pregnant women from participation in the study. Other limitations were time and resources constraints, small sample size (100) and low statistical power.

Methods

The study took place at Hamamah Diagnostic Services Center, Keffi, Nigeria. Hamamah Diagnostic Services Center is a private ultrasound services provider that charges 500 Naira only ($1.5) for a scan. Despite the out-of-pocket payment, employees of different organizations with health insurance cover elsewhere patronize this center. Keffi is a cosmopolitan town about 50km from Abuja, the capital of Nigeria (Figure 1).

A quantitative cross-sectional approach was chosen because of the limited time and resources and the exigency of work. The strength of this design was the feasibility of data collection within the six weeks. The findings can be generalized because of the random sampling technique and would add to the existing body of knowledge and give direction for further research on the topic.

The independent variables were socio-demographic characteristics (age, gravidity, educational level, occupation, and religion) and source of long-lasting insecticide-treated nets. The dependent variable was regular long-lasting insecticide-treated nets use.

The sample frame was pregnant women using long-lasting insecticide-treated nets who attended Hamamah Diagnostic Services Center Keffi for obstetric ultrasound within the study period. The sample consisted of every other pregnant woman within the sample frame that gave informed consent and aged at least 18 years.

The sample size (n) calculation was based on the prevalence (p) of long-lasting insecticide-treated nets use by pregnant women of 49.6% from Ikeako et al. (2017) study in Awka, Anambra state, south-east Nigeria and a precision (d) of 10%. Using the formula, $n = 4pq/d^2$ (where $q = 1-p$): $n = 100$.

The systematic probability sampling technique of choosing every other eligible pregnant woman was used, and the first sample was chosen by simple balloting of the first two participants.

This study used primary data collected through an interviewer-administered structured questionnaire. The researcher and two research assistants collected the data over six weeks in July and August 2018. The survey took place at Hamamah Diagnostic Services Center Keffi, Nigeria from 18th July 2018 to 30th August 2018.

Names and hospital numbers were not captured for ethical reasons. Similarly, excluded were those without informed consent and those less than 18 years of age. Approval was obtained from Hamamah Diagnostic Services Center to carry out the study.

Statistical Package for Social Sciences (SPSS) version 23 was used for the analysis with a Confidence Level (CL) of 95% and a Level of Significance of 0.05. The data was entered into SPSS from the questionnaires. Data was double-entered to ensure accuracy. Cases with missing values were excluded and replaced with valid ones. Age and gravidity were grouped. The qualitative variables were coded into numeric values to aid analysis. The statistical analysis included basic statistics, cross-tabulation, and X^2 test, and logistic regression to control for confounders. When p-value was < 0.05, the null hypothesis (H_0) was rejected, and the research hypothesis (H_r) accepted.

Results

The dataset contained one hundred (100) eligible pregnant women sampled randomly. Cases with missing data were excluded and replaced by appropriate ones. The dataset was captured in SPSS. Age and gravidity were transformed into nominal variables. The data was analyzed, and the results presented.

The age of the 100 respondents ranged from 19 to 40 years, with a mean of 28.2 ± 6.2 years, the median age was 28 years, and the mode was 20 years (Figure 2). Most of the women were carrying a second pregnancy (21%), but the gravidity ranged from 1 to 12 with high-risk primigravida and grand multiparous women accounting for 18% and 31% respectively (Figure 3). As shown in Table 1, the participants were predominantly literate (88%) with Islamic education (30%) being the commonest, followed by a senior secondary school certificate (26%), and those with a degree constituted only 8%. In contrast, their spouses had a higher literacy level of 90% with Ph.D. (1%) as the highest qualification. Besides full-time housewives, the women and their spouses were mostly sustenance farmers, petty-traders, and artisans (34-57%) with unemployment kept at 5%. 78% of the respondents were Muslims while 22% were Christians.

In Figure 4, 82% of the respondents got long-lasting insecticide-treated nets free of charge, while 18% bought them. 70% of the participants reported everyday use of long-lasting insecticide-treated nets, while 30% were using long-lasting insecticide-treated nets not regularly.

Hypothesis testing was done with suitable statistical tests using SPSS. Cross-tabulation/X^2-Test was used to determine associations between qualitative variables at an alpha value of 95%. A p-value of <.05 rejects the Null hypothesis (H_0).

Pearson's X^2-Test of independence explored possible relationships between the independent and the nominal dependent variables. Where >25% of cells had counts <5, Likelihood Ratio (LR) was used. The strength of the association (effect size) was determined with Cramer's V (CV) for asymmetrical tables and Phi or Odds Ratio (OR) for 2x2 tables and Standardized Residuals (SR) for locating the statistically significant differences.

Age, gravidity, educational level, and occupation of the respondents were not significantly associated with regular long-lasting insecticide-treated nets use: $p > 0.05$ (Table 2). However, there was strong evidence of an association between religion and regular long-lasting insecticide-treated nets use ($X^2(1) = 5.372$, $p = .02$). The effect size was small-to-moderate and statistically significant (Phi = .232, p = .02); the difference was among Christians with inconsistent use of long-lasting insecticide-treated nets (SR = 1.7); the odds of Muslims using long-lasting insecticide-treated nets regularly was 1.5 times more than that of Christians (OR 1.513, 95% CL = .98, 2.34).

There was no statistically significant association between free ownership and regular use ($X^2(1) = .826$, p= .363).

Logistic regression confirmed the association between religion and regular long-lasting insecticide-treated nets use was statistically significant (OR 4.47, 95% CI 1.49, 13.40, p .007) after controlling the confounding effects of other socio-demographic variables.

Discussion

In this study, the rate of everyday utilization of long-lasting insecticide-treated nets by pregnant women of 70% closely correlates with the finding of Sangaré et al. (2012) in Jinja, Uganda who reported a rate of 73%. This rate is higher than the previous night long-lasting insecticide-treated nets use reported in sub-Saharan Africa (60%), Ethiopia (58.4%), Ghana (61%), and Nigeria (49.6%).

This high rate of regular long-lasting insecticide-treated nets use among pregnant women in Keffi can be explained by the proximity of Keffi to Abuja, the high educational level of the participants and their spouses, and possible increased long-lasting insecticide-treated nets awareness as supported by Adeola and Okwilagwe (2015), Belay and Deressa (2008), and Ezire et al. (2015), and Sangaré et al. (2012).

Religion was the only statistically significant predictor of regular long-lasting insecticide-treated nets use by pregnant women (($X^2(1) = 5.372$, $p = .02$). Logistic regression to control for confounders confirmed statistical significance (OR 4.47, 95% CI 1.49, 13.40, p .007). Other socio-demographic variables were not shown to be significant predictors in contrast to the findings of previous studies that

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reported education, long-lasting insecticide-treated nets awareness, gravidity, free distribution, urban residence, willingness to purchase long-lasting insecticide-treated nets, confidence to use a net, and being married as significant predictors of long-lasting insecticide-treated nets use (Adeola and Okwilagwe (2015), Belay and Deressa (2008), and Ezire et al. (2015), and Sangaré et al. (2012).

This finding might not be unconnected with long-lasting insecticide-treated nets campaigns in mosques and religious gatherings.

Conclusion

The objectives of this study of determining the rate and determinants of consistent, long-lasting insecticide-treated nets use among pregnant women attending Hamamah Diagnostic Services Center Keffi were primarily achieved. The following recommendations were put forward to improve access to and utilization of Long-lasting insecticide-treated nets by pregnant women in sub-Saharan Africa:

1. The local, state, and federal governments and non-governmental organizations in Nigeria should intensify efforts at the free distribution of long-lasting insecticide-treated nets to pregnant women.
2. Public campaigns should be scaled-up using mass media, social media, and non-medical personnel such as local celebrities, drama actresses/actors, and renowned sportsmen to increase the level of Long-lasting insecticide-treated nets awareness.
3. Religious leaders should be more engaged in long-lasting insecticide-treated nets awareness campaigns and long-lasting insecticide-treated nets distributed at religious gatherings.
4. Pregnant women need to be targeted specifically, and incentives like free delivery kits can be given along with long-lasting insecticide-treated nets to encourage ownership and utilization of long-lasting insecticide-treated nets.

The recommendations would enhance ownership and regular usage of long-lasting insecticide-treated nets by pregnant women. Regular long-lasting insecticide-treated nets use would prevent malaria in pregnancy, reduce feto-maternal morbidity and mortality, and improve feto-maternal survival and standard of living.

The statistically significant associations between religion and everyday use of long-lasting insecticide-treated nets by pregnant women in Keffi, Nasarawa state, Nigeria should serve as a basis for further exploration by researchers. The sample size should be increased, and a qualitative component added in future studies.

Figures and tables



Figure 1. Map of Keffi (Source: HTG)

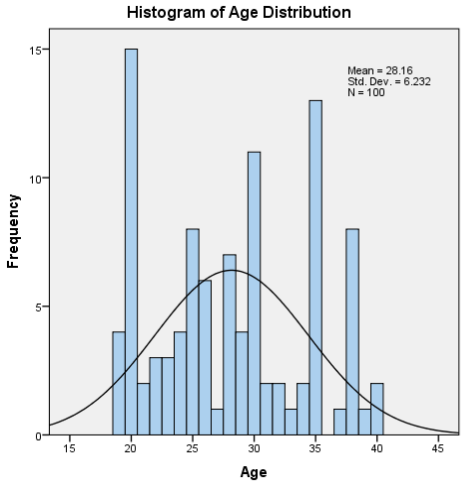


Figure 2. Participants age distribution with normality curve

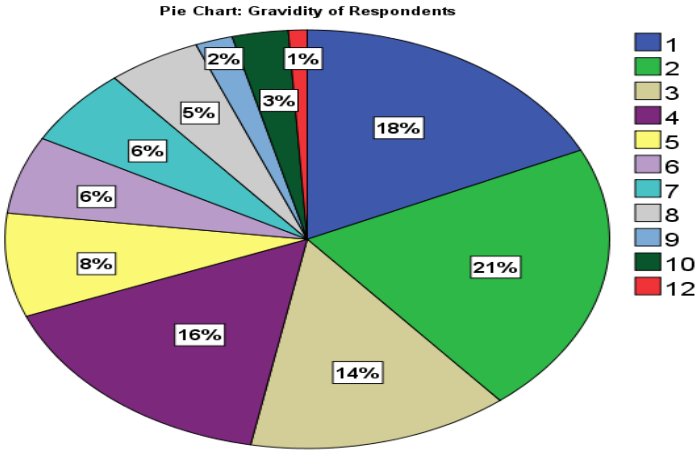


Figure 3. Distribution of respondents by gravidity

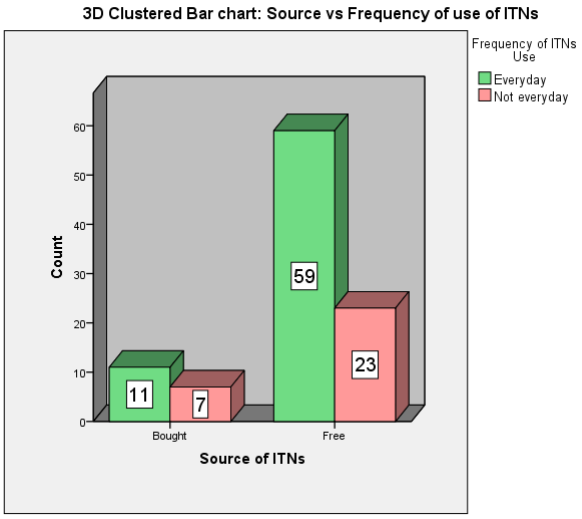


Figure 4. Frequency of Long-lasting insecticide-treated nets Use versus Source

Table 1. Educational level and employment status of respondents and their spouses

Educational Level		
Categories	Respondents (%)	Spouses (%)
Illiterate	12	10

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Islamic education only	30	21
Primary school certificate	3	2
Junior secondary school certificate	8	1
Senior secondary school certificate	26	22
National diploma/NCE	9	21
Higher national diploma (HND)	4	3
Degree	8	15
Master degree	0	4
PhD	0	1
Employment Status		
Categories	Respondents (%)	Spouses (%)
Unemployed	5	0
Housewife	49	0
Employed	12	43
Others (farmers, traders, artisans)	34	57

Table 2. Association between socio-demographic variables and regular Long-lasting insecticide-treated nets use

Predictors	Outcome	Test	X^2/LR Value	df	P-value	Effect size	SR
Age group	Regular Use	X^2	.863	2	.65	-	-
Gravidity group	Regular Use	X^2	5.531	2	.063	-	-
Literacy	Regular Use	X^2	1.171	2	.557	-	-
Spouse literacy	Regular Use	X^2	.866	2	.649	-	-
Occupation	Regular Use	LR	1.643	3	.650	-	-
Spouse occupation	Regular Use	X^2	.857	1	.355	-	-
Religion	Regular Use	X^2	5.372	1	.020	.232(.020) OR 1.513 (.98- 2.34)	1.7

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Contributors to Childhood Obesity in Bhutan: The Views of PHC Workers and School Staff

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Abstract

Objective: *To explore the factors influences on childhood obesity in Mongar, Bhutan to notify and alert future improvement of a childhood obesity interventions for children in Bhutan.*

Study design: *Qualitative study.*

Methods: *Interviews of a purposeful sample with primary health workers and school health coordinator in one district in Bhutan were arranged to explore their perceptions related to the factors contributing to childhood obesity. 11 Primary healthcare workers and two school health coordinators were included. All the discussions were transcribed verbatim in English and iterative thematic approach was used for data analysis.*

Results: *In general, the causes of childhood obesity were perceived to relate to macro-level policy influences, the school environment, sociocultural factors, and family and individual behavioral factors, acting in combination.*

Conclusion: *The findings suggest that primary healthcare workers and school health coordinators have their own views on the causes of childhood obesity which involved behavioral, structural and social causes. A prominent emerging theme was the need for interventions like health workers and public awareness and support for a healthy environment. Any local initiatives in Mongar Bhutan are unlikely to be successful without such support.*

Keywords: *Bhutan, primary health workers, school health coordinator, childhood obesity, exploratory.*

What is known on this subject?

Childhood obesity is a significant health and public policy challenge across developed countries and middle level income countries across nations, countries, continents and cultures. It is observed as one of the features of the nutrition transition in developing countries. Childhood obesity is associated with attitude, behaviour, environment in Bhutan.

What this study adds

This qualitative study explores the factors associated with childhood obesity in Bhutan. The socio environmental changes contribute to childhood obesity in school-aged children in Bhutan. Findings have provided the main contributing factor is consumption of junks foods which is due to unawareness of health workers and the public. This study has placed an important groundwork for the development of appropriate childhood obesity prevention interventions in Bhutan.

Introduction

Bhutan is at the early stage of the demographic transition. And, by 2025, the expected population 65 years and older will increase from 4.4% in 2000 to 7.3%. Therefore, the prevalence of NCDs increase with age and thus the burden of diseases (NCDs) will also increase [1] . NCDs have become the largest health challenge in Bhutan. NCDs account for 62% of the total disease burden while 38% is done to communicable disease, maternal, child health and others [2]. The major NCDs in Bhutan are CVDs, mental health, respiratory disease, cancer and diabetes [3].The cost of health care is increasing and the referral

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outside country due to NCDs has increased by 15% annually the last 3 years [4]. One of the risk factors for NCD is obesity. The country has also seen a recent increase in adult obesity [4]. The adult obesity in 2008; male 4.3% and female 6.4%, the prevalence of total adult obesity is 5.3% [5]. Childhood obesity is strongly correlated with obesity as an adult. The under (<5) overweight in 2008-2012 is 7.6% and 4.4% of pre-school children [6]. The 40% of children those age 15 and above are overweight or obese [1].

There are number of factors associated to childhood overweight and obesity [7]. The factors include individual, environmental and behavioural factors which directly or indirectly change the weight status of a child [8]. Moreover, the increased intake of foods that are high in energy and fat, decreased physical activity are also the major contributors to raise child obesity [7]. Childhood obesity has immediate and long term impacts on physical, social and emotional health. Obese children are more likely to develop non- communicable diseases at young age and stay obese in adulthood. An obese child has more risk of heart diseases, increased cholesterol level and increases the risk of having respiratory problems which causes the shortness of breath and sleep apnea [8]. The problem of childhood obesity is severe and it continues to affect in adulthood [9].

The purpose of this study is to explore the factors associated with childhood obesity, and would be able to lay the foundation for the development of appropriate childhood obesity prevention interventions in Bhutan.

Aim

The study aims to identify the contributing factors associated with the increase of childhood obesity in Bhutan.

Methods

A qualitative method using in-depth semi-structured interviews with the primary healthcare workers and school health coordinator to provide a deep understanding of the causes of childhood obesity and to provide an account that explores and captures their perceptions, feelings, and meaning [10].

The study was conducted in the Mongar District of Bhutan one of twenty Districts. It is the fastest developing district with a population of 37,150, has good highways and most of the regional offices are in this district. Health services in this region include the eastern regional referral hospital (ERRH), a Basic Health Unit (BHU) grade I, 22 BHUs grade II, 5 sub-posts, 5 indigenous units and 52 Outreach Clinics (ORC). The Mongar district has 2 District Health Officers, 2 Medical Doctors, 7 Nurses, 1 Clinical officer and 47 Health assistants [11].

The participants in this study included the District Health Officer, Head of the regional hospital and PHC Staff from Mother and Child Health unit (MCH), NCD focal person, a Medical officer (1) or BHU grade I in charge, and Health assistants (6) (BHU grade II) who works with PHC services and disease prevention. The BHU included larger medium BHUs and small BHUs; classified as per the area size and population. A further two participants included school health coordinators (primary and high school). The total number of participants in the purposive sample was thirteen.

The data was collected between January and March 2018, utilising semi-structured interviews. The 13 informants were interviewed at their places of work. The record of what was said and done during the interviews was audio recorded, and then transcribed prior to data analysis, using content analysis. Themes were finalized and illustrated with quotations from the original text to help communicate meaning. The data and emergent themes were confirmed with the advisor's guidance and included comparison of the coded concepts by other researchers.

Ethical considerations

Ethical approval for this study was granted by the Institutional Review Board at Naresuan University in Thailand (IRB No. 1088/60) and also, from the Royal government of Bhutan, research ethics board of health with ref.no REBH/PO/2017/101. Before proceeding with the study, participants were provided verbal and written information about the study and the researcher obtained written informed consent. Participants' rights to confidentiality and privacy, as well as their ability to withdraw from the study at any time, were protected throughout the study. The interviews were completed within 1-2 hours because of their busy schedule. This study involved only PHC managers who have a responsibility as head of the

organization, units or department and their role based on the principle of PHC. Codes as PHC 1, PHC 2... and PHC 11 were given in place of their identity to maintain their confidentiality and anonymity.

Table 1. Provides a summary of the demographic data from the key informants in this study. the information in a table includes age, gender, education levels, and years of experience in healthcare

Participants	Gender	Age (years)	Education	Work experience (years)
PHC Managers				
PHC 1	Male	43	MBBS, MPH	14
PHC 2	Male	54	Certificate in PHC	33
PHC 3	Male	32	MBBS	5
PHC 4	Male	38	Dip. in nursing and midwifery	14
PHC 5	Male	45	Certificate in PHC	22
PHC 6	Male	47	Certificate in PHC	22
PHC 7	Female	26	Certificate in PHC	4
PHC 8	Male	38	Certificate in PHC	11
PHC9	Female	40	Certificate in PHC	20
PHC10	Male	31	Certificate in PHC	10
PHC11	Male	30	Certificate in PHC	7
SHC 1	Female	32	Bachelor in Science	8
SHC 2	Female	38	Bachelor in Education	14

Results

The respondents described the factors contributing to childhood obesity are related to: i) individual factor, ii) Social Factor, iii). Environmental Factor and iv). Behavioural Factor

i. Individual factors

The individual factor like socioeconomic status is also one of the important determinants of health and wellbeing of child. Children with higher family income has found out more prevalence rate of overweight/obesity. Childhood obesity is caused by both genetic and non-genetic factors.

……I am not sure to say exactly what causes obesity in children. However, one would be a genetic factor. An obese child I shared to you earlier were having both the parents obese… (PHC 3).

***….** These days marketing has reached everywhere right after birth. Time has come that a child has everything to eat like cerlac and formula feeding. I feel obesity is due to giving cerlac (commercial product) at 1-2 months than Breast Feeding. Obesity is also due to family status like being well to do, so children are obese belonging to this family… (PHC 10).*

…. For some, in absence of mother extra feeding like lactogen is given. From this, we let them know if their child is obese that obesity is not good. I feel obesity in children is also due to this kind of situation happening nowadays… (PHC 5)

…...Obesity is mostly in the children whose parents are office goers not in community. Children eat junk foods only. They don't healthy food at home. They visit shops and keep on consuming junks… (PHC6).

…...Children with higher family income has found out more prevalence rate of obesity. The children born to families with high Socio-Economic Status are more likely to be obese as compared to lower Socio-Economic Status…. (PHC 2).

ii. Social factors

Social factors include when children look up to their friends and parents, and other factors to adapt their habits. It also includes an individual cultures and tradition which we usually take up.

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…Mainly like telecommunication facilities like TV, mobile say it one, another is sedentary lifestyles and children whose parents are habited in town are usually they have less time to involve in physical activity, another is they are more engaged in television, screen games, mobile, etc. I see changes in these areas. They are like, they eat more and work less... (PHC 1)

.... I think childhood obesity is also related to poor dietary habits of the mother… (PHC 4).

.... Culture plays an important role in changing the people's attitude towards body image, physical activity and food intake... (PHC 4).

.... Children look up to parents and peers in association with positive cognition about healthy foods and healthier intake…. (PHC 3).

.... Children living in high income neighbourhoods were more likely to be overweight and obese… (PHC 7).

iii. Environmental factors

It can be influenced by the place they live in, school where they spend more duration of time and the community, they live in. At home, the parents have a big role to influence the children food choices and promote healthy life style.

.... Community's lack of accessibility and affordability of healthy food can affect the nutritional status of children. If there are no fast foods outlets in the area, example be in area like school there won't be opportunity for the visits and hence no consumption. As children spend up to 6-8 hours at school…. (PHC 8)

.... School going children are found out to be taking lots of junk foods… with this, parents are having a tough time to bring changes as child asks money while going to school. From this, I have talked to teachers to restrict junk foods in schools…. (PHC 9).

…. We cannot say to stop junk food because we have canteen which sells junks inside the school. Children prefer fast food and convenient for them whenever they feel like eating. Some children do not bring packed lunch to school. Such habits spoil their regular eating habits…. (SHC 1).

iv. Behavioural factors

There are behavioural factors which influence the children's weight gain by eating calorie dense foods, low nutrient foods and beverages without adequate physical activity and get involved in sedentary life styles like television, computers and sleep routine.

.... Rural children are physically active and had less sedentary time than urban children and watching food advertisement was strongly associated to overweight in rural than urban… (PHC 7)

.... They take more of junk food and that particular parent was saying right after he reaches home, he sits in front of the TV and keep on taking junk food without regular meals. At this generation, it has become complacent as lack of exercise, more of technologies... (SHC 2)

.... Junk is available everywhere. I find food habits would be the main contributor. On the other side, he likes to stay indoor watching television and with junks was what shared by mother to me. So, I felt food habits plus physical activity must have caused it… (PHC 11).

Discussion

Summary of main findings

The main aim of this study was to explore and identify the factors contributing to childhood obesity in Bhutan. The perceptions of PHC managers is that Childhood obesity has become public health problem all over the world. It is increasing rapidly day by day. Childhood Obesity is associated with number of factors including genetic and non-genetic factors like environment and other behavioural factors. Prevention of childhood obesity needs to be given a priority considering it's drastic after effects. childhood obesity is a small problem, but the incidence of obesity is rising in Bhutan.

The risk of obesity can be passed from one generation to the next, as a result of behavioural and biological factors. The childhood obesity can have negative effect on health and wellbeing and result in lower levels of academic achievement. The factors associated to childhood obesity summarized its consequences like a child is exposed to risks of many diseases like cardiovascular disease, type 2 diabetes, dyslipidaemia, hypertension, psychological and social morbidity, asthma, orthopaedic,

breathing problems, fatty liver disease, cancers and others. [12].Therefore, the study highlighted the importance of problem of childhood obesity as a public health concern in developing countries, and the development of strategies and polices is necessary. Nevertheless, some of the interventions like taking leadership role and all for all stake holders to recognize the moral responsibility in acting on behalf of the child to reduce the risk of obesity [13].

Limitations

No relevant studies were done in some of the developing countries. The factors associated with childhood obesity from different countries from the studies carried out cannot be applicable to other countries because of the region, socioeconomic status, and the different life styles. It would differ from one region to another. Variation is the common draw back here and the study may be of use for a certain limited time as in future many things could change, relying on material that is likely to be out of date. The clear organizational structure and the need of strong design and excellent statistics would be much more helpful for the improvement of some studies.

Implications of the study

The growing issues of childhood obesity and overweight can be reduced if society focuses on the factors associated with it. It affects the child's physical health, social, and emotional wellbeing and self-esteem. A combined diet and physical activity intervention conducted in the community with the school component is more effective at preventing childhood obesity or overweight. The role of parents especially mother plays an important role in creating healthier environment at home so a child can adapt to the healthier life style. What children learn at home and school about eating healthy and importance of physical activity will have greater influence in their life. Likewise, there are other effective interventions and government policies for the prevention and management of childhood obesity. Hence, focusing on these factors may overtime decrease childhood obesity lead to healthier society as a whole.

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Sociodemographic Determinants of Outcome of Newborn Admission in Federal medical Center Owerri, Nigeria

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Abstract

Introduction: *There has been a global decline in infant mortality without an equivalent decline in newborn mortality. Several studies have investigated the influence of each disease entity on childhood mortality concluding that severity of the disease is a major contributor to outcome. However, only few studies have evaluated the influence of social factors in the outcome of newborn hospitalization. This study aimed to investigate the influence of social and some demographic factors on early neonatal hospital admission.*

Methods*: The study was a descriptive retrospective cross-sectional review of clinical records of 170 newborn admitted in to the Special Care Baby Unit of Federal Medical Centre Owerri form May 2014 – May 2015. Case files of all newborn admitted during this period were reviewed and data collated and analyzed using SPSS version 20. Chi-Squared and Odds Ratio were calculated.*

Results*: a total of 170 newborn were admitted, 10 (6.0%) died while 157 (94.0%) were discharged, the outcome of three admissions were missing. Fathers' education and occupation play significant role in neonatal survival OR 3.23 (1.08- 10.06) p-value 0.04 and OR 6.36 (1.83 – 22.17) p-value 0.004 respectively. Newborn of fathers' and mothers with paid employment had better outcome.*

Conclusion: *This study demonstrated that paid employment is associated with better outcome of newborn admission.*

Keywords*: Newborn Admission, Federal Medical Center Owerri.*

Introduction

The first 28 days of live is the most vulnerable period in a child's life.(1) It has been estimated that about 4 million neonates die annually and majority, 98% of these deaths occur in the developing countries.(1, 2) Neonatal Mortality Rate (NMR) in Nigeria is estimated to be as high as 37 per 1000 live births and constitutes about 54% of infant mortality.(3)

The chances of a newborn in the developing countries dying within the first month of life is about six times higher than the same occurring in developed countries; and over eight times higher in the least developed countries (1). Globally there has been steady decline in infant and Under five mortality rate which tends to mirror economic status of the nation thereby leading to a postulation that these decline in infant and U5MR is due to speedy economic growth. (1,2,4).

Nigeria has implemented Several Strategic interventions including Integrated Management of Childhood Illness (IMCI), Safe motherhood, Baby Friendly Hospital Initiative and many others over so many years to reduce Under Five Mortality Rate U5MR. There was observed decline in U5MR over the years however the rate of decline is slower than expected.(5,6). This persistent high U5MR in Nigeria may be linked to high NMR as is estimated that NMR constitutes 53% of infant mortality in Nigeria. (6) Therefore, U5MR may not improve until NMR is reduced. (6)

While medical conditions and nature of illness are important determinants of neonatal survival there might be other socio-demographic factors that influence neonatal hospital admissions and outcome.

Objective

This study tends to probe into the social and demographic factors that may influence immediate outcome among hospitalized newborn in Owerri Imo State Nigeria.

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Subjects and method

Study setting and design

The study was a retrospective review of the clinical records of all newborn admitted in Special Care Baby Unit (SCBU) of Federal Medical Center Owerri over a one-year period from May 2014 – May 2015.

Data collection and analysis

Using the ward admission register, the list of babies admitted in the ward were generated and their case notes pulled out from the Medical Record department. Using a proforma designed for this study, information on age, place of birth, parental education and other demographic variables were extracted and filled into the proforma. Data was cross checked to eliminate errors.

Data were coded and entered into SPSS version 20. Descriptive and inferential analysis were performed. Mean and standard deviations were calculated for continuous variables, Chi-Square and Odds Ratio were used to test for association between categorical variables, Spearman correlation was done to test the direction and strength of association between variables. A p-value of less than 0.05 was set as the tolerable error margin.

Results

Data from 170 case notes were extracted and some folders had missing variables. One hundred (58.8%) of the subjects were male, 70 (41.2%) were female, 83(48.5%) of mothers and 71 (41.5%) of fathers had tertiary level of education. Majority of parents 104 (66.7%) fathers and 61 (38.1%) mothers were in the informal pay sectors as artisans, traders or self-employed workers. 157 (94.0%) were discharged home while 10 (6.0%) died in the course of admission, all the reviewed patients paid out-of-pocket Table 1.

Table 1. General Characteristics of Research Participants

Variables	**Proportion n(%)**
Gender	
Male	100 (58.8)
Female	70 (41.2)
Place of Birth	
Outborn	86 (51.2)
Inborn	82 (48.8)
Mothers level of Education	
Primary	7 (4.4)
Secondary	68 (43.0)
Tertiary	83 (48.5)
Mothers Occupation	
Student	22 (13.8)
Unemployed	47 (29.4)
Artisan, Trader, Self Employed	61 (38.1)
Civil Servant, Paid Employee	30 (17.5)
Fathers level of Education	
Primary	15 (9.9)
Secondary	66 (43.4
Tertiary	71 (41.5)
Fathers Occupation	
Student	2 (1.3)
Unemployed	3 (1.9)
Artisan, Trader, Driver, Self Employed	104 (66.7)
Civil Servant, Paid Employee	47 (30.1)
Antibiotic Use	
None	9 (5.6)

Ampicillin Based	36 (22.4)
Cephalosporin	108 (67.1)
Both	8 (5.0)
Hospitalization Outcome	
Discharged	157 (94.0)
Died	10 (6.0)
Mode of Payment	
Out-of-pocket	168 (100)

The age at presentation ranged from approximately 1 minute (0.02 hrs) to 5 days (120hrs), gestational age ranged from 23 to 42 weeks and birth weight from 0.50 to 4.5kg as displayed in table 2.

Table 2. Diagnosis within the period

Variables	Min	Max	Mean	STD Dev
Age at presentation (hrs)	0.02	120.00	19.98	28.09
Gestational Age (weeks)	23.00	42.00	36.38	4.13
Birth Weight (kg)	0.50	4.50	3.24	2.10

Perinatal asphyxia and prematurity were the leading cause of newborn admission in the facility contributing 35.4% and 32.3% of all admissions respectively. Jaundice caused 9.4% of cases while the least occurring illness was neonatal meningitis as displayed in figure 1.

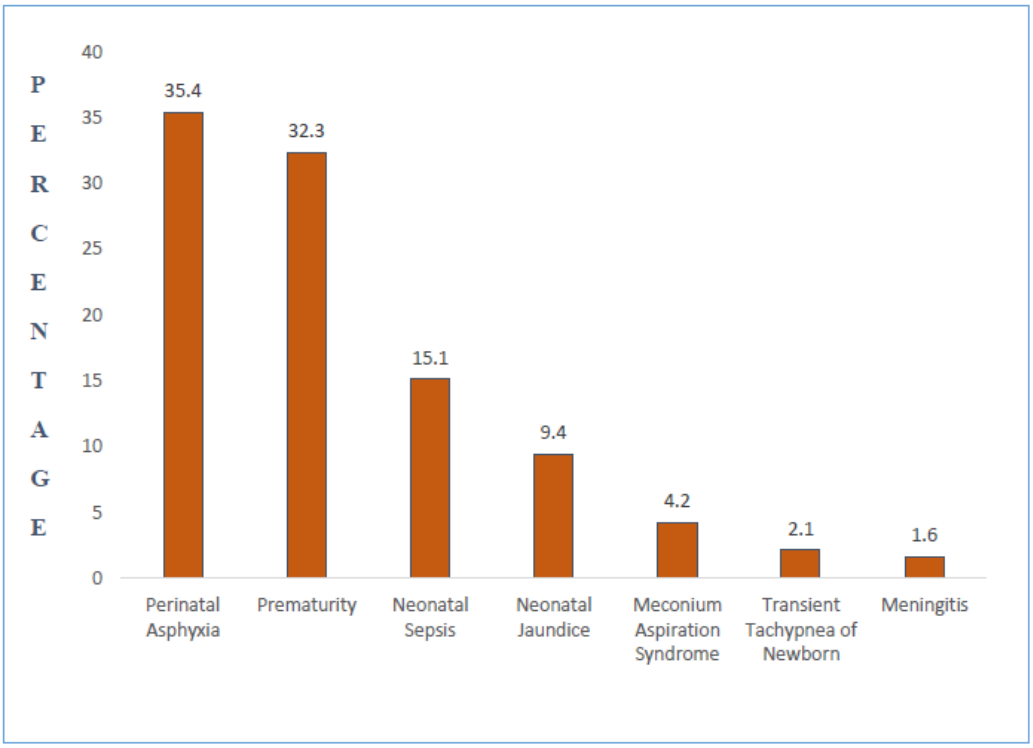


Figure 1. Distribution of Clinical Diagnosis among Participants

All Children (46; 100%) whose Fathers had paid employment survived, 5(5%) of those whose fathers were in the informal sector died. Frequency of neonatal death was highest among neonates whose fathers were unemployed or student 1 (33%) and 1 (50%) respectively p – value 0.016. There was also a significant association between birth weight and outcome. Better survival was observed among neonates of parents (mothers and fathers) with higher level of education but this did not achieve statistically significant level. Proportion of neonatal death was also found to be higher among those who presented more than 1 hour after birth when compare with those who came within 1 hour however this did not achieve statistically significant level p-value 0.50. Gender and place of birth were not significant factors for death or survival in this study as show in table 3 below.

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Table 3. Association between outcome and socio-demographic factors

Variable	Outcome (n/%)		χ^2	OR (95%CI)	p-value
	Died	**Discharged**			
Gender					
Female	5 (7.2)	64 (92.8)	Fisher Exact Test		
Male	5 (5.2)	92 (94.8)		1.44 (0.40-5.17)	0.74
Place of Birth					
Outborn	7 (8.2)	78 (91.8)	Fisher Exact Test	3.45 (0.70-17.16)	0.17
Inborn	2 (2.5)	77 (97.5)			
Mothers' level of Education					
Primary	1 (16.7)	5 (83.3)			
Secondary	4 (6.0)	63 (94.0)	2.49¥	3.15(0.29-33.80)	0.27
Tertiary	2 (2.5)	79 (97.5)			
Mothers' Occupation					
Student	1 (4.5)	21 (95.5)			
Unemployed	2 (6.7)	43 (95.6)			
Artisan, Trader, Self Employed	4 (6.7)	56 (93.3)	3.25¥	1.24(0.56-2.76)	0.59
Civil Servant/ Paid Employee	0	29 (100.0)			
Fathers' Education					
Primary	3 (21.4)	11 (78.6)			
Secondary	2 (3.1)	63 (97.1)	5.87¥	3.23(1.08-10.06)	0.04*
Tertiary	2 (2.9)	67 (97.1)			
Fathers' Occupation					
Student	1 (50.0)	1 (50.0)			
Unemployed	1 (33.3)	2 (66.7)			
Artisan, Trader, Self Employed	5 (5.0)	96 (95.0)	10.37¥	6.36(1.83-22.17)	0.004*
Civil Servant, Paid Employee	0	46 (100.0)			
Birth Weight					
ELBW	2 (100.0)	0			
VLBW	2 (9.1)	20 (90.9)			
LBW	0	48 (100.0)	17.68¥	3.4(1.6-16.70)	0.001*
NORMAL	5 (6.0)	78 (94.0)			
HIGH	1 (9.1)	10 (90.9)			
Time to Admission					
Less than 1 hour	2 (3.8)	51 (96.2)	Fisher	0.52 (0.10- 2.57)	0.50
More than 1 hour	7 (7.1)	92 (92.9)			
Gestational Age					
Preterm	5 (7.8)	59 (92.2)			
Term	2 (2.7)	73 (97.3)	2.94¥	3.4(0.69-16.69)	0.13
Postdate	0	10 (100)			

¥ - Likelihood ratio

* Statistically Significant

There is positive correlation between parental education, income and Hospitalization Outcome however only fathers' occupation achieved statistically significant level. Fathers' occupation can significantly influence the outcome of neonatal admission up to 22% as shown in table 4 below.

Table 4. Spearman Correlation between Fathers' Education/Occupation, Mothers' Education/Occupation and Hospitalization Outcome

Variables	Hospitalization Outcome	
	rho	p-value
Fathers Education (N = 148)	0.15	0.08
Fathers Occupation (N = 152)	0.22	0.007*
Mothers Education (N = 154)	0.12	0.14
Mothers Occupation (N = 156)	0.04	0.60

rho Spearman Correlation Coefficient

Discussions

This study aimed to investigate the sociodemographic contributors to outcome of neonatal hospital admission. It is a well-known fact that the nature of illness and quality of care are the major determinants of neonatal admission. (4,5) The finding from this study shows that perinatal asphyxia, prematurity and neonatal sepsis are the leading cause of hospitalization among newborns. This is in keeping with the report from WHO Health report of 2005. (7).

Case notes of 170 newborn admitted into the newborn unit during the study period were reviewed. Ten (6.0%) of the admitted neonates died while 157 (94.0%) were discharged home. More deaths occurred among outborns and those who presented more than 1 hour after delivery than among inborn patients and those who presented within 1 hour after delivery. Variation in skill mix and time to quality intervention could be the cause of this observed difference.

Neonatal deaths were more common among parents with lower educational status. It was found to be 16.7% among babies born to mothers with primary education and 2.5% among babies of mothers with tertiary education. Similarly, it was found to be higher when the father had only primary education 21.4% compared to 2.9% when father had tertiary education. Fathers' education achieved a significant level while mothers' education did not. This is similar to findings by Shah et.al where maternal education played a significant role in contributing to neonatal death. (8)

A key finding from this study is that fathers' occupation and education were significant factor to neonatal survival. Neonatal mortality was also found to decrease as maternal education increased, also neonatal death was lower among mother and fathers with paid employment (formal sector) when compared to those the informal sectors. This is similar to finding by Oyabanmi et.al where women in civil services and those with higher education had better awareness and perception of Pentavalent Vaccines and immunization. (9) The African culture where men are the major decision makers could play a role; as such educated male are more likely to make better health choices. The influence of occupation could be explained by the fact that paid employees are relatively certain of the amount and time of the next income and as such are more likely to present at the hospital earlier than the person in the informal sector. Organized nature of the work environment in the formal sector might also influence the thought, behavioral and response habit of the people. This is similar to the research by Karasek which suggested that the impact of the workplace on employee health and wellbeing demonstrates that the sense of control employees have over their work, along with the demands of the workplace, combine to affect the likelihood of job strain and subsequently the likelihood of workplace stress.(10) These postulations could have interacted in a complex manner to lead to a better neonatal outcome among educated parents and those in paid employment. Mode of payment might not be the determining factor in this context as most of the subjects paid Out-of-Pocket. However, this is not to undermine the importance of health insurance policy in improving health indices.

Birth weight was also found to be major factor in neonatal death. Mortality was highest among the extreme low birth weight neonates. This is in line with the well-known fact that lower birth weight carries a major risk of morbidity and mortality. Mortality was 100% in extreme low birth weight while equal proportion of death was recorded among very low birth weight and high birth weight neonates. This indicated that the relationship between birth weight and neonatal mortality might not direct but a parabola. From this study it could be postulated that high birth weight and very low birth weight carry similar risk higher risk of neonatal death which is higher than low or normal birth weight.

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Conclusion

Perinatal asphyxia is the leading cause of death among neonates followed by prematurity and neonatal sepsis. Neonatal death is lower among fathers as well as mothers with higher education. Individuals with paid employment recorded lower rate of neonatal death.

Therefore, policies that improve both boys' education is as important as girls' education in improving neonatal survival. An organized system that accommodates more people into the formal employment sector will improve overall neonatal outcome.

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Predictors of Treatment Outcomes among Tuberculosis Patients Treated in Specialist hospital, Sokoto State, Nigeria

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Abstract

Background: *Tuberculosis (TB) is one of the top 10 causes of death worldwide, and the leading cause from a single infectious agent (above HIV/AIDS). Globally, 10.0 million people developed TB disease in 2017 with an estimated 1.6 million deaths. We conducted this study to determine predictors of treatment outcomes among tuberculosis patients treated at specialist hospital, Sokoto State, Nigeria.*

Methods*: A retrospective cohort study was conducted using medical record of 1501 patients treated of tuberculosis between January, 2014 and January, 2017. Treatment outcomes and TB cases were classified according to National TB control program guidelines. Bivariate and multivariate analysis was conducted to identify predictors of unsuccessful treatment outcomes. Odds ratio (OR) and 95% confidence interval (CI) was calculated. P- value of 0.05 was considered as statistically significant.*

Result: *Of the 1,501 patients treated; 72.2% were males with mean age of 36.5 ±14.9 years. Pulmonary TB accounts for 1,143 (76.2%) cases. A total of 174 (11.6%) were co-infected with HIV. successful outcomes accounts for 1,229 (81.9%) cases. Previously treated cases 89 (5.9%). Of the cases, 44 (2.9%) died. Being previously treated (P < 0.001) and co-infection with HIV(p<0.001) are independent predictors of poor treatment outcomes.*

Conclusion: *The treatment success rate was low as compared to the national target. Therefore, targeted interventions of high-risk patients are recommended.*

Keywords: *Tuberculosis, Treatment outcomes, DOT, Sokoto.*

Introduction

Tuberculosis (TB) remains a major global health problem and the leading cause of death from a single infectious agent in 2017 (WHO G*lobal report*, 2018).). In 2017, TB caused an estimated 1.3 million deaths (range, 1.2–1.4 million) among HIV-negative people and there were an additional 300 000 deaths from TB (range, 266 000–335 000) among HIV-positive people. Globally, 10.0 million people (range, 9.0–11.1 million) developed TB disease in 2017. Eight countries accounted for 66% of the new cases; India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa. The severity of national epidemics varies widely among countries. In 2017, there were fewer than 10 new cases per 100 000 populations in most high-income countries, 150–400 in most of the 30 high TB burden countries, and above 500 in a few countries including Mozambique, the Philippines and South Africa (Tuberculosis, 2018).

Nigeria is among the 30 TB high burden countries with incidence of 418/100,000 population as at 2017. (WHO, 2016).

Effective tuberculosis (TB) treatment has been shown to have a significant effect on the control of TB. Directly Observed Treatment Short-course (DOTS) strategy has been used as internationally recommended strategy since 1994 by World Health Organization (WHO) under the stop TB strategy component as it prevents patients from interrupting their treatment and ensures they adhere to the treatment for the expected duration (Tafess et al., 2018). The goal of the Directly Observed Treatment Short Course (DOTS) programme is to cure at least 85% of new smear-positive patients and to detect at least 70% of new smear-positive cases. Some studies conducted in Nigeria by (A. Fatiregun, Ojo, & Bamgboye, 2009) and (Ofoegbu & Odume, 2015) all reported high unfavourable treatment outcomes (Treatment failure, default, Death, and transferred out).

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Detecting and successfully treating a large proportion of TB cases would have an immediate impact on TB prevalence and mortality. Poor treatment outcome has serious public health consequences especially continuous infectivity and development of MDR-TB. Risk factors for unfavourable treatment outcomes have been reported to include socio-economic factors (age, sex, employment and education) (Malede, Shibabaw, Hailemeskel, Belay, & Asrade, 2015), patient factors (diabetes mellitus, smoking, and having co-infection with HIV) (Johnson et al., 2016), disease factors (history of multiple disease treatment, and health care system factors, attending health centres, hospital referrals) (Yen, Yen, Shih, & Deng, 2012) and (Choi et al., 2014).

Determination of factors that are associated with unfavorable treatment outcomes are good opportunity to identify potential obstacles to achieving TB control and to the best of our knowledge treatment outcomes of TB patients and its associated risk factors leading to unsuccessful outcome has not been assessed at Specialist hospital, Sokoto. In this study, we assess treatment outcomes and identify predictors of unsuccessful treatment outcomes among tuberculosis patients treated at specialist hospital, Sokoto State, Nigeria.

Methods

Study design, population

A retrospective hospital-based cohort study was conducted. The study included all TB patients who were registered and commenced TB treatment for the past four years (January 1st, 2014 – December 31st, 2017) at Specialist hospital Sokoto. The Specialist hospital is a tertiary hospital in Sokoto State.

Sources of data and method of data collection

The TB treatment register and hospital patient folders were the primary sources of data in this study. Data was collected retrospectively by trained health professionals using structured checklist. Data collected included; patients` socio-demographic characteristics, TB history (new or previous history of TB), TB type, HIV status, drug resistance and treatment outcome of the patient.

We trained the data collectors and pretested the questionnaires to ensure quality in the data collection. Also, the data collectors were closely supervised to further ensure quality in the data.

Operational definitions

Treatment outcomes definitions were based on standard definitions of National Tuberculosis and Leprosy control program (“FEDERAL MINISTRY OF HEALTH DEPARTMENT OF PUBLIC HEALTH,” n.d.) and WHO guidelines (“Treatment of tuberculosis,” n.d.) as follows: cured (a pulmonary TB patient, who was bacteriologically confirmed by acid-fast bacilli (AFB) microscopy at the beginning of treatment, becomes AFB smear negative or culture-negative in the last month of treatment completion and on at least one previous occasion), Treatment completed (any patient who was smear-positive at diagnosis and who completed treatment but in whom smear examination results are not available at the end of treatment. And all smear-negative and extra-pulmonary patients who completed treatment), Treatment failure (any patient who remains or becomes smear positive again at the end of fifth month or later during chemotherapy), died (any patient who dies for any reason during the course of his/her chemotherapy), Defaulter (any patient who has interrupted for 8 consecutive weeks or more after the date of the last attendance during the course of treatment), transferred-out (a patient who transferred to another reporting unit and for whom treatment outcome is unknown). A patient whose final outcome was either cured or completed treatment had a ‘‘successful outcome’’ while any other outcome was classified as ‘‘unsuccessful’’.

Ethical considerations

Ethical clearance was obtained from ethics and research committee of Specialist Hospital, Sokoto, Nigeria.

Statistical analysis

Data was analyzed using IBM SPSS version 25 for windows. Categorical (such as sex, tribe) and numeric (such as age) variables were summarized using frequencies, percentages, means and standard

deviations accordingly. Univariate and multivariate logistic regression analyses with a confidence level of 95% was performed. Additionally, adjusted odds ratios with their 95% confidence intervals and independent variables with p-value of 0.05 were considered to be predictors of poor treatment outcomes in this study.

Results

A total of 1,501 TB patients were treated, of those treated; 72.2% were males with mean (standard deviation) age of 36.5 (±14.9) years. Majority of cases 410 (27.2%) belong to the age group 20 – 29 years. Ninety-three (11.05%) of the study population had no formal education, while 413 (49.1%) and 223 (26.5%) had secondary and tertiary education respectively. Of the total TB cases treated; 89 (5.9%) were previously treated. Pulmonary TB accounts for 1,143 (76.2%) of cases. TB/HIV co-infection was found in 174 (11.6%) of cases (Table 1).

Table 1. Sociodemographic and clinical characteristics of tb patients treated at specialist hospital, sokoto, nigeria

Characteristics	**Frequency**	**Percent (%)**
Age group (years)		
<10	11	0.73
10-19	124	8.26
20-29	410	27.32
30-39	389	25.92
40-49	246	16.39
50-59	169	11.26
60+yrs	152	10.13
Sex		
Male	1069	71.22
Female	432	28.78
Marital status		
Single	680	45.30
Married	793	52.83
Divorced/separated	28	1.87
Educational level		
No formal education	93	11.05
Primary	113	13.42
Secondary	413	49.05
Tertiary	223	26.48
Tuberculosis Type		
Extra pulmonary	358	23.85
Smear-negative	185	12.33
Smear-positive	958	63.82

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Table 2. Sociodemographic and clinical characteristics of TB patients treated at specialist hospital, sokoto, nigeria

Characteristics	Frequency	Percent (%)
Culture		
Negative	1022	68.09
Positive	479	31.91
Treatment category		
New	1412	94.07
Previously-treated	89	5.93
HIV Status		
Negative	1326	88.40
Positive	174	11.60
Cavity on radiography		
No	750	96.15
Yes	30	3.85
Drug resistance		
No	757	99.74
Yes	2	0.26

Of all the cases; 1,229 (81.9%) had successful outcomes. One hundred and seventy-nine (11.9%) had treatment default, 8 (0.5%) had treatment failure, 41 (2.7%) were transferred-out while 44 (2.9%) died (Table 3).

Table 3. Treatment outcomes of TB patients by age group, sex and HIV status, at Specialist Hospital, Sokoto, Nigeria

Characteristic	Cured (%) (n=412)	Treatment completed (%) (n=817)	Treatment failure (%) (n=8)	Death (%) (n=44)	Default (%) (n=179)	Transferred-out (%) (n=41)
Age group (yrs)						
< 19	34 (8.3)	84 (10.3)	0	1 (2.3)	15 (8.4)	1 (2.4)
20 -29	132 (32.0)	213 (26.1)	1 (12.5)	9 (20.5)	46 (25.7)	9 (22.0)
30 -39	101 (24.5)	208 (25.5)	2 (25.0)	9 (20.5)	57 (31.8)	12 (29.3)
40 -49	68 (16.5)	122 (14.9)	3 (37.5)	15 (34.1)	27 (15.1)	11 (26.9)
50 - 59	50 (12.1)	90 (11.0)	1 (12.5)	6 (13.6)	19 (10.6)	3 (7.3)
60+yrs	27 (6.6)	100 ((12.2)	1 (12.5)	4 (9.1)	15 (8.4)	5 (12.2)
Sex						
Female	108 (26.2)	253 (31.0)	3 (37.5)	14 (31.8)	46 (25.7)	7 (17.1)
Male	304 73.8)	561 (68.7)	5 (62.5)	30 (68.2)	133 (74.3)	34 (82.9)
HIV Status						
Negative	393 (95.4)	786 (96.2)	1 (12.5)	14 (31.8)	117 (65.4)	16 (39.0)

Positive	20 (4.9)	30 (3.7)	7 (87.5)	30 (68.2)	62 (34.6)	25 (61.0)

Patients treated with pulmonary TB were found to have statistically significant association with unsuccessful outcome (P<0.05), similarly, being previously treated, TB location (pulmonary TB), and co-infection with HIV(P<0.05) were significant risk factors for unsuccessful treatment outcomes, While Negative HIV status was protective for unsuccessful outcomes. However, age group, sex, educational level and presence of cavity on radiography were not associated with unsuccessful treatment outcomes (Table 4).

Table 4. Bivariate analysis of some factors that are associated with poor successful treatment outcome at Specialist Hospital, Sokoto, Nigeria

Variable	**Unsuccessful outcome**	**Successful outcome**	**OR (95% C.I)**	**P value**
Age group (yrs):				
< 40	162 (59.56)	772 (62.82)	0.87 (0.67 – 1.14)	0.32
≥ 40	110 (40.44)	457 (37.18)		
Sex:				
Female	64 (24.9)	367 (29.6)	0.79 (0.58 – 1.07)	0.22
Male	193 (75.1)	874 (70.4)		
Educational level				
No formal education	23 (11.1)	70 (11.0)	1.01 (0.61 – 1.66)	0.97
Formal education	184 (88.9)	565 (89.0)		
TB Location				
Pulmonary	220 (80.88)	923 (75.10)	1.40 (1.01 – 1.94)	0.04
Extra-pulmonary	52 (19.12)	306 (24.90)		
Treatment category				
New	215 (79.04)	1197 (97.40)	0.10 (0.06 – 0.16)	<0.001
Previously-treated	57 (20.96)	32 (2.60)		
HIV Status				
Negative	148 (54.41)	1178 (95.93)	0.05 (0.04 – 0.07)	<0.001
Positive	124 (45.59)	50 (4.07)		
Cavity on radiography				
No	259 (97.74)	491 (95.34)	2.11 (0.85 – 5.23)	0.09
Yes	6 (2.26)	24 (4.66)		
Culture				
Positive	44 (16.18)	435 (35.39)	0.35 (0.25 – 0.50)	<0.001
Negative	228 (83.82)	794 (81.88)		

However, multivariate logistics regression output showed that, being previously treated (aOR 0.10, 95% C.I 0.46 – 0.23, P<0.001) and co-infection with HIV (aOR 9.6, 95% C.I 5.90 – 15.41, P<0.001) were the only independent predictors of unsuccessful treatment outcomes (Table 4).

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Table 5. Logistic regression of factors associated with unsuccessful treatment outcome at Specialist Hospital, Sokoto, Nigeria

Variable	Adjusted OR	95% C. I	P-Value
Age group < 40 yrs	1.21	0.81 – 1.83	0.35
Female Sex	0.86	0.55 – 1.35	0.52
No formal education	0.63	0.33 – 1.22	0.17
Pulmonary TB	1.25	0.74 – 2.11	0.40
Positive culture	0.86	0.51 – 1.45	0.58
Positive HIV status	9.6	5.90 – 15.41	**<0.001**
Previously-treated	0.10	0.46 – 0.23	**<0.001**
Cavity on radiography	0.46	0.14 – 1.40	0.16

Discussion

We found that treatment success rate for TB patients was 81.9%. Being previously treated and TB/HIV co-infection were identified as independent predictors of unsuccessful treatment outcome. The overall default rate was 11.9% while mortality rate was 2.9%. The prevalence of HIV co-infection among TB patients in this study was 11.6%.

The overall treatment success rate reported in this study was higher that than reported in a similar studies conducted in Zimbabwe (43.3%) by (Gabida et al., 2015), Northwest Ethiopia (26%) by (Biadglegne et al., 2013), in Tertiary health center of Southwestern Nigeria (46.1%) by (Babatunde et al., 2013) and in National Hospital Abuja (78.5%) by (Ofoegbu & Odume, 2015). Moreover, studies conducted in Yaoundé, Cameroun and Enugu, Nigeria also revealed treatment success rate of 68.4% and 73,7% (Malede et al., 2015) and (Aniwada, Onodugo, Onwasigwe, & Ajayi, 2018) respectively, which is lower than the present study. However, the reported treatment success rate was lower as compared to that reported in Turkey (92.6%) by (Sengul et al., 2015) and in Kola Dibba Health center of North west Ethiopia (85.5%) by (Yakob, Alemseged, Paulos, & Badacho, 2018). On the other hand, our finding is close to 81.5%, 81%, and 83.0% reported in Ethiopia, South India, and Uzbekistan by (Yakob et al., 2018), (Santha et al., 2002) and (Gadoev et al., 2015) respectively. The observed differences in treatment success rate could be due to differences in study settings, sample size, and study period, additionally, our study found high default rate compared to other studies.

Treatment default is one of the major contributor for unsuccessful treatment outcomes (Ifebunandu & Ukwaja, 2012). The default rate constitutes the major population of unsuccessful outcomes in this study. The default rate reported in this study was higher compared to some studies conducted in Northeast Ethiopia, Uzbekistan, and Nigeria (3.0 – 10.6%) by (Malede et al., 2015)(Daniel Tarekegne et al., 2014)(Gadoev et al., 2015)(Oshi, Oshi, Alobu, & Ukwaja, 2014). However, our reported default rate was lower than that reported by (Babatunde et al., 2013) and (Liew et al., 2015) 66.7% and 25.0% in Southwest Nigeria and Malaysia respectively. In order to reduce default rate among tuberculosis patients, there is need to intensify counselling and health education, home visits and motivation of TB patients.

The mortality rate reported in this study was 2.9% and this was lower than 25.0% and 5.8% reported in South west and south east Nigeria respectively by (Babatunde et al., 2013) and (Oshi et al., 2014). Similarly, the mortality rate recorded in the current study was lower compared to other values recorded in some studies in African countries by (Gadoev et al., 2015; Gebrezgabiher et al., 2016; Teshome Kefale & Anagaw, 2017). However, the mortality rate recorded in this study was higher than that reported in some studies conducted in Nigeria by (A. A. Fatiregun, Ojo, & Bamgboye, 2009; Ofoegbu & Odume, 2015). The identification of risk factors associated with mortality will help in prioritizing cases for surveillance and management of TB patients. Pulmonary TB and patients with positive culture were found to be associated with unsuccessful treatment outcome, even though after controlling for confounders, TB/HIV co-infection and previous treatment for TB were the only independent predictors for unsuccessful treatment outcome in this study. This is consistent with study findings by (El-Shabrawy & El-Shafei, 2017), (Santha et al., 2002), (Atif et al., 2018) and (Oshi et al., 2014). This emphasizes the

need for further research for the presence of drug resistant TB among all previously treated cases that is associated with treatment failure and to treat them based on drug susceptibility testing.

HIV is a well-known risk factor for progression to active TB among those infected with Mycobacterium tuberculosis (Lawn, 2009). In this study, the proportion of HIV co-infection among TB patients is 11.6% and this is less compared to co-infection rate reported at National Hospital Abuja, Nigeria (42.7%) and in Northeast Ethiopia (40.4%) by (Ofoegbu & Odume, 2015) and (Belay, Bjune, & Abebe, 2015) respectively. Similarly, our reported TB?HIV co-infection rate was less than what was reported in Addis Ababa, Ethiopia (24.5%) by (Denegetu & Dolamo, 2014) as well as 22.1% and 32.1% by (Deribew et al., 2010) and (Yadeta, Alemseged, & Biadgilign, 2013) respectively. However, our reported TB/HIV co-infection rate is higher than 9.6% reported in North Central Nigeria by (Agbaji, Ebonyi, Meloni, Anejo-Okopi, & Akanbi, 2013). HIV-positive individuals are at greater risk of acquiring opportunistic infections such as TB, and treatment for co-infected patients is complicated by interactions between prescribed drugs. TB/HIV co-infection and previous treatment for TB were the only independent predictors for unsuccessful treatment outcome in this study.

This study, is not without limitations, first, since it is hospital-based study, the findings cannot be generalized to the wider population. Second, the retrospective nature of this study is another limitation, it is impossible to prospectively access some patients` clinical variables and information that were missing in patients' folders. Efforts was made to get some missing data variable through phone calls.

Conclusion

This study revealed that previous treatment for TB and co-infection with HIV are independent predictors of unsuccessful outcomes. These factors may be used in resource-limited settings and for institution/implementation of early intervention.

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A Critical Assessment on the Need for Integrating Alternative Birth Attendant into Prevention of Mother to Child Transmission of HIV (PMTCT) Programme in Ekiti State, Nigeria

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Abstract

Background: The 2014 National ANC Sero-prevalence Survey result for Ekiti State, Nigeria recorded HIV prevalence rate of 2.9% for the state, yet the uptake of PMTCT services was found to be low despite the availability of services even in the remotest local government area in the State. This survey investigated factors influencing the low patronage of government facilities and the possibility of integrating TBA/MBA into the PMTCT programme in the state.

Methods: Study conducted in the sixteen local Government area of Ekiti State. The sample size was 160 women of reproductive age (18-48) years of age, 35 ABH, and their clients (122), research period of 12 months. The instruments used were questionnaire, unstructured personal interviews and documentary reports. Data were collected and analysed by the use of Statistical Package for Social Sciences (SPSS 20) Software.

Results: Of the 16 LGAs in Ekiti State, 14 participated in the survey. Reasons for patronizing TBA/MBA are spiritual assistance 40%, Low bills 10%, Church influence 5.5%, availability 3.4%, personal relationship 7.6%, and other minor reasons. Less than 45%", 32% of the respondents have very low knowledge of HIV; its mode of transmission and prevention, and 32% also score above 79% (Very good knowledge).

76% of the respondents have linkage system with the Government health facilities, while 24% respondents (24%) said NO.

Conclusions: This study showed that integrating TBA/MBA in health care service can be very effective in promoting PMTCT in Nigeria.

Keywords: *Alternative birth Attendants, HIV, PMTCT, TBA, MBA, Government facilities.*

Introduction

Every year, approximately 600,000 women die of pregnancy-related causes.1 Ninety- eight percent of these deaths occur in developing countries, and for every woman who dies, at least 30 others suffer injuries and, often, permanent disability Donna, (2000). Since the adoption of the primary health care approach in Nigeria in 1979, the three tiers of government (federal, state and local government levels) have accepted the idea of the need to integrate TBAs into PHC system and have consequently initiated TBAs training programmes, (Fatusi and Abioye-Ketuyi 1997). A TBA has been defined by United Nations as a person who assists mothers during childbirth and initially acquired her skills by delivering babies herself or through apprenticeship to other TBAs (WHO, 1992). TBAs presently deliver the majority of women in Nigeria as in other developing countries. (Fatusi and Abioye-Ketuyi 1997). It is estimated that between 60 and 80% of all deliveries in the developing countries occur outside modern health care facilities, with a significant proportion of this attended to by TBAs (WHO, 1992). Elimination of vertical transmission of HIV is a global priority, yet interventions still face diverse challenges in the country. It is estimated that 15% of eligible women only found to be enrolled into prevention of Mother to Child Transmission (PMTCT) of HIV program in Ekiti State, Nigeria. Household inequalities and access to resources remains a determinant factor for women choice for a place of birth.

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Rationale

The 2014 National ANC Sero-prevalence Survey result for Ekiti State, Nigeria recorded HIV prevalence rate of 2.9% for the state yet the uptake of Prevention of Mother to Child Transmission of HIV (PMTCT) services was found to be low despite the availability of services even in the remotest local government area in the State. Donor partners who activated and supported 34 of the PMTCT facilities threatened to discontinue support in terms of drug supply, sample collection etc. in about five (5) of them for a start due to low service uptake and decided to link the five facilities to other facilities in the urban and sub-urban areas where the few HIV positive mothers found would be linked for service uptake for cost effectiveness.

General and specific objectives of the study

The purpose of this study is to ascertain the extent to which Alternative Birth Attendants (TBAs and MBAs) are patronized in Ekiti State, as well as factors responsible for such in one part and reasons for low patronage of pregnant women attending Antenatal Care to complete PMTCT programme in the State. The survey also intends to emphasize the need to integrate Alternative Birth Attendants into PMTCT in Ekiti State to achieve a zero level of vertical transmission.

The specific objectives of the study were to:

1. Conduct statistical Analysis of patronage of alternative birth places in Ekiti State.
2. Determine factors influencing the choice of birth place among women of reproductive age
3. Determine TBAs/MBAs Staff capacities and professional skills in maternal care.
4. Determine level of knowledge of TBA/MBA owners on HIV/AIDS
5. Identify and examine the extent of Linkage and partnership of TBAs/MBAs with Government Health Facilities in the referral process for the promotion of antenatal clinic and PMTCT services in Ekiti State.

Literature review

History of traditional attendants (TBAS)

Traditional Birth Attendants (TBAs) is as old as human race operating in an informal setting; TBA is also known as Traditional midwife, Community Midwife or lay midwife. The traditional birth attendants predate colonialism in Africa, they provide the majority of primary maternity care in many developing countries, and may function within specific communities in developed countries (Isichei, and Ammann, 2015).

Traditional birth attendant provide basic health care, support and advice during and after pregnancy and childbirth, based primarily on experience and knowledge acquired informally through the traditions and practices of the communities where they originated (Inegbenebor, 2014) They often learn their trade through apprenticeship or are self-taught in many developing countries of the world; one of the criteria for being accepted as TBAs by clients is experience as a mother (Harrison, 2011). They usually work in rural, remote and other medically underserved areas. TBAs may not receive formal education and training in health care provision and there are no specific professional requisites such as certification or licensure. In recent times,

TBAs socio-demographic characteristics and focus of work

Traditional birth Attendants are often older women who are well respected in their communities with only a small percentage being males, in some communities in the South Western region of Nigeria, the men provided background support particularly in preparation and administration traditional medicine. Men TBAs are also herbalists or other traditional healers (Sareminetol *et al.*, 2016). They considered themselves as private health care practitioners whose service only required on requests. In the past, entry into traditional medical practice was through long period of apprenticeship or through inheritance or a hobby as a form of service to the community with low or no financial expectation from their clients (Bukar, and Jauro, 2013). Health services were administered by illiterate and old people could not document and therefore lost most of their medical knowledge.

The reality of indigenous alternate birth attendants within medical sub-system in nigeria

TBASs may not have any formal training on how to attend to pregnant women or ailing women. Many are highly experienced in women care including how to recognize and respond appropriately to complications of pregnancy Zuluaga etal, 2016. They sometimes serve as a bridge between the community and the formal health system as a panacea in the effect of poverty, non-availability of health services and weak institutional support experienced in most developing countries. TBAs are often thought of as the bridge between formal healthcare and cultural methods. Balogun, M.; and Odeyemi, K.; (2010); and Agbo, M.A.E. (2013) reported that TBAs provide a broad range of reproductive health services including antenatal care, labor and delivery, infertility treatment, and management of threatened abortion. Ofili and Orojie (2005) In a study conducted amongst the users of these services, 74.7 % were satisfied with their services. Ebuehi and Akintujoye, (2012) reported Reasons individuals prefer TBA services were due to greater accessibility, better relationships, lower cost, convenience, and freedom to use traditional birthing positions. Though no valid statistics available on the TBAs population in Nigeria, their age, sex distribution and years of experience yet they were found to be spatially distributed in communities of their residence most especially in the rural communities.

Dynamics of changing structure and emerging trends in traditional midwifery in nigeria

Traditional midwifery in Nigeria has come a long way; most families believe and rely upon the services of the traditional midwifery for the delivery of their unborn babies and also for the relief of physical illness as well as psychological and spiritual comfort (Ekanem *et al.*, 2006). Over the years, their success is enhanced by their understanding of the personal, social, cultural, economic and political conditions of the individuals, families and communities (Roan, 1999). To many Nigerian, therefore, traditional birth delivery services are indispensable as it is more accessible, cheaper and more holistic than the modern health service (Nduka, and Nduka, (2014).

Traditional midwifery as an integral part of traditional medicine represents a natural form of health care which has been used through generations. According to the World Health Organization (WHO, 2015) traditional medicine is the sum total of all knowledge and practices whether explicable of not used in the diagnosis, prevention and elimination of physical mental imbalance but relying exclusively on practical experience and observation down from generation to generation whether verbally or in writing.

Methodology of study

Study area

This study was conducted in the sixteen local Government area of Ekiti State, Nigeria. Ekiti State, called the “Fountain of Knowledge” is one of the 36 states of the Federal Republic of Nigeria. Although Ekiti State is the smallest state in the country in terms of landmass, the National Population Commission (NPC) put the 2006 provisional census figure for the state as 2,300,000 out of the total national figure of 140 million. Ekiti state is an agrarian society and characterised by increased proliferation of low-income earners. The state is estimated entirely within the tropics with the coordinate $7^0$40’N $5^0$15’E / 7.667^{0}N5. 250’E (NPC, 2016).

Study population

The survey was carried out with mapping of Alternative Birth Places in the State. 160 women of Reproductive age (18-48) years of age and 35 Faith Based Birth Home or Mission Birth Place (MBH) owners and their clients (122) in four communities of each of the 16 Local Government in the State were targeted for the study.

Study duration

The research study, which lasted for one year, began with Research design, Instrument test and validation in February 2018 and came to a close February 2019 with report presentation. The second part of the project is devoted to Monitoring, Evaluation and Sustainability of the programme.

Sampling method

The purpose of this study was to access the various Alternative Birth Places and the level of patronage by Women of Reproductive age to underlying critical interventions such as strengthening linkages and

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referral systems between traditional alternative birthplaces and health care facilities for increase in the uptake of PMTCT services.

In carrying out this study, the instruments used for research investigation are:

- Questionnaire, Unstructured Personal Interviews and Documentary Reports.

Collection of data

In the process of gathering data, open and closed ended questionnaire which allow the respondents to write freely on the research topic were used. The questionnaire was for the women of Reproductive age (18-48 years of age). It focuses on general information on the choice of Birth place among women of Reproductive age:

- Social and Demographic information about the respondents
- Analysis of preferences of women of Reproductive age among Alternative Birth Places across the LGAs.
- Analysis of factors influencing the choice of birthplace among women of Reproductive age.

The second questionnaire was designed for TBAs and MBAs owners. This focuses on analyzing the capacities of the TBA and MBA owners in terms of this professional skills and competence. It also evaluates their knowledge level on the basic transmission mechanisms and prevention methods of HIV and the level of synergy existing between the TBAs/MBAs and the various government health facilities around them.

Data analysis

Data collected was analyzed using the Statistical Package for Social Sciences (SPSS 20) and the Epi-Info 7 Software. All data collected were presented and analyzed under the following major ideas:

- Distribution of women of reproductive age by LGA/Regions
- Age distribution of women of reproductive age
- Respondent Birth Places
- Distribution of Birth Places by educational level
- Reasons for the preference of TBAs/MBAs above Government Health Facilities
- Distribution of TBAs/MBAs by LGA/Regions
- Distribution of TBAs/MBAs by age
- Average of deliveries and staff capacities of TBAs/MBAs
- Level of professional skills of TBAs/MBAs by region
- TBAs/MBAs owners' knowledge of HIV/AIDS
- Distribution of TBAs/MBAs partnership and linkage with Government Health Facilities.

The person product moment coefficient of correction would be used. In expressing the adequacy or inadequacy of every facilities material, percentage would be used.

Observations and findings

Part A: TBA/MBA patronage by the Women of Reproductive age

Section 1: Social and Demographic information

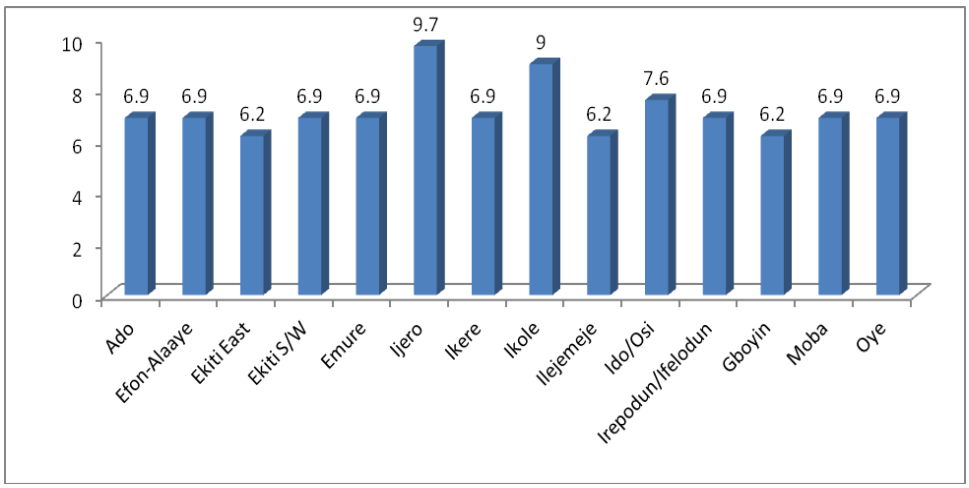


Figure1. Distribution of Respondents by LGA

Figure 1 above shows the distribution of respondents by LGA. Out of the 16 LGAs in Ekiti State, 14 participated in the survey. It could be deduced that Ijero has the highest representation in the survey with about 9.7% respondent, followed by Ikole (9%) and Ido/Osi (7.6%). Others were about 6% representations.

Table 1. Distribution of respondents by region

Regions	Urban	Sub-Urban	Rural
Percentage	27.6	24.8	47.6

It could be seen from the table1 above that majority of the respondents reside in the rural communities in Oye, Moba, Ilejemeje, and Emure. About 27 percent of the respondents reside in communities in Ado, Ikere, efon-Alaaye, Ekiti East and Ekiti West. Others (about 25 percent) are located in the sub-urban centres of Ido/Osi, Gboyin and Ikole LGAs among others.

Table 2. Descriptive Statistics of number of births by respondent and deliveries in TBA/MBA

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Number of children born by respondent	144	8.00	.00	8.00	2.6181	1.77392	.611	.202
Number of children born in either TBA or MBA	145	7.00	.00	7.00	1.1172	1.70987	1.590	.201
Valid N (list wise)	144							

It is seen from the table that the respondents had an average of two (2) children each. This suggests that each of the respondents must have at least given birth twice irrespective of the birth place. Similarly, it could be deduced that at least a child was delivered at TBA/MBA.

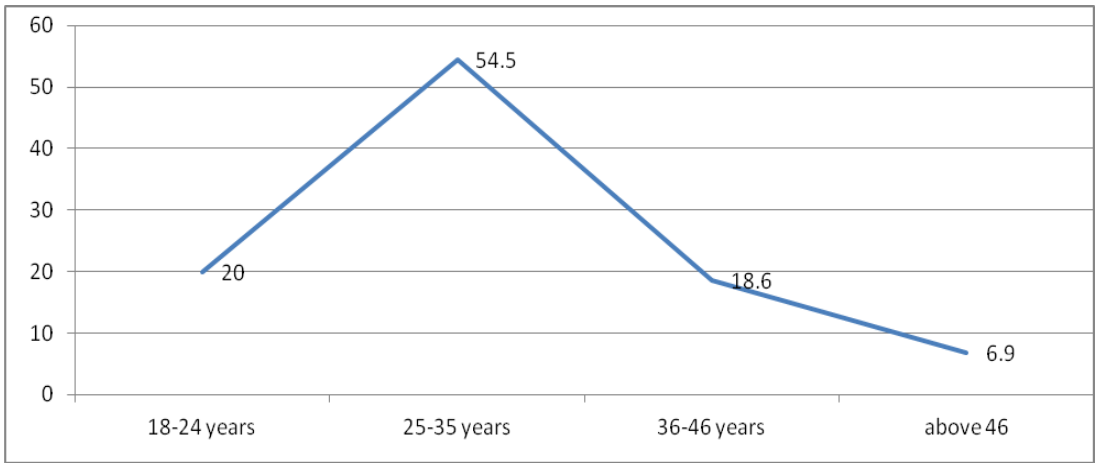


Figure 2. Age distribution of Respondent

Considering the distribution of respondents according to their age brackets across the LGAs, it was observed that majority (about 54 percent) of the women fall within the age bracket of 25-35 years, and about 7 percent are above 46 years.

Table 3. Respondents educational attainment

Educational level	No Education	Primary	Secondary	Tertiary	Others
Percentage	5.5	15.2	42.1	33.8	2.1

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The table 3 above shows the distribution of educational qualifications of the women of reproductive age who participated in the survey. It reveals that about 5 percent of the respondents did not have any form of formal education, 15 percent for Primary school, while majority (42.1%) of them stopped at secondary school. This is followed by those who had tertiary education (33.8%).

Section 2: Analysis of preferences of women of reproductive among alternative birth places across the LGAs

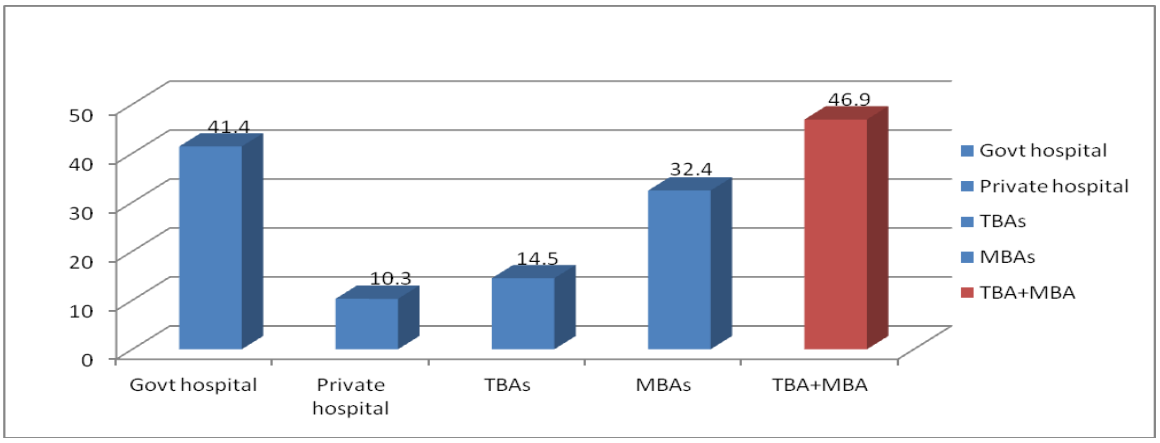


Figure 3. Respondents' Birth Places

Considering the various alternative birth places and the level of patronage by the women of reproductive age, it was discovered from the survey that, put together, about 47 percent of the women preferred to give birth at either TBA or MBA, compared to about 41 percent of who patronized the government hospitals for delivery.

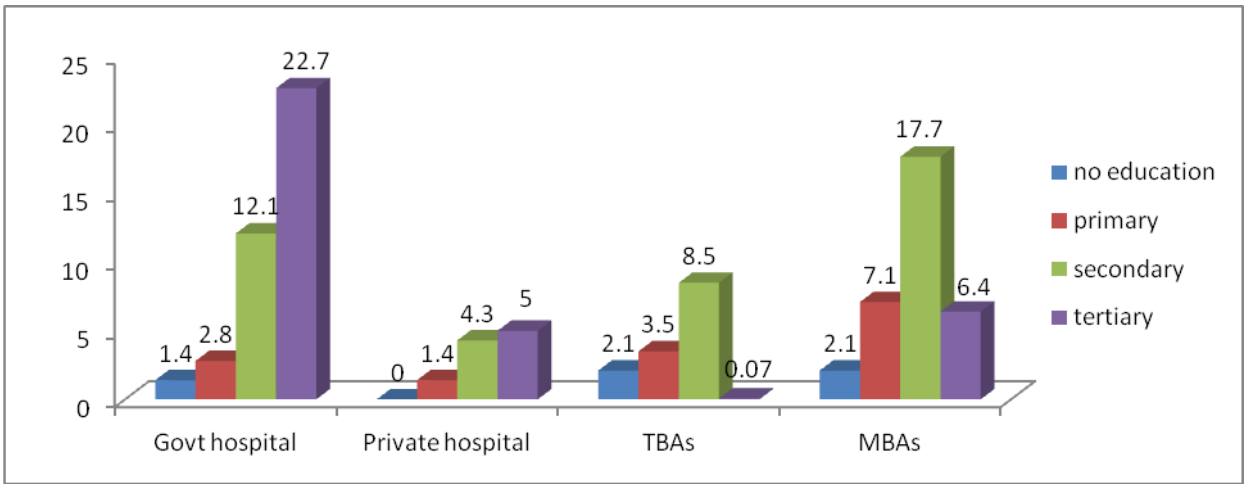


Figure 4. Distribution of birth places by educational level

Cross tabulating respondents' choices of birth places with their respective educational attainment, the data show that women with higher educational qualifications (about 23 percent) preferred Government hospital to other health facilities. However, those with secondary and primary schools' qualifications (about 18 percent for MBAs and 8 percent for TBAs; secondary schools; and 7 percent in MBA and 3 percent; primary school) opt for non-government health facilities.

Table 4. Percentage of women patronizing TBAs/MBAs disaggregated by regions and level of education

TBA/MBA patronage by regions in percentage of total respondent	Urban (N=18)	Sub-urban (N=20)	Rural (N=38)	Total (N=76)
	12.4	13.8	26.2	52.4
TBA/MBA patronage by level of education attainment in percentage of total respondent	No education (N=6)	Primary (N=17)	Secondary (N=40)	Tertiary (N=49)
	4.2	11.9	28	9.1

Discussing the percentage of women disaggregate by their respective regions, who patronize TBAs/MBAs for delivery, it shows that about 26 percent of women of reproductive age in the rural areas preferred delivery at TBAs/MBAs. Comparing to other areas, Women in the rural areas showed more preference for TBA/MBA than others in urban and sub-urban areas.

Disaggregating them by their levels of education, it is deduced that 28 percent of the respondents had their deliveries at the Mission home have only secondary education. Similarly, among those with primary education, about 12 percent had their deliveries at the TBAs/MBAs, and among those with tertiary education, about 9 percent still patronized them.

The survey further identified some of the reason as pointed out by the respondents, why they patronize TBAs/MBAs. These are presented in the figure below.

Section 3: Analysis of factors influencing the choice of birth place among women of reproductive age

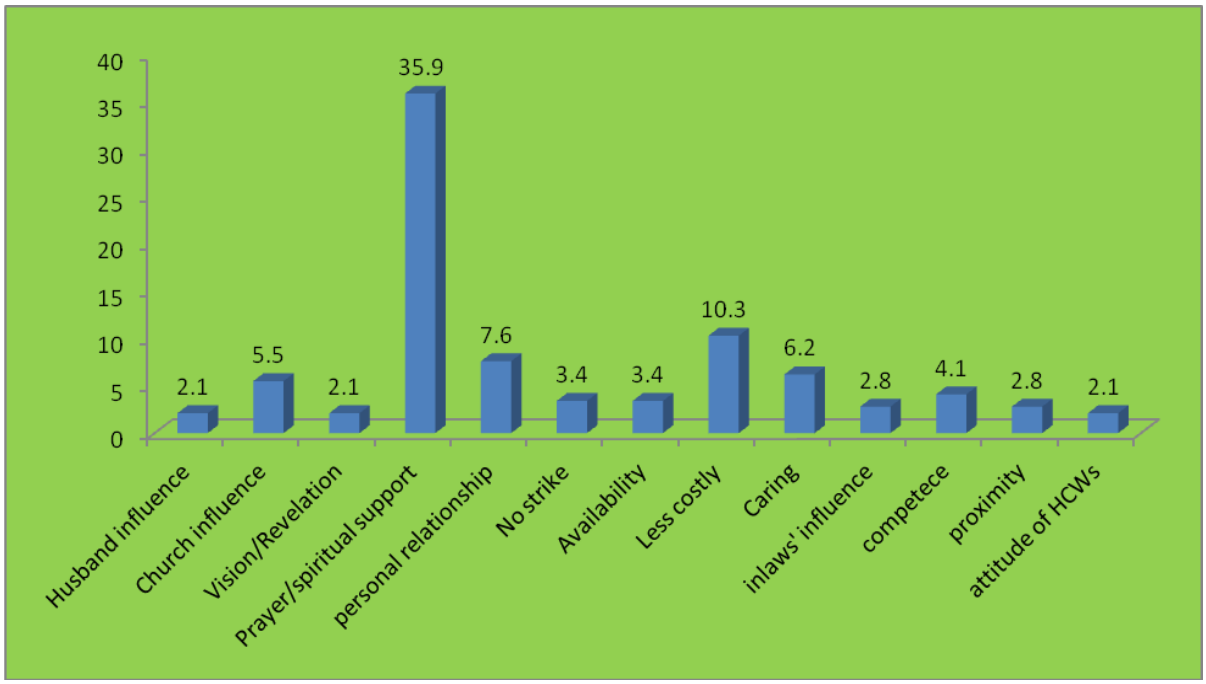


Figure 5. Reason for the preference of TBAs/MBAs above Government health Facilities

Among the reasons the women gave for patronizing TBA/MBAs, about 40 percent of the reported that their quest for spiritual assistance, prayer and miracles during delivery (which they always receive at the mission homes) was why they prefer TBAs/MBAs to Government health facilities. According to them, MBAs pray very well, prophecy and even see visions for them. Hence believe in the intervention of the supernatural power in their delivery is the strongest drive for visiting MBAs.

It was also discovered from the study that about 10 percent of the women patronized MBAs and TBAs because their bills are lesser compared with that of the conventional Government hospitals. Some posits that they do not pay for delivery at some places because it is a mission facility. The study also showed that the church has significant influence over their members' choices of delivery points. About 5 percent of the women opined that they deliver at the Mission homes because the facility belongs to their church, and their pastor had made it compulsory for them to deliver there.

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Part B: Analysis of TBA/MBAs

Section 1: Demographic information of TBA/MBA Owners

This section focuses on analyzing the capacities of the TBA and MBA owners in terms of their professional skills and competence. It also evaluates their knowledge level on the basic transmission mechanisms and prevention methods of HIV, and the level of synergy existing between the TBAs/MBAs and the various government health facilities around them.

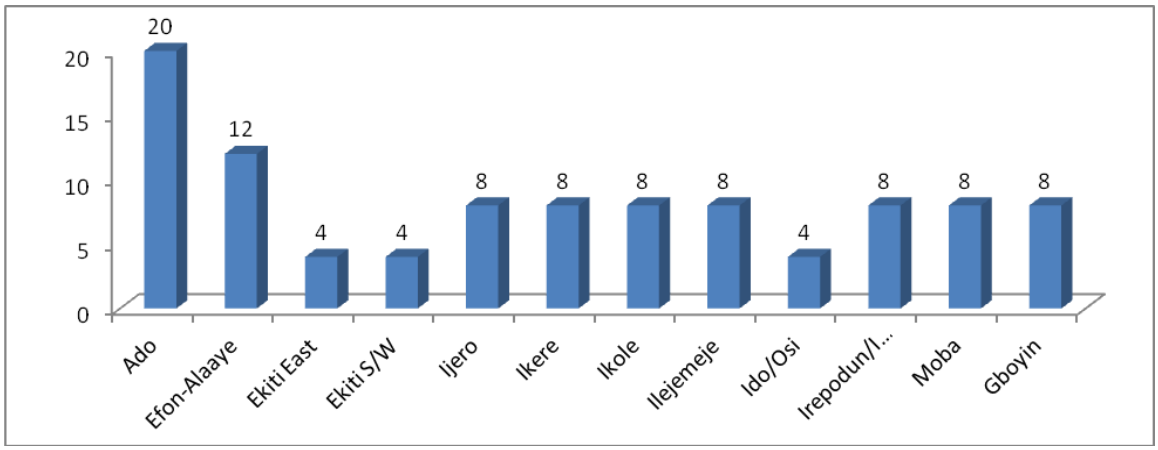


Figure 6. Figure Distribution of Respondents by LGA

The chart above shows the distribution of respondents by LGA. Out of the 16 LGAs in Ekiti State, TBA/MBA owners in 12 participated in the survey. While Ado had the highest representation of response (20 percent), Ekiti East, Ekiti South/West and Ido/Osi shared equal representation of 4% each and others 8 percent.

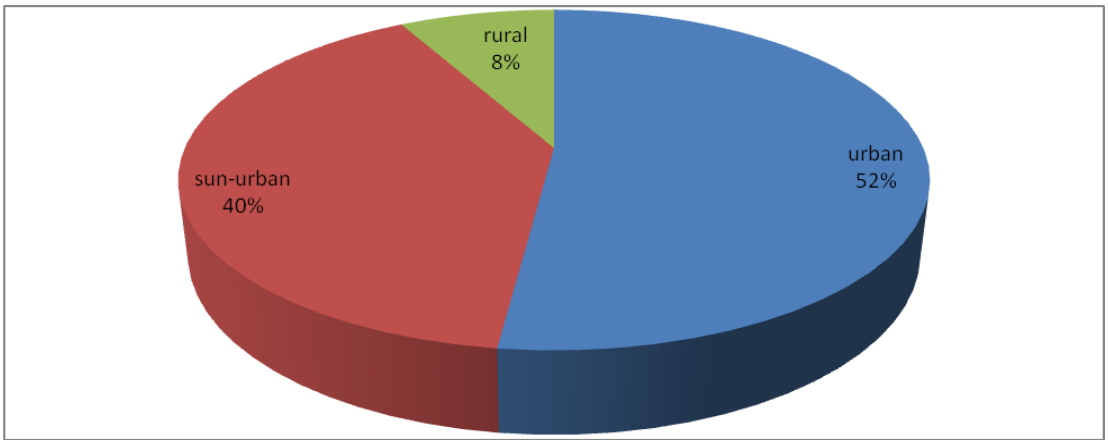


Figure 7. Distribution of respondents by their regions

Considering the distribution of the respondents by region, it could be seen from the figure above that 52 percent of the respondents have their facilities in the urban areas such as Ado and Ikere LGA, 40 percent are in the sub-urban towns and the remaining in the rural communities.

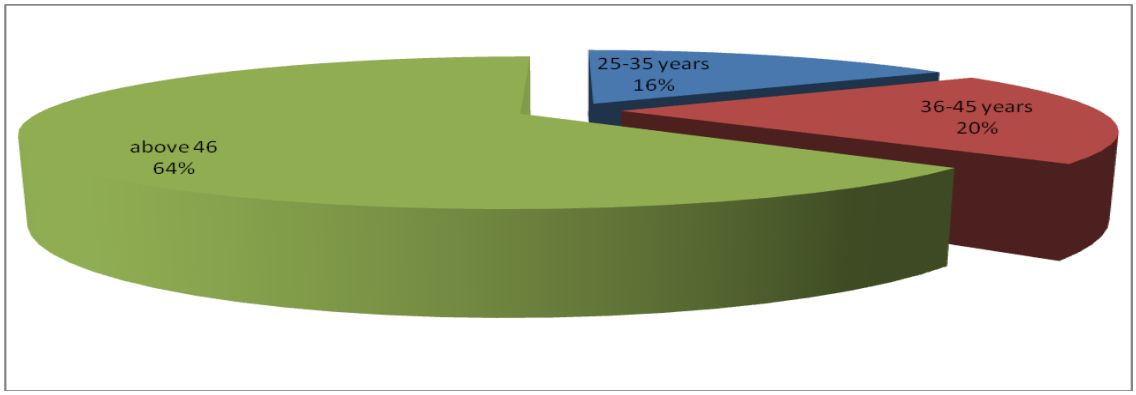


Figure 8. Distribution of Respondents by age

The distribution of respondents according to their age brackets across the LGAs show that majority (about 64 percent) of the women are above 46 years of age, and 16 percent fall within the age bracket of 25-35 years

Table 5. Percentage distribution of TBA/MBA owners by educational qualification, religion and ethnicity

Percentage distribution of TBA/MBA owners' educational qualification	No education	Primary	Secondary	Tertiary
	4	56	36	4
Percentage distribution of TBA/MBA religion	Christianity	Muslim	Traditionalist	Others
	92	4	4	-
Percentage distribution of TBA/MBA by ethnicity	Yoruba	Igbo	Hausa	Others
	92	0	8	-

The table above summarized the distribution of the respondent by their educational status, religion and ethnicity. It can be observed that majority (56 percent) of the TBA/MBA owners possess primary school certificates, while those that attended Secondary school are 36 percent of the total respondent. Among the TBA/MBA owners, only 4 percent had higher educational certificate.

Considering their religious backgrounds, the study shows that over 92 percent of respondents are Christians. Similarly, the sample comprised 92 percent Yoruba and 8 percent Hausa across the state.

Section 2: TBAs/MBAs Staff capacities and professional skills

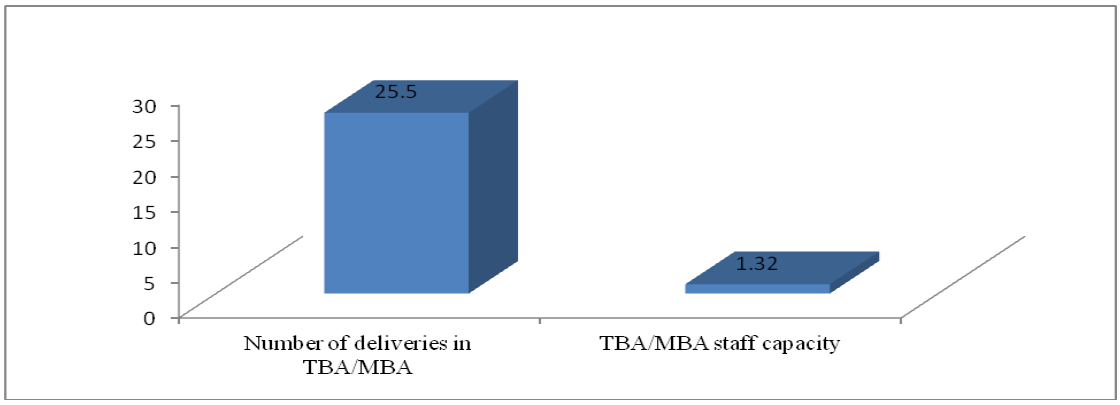


Figure 9. Averages of deliveries and staff capacities of TBA/MBA

Considering the average number of deliveries handled by the TBAs/MBAs, the static shows that they have handle an average of 25 deliveries in recent times. On their staff strength, the TBAs have an average of one staff per facility.

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Table 6. Percentage Distribution of TBAs/MBAs acquisition of professional skills and training schools attended as expressed by the respondents

Does the owner have professional Health Care training		
	Frequency	Percentage
No	6	24
Yes	19	76
Where did you train as health care provider		
No training	2	8
School of midwifery	6	24
Local Government Authority	1	4
Inherited it the skill from my forefather(s)	4	16
Call from God	1	4
Mission homes and TBAs	10	40
NGO/CBO	1	4

On whether the TBA/MBA owner had received any form of professional training before starting the business and/or after, 76 percent of the respondent confirmed that they had received professional health care training in relation to their field of operation.

Among those who had received professional trainings, 40 percent were trained by a Mission. A regular mission home referred to by them is the Christ Apostolic Church (CAC) mission home at Ede, Osun State. About 24 percent attended a school of midwifery while 16 percent suggest that they inherited the skills from their father. However, 8 percent of the respondents had not received any professional skills on midwifery across the sample.

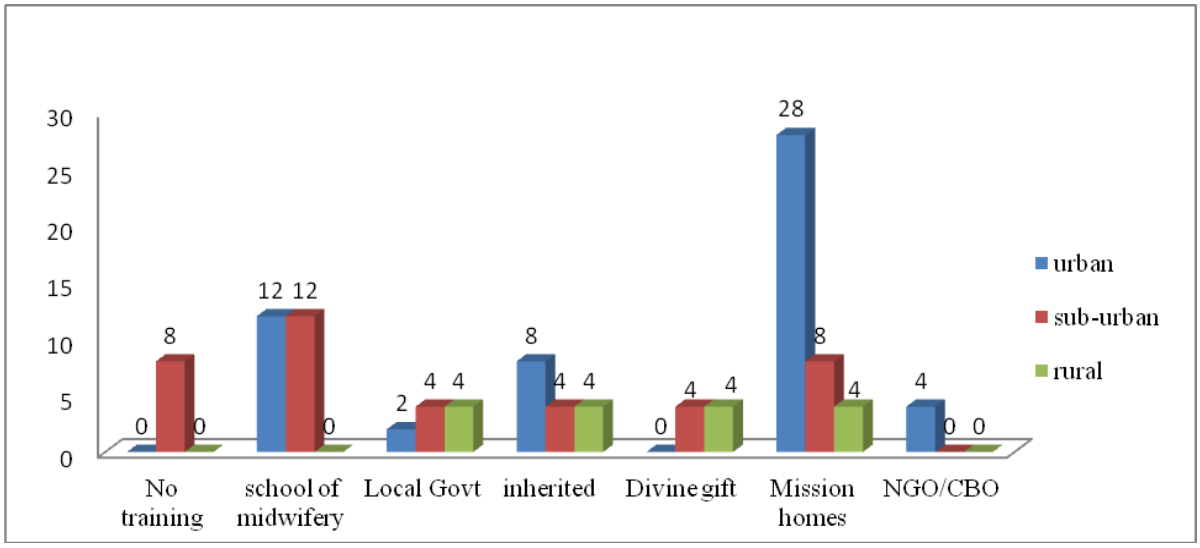


Figure 10. Level of profession skills of TBAs/MBAs by region

Cross tabulating the level of professional skills by the TBA/MBAs by the various regions, it was found that the 8 percent that has not any professional skills are in the sub-urban communities. None of the traditional birth attendants in the rural areas attended a school of midwifery. It is also seen that 28 percent of the TBAs/MBAs that were trained in a mission home are located in the urban areas while 8 percent and 4 percent are in the sub-urban and rural areas respectively. It is also found that NGOs contribution in training of TBAs only benefited 4 percent of the respondents in the urban areas while the sub-urban and rural communities are left out. Similarly, effort of the Local Government Authorities in training the target group also reached 4 percent of the TBA/MBA owners in sub-urban and rural areas

Section 3: TBA/MBA owners' knowledge of HIV/AIDS

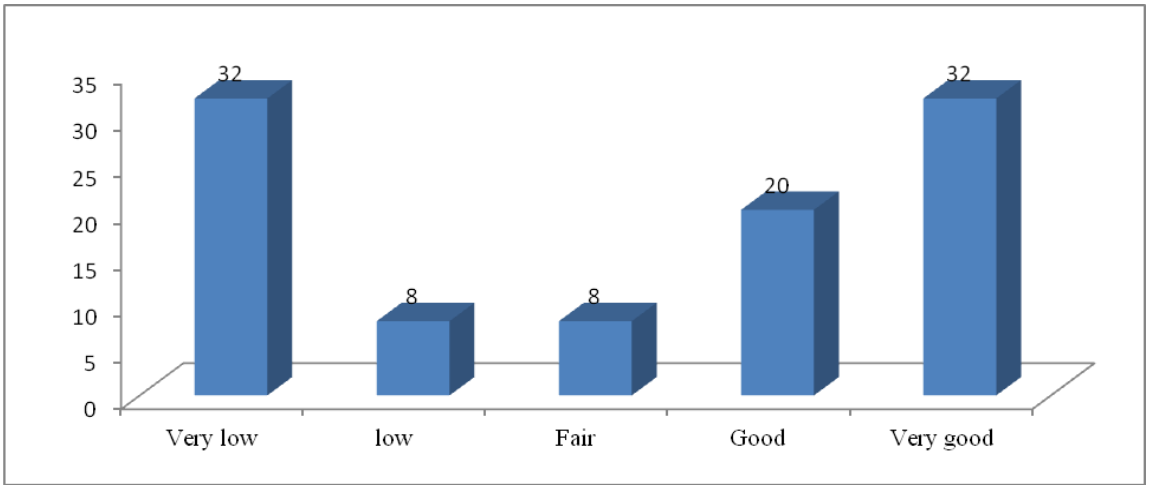


Figure 11. TBAs/MBAs owners' Knowledge of HIV/AIDS

On the knowledge of Traditional and Mission homes birth attendants on the basic HIV infection and prevention methods, the result shows that on a scale of "less than 45%", 32 percent of the respondents have very low knowledge of HIV; its mode of transmission and prevention, and 32 percent also score above 79 percent (Very good knowledge).

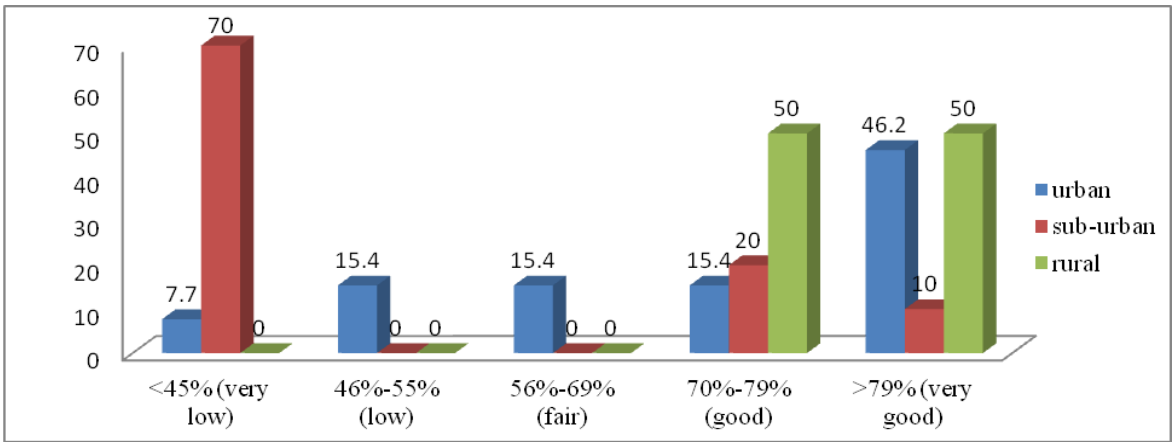


Figure 12. TBA/MBA knowledge of HIV across regions

Relating the above figure to TBA/MBA knowledge of HIV, 70 percent of respondents in the sub-urban showed very low knowledge of HIV/AIDS; the basic mode of transmission and prevention, and about 46 percent of those in the urban areas have very good knowledge of the virus.

Section4: Partnership and linkage of TBAs/MBAs with government health facilities in the state

Table 7. Distribution of TBA/MBA partnership/linkage with government health facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	6	24.0	24.0	24.0
	Yes	19	76.0	76.0	100.0
	Total	25	100.0	100.0	

The table shows that 76 percent of the sample has linkage system with the Government health facilities in the State. Disaggregating the linkage by the type of facilities, 32 percent of the respondents do not refer clients to Government health care facilities. While 24 percent refer to the Basic Health Centres in the communities, 20 percent to Comprehensive Health Centres, 4 percents refer to either State specialist hospital or General hospital nearest to them.

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Disaggregating the data by regions, about 23 percent of the TBA/MBA owners in urban areas do not have linkage with Government health facilities. Similarly, 40 percent and 50 percent of those in sub-urban and rural communities are also involved in the same attitude. While about 31 percent in urban areas and 23 percent refer to Basic health centres and Comprehensive Health Centres respectively, 20 percent in sub-urbans refer to any of the General Hospitals, Comprehensive Health Centres and the Basic Health Centers nearest to them. However, none in the rural areas made referral to either the Basic or Comprehensive health centers nearest to them.

Table 8. Percentage distribution of TBAs/MBAs regular referral points

No linkage	FUTH, Ido	SSH	GH	CHC	BHC	Others
32.0	4	4	12	20	24	4
Percentage distribution of TBAs/MBAs regular referral points by Region						
	No linkage	FUTH, Ido	SSH	GH	CHC	BHC	Others
Urban	23.1	7.7	7.7	0	23.1	30.8	7.7
sub-urban	40	0	0	20	20	20	0
rural	50	0	0	50	0	0	0

Discussion

The patronage of TBAs and MBAs in Ekiti State is still very high despite Government effort to encourage pregnant women to access services at public health facilities. Basically, the rate is highest among the rural settlers compared to their counterparts in the urban areas.

Hamela *et al.*, (2014) reported that TBAs continue to play a significant role in the delivery of maternal health services in developing countries

Relating the above to their level of education, it appears that more women who either had no formal education or stopped at primary or secondary schools have greater preference for TBAs/MBAs. Contrarily, those with higher education showed more preference for government facilities. It suggests that one's level of education may be a factor influencing her choice of where to give birth.

Decision to give birth at TBA, MBA or Government hospital is a function of many variables. These variables include the availability of health care officers in the government hospitals, their attitude to clients, cost/bills charged at the facility, poverty level, quest for spiritual support, miracle and prayers, ability of health worker to see vision and revelation for the clients, proximity of the health facility to the client, church and pastors' influence on their members, husband's influence and the influence of parent in-laws. However, among these many variables, desire for prayers by the pregnant women stood out as the major force. Similarly, influence of the religious bodies and family institution are also prominent in deciding where a woman gives birth. Alison, (2009) reported that Most health facilities are far from the communities, making it difficult to utilize facilities at the time of labor and delivery. Distance, money, and being sick were some of the common reasons for not delivering in the hospital in Malawi (Abubakar *et al.*, 2011). Negative attitudes of health workers were mentioned by the TBAs as a reason woman did not report to the health facility. This finding concurs with findings in Kenya, in which women continued to prefer TBAs due to disrespectful attitudes of health care workers at the health facilities (Kruske, S.; and Barclay, L, 2004). In most rural areas of the study locations, women preferred TBAs because TBAs were more respectful (Harrison, 2011). While we did not discuss health care worker attitudes with the women seeking TBA services, understaffing at primary health centers in Ekiti State is common, suggesting the potential for overworked and stressed health workers. Until staffing deficiencies and a provision for inclusive antenatal care are addressed, strategies that incorporate and empower TBAs within National Health Scheme may be a feasible and realistic (Iyaniwura, C.A.; and Yusuf, Q.; 2009).

It was found that majority of the TBA/MBA owners only have either Primary or secondary education and very few have tertiary education. In the same line, many of them did not train as midwife in a government institution. They were majorly trained in mission homes. While such institutions might train them, it is not a substitute for quality training in government institutions. There is need to evaluate the quality of the training, the training curricular, and possibly provide the training under the supervision of the government so as to ensure global best practices in the field of midwifery. The type of training they received should reflect in their knowledge about basic prevention methods of HIV. However, this was found to be low. This is in agreement with the submission of Ekiti State AIDS Control Agency

publication on Community Based PMTCT, the paper asserted that TBAs lack adequate knowledge on issues relating to reproductive health, STIs and HIV/AIDS. It therefore becomes pertinent to train the informal cadre of community health resource persons to ensure a HIV/AIDS-free future generation. Alison, (2009) also posited that many TBAs have low levels of literacy and some may not be interested in further training, attention must be given to making instructions relevant to the local culture in which TBAs practice. He further suggested that Training and the provision of birth kits resulted in a reported increase in safe deliveries with improved infection control practices. Consistent with our finding, another TBA programme in Malawi concluded that empowering TBAs through supervision and provision of supplies helped them to comply with the requirement of ensuring infection free deliveries.

The study showed that the level of synergy between the TBAs/MBAs is not encouraging. Strong referral and linkage system between TBAs/MBAs and government facilities contribute to providing quality health services to the pregnant women and proper management of complications. Alison Ray and Salihu (2009) reported that Programmes with the greatest impact utilized TBAs and village midwives within multisectoral interventions, and suggested that TBAs and village midwives contribute to positive programme outcomes. However, further investigation is needed to determine the nature of their contribution within larger programmes. Oyeledun *et al.,* (2014) reported that the uptake of PMTCT services in Nigeria remains notably low despite significant advances in HIV/AIDS treatment and care. Community collaborative work aims at improving referral practices between TBAs and PHCs and induces self-referrals to skilled healthcare providers. Where this is lacking in some of the communities and TBAs, it could have a detriment on the clients (Sibley, .L.M.; and Sipe, T.A.; 2006).

Conclusions

The lessons from situation analysis give information on the need for further interventions beyond PMTCT service provision at health facilities. It speaks largely to factors responsible for service uptake and the need to map out strategies and plans for other interventions to address these factors in order to record immense success in PMTCT programme. Such interventions beyond behavioral could include structural interventions such as strengthening linkages and referral systems between these alternative birthplaces and health care facilities/providers, training of the attendants of alternative birthplaces on HCT and referral of positives for PMTCT uptake.

The study also highlighted reasons why decision to give birth at TBA and MBA is a function of many variables. These variables include the unavailability of health care officers in the government hospitals especially in the rural areas, unfriendly attitude of health officers, cost/bills charged at the health care facility, poverty level, quest for spiritual support, miracle and prayers, ability of traditional birth attendants to see vision and revelation for their clients, proximity of TBA/MBA, Religious leaders' influence on their members, husband's influence and the influence of parent in-laws. However, among these many variables, desire for prayers by the pregnant women stood out as the major force. Similarly, influence of the religious bodies and family institution are also prominent in deciding where a woman gives birth and these found to be significantly impede progress in the PMTCT programme in the state as very insignificant population of pregnant women registered in antenatal give birth in the hospital and complete PMTCT in the state.

This study showed that integrating TBA/MBA in health care service can be very effective in promoting PMTCT in Nigeria. Although TBAs are not recognized as part of the formal healthcare system; this experience showed that they could be very useful in promoting maternal and child health services as well as PMTCT. It is imperative for policy makers to acknowledge the importance of TBAs in community mobilization to enhance the success of PMTCT and other maternal and child health programs. Such an important profession in our society should not be alienated from the process of scaling up PMTCT coverage as it that affect the public health.

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Competence of Community Health Workers in conducting Malaria Diagnostic Test for Children Under-Five for Malaria Management in former Northern Bar El Ghazal-South Sudan

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Abstract

By 2012, the majority of malaria cases were diagnosed and treated clinically and only 25% of the health facilities had malaria diagnostic equipment (microscopy or RDTs) in South Sudan (HMIS, 2012). In 2017, the Government of South Sudan and malaria implementing partners started implementation of mRDT at community level. This study sets out to determine the competence of community health workers under ICCM while conducting malaria diagnostic test for children under-five for malaria management in former Northern Bar El Ghazal.

Methods: *A cross sectional study was conducted among 480 randomly selected CHWs. Data was collected using a questionnaire consisting of demographics, case management observation checklist, mRDT assessment checklist and competence factors and a focus group discussion guide. Analysis was done using stata V14 and thematic content analysis.*

Results showed that *competence of CHWs in malaria case management was skewed to right; more than 80 percent of CHWs could rightly assess the danger signs of child, classify patient's illness correctly, gives correct treatment, counsel and records correct relation between classification, diagnosis and treatment. CHWs scored between 75 and 86 percent on the nine important mRDT procedures and a few CHWs (less than 10%) scored below 40 percent on mRDT procedure competence assessment.*

In conclusion, the majority of *CHWs were found to be competent in assessing and treating malaria sick children and conducting mRDTs. Therefore, use of mRDTs can be scaled at community level in South Sudan while strengthening competency determinants such as provision of equipment and supplies.*

Keywords: *Competence, Community Health Workers, Integrated Community Case Management, Malaria Diagnostic Test for Children Under-Five, Malaria Management, mRDT Procedure, Malaria Case Management, mRDT Competence Assessment.*

Introduction

Malaria remains one of the diseases of public health importance in South Sudan with respect to morbidity and mortality burden as well as economic losses (Malaria Strategic Plan, 2017). By 2012, in South Sudan the majority of malaria cases were diagnosed and treated clinically and only 25% of the health facilities had malaria diagnostic equipment (microscopy or RDTs) (HMIS, 2012). The 2013 Malaria Indicator Survey (MIS) found that only 28% of patients received parasitological confirmation before treatment (MIS, 2013). Most malaria cases are diagnosed and managed based on clinical symptoms because only 40% of the health facilities have capacity to perform malaria diagnostic tests (Health Facility Assessment Report, 2011) despite policy recommendation for parasite diagnosis before treatment at all levels. In order to address the high morbidity and mortality due to malaria by improving case management of fever among children under five and the rational use of valuable anti-malarials at community level, the Government of South Sudan and malaria implementing partners adapted the WHO Policy of testing malaria before treating at community level in 2017 and started implementation of mRDT use at community level through training and equipping community health workers implementing integrated community case management (ICCM) with mRDTs and other tools required to perform a successful mRDT and supportive supervision of the Community Health Workers.

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Competences enhance malaria management by community health workers (CHWs) while using Malaria Diagnostic Test for children under-five. Therefore, it is important to understand how CHWs conduct their responsibilities and health tasks in communities especially under the iCCM strategy (USAID, 2015). In a community setting, competence for community health workers while conducting malaria rapid diagnostic tests for children is manifested by safe and effective use of mRDT tools through conducting training and other post training exercises such as competence evaluation (Malaria Consortium, 2014).

With regard to competence of CHWs, focus needs to be on strengthening the community health workers' competences in order to improve their capacity to analyze data, use such data to make health related decisions and planning interventions (Counihan et al, 2014). In addition, competences for community health workers can be reflected by effort to improve febrile iliness management among children in remote and resources constrained communities. It is vital to have supplies and other requirements such as gloves to competently manage malaria among children in the community. Community health workers' competence in managing children with malaria under the iCCM strategy can be promoted by training, use of mRDT tools in the management of malaria for children under five years and the use of Artemisnin-Based Combination Therapy-ACT (Gopalan, Mohanty & Das, 2012). However, in some instances community health workers may offer malaria treatment based on assumptions and this can constitute health and professional implications with regard to health services delivery to clients in the community (Hansen et al, 2017).

Studies carried out regarding competence of CHWs in the managing children under five with malaria have indicated varying results. For example, in Denmark, it was found that competence regarding malaria rapid diagnostic test for under-five malaria management was high since there was increased treatment of malaria in relation to transmission setting (Hansen et al 2017). This led to improved ACTs targeting to children with malaria and it was regarded as the cost-effective intervention in place as compared to diagnosis means and results reflected the degree of training that was extended to community health workers before the introduction of Malaria Rapid Diagnostic Test (mRDTs).

With reference to competence of CHWs, it is also important for CHWs to be able to acknowledge mixed infections using Malaria Rapid Diagnostic Test (mRDTs) and achieve set targets in terms of detection (Murray et al, 2008). However, this can be attributed by the nature and quality of training that had been acquired by CHWs, support supervision, documentation and reporting, assessments, equipment and drug supplies that need to be adequate under the ICCM strategy (Kalyango et al, 2012). Therefore, this study was set to determine the competence of community health workers under ICCM while conducting malaria diagnostic test for children under-five for malaria management in Northern Bar El Ghazal.

Methods and material

Study setting

This study was conducted among CHWs in former Northern Bar El Ghazal. The area was one of the 10 states of South Sudan before they were re-organized in 2015. It has an area of 30,543 km². It borders South Darfur to the north, Western Bahr el Ghazal to the west and south, and Warrap and Abyei to the East**.** The state has an estimated population of one million people with 20.6% being children under the age of five years. Former Northern Bahr el Ghazal is the poorest state in South Sudan with 75.6% of state population living below the poverty line as compared to national figure of 50.6%. Almost 93.0% of the population in the state resides in rural areas as agro-pastoralists, and over 9.0% of the population in NBeG is severely food insecure. The study utilised a cross-sectional research design with quantitative and qualitative data collection approaches. A mixed method approach was adopted to collect data using both questionnaire and focus group discussion-guide.

Sampling

Simple random sampling was used to select respondents (CHWs) and a list of CWHs under ICCM who had worked for at least six months generated and captured into STATA software. The rationale for selecting CHWs who had worked for at least six months was to be able to generated sample

population who had experienced sick children and used mRDT in their areas. Using the STATA software 480 CHWs were randomly selected using STATA command sample which drew random samples of the data in memory without replacement.

Data collection

Data collected from the questionnaire was analysed using both descriptive and explanatory analysis. Quantitative data was collected using a survey questionnaire composed of four sections; where section one focused on demographic characteristics of the CHW, section two about case management (assessment and treatment of sick child) observation checklist, section three was about mRDT competence assessment checklist and four reflected on the factors that may affect competence. A CHW was required to assess a sick child with fever or without fever while being observed by the enumerator who ticked off the different steps being conducted by the CHW. A correctly completed step was ticked as yes and otherwise no. For competence factors, the questions were based on a Five-Point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) which a CHW would respond to or choose a facial expression based on what they feel about the factor being assessed.

Qualitative data was collected using focus group discussions that were conducted using a focus group discussion guide to capture an in-depth understanding of the factors associated with competence of CHWs while conducting mRDTs for children under five.

Data management and analysis

For both quantitative and qualitative data collected, the basic data analysis procedure involved conducting separate data analyses for each of the quantitative and the qualitative data, and thereafter triangulation and complementarity in explanation and discussion was done depending on the research questions of the study. Quantitative data obtained from the survey questionnaire was captured by Epidata software for data entry and analysed using STATA Version 14 software.

To ascertain which individual, community and programmatic factors significantly affected competence of CHWs in the management of malaria among under five children, both descriptive and explanatory analysis techniques were employed. At univariate level, the description of the independent and dependent variable of study was done using mean score, frequencies and percentages using tables and graphs. The fact that various question items were used to assess the competence of CHW case management of malaria to mRDT protocols in the management of Malaria among under five children, percentage competence scores were generated. The total score obtained from getting the right steps or procedures as far as assessment of the sick child, conducting an mRDT, and following the mRDT procedures over the total expected times 100 determined the CHWs percentage scores.

Inferential data analysis was carried out using Pearson to examine the relationship between the study variables by showing the statistical significance. Logistic regression was used to reflect the effect of the associated factors to the dependent variable-competence of CHWs and odds ratios were used to show the probability of occurrence between the tested variables.

Qualitative analysis was carried out by use of thematic content analysis where themes were developed basing on study objectives.

Ethical approval

Ethical approval was obtained from University Ethical Committee-Texila American University Guyana, South Sudan Ministry of Health Department of Policy, Planning, and Budgeting Research Institution Review Board as well as from individual respondents.

Findings and discussion

Competence of CHWs in malaria case management

More than 80 percent of CHWs could rightly assess the danger signs of child, classify patient's illness correctly, give correct treatment, counsel and record correctly. Specifically, the biggest proportion of CHWs score were competent in malaria case management based on the five competence assessment questions and most of the CHWs scored more than 80 percent, a few CHWs (less than 20%) scored below average score of 50 percent (Figure 1). The difference among CHWs in terms of

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assessing dangers signs counselling, giving correct treatment, among others may be attributed to the training and how they comprehended the training content and this is in agreement with Counihan et al (2014) who revealed that CHWs competence need to be enhanced through training for capacity and decision making improvement to enable CHWs make appropriate interventions in the management of malaria under the iCCM strategy in a given community. The gaps in the CHW's management of malaria cases despite the trainings is attributed to fact that CHWs at times anchor their case management of malaria of under five children on assumptions (Hansen et al, 2017).

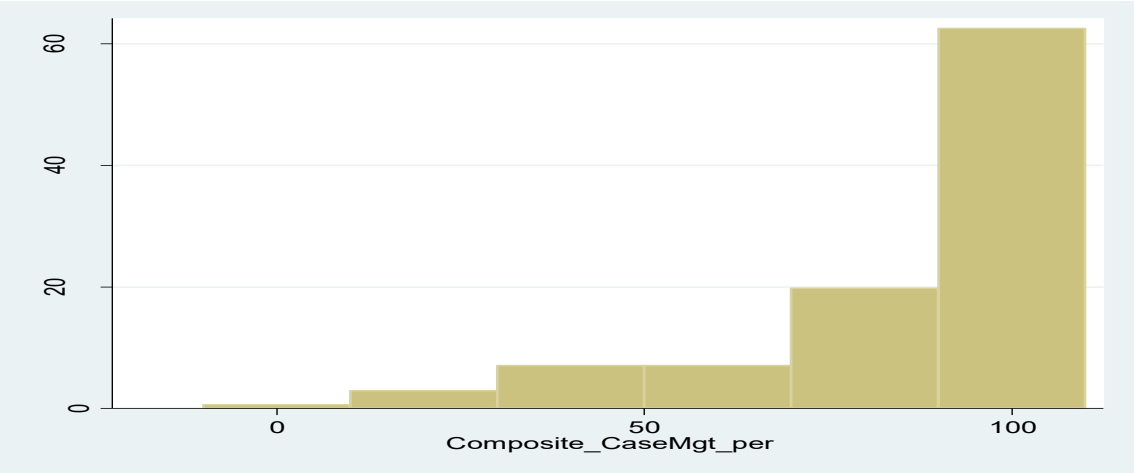


Figure 1. Percentage score of CHWs on malaria case management competence assessment

Source: Primary Data (2019)

CHWs' competence in mRDT procedure

Most of the CHWs scored more than more than 85 percent. A few CHWs (less than 10%) scored below 40 percent, implying that there are few CHWs scored lower than the rest of CHWs on mRDT procedure competence assessment (Figure 2). The results are consistent with Agrawal et al (2012) who argued that competence of CHWs in mRDT procedure is supported by the level of knowledge and competences among CHWs to be able to deliver the right treatment to the community beneficiaries. Therefore, level of knowledge and competence for CHWs reflect how they can rightly perform procedure for mRDT with regard to managing malaria for children under five in a community. In addition, Bagonza et al (2015) expressed that appropriate interpretation of mRDTs results and drug prescription by CHWs influence their competence in the management of malaria among children under five.

Qualitative results obtained from the focused group discussion indicated that CHWs are motivated to work as they feel they serve their communities and this has reduced mortality of children under five.

'……I love being a CHW, we have reduced the deaths. Before children used to die and every day, we used to be doing burials and every home had a fire place by the road side but with ICCM and MRDT introduction this has stop……. CHW in Aweil West….'

The results are in agreement with World Health Organization-WHO and UNICEF (2012) where it was noted that mRDT competence assessment requires new local-level algorithms for actions to be taken based on mRDT results. Further, Chinbuah et al (2013) revealed that mRDT competence assessment needs to reflect dosing guidelines for childhood treatment. However, in their study Chinbuah et al (2013) observed that there was non-adherence to mRDT procedures by CHWs with negatively affected health services delivery in the communities.

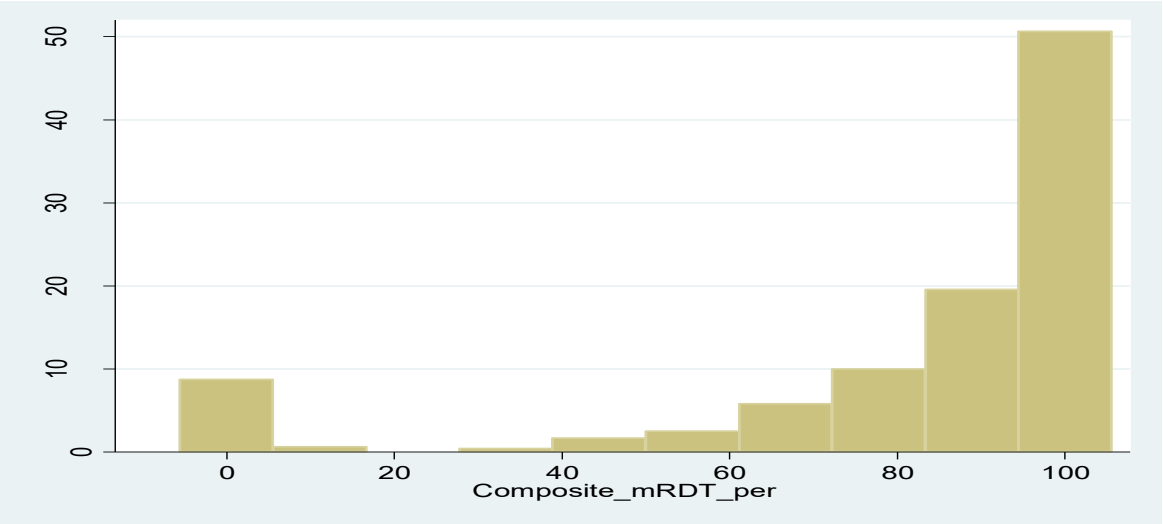


Figure 2. Percentage score of CHWs on mRDT Competence Assessment

Source: Primary Data (2019)

Factors associated with mRDT and case management competence

CHWs who scored 100 percent on competence assessment scale of case management and mRDT were classified into competent =1, 0 otherwise. CHWs who do not achieve 100% in the standard basic activities in case management and mRDT procedures were considered to be incompetent. The Pearson chi-square values are not statistically significant, the Pearson chi2 (461) = 478.27 with p-value of 0.2797 for case management and Pearson chi2 (461) = 466.38 with p-value of 0.4213 for mRDT procedure. Motivation, area of coverage, age of CHWs, and documentation and reporting had statistically significant association with competence of CHWs in Malaria case management.

(Table 1). The results can be attributed to differences in perception of motivation among CHWs and Strachan et al (2014) found motivation as one of the factors that were associated with CHWs' competence. Results with area of coverage implied that CHWs had appropriate distance to cover in order to provide health care services to communities. The results are in agreement with Ngeny (2015) who argued that CHWs' area of coverage depends on the number of homesteads each person is responsible for in relation to the geographical locations of such houses. Therefore, CHWs has appropriate households to operate with in terms of management of malaria among children under five. Results are in support of Health Communication Capacity Collaborative (2015) where it was noted that age of CHWs is associated with adherence to mRDT Test Procedure. Thus, the results may be attributed to age having a relationship with experience in service among health professions; that is CHWs in a community. The association between documentation and reporting; and competence among CHWs imply the CHWs were able to make and deliver quality information regarding malaria case management and mRDT utilisation. The results are in agreement with Hay et al (2011) who noted that document and report information enhance decision making among CHWs while managing malaria among children under five.

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Table 1. Logistic Regression Results on Competence of CWHs in Malaria Management

	Competence in Case management				Competence in mRDT procedure			
	Odds Ratio	**P-value**	**95% Conf. interval**		**Odds Ratio**	**P-value**	**95% Conf. interval**	
Variables			**Low**	**High**			**Low**	**High**
Motivation	1.57	0.009*	1.12	2.21	1.06	0.765	0.73	1.53
Support Supervision	0.85	0.346	0.60	1.20	0.94	0.750	0.63	1.39
Training	1.12	0.411	0.85	1.49	1.12	0.463	0.82	1.53
Cooperation	0.98	0.917	0.71	1.36	1.05	0.773	0.74	1.51
Area coverage	0.72	0.009*	0.56	0.92	1.35	0.070*	0.98	1.88
Education (Base: No education)								
Primary	0.69	0.122	0.43	1.10	0.89	0.666	0.53	1.50
Secondary	0.92	0.811	0.45	1.86	1.82	0.131	0.84	3.94
Age in years	0.97	0.069**	0.95	1.00	1.02	0.235	0.99	1.05
ICCM experience in years (Base: less than year experience)								
1-4 years	0.33	0.119	0.08	1.33	1.42	0.592	0.39	5.14
5-8 years	0.71	0.631	0.18	2.85	1.93	0.313	0.54	6.97
Over 8 years	0.61	0.593	0.10	3.66	6.65	0.100	0.70	63.50
Gender (Base: female)								
Male	0.86	0.564	0.52	1.43	0.78	0.402	0.44	1.38
Workplace environment	1.01	0.271	1.00	1.01	1.02	0.001*	1.01	1.03
Equipment & Supplies	1.00	0.755	0.99	1.01	1.02	0.000*	1.01	1.03
Documentation & reporting	1.01	0.000*	1.01	1.02	1.03	0.000*	1.01	1.04
Constant	1.88	0.491	0.31	11.34	0.00	0.000*	0.00	0.02

Note: "" Statistically Significant at 5% level and "**" Statistically Significant at 10% level*
Source: Primary Data (2019)

Conclusion

Community health workers can competently conduct mRDTs and would correctly assess a child with malaria in former Northern Bar El Ghazal – South Sudan and therefor the intervention can be scale up across the country to improve case management thus reducing mortality and morbidity among children under five dues to malaria. However, factors associated with competence need to be strengthened during the scale up especially ensuring that the CHWs have commodities and supplies for them to treat children adequately.

Recommendations

The government and implementers should consider more sensitisation of communities utilise and demand for testing before being treated and also have constant availability of commodities for community health workers to test consistently. Furthermore, supervision and on job mentorship should be done given this is a new intervention.

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Factors Associated with Adherence to mRDT Test Procedure by Community Health Workers during Management of Malaria for Under-Five in former Northern Bar El Ghazal-South Sudan

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Abstract

South Sudan Government and health partners started implementation of malaria Rapid Diagnostic Test (mRDT) testing at community level through Community Health Workers in 2017 in order to reduce malaria morbidity and mortality through improvement of malaria case management among children under five. Malaria diagnostic equipment were available at only 25% of the health facilities (HMIS Report 2012). This study was conducted to determine the factors associated with adherence to mRDT test procedure among Community Health Workers (CHW) while managing malaria for under-fives in former Northern Bar El Ghazal.

Methods and materials: *A cross sectional study design was conducted among 480 randomly selected CHWs. Mixed method data collection methods were conducted by using questionnaire for quantitative data which was divided into three sections; demographic, mRDT assessment checklist and adherence factors and focus group discussion guide for qualitative data. Quantitative data was analysed using stata Version 14. Pearson correlation product moment, chi-square, odds ratio and logistic regression were used to ascertain the association. Qualitative data was analysed using thematic analysis and triangulation was done.*

Results showed *that 30% of the CHWs adhered to mRDT test procedure 100%. Workplace environment (p=0.02), education (p=0.00) age (0.04), equipment and supplies(p=0.01) and documentation and reporting (p=0.02) tools availability were found to be significantly associated with adherence of CHWs to mRDT test procedures.*

Conclusion: *Education, age, workplace environment, equipment and supplies and documentation and reporting tool were significantly associated with adherence of CHWs to mRDT test procedure. Therefore, selection criteria should emphasise education and age. Also programme implementers should provide tools to facility conducting of mRDTs.*

Keywords: *Individual, community, program, Factors, Adherence, mRDT Test Procedure, Community Health Workers during, Management of Malaria for Under-Five, mRDT Procedures, Individual, community, program, Northern Bar El Ghazal.*

Introduction

South Sudan is malaria endemic in all parts, with the entire population at risk of infection and the prevalence of fever among children below 5 years of age increased from 30% to 45%, malaria parasite prevalence in pregnant women increased from 10% to 15%, from 2009 to 2013 respectively (CCM-South Sudan, 2018). By 2012, in South Sudan the majority malaria of cases was diagnosed and treated clinically and only 25% of the health facilities had malaria diagnostic equipment (microscopy or mRDTs) (HMIS, 2012). The 2013 Malaria Indicator Survey (MIS) found that only 28% of patients received parasitological confirmation before treatment (MIS, 2013). At community level testing for malaria before treatment had not been done until 2017 when South Sudan Government with support from partners adopted the world health organisation policy where testing malaria prior to treatment is done by Community Health Workers (CHW) at community level. Community Health Workers (CHWs) were trained and equipped with mRDTs to test before treating accompanied by support supervision under the Integrated Community Case Management (iCCM) strategy. However, it should

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be noted that CHWs adherent use of malaria treatment guidelines can improve malaria health care services delivery in communities (Rowe, et al, 2007). In the bid to increase CHWs' adherence to malaria treatment guidelines, it is important to put into consideration of CHWs' motivation through delivery/provision of required material, financial and information support (Health Communication Capacity Collaborative, 2015). Empirical research from Ghana showed that adherence to dosing guidelines by CHWs was successfully practiced though CHWs never adhered to referral-based guidelines which resulted into poor health care services delivery in communities of Ghana (Chinbuah et al, 2013).

This study therefore assessed factors associated with adherence to Malaria Rapid Diagnostic Test (mRDT) test procedure by community health workers during management of malaria for under-fives in former Northern Bar El Ghazal, South Sudan prior to scale up of the intervention.

Methods and material

Study setting

The study was conducted among CHWs in former Northern Bar El Ghazal. The state was established in 2015 after Government's merger of the 10 states that initially existed and it has an area of 30,543Km^2, bordered by South Darfur in the North, Western Bahr el Ghazal in the west and south part of the country. It is estimated that this province has a population of 1 million South Sudanese with only 20.6 percent of the population being children below the age of 5 years.

A cross-sectional research design was adopted, quantitative and qualitative data collection methods were used. A structured questionnaire and FGD-guide were used to collect data regarding CHWs adherence to mRDT procedures.

Sampling

Simple random was utilised to select 480 CHWs from the list of those delivering iCCM and had worked for more than six months while using mRDTs during management of malaria for children under five. STATA software command was applied to randomly select the respondents of this study.

Data collection

Quantitative data was collected using a structured questionnaire divided into three parts, the demographic characteristics, the mRDT test procedure assessment checklist and the presumed factors that affected adherence to test procedure. The questionnaire was administered by a well-trained enumerator who observed the CHW will testing a child using an mRDT. A right procedure conducted was ticked yes and otherwise a no was ticked. The children tested were selected randomly from the community near the CHW whether with or without fever after seeking consent from their guardians. For the presumed adherence factors, the questions included working environment, availability of commodities, reporting materials and furthermore other performance factors assessed were based on a Five-Point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) which a CHW would respond to or choose a facial expression on what they felt.

Qualitative data was collected through focus group discussions to capture in-depth understanding of the factors associated with adherence to mRDT test procedure.

Data management and analysis

Quantitative data was entered in epi data software and analysed using of STATA V14. For qualitative data analysis was done using thematic analysis and the triangulation was done to supplement and complement based on the study objectives and questions.

To determine the adherence of CHWs to mRDTs test protocols, percentage scores were generated. The total score obtained from getting the right steps following the mRDT procedures over the total expected times 100 determined the CHWs percentage score. This kind of computation gave each component of assessment questions equal weight (Langbein, 2014; Kellow, 2006). Furthermore, in the degree of adherence to mRDTs test procedure was classified into two forms, strict for CHWs who performed 100% the steps as per the assessment checklist and moderate adherence when the CHWs got at least 80% of the procedures recommended for mRDT right. Logistic regression analysis was

employed to evaluate the factors associated with CHWs adherence to mRDT procedures. Odds ratios were used to reflect the likelihood of behavioural occurrence among CHWS in terms of adherence to mRDT test procedures.

Ethical Approval: The University Ethical Committee-Texila American University Guyana, South Sudan Ministry of Health Department of Policy, Planning, and Budgeting Research Institution Review Board approved this study. Consent was obtained from CHWs' and care givers before their children were tested and their rights and freedom observed.

Findings and discussion

Adherence to mRDT Protocol

Results showed that 29 percent of CHWs who participated in study strictly adhered (100 percent) to the mRDT test procedure. However, 64.8 percent of the CHWs adhered to 80 percent and above (moderate adherence) to the mRDT test procedures. The results therefore, are in agreement with Agrawal et al, (2012) who argued that in health care service delivery, adherence to treatment guidelines enhances CHWs' effort to make mothers practice acceptable care to the new born babies and this can be advanced further in a community leading to improved health care for the mothers and the newborn as well as the entire community. Figure 1.

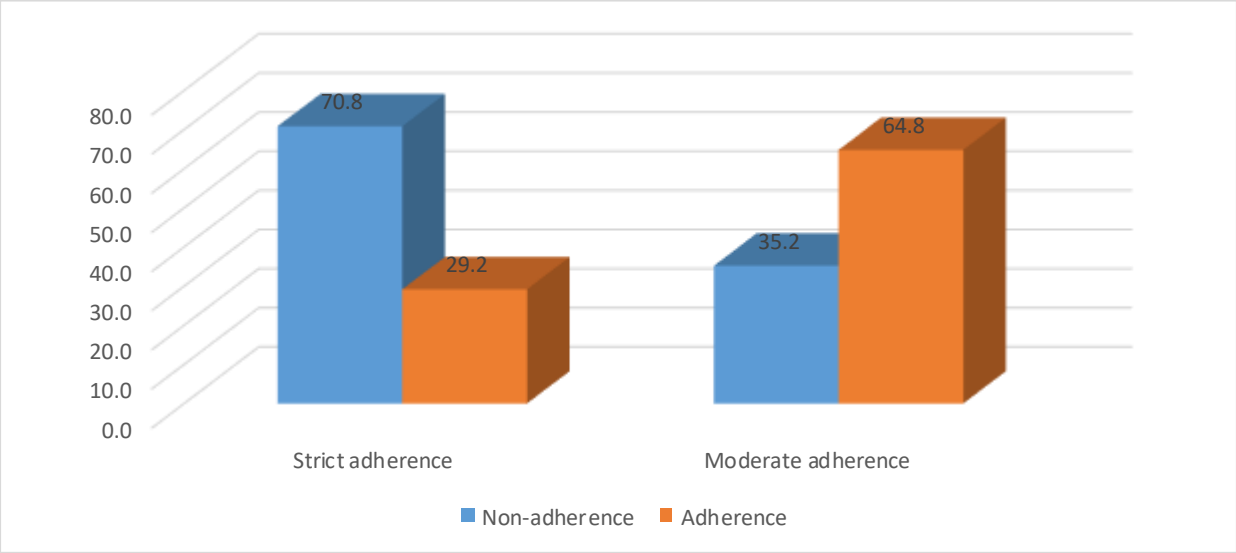


Figure 1. Adherence to mRDT Procedures

Source: Field Data (2019)

Individual Factors and Adherence to mRDT Test Procedure by Community Health Workers in Northern Bar El Ghazal

Education

Logistic regression results revealed that education was significantly associated (p=0.00) with adherence to mRDT Test Procedure by community health workers in Northern Bar El Ghazal (Table 4). Findings implied that CHWs with secondary level of education were 2.82 times more likely to practice strict adherence to mRDT procedures compared to those who moderately adhered to mRDT procedures. The results are in agreement with Mukanga et al (2010) who noted that highly educated CHWs can better adhere to mRDT procedures and can be easily trained for more skills and competences while in service.

iCCM Experience

Results showed that CHWs with experience of over 8 years were 4.3 times more likely to strictly adherence to mRDT procedures and this implies that with more experience, there was better adherence to mRDT procedures among CHWs. Altaras et al (2016) presented experience as one of the factors that influence adherence to mRDT among CHWs. However, although ICCM experience

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dummies are statistically significant, the odds are less than 1, implying that CHWs who have worked with ICCM longer are less likely to adhere to mRDT procedure. This is surprising result since it was expected that more experienced CHWs would be more knowledgeable and proficient in mRDT procedures but since mRDTs testing was recently introduced, having worked for many years under ICCM may not necessarily influence once adherence to the procedure.

Age of CHWs and adherence to mRDT test procedure

The logistic regression results show that for strict adherence to mRDT procedures age of CHWs had a positive and statistically significant association (p=0.04) with adherence to mRDT procedures. (Table 4) Older CHWs were more likely to adhere to mRDT procedures. Results are in support of Health Communication Capacity Collaborative (2015) where it was noted that age of CHWs is associated with adherence to mRDT Test Procedure. Thus, the results may be attributed to age having a relationship with experience in service among health professions; that is CHWs in a community.

Motivation and adherence to mRDT test procedure by CHWs

Overall aggregate mean score for motivation stands at 4.5 and the standard deviation at 0.82. This implies that, on average, CWHs who participated in the study are motivated (Table 1).

Qualitative results obtained from the focused group discussion indicated that CHWs are motivated to work as they feel they serve their communities and this has reduced mortality of children under five.

'……I love being a CHW, we have reduced the deaths. Before children used to die and every day, we used to be doing burials and every home had a fire place by the road side but with ICCM and MRDT introduction this has stop…… CHW in Aweil West….

Programme factors and adherence to mRDT test procedure by community health workers in northern bar El Ghazal

Training

Overall aggregate mean score for training stands at 4.64 and the standard deviation at 0.68. This implies that, on average, CWHs who participated had received adequate training. Results are supported by Black et al (2010) who noted that integrated community case management iCCM in a community system entails community health workers being trained to be able to manage malaria and other diseases among children under five. However, regression results did not indicate any association between training and adherence to mRDT test procedures among CHWs in Northern Bar El Ghazal.

Support supervision

Overall aggregate mean score for support supervision stands at 4.42 and the standard deviation at 0.86. This implies that, on average, CWHs who participated believe that the support and supervision they receive in doing the community health work is adequate. (Table 2).

Results from FGDs revealed that CHWs are satisfied with the supervision and feel they benefit as they get chance to practice when the supervisors visit them and have chance to correct them when they make a mistake. This has improved their ability to use the MRDT than when they had just started.

'……. Recording patients name was difficult for me since most of us don't know how to write and we have to write the children names so that we don't forget who was negative and who was positive but from the supervision, our supervisors have encouraged us to write the names and now I do……." (Male, CBD, Aweil South].

"all the stages of testing for malaria are easy, if you do it every day you become better and better, but if you stay for a long time without doing it you forget but when the supervisors come we practice with them again…." [Female CBD, Aweil Centre].

Results are supported by Kallander et al (2015) who expressed that increased support supervision, performance and coverage of communities can increase uptake of timely and appropriate treatment for malaria among care-takers for children under the age of five years. However, in this study there was no association between support supervision and adherence to mRDT test procedure.

Workplace environment

Work environment within which CWHs conduct their roles and responsibilities directly affect their performance in managing malaria. An assessment of the perceived availability of three work environment aspects was carried out for the assessment and the study revealed that of CHW work place conditions were significantly associated(p=0.02). Availability of equipment and supplies to conduct an mRDTs was significantly associated(p=0.01) with adherence to test procedure. The findings are in line with a study by Kalyango et al (2012) who asserted that in the health care service delivery system, the attitude of CHWs is shaped by the availability of drugs, equipment and other motivation factors which translates into improved performance in terms of malaria management among children under the age of five. The results are also supported by Bagonza et al (2015) who found that under the ICCM drugs availability influenced community health workers.

One of the CHWs interviewed decried that some CHWs do not have supplies which undermine their performance;

"mRDT supplies where are not enough, with some CHWs completely not having anything and the others only having part of the supplies which affect their performance".

CHWs having documentation and reporting tools like patient registers adhered to test mRDT test procedures and the association was significant (0.02). Results in agreement with Hay et al (2011) who presented the importance for CHWs to document and report information regarding how they carry out their duties to support decision making while managing malaria among children under five.

Community Factors and Adherence to mRDT Test Procedure by Community Health Workers in Northern Bar El Ghazal

Community cooperation

Overall aggregate mean score for cooperation was at 4.56 and the standard deviation at 0.79. This implies that, on average, CWHs who participated had received cooperation from caregivers, health facilities community. However, this variable was not statistically significant. From FGDs, CHWs feel the caregivers are cooperative especially when they are given negative results, they accept them which makes their work easy.

"…*We have never experienced any caregiver rejecting this because our explanations before opening up mRDT kit were clear to every caregiver. Communities had high expectations of mRDTs. They welcomed the tests as aiding clinical diagnoses and as tools that could communicate their children problem better than they could, verbally" [Female CHW, Aweil North].*

The results are attributed to the fact that CHWs who engaged in this study had been trained under iCCM to manage malaria among children below the age of five in their respective rural communities. Therefore, the results are in agreement with Kalyango et al (2012) in their study noted that there is need for community cooperation with CHWs to have better health care services delivery in the community as well as increased health seeking behaviours among the local people in rural communities most especially.

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Table 1. Descriptive Results for Motivation

S/No	Measurement Statement	N	Strongly disagree (SD)	Disagree (D)	Not sure (NS)	Agree (A)	Strongly Agree (SA)	Measures of Central Tendency				Interpreting the Mean
			%	%	%	%	%	Min	Max	Mean	SD	
1	Overall you are satisfied with your role as a CBD	480	0.6	0.8	1.5	17.7	79.4	1	5	4.74	0.59	Strongly agree
2	The work you are asked to do is worthwhile/ has value	480	0.8	2.3	3.3	26.3	67.3	1	5	4.57	0.74	Strongly agree
3	It's important for you to do a good job so that the ICCM project works well	480	0	0	1.7	22.1	76.3	3	5	4.75	0.47	Strongly agree
4	You are respected in your community because of the work you do	480	0	0.8	2.7	17.9	79.2	2	5	4.75	0.54	Strongly agree
5	You do this job only because of the benefits which comes out of it	480	13.3	7.5	5.6	20.8	52.7	1	5	3.92	1.44	Agree
6	You proud to be working as a CBD	480	0.4	1	2.1	19	77.5	1	5	4.72	0.6	Strongly agree
7	You are willing to do more than is asked of you?	480	1.3	2.1	3.5	34.4	58.8	1	5	4.47	0.77	Strongly agree
8	Sometimes as a CBD you asked to do work which doesn't make sense	480	10.8	10.8	11.7	31.5	35.2	1	5	3.69	1.34	Agree
9	This CBD program provides everything you need to do your job effectively.	480	1.9	5.8	7.3	25.6	59.4	1	5	4.35	0.98	Strongly agree
10	Suggestions you make on how to improve your work are usually considered by supervisors	480	1.5	2.1	5.4	28.1	62.9	1	5	4.49	0.81	Strongly agree

11	You feel you have strong ties with other CBD members	480	0.8	1.3	7.5	20.8	69.6	1	5	4.57	0.76	Strongly agree
Global Mean and Average Standard Deviation										4.5	0.82	Strongly agree

Source: Primary data.

Table 2. Descriptive results for support supervision

S/No	Measurement Statement	N	Strongly disagree (SD)	Disagree (D)	Not sure (NS)	Agree (A)	Strongly Agree (SA)	Measures of Central Tendency				Interpreting the Mean
			%	%	%	%	%	Min	Max	Mean	SD	
1	You receive drug supplies regularly	480	2.1	8.3	6.3	25.2	58.1	1	5	4.28	1.04	Strongly agree
2	The quantities you receive are adequate	480	9.6	8.5	7.3	29.4	45.2	1	5	3.92	1.31	agree
3	You had no stock out for Malaria Rapid Diagnostic Test kits in the last 3 months	480	22.1	11.5	5.6	16.7	44.2	3	5	3.49	1.64	agree
4	Do you feel CBD quarterly meetings are useful	480	2.5	1.9	3.8	29.8	62.1	2	5	4.47	0.86	Strongly agree
5	You receive support supervision by Health workers on a regular basis	480	8.3	7.1	6.3	25	53.3	1	5	4.08	1.28	Agree
6	The supervision of you work is good.	480	0.2	0.2	1.7	15.2	82.7	1	5	4.8	0.48	Strongly agree
7	The support given to you helps you to improve and perform better	480	0.4	0.4	2.1	23.5	73.5	1	5	4.69	0.57	Strongly Agree
8	You feel happy whenever you are visited at your home by a health worker/MC staff	480	0	0	3.1	17.7	79.2	3	5	4.76	0.5	Strongly agree

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9	The community is aware of you work as a CBD		0.2	0.6	2.3	14.8	82.1	1	5	4.78	0.53	Strongly agree
10	You feel the community is supportive when you are doing you work	480	0.6	0.4	1.9	27.1	70	1	5	4.65	0.6	Strongly agree
11	Community leaders mobilize care-givers to seek treatment from you	480	0.8	0.6	2.7	20	75.8	1	5	4.69	0.64	Strongly agree
Global Mean and Average Standard Deviation										4.42	0.86	Strongly agree

Source: Primary Data

Table 3. Descriptive Results for Area of Coverage

S/No	**Measurement Statement**	**N**	**Strongly disagree (SD)**	**Disagree (D)**	**Not sure (NS)**	**Agree (A)**	**Strongly Agree (SA)**	**Measures of Central Tendency**				**Interpreting the Mean**
			%	%	%	%	%	Min.	Max.	Mean	SD	
	The area you serve as a CBD is manageable	480	7.5	2.3	5.4	19.8	65	1	5	4.33	1.67	Strongly agree
	The workload you have is manageable	480	7.5	4.4	2.5	21.7	64	1	5	4.30	1.19	Strongly agree
	The work I do as a CBD allows me to do my other work	480	10.6	3.1	2.7	14	69.6	1	5	4.29	1.31	Strongly agree
Global Mean and Average Standard Deviation										4.31	1.39	Strongly agree

Source: Field Data (2019)

Table 4. Logistic Regression Results on Adherence on mRDT Procedures

	Strict adherence to mRDT procedures				Moderate adherence to mRDT procedures			
	Odds Ratio	P-value	95% Conf. interval		Odds Ratio	P-value	95% Conf. interval	
Variables			**Low**	**High**			**Low**	**High**
Motivation	0.78	0.23	0.52	1.17	1.36	0.16	0.89	2.08
Support Supervision	1.10	0.68	0.69	1.76	1.07	0.76	0.69	1.66
Training	1.46	0.13	0.89	2.39	0.83	0.24	0.62	1.13
Cooperation	0.98	0.95	0.63	1.53	1.47	0.06	0.99	2.19
Area coverage	1.34	0.26	0.81	2.20	1.10	0.61	0.77	1.56
Education (Base: No education)								
Primary	1.52	0.12	0.90	2.57	1.57	0.16	0.83	2.95
Secondary	2.82	0.00*	1.39	5.75	2.30	0.05*	1.02	5.18
Age in years	1.04	0.04*	1.00	1.07	1.03	0.21	0.99	1.07
ICCM experience in years (Base: less than year experience)								
1-4 years	0.43	0.25	0.10	1.81	0.00	0.00*	0.00	0.00
5-8 years	0.62	0.52	0.15	2.63	0.00	0.00*	0.00	0.00
Over 8 years	4.30	0.27	0.32	58.50	0.00	0.00*	0.00	0.00
Gender (Base: female)								
Male	0.97	0.93	0.51	1.84	0.58	0.10	0.31	1.10
Workplace Environment	1.02	0.02*	1.00	1.03	1.03	0.00*	1.02	1.05
Equipment & Supplies	1.02	0.01*	1.00	1.03	1.02	0.00*	1.01	1.04
Documentation & reporting	1.06	0.02*	1.01	1.12	1.02	0.00*	1.01	1.03
Constant	0.00	0.00*	0.00	0.01	1.26	0.00	2.21	1.73

Conclusion

Education and age are associated with adherence to mRDT test procedure among CHWs while managing malaria in children under five. Workplace environment, equipment and supplies and documentation and reporting tool availability are also associated with adherence of CHWs to mRDT test procedure.

Recommendations

Adequate supply of commodities and supplies required by CHWs should be made timely by the program implementers. In addition, CHWs supervision and constant training of CHWs in communities is vital with regard to mRDT and should be timely and promptly done giving chance of practicing mRDT as well as consistent use of job aids use while conducting mRDTs for children below five in the communities. Level of education should be considered as a key selection criterion for CHWs.

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The Prevalence and Determinants of Overweight, Obesity, and Hypertension in a Bank in Birnin Kebbi, Kebbi State, North-West Nigeria

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Abstract

Cardiovascular disease is the leading cause of death globally. Overweight, obesity, and hypertension are the top modifiable risk factors for cardiovascular diseases. Sedentary lifestyle, unhealthy eating, and stress in the banking industry predispose employees to overweight, obesity, and hypertension.

The study was a cross-sectional survey of 52 employees of a bank in Birnin Kebbi, North-East Nigeria that participated in a healthy lifestyle program. The aim of the study was to determine the prevalence and determinants of overweight, obesity, and hypertension in bank employees. The data was collected using an interview schedule, anthropometric and blood pressure measurements and analyzed with statistical package for social sciences.

The participants aged 26 to 59 years, 65.4% were youth, 34.6% middle-aged, 94.2% men, and 5.8% women. Senior staffs constituted 53.8%, junior 38.5%, and executive 7.7%. The mean weight was 77.99 ± 12.4kg, height 1.72 ± 0.07m, Body Mass Index 26.38 ± 3.93Kg/m2, systolic blood pressure 122 ± 21mmHg, and diastolic blood pressure 76 ± 14mmHg. The prevalence of overweight was 50%, obesity 15.4%, and hypertension 28.8%. Gender was significantly associated with overweight (p .037). The relationship between obesity and hypertension was not statistically significant (p 0.056).

Lifestyle modification in form of regular exercise and healthy eating would reduce overweight, obesity, and hypertension as well as cardiovascular morbidity and mortality in the banking industry. There is the need to establish workplace gymnasium and to increase public health awareness on healthy eating and regular exercise.

Keyword: *Prevalence, Determinants, Overweight, Obesity, Hypertension, Bank.*

Introduction

Non communicable diseases, particularly cardiovascular disease, are prevalent in the banking industry. This study explored the prevalence and determinants of overweight, obesity, and hypertension in bank employees in Birnin Kebbi, North-West Nigeria. The banking industry is characterized by risk factors that predispose to overweight, obesity, and hypertension such as high income, unhealthy eating, sedentary lifestyle, long working hours, and stress necessitating the need for the study.

Obesity is a recognized clinical entity and implies an excessive accumulation of body fat causing an increase in body weight. Visceral obesity constitutes a significant risk factor for cardiovascular disease. Obesity is caused by the interaction of genetic factors with environmental factors of excessive eating of unhealthy foods and reduced physical activity. Sedentary lifestyle is the leading cause of obesity in this era of technological advancement.

Globally, the most acceptable definition of obesity is based on body mass index (BMI) (WHO, 2019a). BMI is calculated as weight (in Kg) divided by height squared (in meters). It is used to classify body weight as underweight, healthy weight, overweight, and obesity (Table 1) with obesity grouped into obesity type 1, type 2, and type 3 (morbid obesity).

According to WHO (2019b), Hypertension is a sustained increase in blood pressure (BP) above 140/90 irrespective of age and sex. Hypertension can be mild, moderate, or severe; systolic or diastolic; and primary (idiopathic) or secondary. In primary hypertension, the cause is not known but it is associated with family history, high salt intake, obesity, stress, and sedentary lifestyle. Secondary causes of hypertension include kidney diseases, endocrine disorders, pregnancy-induced, drugs, raised intracranial pressure, and vascular abnormalities.

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Globally, over 1.9 billion people are overweight with 13% (650 million) obese (WHO, 2019a). Overweight and obesity are most prevalent in North America and least common in Asia. Obesity-related diseases cause over 2.8 million people death annually (WHO, 2019a). Hypertension is the leading risk factor of cardiovascular disease, and causes over 7.5 million deaths annually with Africa having the highest prevalence (46%) and Americas the lowest - 35% (WHO, 2019b).

The risk factors of overweight, obesity, and hypertension appear to similar. These include increasing age, family history, sedentary lifestyle, high socioeconomic status, (WHO, 2019a). Overweight and obesity are also risk factors for hypertension (WHO, 2019b).

Methods

This study was conducted at a bank in Birnin Kebbi, Kebbi state, North-West Nigeria in 2016 during a healthy lifestyle program to explore the prevalence and determinants of overweight, obesity, and hypertension. It adopted a cross-sectional approach using convenience non-probability sampling technique. A total of 52 bank employees that participated in the program gave informed consent and were included in the study.

The data was collected by trained medical personnel through interview schedule and anthropometric and blood pressure (BP) measurement using questionnaire, measuring tape, weighing scale, standiometer, calculator, Excel template, and electronic sphygmomanometers. Personal data was limited to age, sex, and office status (a measure of personal and family income) while biometrics included weight, height, BMI, waist circumference (WC), hip circumference (HC), waist-hip-ratio (WHR), and BP.

The Excel dataset was exported to SPSS. The names and identity numbers of the participants were deleted. The age was grouped into youth (18-39 years old) and middle age (40-64 years old). Qualitative data was coded into numeric values to aid analysis. BMI, WHR, and BP were also transformed and grouped as ordinal variables based on the WHO criteria. The only nominal variable was gender. The ordinal variables included age groups, office status, BMI groups, WHR groups, and BP groups. The office status included junior, senior, and executive. The BP was grouped into normal (<140/90) and hypertension (>140/90). The BMI groups were healthy weight (18.5-24.9kg/m^2), overweight (25-29.9kg/m^2), and obesity (>30kg/m^2). The WHR groups were normal (<0.85 in women and < 0.9 in men) and abnormal (>0.85 in women and >0.9 in men).

The independent or predictor variables were age, age group, gender, office status, weight, height, BMI, BMI groups, WC, HC, WHR, and WHR groups while the dependent variables were systolic and diastolic BP, overweight, obesity, and hypertension. The analysis involved univariate statistics, cross-tabulation and X^2 test, and correlation. A Confidence level (CL) of 95% and a level of significance of 0.05 were used for the analysis. When p-value was < 0.05, the null hypothesis (H_0) was rejected meaning the observed association was statistically significant.

The greatest weakness of the study was the small sample size (52) and the use of a non-probability sampling technique. Therefore, the statistical power of the study was low and generalization of findings guarded. However, the findings of this study could open up the need for more research in this direction.

Results

The socio-demographic profile of the staff is summarized in Tables 2 and 3. The ages range ranged from 26 to 59 years with a mean of 38.44 ± 9.40 years, and 65.4% were youths and 34.6% were middle-aged with 94.2% men and only 5.8% women. Senior staff were 53.8%, junior 38.5%, and executive 7.7%.

The mean weight, height, BMI, WC, HC, WHR, systolic and diastolic BP of the participants were 77.99 ± 12.4kg, 1.72 ± 0.07m, 26.38 ± 3.93Kg/m^2, 93.77 ± 8.82cm, 102.12 ± 8.16cm, 0.92 ± 0.08, 122 ± 21mmHg, and 76 ±14mmHg respectively (Table 3). Weight was bimodal while WC was quadrimodal (Figure 1 and 2).

Based on BMI, 18 staff (34.6%) had normal weight, 26 were overweight (50%), and 8 were obese (15.4%). Similarly, WHR indicated that 17 staff (32.7%) had normal WHR while 35 (67.3%) had abnormal WHR. A total of 37 staff (71.2%) had normal BP while 15 were hypertensive (28.8%).

Therefore, the prevalence of overweight, obesity, abnormal WHR, and hypertension were 50%, 15.4%, 67.3%, and 28.8% respectively (Figure 3).

The statistical associations are shown in Tables 4, 5, 6, 7 and 8. Gender was significantly associated with overweight (LR (1) = 4.343, p .037) with small effect size (Phi = 247). All female participants (100%) were overweight. Age and office status did not show statistically significant relationships with overweight. Age, gender, and status were not significantly associated with obesity or hypertension. Overweight, obesity, and abnormal WHR were not significantly associated with hypertension. BMI was positively associated with WC (r (52) = .688, p .0001) and HC (r (52) = .703, p .0001). There was a weak negative insignificant association between WHR and BP that needs further investigations.

Discussion

In the banking industry across the world, the prevalence of overweight and obesity is higher than in the general population. Sekoni et al. (2013) reported the least prevalence of 40.4% of combined overweight and obesity amongst bank employees in Lagos, Nigeria while Addo et al. (2015) reported 55.6% in Accra, Ghana. Studies in Iran and India showed a higher prevalence of 76.5% - 77.5% (Hirani et al., 2017; Jafari-Shakib et al., 2016; Salaroli et al., 2013). These prevalences are much higher than the national prevalence of overweight (20-35%) and obesity (8-22%) in Nigeria (Chukwuonye et al. 2013).

In this study, the prevalence of overweight was 50%. Young et al. (2018) and Sulaiman et al. (2017) found a comparable prevalence of 47.3% and 43% among blacks in the US and expatriates in the UAE respectively. This high prevalence of overweight may be attributed to the relatively high standard of living enjoyed by bank employees since in Africa obesity is perceived as evidence of good living. It also demonstrates the rate at which isolated populations and communities in developing countries are already in the third stage of demographic transition with a preponderance of non-communicable diseases. The relatively low prevalence of obesity in this study (15.4%) much lower than 32.3% reported by Sulaiman et al. (2017) in UAE might have to do with the availability of gymnasium in the bank under study.

The national prevalence of hypertension in Nigeria is 28%, and this figure will double by 2030 (Adeloye et al., 2015). Globally, the prevalence of hypertension is asserted to be higher among bank employees. Ismail et al. (2013) reported a prevalence of 39.3% in India and Salaudeen et al. (2014) reported 34.4% in Ilorin, South-West Nigeria. In contrast, a lower prevalence was reported in Ethiopia (19.2%) and Owerri South-East Nigeria (12.4%) suggesting possible compounding effect of extraneous factors (Diwe et al. 2015; Fikadu and Lemma, 2016).

The 28.8% prevalence of hypertension in the study tallies with 28.9% national prevalence in Nigeria (Adeloye et al., 2015). The higher prevalence of 34.4% reported by Salaudeen et al. (2014) among bankers in Ilorin Nigeria may suggest the role of environmental factors in hypertension.

The finding of a significant association between gender and overweight where 100% of the women in the study were overweight sharply contrast with the findings of Yang and Colditz (2015) in the US where overweight was commoner in men and obesity was more common in women. A larger study is required to validate these findings.

Conclusion

The objectives of this study have been met to a large extent. The main limitation of the study was the small sample size. However, this study has opened up potential areas for further exploration and research.

The statistically insignificant associations of age, sex, overweight, and obesity with hypertension should not be ignored since the statistical power of this study was low. The sample size should be increased in future studies and sampling method enhanced to permit generalization of findings.

Giving the high prevalence of overweight and hypertension in the banking industry and the relatively low level of utilization of the gymnasia across Nigeria, it is recommended that social and behavioral experts be integrated into the healthy lifestyle interventions to ensure a multidisciplinary approach so that socially and culturally acceptable protocols can be integrated to encourage regular exercise at the gym and a healthy eating habit.

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Other banks in Nigeria and Africa should establish workplace gym. This strategy will go a long way in discouraging sedentary lifestyle and curb the menace of overweight, obesity, hypertension, and even diabetes mellitus and the consequent cardiovascular diseases.

Figures and tables

Table 1. Classification of BMI

BMI	
Classification	BMI Score (Kg/m^2)
Underweight	< 18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obesity type 1	30.0 – 34.9
Obesity type 2	35.0 – 39.9
Obesity type 3 (morbid obesity)	> 40.0

Table 2. Socio-demographic features of the participants

Demographics					
Age (years)	Mean ± SD	Median	Mode	Minimum	Maximum
	27.37±5.96	26	25	18	45
Age group	Youth (18-39 years)			Middle-age (40-64 years)	
	65.4%			34.6%	
Sex (Gender)	Male			Female	
	94.2%			5.8%	
Office status	Junior		Senior		Executive
	38.5%		53.8%		7.7%

Table 3. Descriptive statistics of biometrics

	Descriptive Statistics of Biometrics					
	Minimum	Maximum	Mode	Median	Mean	Std. Deviation
Weight (Kg)	54.4	116	73*	76.4	77.99	12.46
Height (m)	1.56	1.88	1.75	1.74	1.72	0.07
Body Mass Index	19.16	38.7	30.50	26.15	26.38	3.93
Waist Circumference	75	114	92*	93.5	93.77	8.82
Hip Circumference	83	119	103	102	102.12	8.16
WH Ratio	0.82	1.20	0.95	0.91	0.92	0.08
Systolic BP	84	168	121	119.5	122.42	20.69
Diastolic BP	48	108	80	76.5	75.69	13.67

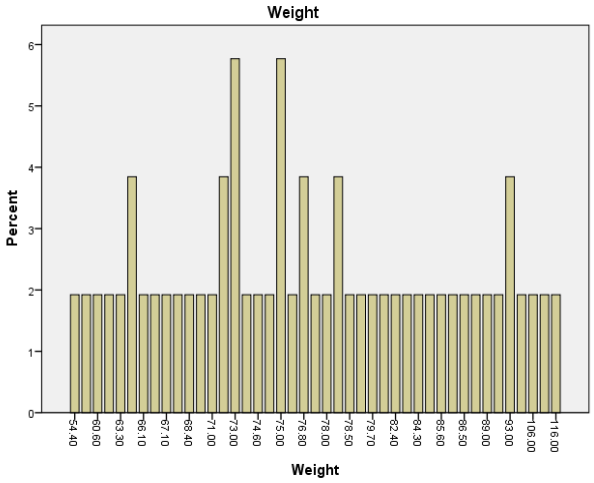


Figure 1. Bar-charts showing weight distribution

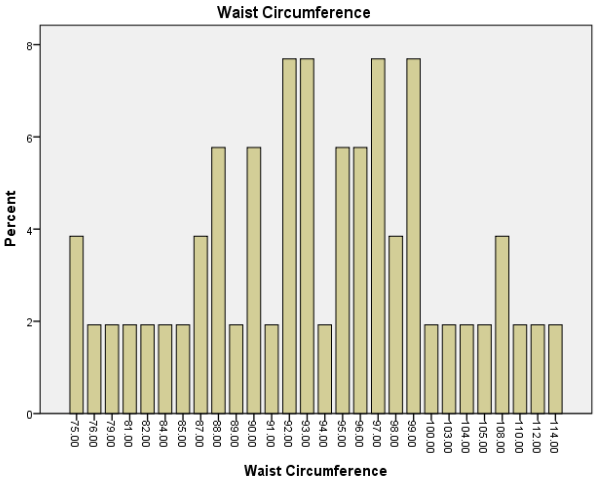


Figure 2. Bar-charts showing WC distribution

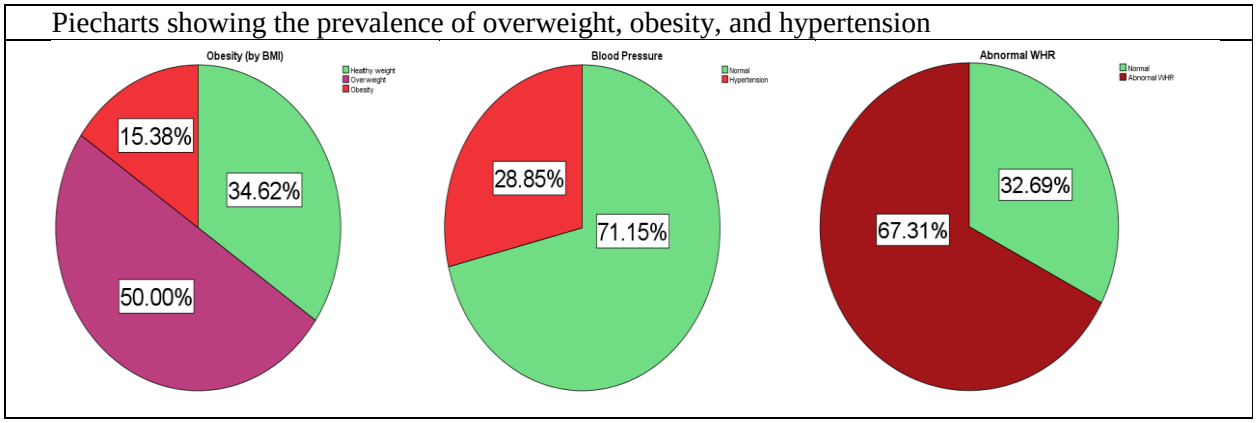


Figure 3. Piecharts showing the prevalence of overweight, obesity, abnormal WHR, and hypertension

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Table 4. Predictors of overweight and obesity

Predictors	Outcome	Test	X^2/LR Value	df	P-value	Effect size	SR
Age	Overweight	X^2	0.000	1	1.000	.000 (p = 1.000)	-
Gender	Overweight	LR	4.343	1	.037	.247 (p = .074)	-
Office status	Overweight	LR	1.379	2	.502	.162 (p = .504)	-
Age	Obesity	LR	3.086	1	.079	.250 (p = 0.72)	-
Gender	Obesity	LR	1.035	1	.309	-.106 (p = .447)	-
Office status	Obesity	LR	5.218	2	.074	.290 (p = .112)	-

Table 5. Association between age group, gender, and office status versus BMI

Age group/BMI	% within BMI	% within Middle Age
Normal weight	22.2%	22.2%
Overweight	34.6%	50.0%
Obesity	62.5%	37.8%
Gender/BMI	**% within BMI**	**% within Female Staff**
Normal weight	0%	0%
Overweight	11.5%	100%
Obesity	0%	0%
Office status/BMI	**% within BMI**	**% within Senior Staff**
Normal weight	50.0%	32.1%
Overweight	46.2%	42.9%
Obesity	87.5%	25.0%

Table 1. Predictors of hypertension

Predictors	Outcome	Test	X^2/LR Value	df	P-value	Effect size	SR
Age	Hypertension	LR	.564	1	.453	.105 (p = .448)	-
Gender	Hypertension	LR	2.207	1	.137	.222 (p = .110)	-
Office status	Hypertension	LR	.900	2	.638	.130 (p = .643)	-

Table 7. Association between overweight /obesity and hypertension

Predictors	Outcome	Test	X^2/LR Value	df	P-value	Effect size	SR
Overweight	Hypertension	X^2	0.000	1	1.000	.000 (p = 1.006)	-
Obesity	Hypertension	LR	2.324	1	.127	.222 (p = .110)	-
Abnormal WHR	Hypertension	LR	.877	1	.349	-.132 (p = .343)	-

Table 8. Correlations between the various continuous variables

	Age	Weight	Height	BMI	WC	HC	WHR
BMI	r = .194 p = .168	-	-	-	r = .688 p = .0001	r = .703 p = .0001	r = .146 p = .303
WHR	r = .233 p = .097	r = .121 p = .392	r = .082 p = .563	r = .110 p = .437	-	-	-
Systolic BP	r = .109 p = .441	r = .151 p = .286	r = -.021 p = .883	r = .174 p = .218	r = .004 p = .978	r = .260 p = .063	r = -.245 p = .080
Diastolic BP	r = .157 p = .265	r = .254 p = .069	r = .271 p = .052	r = .114 p = .422	r =.088 p = .536	r =.188 p = .181	r = -.153 p = .279

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Factors associated with Congenital Abnormalities in North-East Nigeria: A Case Study of Al-Manzoor Diagnostic and Clinical Services, Bauchi, North-East, Nigeria

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Abstract

Congenital malformations are rare disorders, but the prevalence is on the increase globally due to access to imaging modalities, particularly ultrasound. Severe congenital abnormalities are not compatible with life leading to miscarriages while others cause fetal, neonatal, infant, and under-five morbidity and mortality. Ultrasonography provides a safe tool for the early diagnosis of congenital abnormalities in pregnancy.

This study used a quantitative cross-sectional approach to determine the factors associated with fetal congenital abnormalities in 11 pregnant women diagnosed by ultrasound between January and June 2019 in a private diagnostic center in Bauchi, North-East Nigeria. The primary data was collected using interview schedule and analyzed with statistical package for social sciences.

The most common anomaly (33%) was central nervous system abnormality (hydrocephalus - 75% and anencephaly - 25%). The congenital abnormalities were associated with fever in first trimester (100%), poverty (82%), being a housewife (82%), multigravida (73%), illiteracy (73%), 18-27 age group (55%), and ingestion of herbs in the first trimester (54%). Hydrocephalus was associated with ingestion of drugs and herbs in first trimester and maternal occupation; anencephaly with maternal occupation, spouse occupation, and poverty; fetal ascites with advanced maternal age >38 years and grand-multiparity; and multicystic dysplastic kidney disease with spouse occupation (p .05).

Health education, avoidance of drugs and herbs in first trimester, access to healthcare, family planning, and poverty alleviation will prevent congenital abnormalities, reduce feto-maternal morbidity and mortality, and improve maternal and child health in Nigeria and other developing countries.

Keyword: *Congenital Abnormalities, Factors, Pregnancy, Ultrasound, Nigeria.*

Introduction

Congenital abnormalities are a leading cause of infant morbidity and mortality globally with over 29% of neonatal deaths attributed to birth defects (Lehtonen et al., 2017). In Nigeria, congenital abnormalities are often detected after delivery at home and the diagnosis made when the newborn presents at a medical facility. Most pregnant women carrying fetuses with congenital abnormalities do not have access to antenatal care. Where antenatal care is available, most of the facilities do not provide ultrasound services.

With ultrasound services becoming available and affordable in Nigeria, the diagnosis of congenital abnormalities in pregnancy is on the increase. The early detection of congenital anomaly can help in planning the management of the abnormalities to improve feto-maternal survival.

The intake of herbs and non-prescribed drugs is prevalent in Nigeria (Igweze et al., 2019). This habit is particularly common in northern parts of Nigeria (Aliyu et al., 2015), and can predispose pregnant women in early pregnancy to congenital malformations (Ahmed et al., 2018).

Therefore, this study explored the factors associated with 11 cases of fetal congenital abnormality diagnosed by ultrasound during obstetric scan from January to June 2019 at a private diagnostic center in Bauchi, the state capital of Bauchi state, North-East, Nigeria.

Bauchi is the capital of Bauchi state, one of the 36 states in Nigeria. It was created in 1976 and has 23 local government areas. It is 396 km from Abuja, the capital city of Nigeria. It bordered by Yobe and Gombe states to the north, Taraba state to the east, Plateau state to the south, and Kano and

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Kaduna states to the west. It has diverse ethnic groups, a teaching hospital, a specialist hospital, a Federal University of Technology, many private hospitals, and primary, secondary, and tertiary government and private institutions.

Methods

This research was a cross-sectional study to explore the factors associated with the congenital abnormalities detected by obstetric ultrasound scan within a period of six months (January to June, 2019) at Al-Manzoor Diagnostic and Clinical Services center in Bauchi, North-East, Nigeria.

A retrospective cohort design would have been most appropriate for this study because congenital abnormalities are rare but matching the participants with controls of similar socio-demographic variables was not feasible. Therefore, the study adopted an analytical cross-sectional approach. A prospective study was not suitable because it would require a large sample size and follow up for at least nine (9) months, practically not possible with the limited time and resources, and academic and work demands.

The primary data was collected by two experienced research assistants who were competent sonographers using a structured interviewer-administered questionnaire. The survey instruments were questionnaires, ultrasound machines, and ultrasound reports. Personal data included age, sex, gravidity, occupation, spouse occupation, educational level, and spouse educational level.

The study population consisted of pregnant women who came for obstetric scan at Al-Manzoor Diagnostic and Clinical Services, Bauchi. The sample size was eleven (11) pregnant women diagnosed with fetal congenital abnormalities during ultrasound scan between January and June, 2019. The convenience non-probability sampling technique was used to select the sample, meaning only those with sonographic diagnosis of congenital abnormality were selected.

The data was captured in SPSS. The age was grouped into three at ten (10) year-interval: 18-27; 28-37; and 38 years and above. Gravidity was grouped into primigravida, Gravida 2-4 (multigravida), and Gravida 5 and above (grand multigravida). Qualitative data was coded into numeric values to enable statistical analysis. Religion and presence or absence of fever, drug use, herb use, family history, and congenital abnormalities were the nominal variables. Age group, gravidity group, educational status, and occupation were the ordinal variables. The independent variables were the socio-demographic variables and the absence or presence of congenital abnormality was the dependent variable.

The analysis involved univariate statistics, percentages, and cross-tabulation and X^2 test. The research questions and hypothesis were addressed using appropriate statistical tests. A Confidence Level (CL) of 95% and a Level of Significance of 0.05 were used for the analysis. When p-value was < 0.05, the null hypothesis (H_0) was rejected, and research hypothesis accepted.

The main limitation was the small sample size and the absence of control to validate a classical retrospective cohort study which could have explored a causal relationship. Other limitations were exclusion of pregnant women less than 18 years old for ethical reasons, time and resources constraints, and low statistical power because of small sample size. Approval for the study was obtained from Al-Manzoor Diagnostic and Clinical Services, Bauchi. All participants were anonymous and gave informed consent.

Results

The socio-demographic profile of the participants is summarized in Tables 1. The age-range was 20 to 40 years, the mean age was 27.4 ± 6.5 years, 55% participants were within 18-27 age-group, 36% within 28-37, and 9% were > 38 years old. The gravidity ranged from 2 to 10 with 73% carrying 2-4th pregnancy and 27% carrying 5th and above pregnancy. Most of the participants were illiterate (73%), followed by primary education (18%), and the remaining 9% had junior secondary school education, while 55% of their spouses were literate. All of the participants were Muslims with 82% being full-time housewives and 82% of their spouses were petty traders, small-scale farmers, or artisans. Eighty-two (82%) of households were living below the poverty line of < $2 per day.

No participant or spouse was smoking or drinking alcohol, but 54% of the participants took herbs in first trimester (Figure 1). All of the participants (100%) had fever in the first trimester. There was no family history of congenital abnormality in 91% of the participants and 100% of the spouses.

The identified congenital abnormalities were hydrocephalus (25%), fetal ascites (17%), hydrops fetalis (17%), anencephaly (8%), multicystic dysplastic kidney disease (8%), prune-belly syndrome (8%), amelia (8%), and cystic hygroma (8%) as shown in Table 2. Central nervous system abnormalities constituting 33% were the most common anomaly (Figure 2).

The observed congenital abnormalities were associated with fever in first trimester (100%), poverty, < $2 per day (82%), being a housewife (82%), multigravida (73%), illiteracy (73%), 18-27 age-group (55%), and ingestion of herbs in the first trimester (54%) as shown in Table 3. Hydrocephalus was associated with intake of drugs or herbs in first trimester (OR 2.5, 95% CI .86, 7.31, p .013) and maternal occupation (OR 2, 95% CI .50, 7.99, p .047). Anencephaly was associated with maternal occupation, spouse occupation, and poverty (OR 2, 95% CI .50, 7.99, p .047). Fetal ascites was associated with advanced maternal age > 38 years (p .03) and grand-multiparity (OR 3, 95% CI .6, 14.8, p .010) while multicystic dysplastic kidney disease was associated with spouse occupation (OR 2, 95% CI .50, 7.99, p .047) – Table 4.

Discussion

Congenital anomalies are abnormalities that occur during intrauterine life and are detected either prenatally, at birth or later in life (WHO, 2019). The underlying cause of congenital malformations include genetic defects and chromosomal disorders, environmental factors, and nutritional deficiencies (Kalliora et al., 2019). Some of the genetic insults are hereditary, but environmental factors are known to cause chromosomal damage and induce congenital abnormalities in early pregnancy (Chang et al., 2019).

These environmental factors include physical agents such as ionizing radiation (Warembourg et al., 2017), biological agents like TORCH syndrome (Sunitha et al., 2017), chemical factors such as drugs, toxins, and herbs (Foster et al., 2017), and others factors like advanced maternal age associated with Down's syndrome (Frederiksen et al., 2018) and folic acid deficiency associated with neural tube defects (Welderufael et al., 2019).

All the observed congenital anomalies were associated with fever in first trimester. Fever in early pregnancy may be caused by teratogenic viral infections such as TORCH syndrome as demonstrated by Sunitha et al. (2017) (OR = 4.45, p= 0.009). Poverty, defined as daily household income of < $2 per day, was related to 82% of the anomalies. A similar association was reported by Adeboye et al. (2016) in Bida, North-Central Nigeria. Illiteracy, seen in 73% participants and being a housewife in 82% could synergistically translate into household poverty especially in the area of the study where unemployment is very rampant and women are not working class, and therefore, do not contribute to household income.

Multigravidity correlates with advanced maternal age, and both were found to be significant predictors of congenital anomaly as reported by Frederiksen et al., (2018) where maternal age of 40 years or older had a higher risk of chromosomal abnormalities (3.83% vs 0.56%, OR 7.44, CI 5.93 - 9.34) when compared with 20 - 34 age group.

The intake of drugs and herbs in the first trimester was significantly associated with hydrocephalus. Okoro et al., (2018) observed an associated between congenital abnormalities and herbs intake in pregnancy in South-East Nigeria. Similarly, Foster et al. (2017) alluded to this finding in a critical literature review of 97 studies involving various congenital anomalies including hypospadias, cryptorchidism, anogenital anomalies, congenital heart defects, oral clefts, neural tube defects, limb deficiency defects and gastroschisis.

The significant associations between central nervous system and kidney abnormalities with maternal and spouse occupation could be related to soil contamination by pesticides as asserted by García et al., (2017) where they observed congenital anomalies were associated with pesticides use. Since farming and artisan jobs (besides being a full-time housewife) were the most prevalent occupation in both participants and their spouses, contact with pesticide contaminated soil could be the underlying factor.

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The finding of central nervous system abnormalities as the most common anomalies (33%) tallies with findings in other studies (Eke et al., 2016; Goetzinger et al., 2017; Jystad et al., 2017; Sefidbakht et al., 2016). In a large prospective study of 3 years involving over 3000 participants in Hyderabad, south India, Sunitha et al. (2017) found that central nervous system malformations were the most prevalent congenital abnormality (37%), though Okoro et al. (2018) in South-East Nigeria observed that central nervous system anomaly was second to gastrointestinal malformations.

Conclusion

Having achieved the objective of this study of determining the factors associated with congenital anomalies in 11 pregnant women attending Al-Manzoor Diagnostic and Clinical Services, Bauchi, North-East Nigeria and based on findings from the study, the following recommendations are given to reduce the occurrence of congenital malformation and improve feto-maternal morbidity and mortality in Nigeria:

1. All pregnant women having fever in the trimester should seek medical attention at approved medical facilities.
2. The intake of drugs and herbs should be discouraged through regular public health campaigns using traditional leaders, politicians, footballers, and celebrities and various media outlets such as television, radio, social media, posters, and pamphlets.
3. Farmers and artisans should use protective gloves and boots when in contact with soil.
4. Sale and use of pesticides and herbicides should be regulated by the relevant government authorities.
5. Pregnant women should be encouraged to do antenatal care and be given incentives such as free delivery kits and free antenatal services.
6. Free medical care of pregnant women diagnosed with malformed babies.
7. Government should bring up various poverty alleviation programs and employment opportunities.
8. Establishment of antenatal clinics and provision of ultrasound facilities and training of midwives on the conduct of basic obstetric ultrasound scan.
9. Establishment and scaling up of family planning services especially in rural areas.
10. These recommendations would go a long way in preventing congenital anomalies, enhancing the early detection of congenital malformations, improving feto-maternal and child care, reducing infant and child morbidity and mortality, and improving feto-maternal survival and standard of living.

Figures and tables

Table 1. Summary of the socio-demographic profile of the participants

Socio-demographic profile of the participants					
Age (years)	**Mean ± SD**	**Median**	**Mode**	**Minimum**	**Maximum**
	27.4 ± 6.5	25	20	18	40
Age group	**18-27**		**28-37**		**≤ 38**
	55%		36%		9%
Gravidity	**Primigravida**		**Multigravida (2-4)**		**Grand Multigravida**
	0%		73%		27%
Educational Level	**Illiterate**		**Primary**		**Junior Secondary**
	73%		18%		9%
Occupation	**Housewife**				**Others**
	82%				18%
Household Income	**< $2 per day**				**> $2 per day**
	82%				18%

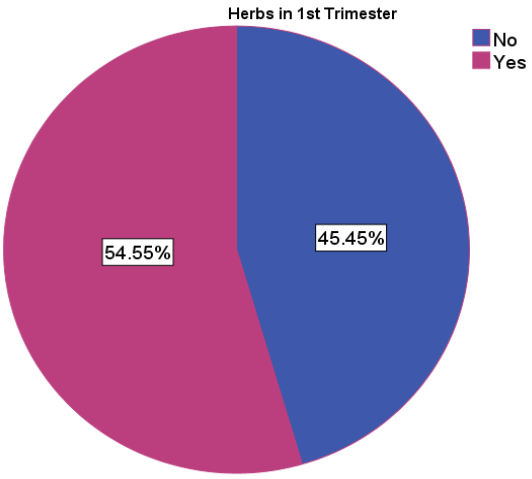


Figure 1. Use of Herbs in First Trimester

Table 2. Frequency of congenital abnormalities

Congenital Abnormality	Frequency	Percentage
Hydrocephalus	3	25%
Fetal Ascites	2	17.5%
Hydrops Fetalis	2	17.5%
Anencephaly	1	8%
Multicystic Dysplastic Kidney	1	8%
Prune-Belly Syndrome	1	8%
Amelia	1	8%
Cystic Hygroma	1	8%
Total	12	100

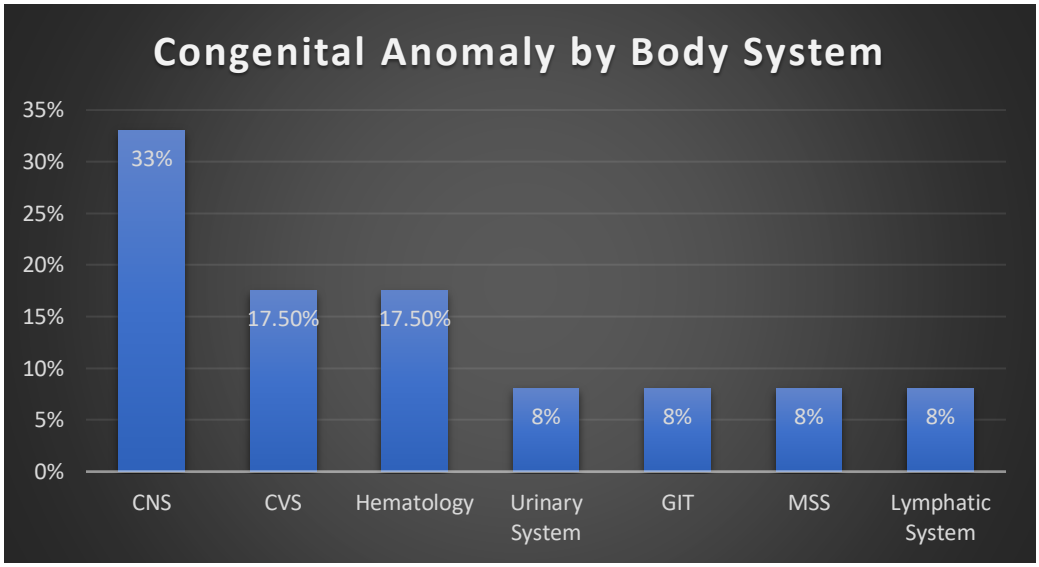


Figure 2. Frequency Distribution of Congenital Anomalies according to Body Systems

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Table 3. Factors associated with congenital abnormalities

Associated factors	Percentage frequency
Fever in the 1st trimester	100%
Poverty (< $2 per day)	82%
Being a housewife	82%
Multigravida (2-4 pregnancies)	73%
Illiteracy	73%
18-27 age group	55%
Use of herbs in 1st trimester	54%

Table 4. Significant factors associated with individual congenital abnormalities

Predictors	**Outcome**	**X^2/LR Value**	**df**	**P**	**Effect size**	**Standardized Residuals**	**Odds Ratio 95% CI**
Age > 38	Fetal Ascites	4.712	1	.030	.736 (p .051)	1.9	-
Grand Multiparity	Fetal Ascites	6.612	1	.010	.770 (p .011)	2.0	3(.6-14.8)
Occupation	Hydrocephalus	3.929	1	.047	.671 (p .026)	1.9	2(.5-7.99)
Occupation	Anencephaly	3.929	1	.047	.671 (p .026)	1.9	2(.5-7.99)
Spouse Occupation	Anencephaly	3.929	1	.047	.671 (p .026)	1.9	2(.5-7.99)
Spouse occupation	MDKD	3.929	1	.047	.671 (p .026)	1.9	2(.5-7.99)
Poverty > $2	Anencephaly	3.929	1	.047	.671(p .026)	1.9	2(.5-7.99)
Drug Use	Hydrocephalus	6.161	1	.013	.671(p .026)	1.4	2.5(.86-7.31)
Herbs Use	Hydrocephalus	6.161	1	.013	.671(p .026)	1.4	2.5(.86-7.31)

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I wish to express my gratitude to the two research assistants that helped in the collection of data and the management of Al-Manzoor Diagnostic and Clinical Services Center, Bauchi, Nigeria for giving me the permission to conduct this study.

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The Proportion and Nature of Disrespect and Abuse during facility-based care in a rural and an urban setting in Kano, northwest Nigeria; A mixed-method study

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Abstract

Objectives: *Disrespect and abuse is noted to be high but poorly reported, especially in northern Nigeria. This study was undertaken to determine the proportion and nature of disrespect and abuse of women during childbirths in health facilities at selected locations in Kano, a north-west Nigerian State*

Method: *Ethical approval and informed consent were obtained. The study adopted quantitative and qualitative data collection methods. A sample size of 292 women who delivered in the past 1year preceding the study. Quantitative data was analyzed using descriptive statistics (frequencies, percentages, means and standard deviation) and inferential statistics (chi-square). Qualitative data was analyzed along themes using Atlas.ti. P value is ≤0.05 was considered statistically significant.*

Results: *The average age of the respondents was 28.3±6.9 years. Most of the respondents were aged 25-29 years, mostly married (96%), housewives (68.8%), of Hausa tribe (85.1%) and had primary education (52.2%). About 50.7% were urban and 49.3% were rural residents. Averagely, 46.5% said that they experienced D&A during care but it was more in urbn (76.3%), compared to rural (18.30%). More than one type of D&A occurred in most individual (76%) mainly at multiple service points, but physical abuse is the most recurrent in various mix. Among types of D&A occurring singly, non-consented care and non-confidential care were mostly reported. Downward pressure placed on the abdomen before baby was born, being blamed for something that happened to them or their babies, health workers did not provide explanations for procedures and sexual abuse were also reported.*

Conclusion: *D&A is common in health facilities in both rural and urban settings of Kano. However, D&A was higher in urban compare to the rural areas. The proportion among urban women was higher than that reported in a previous study in Kano. Although D&A types commonly occurred as a mix. Further studies to explore the determinants and recommendations for D&A are necessary.*

Keywords: *Proportion, Nature, Disrespect, Abuse, Health Facility, Nigeria.*

Introduction

Disrespect and abuse (D&A) are noted to be high but poorly reported, especially in northern Nigeria. A systematic review of 14 literatures across Nigeria showed evidence of physical abuse; non-consented care; non-confidential care; non-dignified care; discrimination; abandonment/neglect; and detention in facilities for being unable to pay for services and generated some lessons and provided future research direction [1]. As disrespect and abuse determines where a woman chooses to be delivered of her baby, the high rate in the health facilities may be responsible for the poor utilization of health facilities during births [2]. WHO included a woman's experience of care as a major domain in its quality of care framework and also identified various D&A themes which includes physical abuse, sexual abuse, verbal abuse, stigma and discrimination, failure to meet professional standards of care, poor rapport between women and providers, and health system conditions and constraints [3,4]. However, based on a comprehensive review of the evidence, seven categories of D&A in childbirth

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are identified which include physical abuse, non-consented care, non-confidential care, non-dignified care, discrimination based on specific patient attributes, abandonment of care, and detention in facilities. Proposed categories of disrespect and abuse draw on human rights and ethics principles, and are intended to help synthesize and organize the broad range of manifestations of D&A reported in the literature. It is understood, however, that manifestations of D&A often fall into more than one category, so that categories are not intended to be mutually exclusive. Rather categories should be seen to be overlapping along a continuum. Numerous adverse outcomes of D&A on reproductive age women have been reported including increased risk of birth complications [5]; poor self-rated health, sleeping problems, and signs of post-traumatic stress disorder [8]; and the reluctance to use health facilities [6]. D&A can apparently constitute a barrier to facility delivery with its attendant complications, including maternal mortality [7]. Many factors have been identified to contribute to D&A in health facilities such as poor communication between women and healthcare providers; inadequate healthcare policies; prejudices from healthcare providers; and demoralization of healthcare providers in poorly performing health facilities [6, 9, 10].Although there are variations in prevalence, reports of high prevalence rates of D&A among women during facility birth have been documented in several countries [8,11,12]. For instance, approximately 13–28%women who accessed obstetrics and gynaecology services in Northern Europe experienced some form of abuse in healthcare centres [8]. A multi-country study found that 1 in 5 women who attended antenatal care in maternity health facilities had at least one episode of abuse in six European countries–Sweden, Norway, Belgium, Estonia, Iceland and Denmark [11]. Much higher prevalence rates are recorded in some of the African countries [13, 14] including Nigeria, with the prevalence rates among women during childbirth in health facilities ranging between 23.7–98% [15–17]. A previous study was conducted only in urban Kano and used quantitative method [17]. The determinants of D&A are also poorly misunderstood but are beyond the scope of this initial report. This study was undertaken to determine the proportion and nature of D&A in Kano State Nigeria using both qualitative and quantitative method.

Method

Ethical approval and informed consent were obtained. The study adopted a quantitative data collection utilizing questionnaire and qualitative data collection by utilizing in-depth interviews (IDIs) for health workers and focus group discussions (FGDs) for recently delivered women. It was a hospital-based survey which took place in the postnatal and immunization clinic and involved women of reproductive age (15-49years) in the selected communities who delivered their babies in the health facility within the past 1year (7, 17-23).

Simple random sampling was used to select women who delivered in the facility in the last one year preceding the study. A sample size of 292 was used to include respondents selected from facilities in the urban and rural setting. Using a prevalence of disrespect and abuse of 55.9% reported in Kano recently, North-west Nigeria [17], a sample size for the women's survey was calculated with the formula as $n = z^2P\ q/d^2$ (where n = Sample size, z = Standard normal deviation = 1.96 at 95% Confidence limit, P = Prevalence rate of disrespect and abuse = 55.9%, q = 1 − P = 1–0.559=0.441, d = Error margin = 5%). This gave a sample size of 292 after adding 20% to account for attrition.

An IDI and FGD guides were used to collect information from health workers and recently delivered women respectively.

We collected socio-demographic and obstetrics variable. The tools were administered in English and Hausa languages to clients depending on preference. The potential risks related to recruitment in the study were minimal. The researchers were trained on privacy and confidentiality. During the recruitment process, personal identifiers of potential (eligible) interviewee such as names, addresses and phone numbers were kept confidential. Qualitative data notes were transcribed and analyzed along themes. Quantitative data was analyzed using descriptive statistics (frequencies, percentages, means and standard deviation) and inferential statistics (chi-square). Statistical The dependent variable was D&A at hospital with a "yes" or "no" and in some cases a ''choose not to answer'' option. significance was achieved when P value is ≤ 0.05.

Result

Table 1. Socio-demographic characteristics, n=288

Variable	Frequency	Percentage	Mean+/-SD
Age			
15-19	28	9.7	
20-24	63	21.9	
25-29	76	26.3	
30-34	67	23.3	**28.29±6.85**
35-39	27	9.4	
40-44	23	8	
45-49	4	1.4	
Marital Status			
Single	9	3	
Married	276	96	
Divorces	3	1	
Occupation			
House wife	198	68.8	
Farming	15	5.2	
Teaching	20	6.9	
Trading	24	8.3	
Hand work	12	4.2	
Health work	9	3.1	
Student	5	1.7	
Not employed	4	1.4	
Other	1	0.4	
Language			
English	7	2.4	
Fulani	3	1	
Hausa	245	85.1	
Igbo	7	2.4	
Others	10	3.5	
Yoruba	16	5.6	
Education			
None	11	3.7	
Quaranic	39	13.5	
Primary	150	52.2	
Secondary	59	20.4	
Tertiary	29	10.2	
Location			
Urban	146	50.7	
Rural	142	49.3	

Table 1 showed that the average age of the respondents was 28.3±6.9. Most of the respondents were aged 25-29 years (26.3%) and these were closely followed by those aged 30-34 years (23.3%) and 20-24 years (21.9%). The respondents were mostly married (96%), housewives (68.8%), hausa (85.1%) and had primary education (52.19%). Concerning locations, 50.7% were urban and 49.3% were rural residents.

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Table 2. Disrespect and abuse during care

Variable	Frequency (%)	Percentage
Were you disrespected and abused during care (n=288)		
Yes	134	46.52
No	147	51.04
Choose not to answer	7	2.44
If you were not treated respectfully at what point did that occur (n=134)	13	9.7
antenatal	7	5.2
during labour	6	4.5
delivery	6	4.5
after delivery	4	3
postnatal visit	14	10.5
ANC & lABOUR	30	22.4
ANC, labour& delivery	14	10.5
ANC, delivery	4	3
ANC&PNC	7	5.2
Labour and delivery	14	10.5
Anc and delivery	4	3
ANC and after delivery	7	5.2
Labour & delivery	4	3
Labour & after delivery		
What type of abuse or disrespect did you experience during your childbirth-multiple (n=102)	94	92.3
physical abuse	42	14.6
non-consented care	62	21.5
non-confidential care	58	20.1
non-dignified care	52	18.1
discrimination	29	10.1
abandonment of care	42	14.6
detention in facilities		
Have you ever been disrespectful and abusive to a health worker	11	3.8
yes	243	84.4
no	33	11.5
choose not to answer		
How would you rate the respect the providers showed you at the facility during your last delivery	52	18.1
Excellent	120	41.7
Very good	16	5.6
Good	40	13.8
Poor	45	15.6

Fair Dk	15	5.2

Table 2 showed that 46.52% said that they were disrespected and abused during care and these mostly happened at multiple sites including ANC, labour and delivery in 22.4% of cases. The present study showed D&A were as high as 75.3% in urban settings unlike 18.3% obtained in rural settings. Disrespect and abuse occurred mostly as more than one type in most individuals (76%) but physical abuse is the most recurrent in various mix. Among types of D&A occurring singly, the proportions were as non-consented care (25%), non-confidential care (25%), detention in facilities (18.8%) and physical abuse (15.6%). Most of the respondents 84.4% have not been disrespectful and abusive to a health worker.

Table 3. Other disrespectful and abusive practices

Variable	**Frequency**	**percentage**
Sexual Abuse		
SA	0	0
A	7	2.4
UD	13	4.5
D	105	36.5
SD	168	58.3
Health workers provided explanations for procedures		
SA	60	20.8
A	32	11.1
UD	17	5.9
D	10	3.5
SD	166	57.6
I was not assisted to deliver my baby by healthcare provider	7	2.4
SA	10	3.4
A	25	8.7
UD	194	67.4
D	50	17.4
SD		
You were restrained at any point		
SA	12	4.2
A	19	6.6
UD	38	13.2
D	188	65.3
SD	28	9.7
Downward pressure placed on my abdomen before baby was born	4	
SA	87	1.4
A	25	30.2
UD	133	10
D	36	46.2
SD		12.5
I was cut in my private part during my last delivery		
SA	9	
A	19	
UD	25	
D	203	

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SD	31	
I was asked for permission before being cut in my private part during my last delivery SA A UD D SD	29 42 26 174 15	
I was blamed for something that happened to you or your baby SA A UD D SD	11 105 23 125 28	3.8 36.5 8 43.4 9.7

Table 3 showed that downward pressure placed on my abdomen before baby was born in 31.6%, 40.3% was blamed for something that happened to them or their babies, and health workers provided explanations for procedures in 31.9% and 2.4% claimed that they were sexually abused.

The qualitative data also corroborated with various forms of D&A mentioned on the quantitative data.

The authors observed very low prevalence of D&A in the rural area compared to the urban. A head of nursing/midwives in the rural area commonly called matron mentioned that,

''Most of the staff here respects their patients. I have never come across a case of D & A. Client prefers to come here for their care because they are well taken care of. Most of the problem comes from the relative''

The staff also opined that.

''Woman need to be treated individually; they need privacy''

Neglect is an important type of D&A, one client lamented thus:

''When I came for my delivery of this child five months ago the doctors were sleeping some of them were hearing me shouting but they neglected me, the head of the baby was out but no one to help and I was not strong enough to push the baby out it was only the grace of God that helped me the baby baby come out, it was after the delivery my sister that come with me ran to them and call them, that negligence is a very bad attitude I was not happy at all ''

Another said,

''I was brought to this hospital as a patient and I was neglected for almost two days instead of them to directed me to were my situation would be handling properly but I was neglected as if I am not a human being''

Physical abuse was as common, one respondent said that, *''sometimes when you are kicking your legs because of the pain of labor they do beat us''*

Another said,

''*When you are in labor and the pain makes you to start demonstrating and crying then if you shout on me, it is an insult because you don't know what I am feeling''*

Paying a ''bribe'' for treatment was noted,

''We don't like coming to the hospital because of their insult in fact, here is my daughter she was brought the girl was fainting but the doctor refuse to attend to us we have to bribe by giving him five hundred naira before he put blood on her''

Rejection and negligence were described as a form of D&A, a client said that,

''There was a woman who came here for delivery and she lost her card because she was in haste, when she met the nurses they rejected in that condition and sent her away''

Discussion

Disrespect and abuse are very common in many parts of Nigeria and may be responsible for the persistently low utilization of facility-based deliveries among women of child-bearing age in our society [1]. The present study had 50.7% urban and 49.3% rural respondents. The author is not aware of any study on D&A involving both rural and urban settings in Kano.

Most of the respondents were 25-29years with average age of 28.29 ± 6.85. These were mostly married, housewives, of Hausa ethnic group and had primary level of education. These are similar to findings of Amole et al who reported that most of the respondents were 25-29years with average age of 27.7 ± 6.3, mostly married, housewives, of Hausa ethnic group, but rather a secondary level of education as their respondents were only urban Kano women [17]. The finding defers from those of a study from the South-west Nigeria where more than half of the respondents were in the 30–39 year age group, another half had a tertiary education and of Yoruba ethnic group [24] or another from the south east where mean age of the respondents was 32.1 ± 2.7 years, mainly from the Igbo tribe and more than one third had completed tertiary education [18].

The present study reported a D&A proportion of 46.52% when rural and urban settings are calculated together, but the actual proportions are significantly higher in the urban (75.3%) when compared to rural (18.3%). Disrespect and Abuse is as high as 93% in south-west Nigeria55 and 98% in southeast18. Amole et al however recently reported a rate of 55.9% in Kano north-west17. All three regions of the previous studies were however done in urban settings alone. Evidence from a recent study in another south west state showed a low rate of about 19% and various interventions are likely to reduce D&A where the rates are already high [24]. The present study showed D&A were as high as 75.3% in urban settings unlike 18.3% obtained in rural settings. There are few studies comparing D&A between urban and rural community the author believes as reported in the present study may be less common in a rural setting as women were likely going to report D&A if they were exposed enough to know their rights [1,25]. Report of D&A may be low in environment where women normalize them [1]. On the contrary, one non-comparative cross-sectional study has reported that respondents from a rural setting are more likely to complain of D&A [26]. It is also important to note that studies document a wide range of estimates due to different methodological approaches, including varying operational definitions of the construct of interest [23].

The present study showed that D&A can occur at multiple service areas such as ANC, labour and delivery in a single person at various times. Previous study has shown that respondents sought improvement of maternity services in ANC services and delivery services [84]. The present study showed that D&A occurred mostly as more than one type in 76% of cases and physical abuse is the most recurrent in various mix. In 24% of cases various forms of D&A occurred singly. The finding defers from that of a previous study that D&A occurred more in at least one form than they would occur in at least two forms [27]. Non-consented and non-confidential care were the commonest each occurring in 25% of cases. Two studies from south eastern part of Nigeria reported that non-consented care was very prevalent [18, 28]. Contrary to the findings of this study, a systematic review suggests that the type of D&A most repeatedly reported was non-dignified care and the least commonly reported were physical abuse and detention in facilities [1].

Conclusion/Recommendations

D&A is common in health facilities in both rural and urban settings of Kano. However, D&A was higher in urban compare to the rural areas. The prevalence among urban women was higher than that reported in a previous study in Kano. Although D&A types commonly occurred as a mixed, the various types were mostly those commonly reported in literatures. Further studies to explore the determinants and recommendations for D&A are necessary.

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Practice and Correlates of Widowhood Rites in A City in North Central Nigeria

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Abstract

Objectives: *This study determined the practice and correlates of widowhood rites in a city in North-central Nigeria.*

Methodology: *A descriptive cross-sectional design was used for the study. Multistage sampling technique was used to recruit 450 respondents into the study. Interviewer administered questionnaire and two focus group discussions were used for data collection. Data analysis was done using Epi-info version 3.5.3. A p-value of 0.05 or less was regarded as statistically significant. The study included all males and females over 18years of age residing in Ilorin South Local Government Area.*

Results: *The age range of respondents was between 20 – 79 yrs. A quarter of all respondents (25.9%) were in the fifth decade of life. Widowhood rites commonly practiced in Ilorin South LGA as identified by more than 70% of the respondents include; preventing the widow from going to the farm and market during the mourning period and preventing her from doing household chores. About 16.2% of respondents had ever practiced one or more forms of widowhood rites. There was a statistically significant relationship between age, gender, religion, marital status, educational level, ethnicity and occupation of respondents and the practice of widowhood rites ($p< 0.05$).*

Conclusion: *Widowhood rites are observed across different categories of people. Age, gender, religion, marital status, educational level, ethnicity and occupation were significantly associated with practice of widowhood rites. There is a need for legislation against harmful widowhood rites by relevant stakeholders.*

Keywords: *Widowhood Rites, Ilorin, Nigeria.*

Introduction

All enduring marriages ultimately end with the death of either the husband or the wife or both. The death of a spouse may be the most extreme life crisis because it severs some of the deepest emotional bonds established in a life time (Nwadinobi, 2001). The loss of one's spouse is a source of emotional and psychological stress which requires a period of time to overcome. Most widows and widowers go through an intense grieving process early in widowhood, marked by feelings of depression, mood changes, disrupted sleep patterns, obsessive thoughts about the deceased and disorientation(Wells and Browning, 2002).

Widows across the globe share two common experiences: a loss of social status and reduced economic status. African widows, irrespective of ethnic groups, are among the most vulnerable and destitute women in the region(United Nations, 2001). Common to both francophone and Anglophone countries is the concept that death does not end marriages. While the widow may have no rights to ownership of her husband's property, she is usually expected to fulfil obligations towards her deceased husband through her participation in widowhood rites(Mezieobi et al., 2011; United Nations, 2001).

Widowhood rites are sets of expectations as to actions and behaviour of the widow, actions of others towards the widow, and rituals performed by, or on behalf of the widow, from the time of the death of her husband(Ilika and Ilika, 2017; Mezieobi et al., 2011). Widowhood rites are also described as series of superstitious acts performed on, by or against the widow on the instruction of her deceased husband's family in the name of custom and tradition(Sossou, 2002). Widowhood rites are also seen as a test of the woman's fidelity to her late husband and a cleansing ritual to free the woman from the

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curses that come along with disobedience. Unfortunately these rites have led to ill treatment and gross psychological torture of women at a time when they need comfort the most(Sossou, 2002). Widowhood rites vary from one community to another and some of these rites violate a woman's human rights (Fasoranti and Aruna, 2015).

In Nigeria, harmful widowhood rites are prevalent in the Southern and Eastern parts of the country (Izuako, 2003). Family laws permits certain widowhood rites which discriminate against women, particularly women married according to customary rather than statutory law(United Nations, 2001). During the process of carrying out some widowhood rites, widows through poor nutrition, lack of hygiene, a lack of access to health care and vulnerability to violence are likely to suffer physical ill health as well as psychological pain(United Nations, 2001). Also, discussions about widowhood rites are considered as taboos thus there is scanty information, since not much research has been done in this area (Aderibigbe et al., 2017). Understanding the factors that influence the practice of widowhood rites will help in the design of programs and interventions aimed at reducing and addressing harmful widowhood rites. This study determined the practice and correlates of widowhood rites in a city in North-central Nigeria.

Methods

Ilorin, the capital of Kwara state is located in North Central Nigeria at the geographical and cultural confluence of the North and South of Nigeria. The indigenes of Ilorin are mainly Muslims and the major ethnic groups are Yoruba, Fulani, Hausa and Nupe. The study was conducted in Ilorin South Local Government Area (LGA), one of the three LGAs in Ilorin metropolis. It has a population of 315,000 delineated into 11 wards.

A descriptive cross-sectional design was used for the study. Multistage sampling technique was used to recruit 450 respondents into the study. Data was collected using an interviewer administered, semi-structured questionnaire. The questionnaire sought information on the socio-demographic characteristics of the respondents, practice of widowhood rites and its correlates. Also, two focus group discussions were carried out; one among the male participants and the other among the females.

Data analysis was done using Epi-info version 3.5.3. The results were presented in frequency tables and charts. A p-value of 0.05 or less was regarded as statistically significant. The study included all males and females over 18years of age residing in Ilorin South Local Government Area. Informed consent was obtained verbally from the respondents before the questionnaire was administered. All information was treated with strict confidentiality and respondents were given the free will to consent without coercion.

Results

The age range of respondents was between 20 – 79 yrs. A quarter of all respondents (25.9%) were in the fifth decade of life. A little more than half (53.6%) were females while a majority (80.0%) were of the Islamic faith. Slightly more than three quarters (76.7%) of the respondents were Yorubas by ethnicity while a majority (89.6) were married. About two thirds of all respondents had a form of education. (Table 1)

Table 1. Socio- Demographic characteristics of the respondents

Socio-demographic variables	**Frequency**	**(%) (N=450)**
Age group (years)		
20-29	30	(6.7)
30-39	88	(19.6)
40-49	166	(25.8)
50-59	106	(23.6)
60-69	51	(11.3)
70-79	9	(2.0)
Gender		
Male	209	(46.4)
Female	241	(53.6)

Religion		
Islam	360	(80.0)
Christianity	90	(20.0)
Marital status		
Single	18	(4.0)
Married	403	(89.6)
Separated /divorced	8	(1.8)
Widowed	21	(4.7)
Tribe		
Yoruba	345	(76.7)
Fulani	22	(4.9)
Hausa	16	(3.6)
Igbo	14	(3.1)
Others	53	(11.8)
Occupation		
Artisan	159	(35.3)
Business	158	(35.2)
Civil servant	82	(18.2)
Farmer	31	(6.9)
Student	13	(2.9)
Unemployed	7	(1.6)
Educational Level		
No Formal	173	(38.4)
Primary	123	(27.3)
Secondary	92	(20.4)
Tertiary	62	(13.8)

Widowhood rites commonly practiced in Ilorin South LGA as identified by more than 70% of the respondents include; preventing the widow from going to the farm and market during the mourning period and preventing her from doing household chores. None of the respondents agreed that widows are made to drink the water used to wash their husband's corpse. (Table 2)

Table 2. Types of widowhood rites practiced in ilorin south local government

***Types of widowhood rites**	**Frequency**	**(%)**
Preventing the widow from going to the market during mourning	367	(93.9)
Preventing the widow from going to the farm during mourning	359	(91.8)
Preventing the widow from doing household chores during mourning	290	(74.2)
Confining the widow to a room during mourning	246	(62.9)
Widows paying a fine to abstain from any of the rites	108	(27.6)
Compulsory inheritance of the widow by her late husband's kin	95	(24.3)
Forcing the widow to eat with left hand during mourning period	89	(22.8)
Widow cleansing (ritual cleansing)	82	(20.9)
Preventing the widow from eating certain food items	70	(17.9)
Confiscation of the husband's property by his people	57	(14.6)
Preventing the widow from changing her clothes during mourning period	47	(12.0)
Compulsory crying at specific periods of day and night during mourning	39	(10.0)
Wearing black clothes for the duration of the mourning period	13	(3.3)

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Forcing the widow to sit on the floor during the mourning period	11	(2.8)
Forcing the widow to sleep on the floor during the mourning period	9	(2.3)
Shaving the hair on the head of the widow	9	(2.3)
Forcing the widow to eat from dirty or broken plates during the mourning period	9	(2.3)
Preventing the widow from taking baths during the mourning period	7	(1.8)
Forcing the widow to drink the water used to wash the corpse	0	(0)

***Multiple response N= 391**

About 16.2% of respondents had ever practiced one or more forms of widowhood rites. None of the respondents; had forced a widow or was forced to eat from dirty/broken plates, had prevented a widow/was prevented from taking baths and had forced a widow/was forced to drink the water used in washing the husband's corpse. (Table 3)

More than three quarter: 28 (93%) of respondents within 20-29 age bracket had never practiced any form of widowhood rites while 88% of respondents within 70-79 age bracket had practiced one or more forms of widowhood rites. Less than one fifth, 27 (11.2%) of female respondents had practiced one or more forms of widowhood rites while majority: 84 (93.3%) of Christian respondents had never practiced any form of widowhood rites. Majority: 20 (95.2%) of the widowed respondents had practiced one or more forms of widowhood rites. In Addition, most 56 (90.3%) of the respondents who had tertiary education had never practiced any form of widowhood rites. (Table 4)

Table 3. Distribution of respondents who had experienced one or more forms of widowhood rites

Practice of one or more forms of widowhood rite	**Frequency**	**(%)**
Yes	73	(16.2)
No	377	(83.8)
***If yes, type of widowhood rite experienced (N=73)**		
Preventing a widow/being prevented from going to the farm during mourning	71	(97.3)
Preventing a widow/being prevented from doing household chores during mourning	69	(94.5)
Preventing a widow/being prevented from going to the market during mourning	63	(86.3)
Confining a widow/being confined to a room during mourning	47	(64.4)
Making widows pay a fine/being made to pay a fine to abstain from any of the rites	23	(31.5)
Forcing widows/being forced to be inherited by late husband's kin	17	(23.3)
Preventing a widow/being prevented from changing clothes during mourning period	12	(16.4)
Preventing a widow/being prevented from eating certain food items	8	(11.0)
Forcing a widow/being forced to cry at specific periods of day and night during mourning	6	(8.2)
Confiscation of the husband's property/being dispossessed of husband's property by his people	5	(6.8)
Forcing a widow/ being forced to eat with left hand during morning period	4	(5.5)
Forcing a widow/being forced to sit on the floor during the mourning period	4	(5.5)
Forcing a widow/ being forced to undergo ritual cleansing	2	(2.7)
Forcing a widow/being made to wear black clothes for the duration of the mourning period	2	(2.7)
Shaving the hair on the head of the widow/having your hair shaved	2	(2.7)
Forcing a widow/being forced to sleep on the floor during the mourning period	1	(1.4)
Forcing a widow/being forced to eat from dirty or broken plates during the mourning period	0	(0.0)
Preventing a widow/being prevented from taking baths during the mourning period	0	(0.0)
Forcing a widow/ being forced to drink the water used to wash the corpse	0	(0.0)

*Multiple responses

Less than one fifth: 57(16.5%) of respondents who were Yoruba had practiced one or more forms of widowhood rites while more than two third: 70(85.4%) of respondents who were civil servants had never practiced any form of widowhood rites. There was a statistically significant relationship between age, gender, religion, marital status, educational level, ethnicity and occupation of respondents and the practice of widowhood rites ($p< 0.05$). (Table 4)

Table 4. Relationship between practice of widowhood rites and socio-demographic variables of respondents

	Practice of Widowhood rite		
Socio-demographic variables	**Yes (%)**	**No (%)**	**X^2, p-value**
20-29.	2(6.7)	28(93.3)	
30-39	5(5.7)	83(94.3)	X^2= 104.88
40-49	12(7.2)	154(92.8)	p-value =0.0000
50-59	19(17.9)	87(82.1)	
60-69	27(52.9)	24(47.1)	
70-79	8(88.9)	1(11.1)	
Male	46(22.0)	163(78.0)	X^2= 9.62
Female	27(11.2)	214(88.8)	p-value =0.0019
Islam	67(18.6)	293(81.4)	X^2= 7.56
Christianity	6(6.7)	84(93.3)	p-value =0.0059
Marital Status			
Single	3(16.7)	15(83.3)	
Married	47(11.7)	356(88.3)	X^2= 105.31
Separated/Divorced	3(37.5)	5(62.5)	p-value =0.0000
Widowed	20(95.2)	1(4.8)	
Educational Level			
No formal education	35(20.2)	138(79.8)	
Primary	24(19.5)	99(80.5)	X^2= 8.81
Secondary	8(8.7)	84(91.3)	p-value =0.0218
Tertiary	6(9.7)	56(90.3)	
Ethnic Group			
Yoruba	57(16.5)	288(83.5)	
Fulani	3(13.6)	19(86.4)	X^2=12.70
Hausa	4(25.0)	12(75.0)	p-value =0.0128
Igbo	6(42.9)	8(57.1)	
Nupe	3(5.7)	50(94.3)	
Occupation			
Artisan	16(10.1)	143(89.9)	
Business	21(13.3)	137(86.7)	X^2=54.16
Civil Servant	12(14.6)	70(85.4)	p-value =0.0000
Farmer	18(58.1)	13(41.9)	
Student	2(15.4)	11(84.6)	
Unemployed	4(57.1)	3(42.9)	

Discussion

Until recent times there had been a silence that surrounded Gender and Culturally Based Violence (GCBV) and a resistance by international agencies to address it because of cultural differences in relation to challenging existing local norms. Widowhood rites like many other customary practices form an integral part of the cultural beliefs of most African communities. These rites may have useful purposes but some also have negative effects on the widows. There are however few researches on this topic and most of the studies on widowhood rites are scantly published in scientific journals to provide other readers and workers the opportunity to learn more about them.

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The types of widowhood rites are varied. There are however certain rites that are frequently practiced and therefore serve as the core practices. Widowhood rites commonly practiced in Ilorin South as stated by more than 60% of the respondents included; preventing the widow from going to the market and farm during mourning, preventing her from doing household chores and confining her to a room during the mourning period. This finding quite agrees with Aderinto's report in 2000 which stated that in Ekiti State, the community provides necessary social and psychological support to the widow. Family, friends and sympathizers cook for the widow and help her in doing the household chores although the exception to this is a childless widow, who according to them has no stool (*Ijoko*) (Aderinto, 2000). This finding implies that the core practices may not really entail abuse of fundamental human rights and that there are widowhood rites that may be beneficial to the widow. Although, confining a widow to a room denies her the freedom of movement and may increase her feelings of loneliness and therefore have negative effects. Very few of the respondents said that widows are forced to sleep on the floor, shave their heads and eat from broken plates while none of the respondents stated that widows are forced to drink the water used to wash their husband's corpse.

Findings from the focus group discussions revealed that the length of the mourning period is four months and ten days according to Islamic injunctions and this period is used to know if the widow is pregnant. This is in line with a study by Aransiola *et al.* which showed that one of the reasons for widowhood rites among the Yoruba is for the husband's relatives to know if the woman was pregnant before the death of her husband, that is; her staying at home will give them the assurance that the pregnancy is theirs and that they must be responsible for the care(Aransiola and Ige, 2010). The findings from this study indicated that dehumanising rites are less commonly practiced in Ilorin South and this is in agreement with studies that reported that less harmful rites are carried out in the Northern part of the country(Kabir, 1991), Ilorin lying within the North- central geopolitical zone.

The proportion of respondents who had experienced one or more forms of widowhood rites was 16.2%. None of the respondents in this study had; forced a widow or was forced to eat from dirty or broken plates, prevented a widow or was prevented from taking baths during the mourning period and forced a widow or was forced to drink the water used in washing the corpse of the husband.

There was a significant difference in age and practice of widowhood rites as the practice of widowhood rites by respondents was shown to increase with age. The likely reason for this is that as people grow older, the chances of becoming widowed increases, as well as the power to make other people observe widowhood rites. The observed difference in gender and practice of widowhood rites was also statistically significant. Despite the larger number of females in this study, a higher proportion of males had practiced one or more forms of widowhood rites when compared to females, implying that men are enforcers of the rites. This finding is in concordance with a report that stated that the differentiation between men and women's role involves a hierarchy in which men are given greater leverage over decision-making than women(Owasanoye et al., 1997).

In this study, practice of widowhood rites was linked to religion as more Muslims had carried out one or more forms of widowhood rites when compared to Christians. The probable reason for this finding is that Islam is the predominant religion in the study area. There was an association between marital status and the practice of widowhood rites by respondents. Although the number of widowed respondents was few, majority of them had been involved in one or more forms of widowhood rites. This could be because the practice of widowhood rites arises only when a spouse dies, therefore those who are not widowed are less likely to practice widowhood rites.

Level of education was shown to significantly influence the practice of widowhood rites. Respondents who had no formal education had the highest practice of widowhood rites when compared to those who had some form of Western education. This finding is in line with studies that reported that women who were well educated suffered less or none of the harmful widowhood rites as against those who were not educated or less educated(Aransiola and Ige, 2010; Okoye, 2001). This suggests that with education, people become more empowered and have better knowledge of their rights. They are therefore less likely to subject others or be subjected to detrimental rites while illiterate individuals remain less empowered and defenceless because they do not know their rights.

The observed difference in tribe and practice of widowhood rites was significant connoting that tribe influences the practice of widowhood rites. This finding concurs with reports that stated that culture plays an important role in determining the extent to which widowhood rites are carried out(Aransiola

and Ige, 2010) because, culture is an ethnic identity, and widowhood rites vary from one culture to another(Fasoranti and Aruna, 2015). The occupation of respondents was also shown to significantly influence the practice of widowhood rites, implying that practice of the rites was linked to occupation. Similarly, studies by Aransiola *et al.* indicated that the intensity of widowhood rites varied based on occupation of the widows. While a woman who was either self-employed or a full house wife was enforced to stay at home for certain number of days/months, those who were engaged in civil service or in private business organizations could not be enforced since they had to resume in their places of work after the number of days they were allowed to stay off duty by their bosses(Aransiola and Ige, 2010).

Conclusion

Widowhood rites are observed across different categories of people. Age, gender, religion, marital status, educational level, ethnicity and occupation were significantly associated with practice of widowhood rites. Better knowledge of widowhood rites, their implications and the factors influencing the practice would help in the design of programs and interventions aimed at reducing and addressing harmful widowhood rites. The Federal and State government should initiate/put up legislation against harmful widowhood rites and ensure that it is implemented.

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Factors affecting Disrespect and Abuse during facility-based care in rural and urban setting in Kano, northwest Nigeria; A mixed-method study

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Abstract

Objectives: *This study was undertaken to explore various factors affecting disrespect and abuse (D&A) of women during childbirths in health facilities in selected locations in Kano, a north-west Nigerian State.*

Method: *Ethical approval and informed consent were obtained. The study adopted quantitative and qualitative data collection methods. A sample size of 292 women who delivered in the past 1year preceding the study. Quantitative data was analyzed using descriptive statistics (frequencies, percentages, means and standard deviation) and inferential statistics (chi-square). Qualitative data was analyzed along themes using Atlas. ti. P value is ≤ 0.05 was considered statistically significant.*

Results: *The age group 25-29years had the highest proportion of D&A (61.84%). Those who were single had more proportion of D&A (55.6%) compared to those who were married (45.7%). The women that leaved in urban setting (75.3%) had more proportion of D&A compared to those who lived in a rural setting (18.3%). The proportion of D&A was highest among parity group 7-8 (100%). D&A greater if the respondent spends 2days (95.7%) and above in the hospital compared to when they spent <2 (45.8%). 94.2% of those who will not recommend the facility for delivery had D&A compared to 22.4% of those who will recommend the facility. Health system inadequacies including lack of supervision, poor remuneration, inadequate staffing and supplies were common barriers mentioned.*

Conclusion: *Socio-demographic, obstetrics, level of health facility, health system inadequacy and social class affect occurrence of D&A. improved socio-demographic status and health systems can reduce the occurrence of D&A.*

Keywords: *Factors; Disrespect; Abuse; Health Facility; Nigeria*

Introduction

DA reported by women did not differ significantly by age group, religion, education, and parity in some studies [Diamond-Smith et al, 2017; Nawab T, 2015]. Okafor *et al*. have also reported that maternal characteristics such as age, parity, and educational status did not affect prevalence of DA significantly [Okafor, Ugwu, Obi; 2015]. Among the various sociodemographic determinants of DA, SES was found to be a significant one, with odds 3.6 times more among females with low SES [Nawab T, 2015; Azhar, Oyebode, Masud, 2017]. Health providers may treat lower SES females poorly as they are less likely to report it or reply back. On the other hand, some authors have found that females belonging to higher wealth quintiles reported more mistreatment [Diamond-Smith et al, 2017]. Females of higher SES may have more expectations from facility and are more likely to be sensitive to their needs and behavior meted out to them. No significant association was found between the time of delivery (daytime or night) and DA in this study [Nawab T, 2015].

Moronkola et al speculated that women who are not aware of their rights and have never been exposed to any other system of care are not sensitive to the disrespect and abuse of health care workers and see such behavior and attitude as normal [Moronkola et al;2007]. It has also been observed that an important barrier to respectful care at childbirth as well as skilled delivery service is

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the financial status of the woman [Moronkola et al,2007; Iyaniwura and Yussuf, 2009; Lamina, Sule-Odu, Jagun, 2004]. Some women indicated that they report to hospitals late or not at all because of the costs involved. Studies showed that majority of women reporting disrespect and abuse were uneducated and of low socioeconomic status [Moronkola et al,2007; Iyaniwura and Yussuf, 2009]. The authors of these studies concluded that educated women are better aware of their rights thereby reducing the likelihood of being subjected to disrespectful and abusive behavior. Lamina et al also commented on the higher rate of hospital deliveries in educated women postulating they were less likely to be disrespected thereby increasing their level of utilization [Lamina, Sule-Odu, Jagun, 2004]. Moore et al reported that as policies that protect the rights of women are hardly enforced and providers are rarely held accountable for their actions these result in cases of disrespect and abusive [Moore et al;2002]. According to Igboanugo et al, women feel that health workers are disrespectful and abusive because sometimes, there is weak leadership and no supervision [Igboanugo and Martin;2011]. The negative effects of under-resourced and strained health systems on provider motivation were described as contributors to disrespect and abuse in three studies[9]. Bad attitude of health workers was attributed to health facilities being understaffed leading to them becoming overworked, tired and easily irritable [Igboanugo and Martin;2011]. Lack of training of staff to improve quality of care [Igboanugo and Martin;2011]., poor remuneration and lack of motivation [Moore, Alex-Hart, George;2011] could contribute to negative attitude. Poorly designed hospital environment with minimal privacy and lacking equipment and infrastructure was also reported with as contributing factors to disrespect and abuse of women [Igboanugo and Martin;2011].

Disrespect and abuse in facility-based childbirth often acts as a barrier to current and/or future utilization of facility-based childbirth services. Several studies highlight the connection between disrespectful facility-based childbirth care as described by women users and a decision by women users not to use facility-based childbirth services. The bad attitude of health workers was cited as one major reasons for women avoiding skilled delivery services [Moronkola et al, 2007; Onah, Ikeako, Iloabachie, 2006], and choosing to deliver at home or in spiritual church based centers[12]. Some women reported presenting to the hospital was a last resort because the health staff were usually very rude and abusive [Moronkola et al, 2007].

This study was undertaken to explore various factors affecting D&A of women during childbirths in health facilities in selected locations in Kano, a north-west Nigerian State.

Method

Ethical approval and informed consent were obtained. The study adopted a quantitative data collection utilizing questionnaire and qualitative data collection by utilizing in-depth interviews (IDIs) for health workers and focus group discussions (FGDs) for recently delivered women. It was a hospital-based survey which took place in the postnatal and immunization clinic and involved women of reproductive age (15-49years) in the selected communities who delivered their babies in the health facility within the past 1year.

Simple random sampling was used to select women who delivered in the facility in the last one year preceding the study. A sample size of 292 was used to include respondents selected from facilities in the urban and rural setting. Using a prevalence of disrespect and abuse of 55.9% reported in Kano recently, North-west Nigeria [Amole et al;2019], a sample size for the women's survey was calculated with the formula as $n = z^2P\ q/d^2$ (where n = Sample size, z = Standard normal deviation = 1.96 at 95% Confidence limit, P = Prevalence rate of disrespect and abuse = 55.9%, q = 1 − P = 1–0.559=0.441, d = Error margin = 5%). This gave a sample size of 292 after adding 20% to account for attrition. An IDI and FGD guides were used to collect information from health workers and recently delivered women respectively.

We collected socio-demographic and obstetrics variable. The tools were administered in English and Hausa languages to clients depending on preference. The potential risks related to recruitment in the study were minimal. The researchers were trained on privacy and confidentiality. During the recruitment process, personal identifiers of potential (eligible) interviewee such as names, addresses and phone numbers were kept confidential. Qualitative data notes were transcribed and analyzed along themes. Quantitative data was analyzed using descriptive statistics (frequencies, percentages,

means and standard deviation) and inferential statistics (chi-square). Statistical The dependent variable was D&A at hospital with a "yes" or "no" and in some cases a ''choose not to answer'' option. significance was achieved when P value is ≤ 0.05.

At the end of data collection, the data collection tools were checked for completeness and coded. Data entry was done into Microsoft excel, cleaned and exported to statistical package for social sciences (SPSS) version 20.0 software (Chicago IL USA) for analysis. Qualitative data notes was transcribed and analyzed along themes using Atlas.ti. Quantitative data was analyzed using descriptive statistics (frequencies, percentages, means and standard deviation) and inferential statistics (chi-square and logistic regression). The statistical test was used for evaluating association between dependent and independent variables. Statistical significance was said to be achieved when P value is ≤ 0.05. The dependent variable was D&A at hospital with a "yes" or "no.

Results

Table 1. Socio-demographic Determinants of D & A

Variable		Yes D&A (%)	No D & A (%)	Na D&A (%)	Fisher's Exact Test	p-value
Age					36.362	0.004*
15-19	28	15(53.57)	13(46.43)	0		
20-24	63	32((50.79)	31(49.21)	0		
25-29	76	47(61.84)	29(38.16)	0		
30-34	67	31(46.27)	33(49.25)	3(4.48)		
35-39	27	9(33.33)	18(66.67)	0		
40-44	23	2(8.70)	20(86.95)	1(4.35)		
45-49	4	1(2.5)	3(97.5)	0		
Marital Status					38.772	0.004*
Single	9	5(55.6)	4(44.4)	0		
Married	276	129(45.7)	147(54.3)	0		
Divorces	3	0 (0)	3(100)	0		
Occupation					64.314	0.000*
House wife Farming	198	109(55.1)	88(44.4))	1(0.5)		
Teaching	15	4(26.7)	10(66.6)	1(6.7)		
Trading	20	4(20)	16(80)	0(0)		
Hand work Health	24	9(37.5)	15(62.5)	0(0)		
work	12	6(50)	6(50)	0(0)		
Student	9	0(0)	9(100)	0(0)		
Not employed	5	2(40)	3(60)	0(0)		
Other	4	0(0)	4(100)	0(0)		
	1	0(0)	1(0)	0(0)		
Language					19.229	0.539
English	7	1(14.3)	5(71.4)	1(14.3)		
Fulani	3	1(33.3)	2(66.7)	0(0)		
Hausa	245	123(50.2)	122(49.8)	0(0)		
Igbo	7	3(42.86)	4(57.14)	0(0)		
Others	10	3(30)	7(70)	0(0)		
Yoruba	16	1(6.25)	15(93.75)	0(0)		
Education					23.348	0.018*
None	11	6(54.5)	5(45.5)	0(0)		
Quaranic	39	14(35.9)	25(64.1)	0(0)		
Primary	150	82(54.7)	68(45.3)	0(0)		

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Secondary	59	20(33.9)	34(57.6)	5(8.5)		
Tertiary	29	6(20.7)	23(79.3)	0(0)		
Location					21.699	0.000*
Urban	146	110 (75.3)	35(24)	1(0.7)		
Rural	142	26(18.30)	104(73.2)	12(8.5)		

Table 1 showed that the respondents in the age group 25-29years had the highest proportion of disrespect and abuse (61.84%) and was followed by 15-19 years (53.57%), 20-24years (50.79%), 30-34years (46.27), 35-39 years (33.33%), etc. Those who were single had more proportion of D&A (55.6%) compared to those who were married (45.7%). The housewives had more proportion of D&A compared to other occupation groups such as traders, farmers, teachers or students. Hausa women had higher proportions of D&A (50.2%), compared to the other ethnic groups, followed by the Igbos (42.9%) and the Yoruba ethnic group had the lowest (6.3%). Those who had no education or had a primary education had more proportions of D&A (54.5 and 54.7% respectively) compared to those who had quaranic (35.9%), secondary (33.9%) or tertiary education (20.7%). The women that leaved in urban setting (75.3%) had more proportion of D&A compared to those who lived in a rural setting (18.3%).Age is a predictor of D & A and younger women and adolescents have more proportion of D&A. House wives and unemployed have more proportion of D&A compared to other occupation group; there is no statistically significant difference in D&A with ethnic groups ($p>0.05$); those who had no education or primary education have more proportions of D&A; those who leave in urban setting (75.3%) have more proportion of D&A compared to those leaving in rural setting (18.30%) and this is statistically significant.

Table 2. Social class Determinants of D & A

Variable	**Frequency**	**Yes D&A (%)**	**No D&A (%)**	**NA D&A (%)**	**Chi square test**	**p-value**
Husband's highest					19.935	0.107
education	2	0(0)	2(100)	0(0)		
None	14	5(35.7)	9(64.3)	0(0)		
Quaranic	35	21(60)	14(40)	0(0)		
Primary	179	88(49.2)	63(35.2)	28(15.6)		
Secondary	67	17(25.4)	47(70.2)	3(4.4)		
Tertiary						
Husbands occupation					53.971	0.007*
Farming	24	5(20.8)	18(75)	1(4.2)		
Teaching	25	6(24)	19(76)	0(0)		
Trading	180	109(60.6)	69(37.2)	2(2.2)		
Hand work	26	10(38.5)	16(61.5)	0(0)		
Health work	7	1(14.3)	6(85.7)	0(0)		
Student	2	1(50)	1(50)	0(0)		
Not employed	3	0(0)	3(100)	0(0)		
Others[a]	8	1(12.5)	6(75)	1(12.5)		
NA	13	2(15.4)	11(84.6)	0(0)		
Average family income					237.058	0.529
monthly in naira	17	4(23.5)	13(76.5)	0(0)		
1000-9999	29	11(38)	18(62)	0(0)		
10,000-19,999	32	15(47)	17(53)	0(0)		
20,000-29,999	36	20(55.6)	14(38.9)	2(5.5)		
30,000-39,999	58	41(70.7)	17(29.3)	0(0)		
40,000-49,999	35	23(65.7)	12(34.3)	0(0)		
50,000-59,999	11	7(63.6)	4(36.4)	0(0)		
60,000-69,999	36	11(30.6)	25(69.4)	0(0)		
≥70,000	32	4(12.5)	28(87.5)	0(0)		

Choosed not to answer						
Amount paid for delivery	108	23(22.3)	82(75.9)	3(1.8)	29.231	0.000*
0[b]	31	7(22.9)	23(74.2)	1(3)		
1-2,499	1	0(0)	1(100)	0(0)		
2500-4,999	69	49(71)	19(27.5)	1(1.5)		
5,000-7,499	72	52(72.2)	20(27.8)	0(0)		
7,500-9,999	5	5(100)	0(0)	0(0)		
10,000-12,499						

[a]= include 2 bankers, 1 lawyer and 2 unspecified; [b]= 5 women who paid nothing gave HWs foodstuff and wrapper as gifts.

Table 2 shows that traders have higher proportion of D&A (p=0.0038); D&A was higher among those who paid N10,000-12,499 and lowest among those who paid nothing for delivery. Education of husbands and family monthly incomes did not affect the proportions of D&A.

Table 3. Obstetrics Determinants of D & A

Variable		**Yes D&A (%)**	**No D&A (%)**	**na D&A (%)**	**Statistical test**	**P-value**
Facility type at delivery					17.967	0.71
Hospital	274	127(46.4)	0(0)	28(53.6)		
Health Centre	8	2(25)	6(75)	0(0)		
Other	6	2(33.3)	4(66.7)	0(0)		
Parity						0.000*
1-2	61	33(54)	27(44.3)	1(1.7)	72.912	
3-4	84	41(48.8)	42(50)	1(1.2)		
5-6	83	46(55.4)	35(42.2)	2(2.4)		
7-8	33	10(100)	0(0)	0(0)		
≥9	27	5(18.5)	22(81.5)	0(0)		
Companion in labour					10.716	0.061
Yes	198	90(45.5)	105(53.0)	3(1.5)		
No	90	46(51.1)	42(46.7)	2(2.2)		
ID of Companion in labour (n=198)					34.460	0.400
Mother-in-law	16	7(43.8)	8(50)	1(6.2)		
Mother	102	58(56.9)	43(42.2)	1(0.9)		
Husband	40	18(45)	22(55)	0(0)		
Health workers friend	8	2(25)	6(75)	0(0)		
	32	14(43.8)	17(53.1	1(3.1)		
age of LCB					130.805	0.000*
0-11	7	1(14.3)	6(85.7)	0(0)		
12-23	137	84(61.3)	52(38.0)	1(0.7)		
24-35	56	19(33.9)	37(66.1)	0(0)		
36-47	32	6(18.8)	25(78.1)	1(3.1)		
≥48	22	4(18.2)	17(77.3)	1(4.5)		
NA	36	19(52.8)	16(44.4)	1(2.8)		
How many of your previous baby did you deliver outside the health facility					69.975	0.000*
0-1	236	122(51.7)	101(42.8)	3(5.5)		
2-3	25	6(24)	19(76)	0(0)		
	13	6(46.2)	7(53.8)	0(0)		
	10	2(20)	8(80)	0(0)		
	3	0(0)	2(66.7)	1(33.3)		

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4-5 6-7 8-9						
Have you had another delivery in this facility before? Yes No	231 57	111(48.1) 25(100)	116(50.2) 0(0)	4(1.7) 0(0)	33.433	0.000*
Will you have another delivery in this facility? Yes No	145 143	65(44.8) 72(50.4)	76(52.4) 70(49)	4(2.8) 1(0.6)		
Will your recommendation Yes No	149 138	22(14.8) 114(100)	124(83.2) 0(0)	3(2) 0(0)	38.133	0.000*
Time of the day delivery happened Day Afternoon Night NA	111 83 83 10	58(52.3) 46(55.4) 30(36.1) 2	53(47.7) 37(44.6) 53(63.9) 8	0(0) 0(0) 0(0) 0	19.239	0.007*
Cadre of HCW who assisted in last delivery CHEW Doctor Nurse-midwife	22 28 238	9(40.9) 15(53.6) 102(42.9)	13(59.1) 13(46.4) 136(57.1)	0(0) 0(0) 0(0)	79.532	0.004*

Table 3 showed that D&A was highest when delivery was at hospital (46.4%) and lowest when it was at a health centre (25%) but level of facility did not significantly affect the occurrence of D & A. The proportion of D&A was highest among parity group 7-8 (100%), compared to ≥9 (18.5%), 3-4 (48.8%), 1-2 (54%), 5-6 (55.4%). D&A was higher when there was no companion in labour (51.1%) compared to when there was a companion (45.5%). D&A was highest if the companion was the mother (56.9%) and lowest if it was a health worker (25%) but these differences are not statistically significant. D&A was highest if LCB was 12-23months and lowest if it was ≥48. D&A was more if the client had previously delivered 0-1 babies outside the facility (51.7%) compared to 6-7 (20%). D&A was more if the respondent has not had a previous delivery at the facility (100%), compared to when she had (48.1%). D&A was highest among clients who had their delivery in the afternoon (55.4%) and morning (52.3%) compare to those who delivered at night (36.1%). D&A was highest when a doctor assisted the delivery (53.6%) than when a nurse-midwife (42.9%) or CHEW (40.9%).

Table 4. Outcomes of labour as a factor for D & A

Variable	Frequency (%)	Yes D&A (%)	No D&A (%)	Na D&A (%)	Fisher's Exact Test	P-value
How many days or hours did you spend in the hospital during labour?					90.100	0.004*
NA	16	6(37.5)	10(62.5)	0(0)		
0-3	79	45(57)	34(43)	0(0)		
4-7	149	56(37.6)	93(62.4)	0(0)		
8-11	8	7(87.5)	1(12.5)	0(0)		
12-15	10	4(40)	6(60)	0(0)		
16-19	1	1(100)	0(0)	0(0)		
20-23	1	1(100)	0(0)	0(0)		
24-27	20	14(70)	5(25)	1(5)		
≥28	4	3(75)	1(25)	0(0)		
How many days or hours did you spend in the hospital after labour?					107.112	0.000*
NA	19	7(36.8)	12(63.2)	0(0)		
0-3	65	38(58.5)	27(41.5)	0(0)		
4-7	124	47(37.9)	74(59.7)	3(2.4)		
8-11	57	31(54.4)	25(43.9)	1(1.7)		
12-15	5	3(60)	2(40)	0(0)		
16-19	0	0	0	0		
20-23	0	0	0	0		
24-27	13	6(46.2)	6(46.2)	1(7.6)		
≥28	5	4(80)	1(20)	0(0)		
What is the outcome of your labour?					49.686	0.004*
live baby healthy	248	125(50.4)	122(49.2)	1(0.4)		
live baby sick	3	2(66.7)	1(33.3)	0(0)		
excess bleeding	1	1(100)	0(0)	0(0)		
convulsion	2	0(0)	2(100)	0(0)		
caesarean section	3	2(66.7)	1(33.3)	0(0)		
vaginal delivery	7	0(0)	7(100)	0(0)		
delivered dead baby	10	3(30)	7(70)	0(0)		
I had fever	14	4(28.6)	0(71.4)	0(0)		
Number of days women was in the hospital after delivery					14.518	0.046*
NA	24	11(45.8)	13(54.2)	0(0)		
<2	101	32(31.7)	69(68.3)	0(0)		
2	23	22(95.7)	1(4.3)	0(0)		
>2	139	92(66.2)	46(33.1)	1(0.7)		
Maternal complications reported Too much					142.673	0.000*
bleeding	15	4(26.7)	11(73.3)	0(0)		
Infection or fever	7	2(28.6)	5(71.4)	0(0)		
Caesarean section	3	0(0)	3(100)	0(0)		
High blood pressure or	7	2(28.6)	5(71.4)	0(0)		
seizure Labor lasting	10	1(10)	8(80)	1(0)		
	233	124(53.2)	106(45.5)	3(1.3)		

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more than 1 day No complications others	5	1(20)	4(80)	0(0)		
Newborn complications reported No complications Trouble breathing after delivery Infection or fever Born too early or very small born after the expected date, too late or too big others	 240 13 11 4 16 1	 130(54.2) 1(7.7) 2(18.2) 1(25) 2(12.5) 0(0)	 110(45.8) 12(92.3) 9(81.8) 3(75) 14(87.5) 1(100)	 0(0) 0(0) 0(0) 0(0) 0(0) 0(0)	75.047	0.000*
Baby outcome immediately at birth alive dead	 279 9	 135(48.4) 1(11.1)	 120(43) 8(88.9)	 3(8.6) 0(0)	23.673	0.004*

Table 4 showed that D&A was present at various proportions if respondents spent 16-19hours (100%), 20-23hours (100%), 8-11(87.5%), ≥28(75%), 24-27hours (70%), 0-3hours (57%) and 4-7hours (37.6%). D&A greater if the respondent spends 2days (95.7%) and >2 (66.2%) compared to when they spent <2 (45.8%). Among respondents that had maternal complications, D&A occurred at various proportions including infection/fever (28.6%), high blood pressure or seizures (28.6%), too much blinding (26.7%) and labour lasting more than 1day. Among respondents that had newborn complications, D&A occurred in 25% for those with babies born too early or very small, infection/fever (18.2%) and born after EDD, too late or too big (12.5%).

Table 5. Other factors affecting D & A

Variable	**Frequency (%)**	**Yes D&A (%)**	**No D & A(%)**	**Na D &A (%)**	**Chi square test**	**p-value**
Point of disrespectful treatment: ANC During labour At delivery After delivery During postnatal visit ANC & labour ANC, labour & delivery ANC, delivery ANC&PNC Labour/delivery Anc and at delivery ANC and after delivery During labour &delivery Labour & after delivery	 13 7 6 6 4 14 30 14 4 7 14 4 7 4	 6(46.2) 2(28.6) 4(66.7) 2(33.3) 1(25) 12(85.7) 30(100) 13(92.9) 2(50) 7(100) 13(92.9) 2(50) 7(100) 2(50)	 7(53.8) 5(71.4) 2(33.3) 4(66.7) 3(75) 2(14.3) 0(0) 1(7.1) 2(50) 0(0) 1(7.1) 2(50) 0(0) 1(25)	 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 1(25)	81.052	0.100
Ever disrespected and abused a HCW? Yes	 11 243	 1(9.1) 123(50.6)	 9(81.8) 117(48.1)	 1(9.1) 3(1.3)	57.854	0.000*

No Choose not to answer	33	12(36.7)	18(54.5)	3(8.8)		

Table 5, D&A occurred during Anc, labour& delivery (100%), Labour and delivery (100%), ANC and delivery (92.9%), ANC and labour (85.7%) and was least during postnatal visit (25%). The table however showed that there is a statistically significant association between being disrespectful and abusive to a health worker with experience of D&A.

Table 6. D & A as factor affecting utilization of facility birth

Variable	**Frequency (%)**	**Yes D&A (%)**	**No D&A (%)**	**Na D&A (%)**	**Chi square test**	**p-value**
I will use this facility for future delivery Yes No NA	143 128 17	32(22.4) 100(78.1) 2(11.8)	111(77.6) 28(21.9) 15(88.2)	0(0) 0(0) 0(0)	18.739	0.243
I will recommend this facility to a friend or relation in their delivery Yes No NA	174 104 10	39(22.4) 98(94.2) 2(20)	135(77.6) 6(5.8) 8(80)	**0(0)** **0(0)** **0(0)**	15.675	0.121

Table 6 showed that about half of the respondents said that they will not have another delivery in the facility and 78.1% had D&A compared to 22.4% who said that they will have another delivery in the hospital. 94.2% of those who will not recommend the facility for delivery had D&A compared to 22.4% of those who will recommend the facility. These differences were however not statistically significant.

Findings from the qualitative study also shed more light as shown in the sections that follow.

D&A can occur when clients or their relatives' disrespect and abuse healthcare workers

A respondent said,

'Some women have no patience; they quarrel the health personnel and show them that they know the health work better than the health personnel and this can cause them more problems in the hospital'

One respondent said that,

'One day one woman was in the labor room and when her relatives came, they said that they must see her and that was not the right time. So, when the doctors refused them seeing her, they started fighting the doctors'.

When women experience D&A their relatives may retaliate

A respondent said,

'When my sister came here for delivery the nurse beat her on her lap when the baby was coming out, so after the delivery my sister said that she must revenge the beating and that lead to fight'

D&A are commoner in hospitals than other cadre of health facilities.

During an FGD in the urban setting, a respondent said concerning the type of health facility a woman would like to deliver he baby, that,

'The women like to deliver in the hospital but the private ones because they are the one that can give the adequate care'

Another said,

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'No, these cares are not found in all the hospitals we have, though it maybe because of lack of sufficient health personnel in the hospital. We can only get these cares in private hospitals but not in government hospital because weather they work or they did not work the government will pay them'

Socioeconomic and obstetrics characteristics determine D&A

Respondents said,

'Woman with the first issue receive more attention and care in the hospital than the one that had experience'

Also,

'The married women are given more respect and care than the single ladies because the society knows that their own condition illegal'

It is also opined that,

'The illiterate ones use to face more problems'

Respondents believe a weak health system and ineffective clinical governance structure is responsible for D&A

'Honestly it is the fault of the general management the health sector they don't carry out they duty. There is no regular hospital checkup that is why every worker did the way they like'

'What my sisters said is true it is the fault of the leaders because whenever they know there will be visitor from the above you would find out that they tidy everywhere in the hospital'

'Sometimes the nature of their salaries can make them to behave one kind most especially when they compare it with the bulky work they do'

Women choose to deliver at home or elsewhere because of D&A

Respondents noted that,

'Some people choose to deliver at home because they are not pet in the hospital'

Another said that,

'I was not neglected but I saw when they neglected one woman that I came to the hospital together with, she was bleeding but they refused to accept her and that make her to went back I don't know where she went'

'My neighbor told me that her dignity is more protected; because she will not be asking to lay upside people will be seeing her nakedness. That is why she likes to deliver at home'

'At home your people will show you love and they will give you whatever you like to eat which if it is in the hospital, they will not give you what like to eat they will be said you can shit for them'

Discussion

D&A reported by women differed significantly by age group, education, and parity in this study. Younger women and adolescents, women who had no education or primary education and those of high parity suffer more D&A. A previous study reported higher D&A among women older than 19years [Kruk et al; 2018]. This is contrary to Nawab et al and Okafor et al. who reported that maternal characteristics such as age, parity, and educational status did not affect prevalence of DA significantly [Nawab et al, 2019; Okafor, 2015 et al.].

There was significant association found between D&A and the time of delivery (daytime or night) in this study as women who delivered at night reported less D&A than those who delivered in the day time. This is similar to the findings of Banks et al. [Banks et al, 2018] that women who delivered at night were less likely to report D&A than those who delivered during day, but the difference was not significant and Nawab et al report no variation with time of delivery [Nawab et al, 2019]. D&A was highest when delivery was at hospital (46.4%) and lowest when it was at a health center (25%). Similar findings have been reported by Hameed et al. [Hameed and Avan, 2018]. This may be because of higher patient load and unfavorable patient–provider ratio in public hospitals. The present study noted that D&A is associated with the cadre of health worker, but a previous study reported that the cadre of health worker was not significantly associated with reporting of D&A [Banks et al, 2018]

As reported in a previous study, the present study showed that D & A were reported more by women who experienced longer labour duration, and also by women who did not have support

persons present during labour and delivery [Mengistu et al, 2018]. As in previous study, the present study also showed that mothers who stayed in a health facility longer than 2 days after delivery were likely to experience D&A [17, 18]. The present study findings also corroborate with previous studies that childbirth complications were associated with reporting D&A [Banks et al, 2018; Abuya, 2015].

The present study has shown that D&A was commoner among women with high monthly family income. Similarly, some authors have found that females belonging to higher wealth quintiles reported more mistreatment [Kruk et al, 2018, Mengistu et al, 2018]. Females of higher incomes may have more expectations from facility and are more likely to be sensitive to any D&A. The same applies for women who had paid significantly for the delivery services compared with those paying nothing. A recent study in the contrary reported higher proportion of D&A among women of low socioeconomic status by some authors [Ishola, Owolabi, Filippi; 2017].

Various studies agree with the result of the study that D&A determine where woman chooses to deliver her baby or recommend to others [Ishola, Owolabi, Filippi; 2017; Orpin, 2018]. Women who experienced D&A were unlikely to use the facility or recommend it to others.

Socio-demographic, obstetrics, level of health facility, cadre of health worker and social class characteristics affect occurrence of D&A. Health system inadequacies such as lack of supervision, poor remuneration, inadequate staffing, supplies and equipment were the most common barrier mentioned.

Overall, there are areas in which successful interventions can interrupt the trend of D&A in our health facilities. For example, health system inadequacies can be corrected through adequate staffing, supply of needed hospital equipment, training and retraining of health care providers. Health care providers' capacity should be built through training/retraining in order to comply with new concepts of respectful maternity care (RMC) and human right. It is also important to consider allowing support persons to accompany women during facility care as this may reduce D&A.

The study limitation was that this study assessed opinion which is generally subjective. An observational study would be more objective.

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Public Health Implications of Heavy Metal Contamination of Leaves and Stems of Amarantus Hybridus (African spinach) Consumed in Nigeria

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Abstract

The objective of this study was to measure the concentration and pattern of distribution of Cd, Cr, Co, Cu, Mn, Ni, Pb, and Zn on the leaves and stem of Amaranthus hybridus (African Spinach) one of the most consumed leafy vegetables in Nigeria with an estimated population of over 200 million people, findings from this study showed that with the exception of Cd and Co two heavy metals of public health importance, the results of the analysis for heavy metals using atomic absorption spectrophotometer were within the maximum permissible limits set by FAO/WHO Committee of the Codex Alimentarius Commission and Agency for toxic substance disease registry (ATSDR). The results showed that while the values for Cd were within acceptable limits in the leaves, the concentration in the stem ranged of 0.007 to 0.3358 ppm above the maximum limit of 0.1ppm. The result also showed the presence of Co at a concentration of range of 0.1289 to 0.3487ppm in the leaves and 0.1470 to 0.3719 ppm in the stems above the maximum permissible limit set by the Agency for Toxic Substance Disease Registry (ATSDR) of between 0.05 to 0.1 ppm. The potential consequences of exposure to harmful substances, on either a population or an individual basis, is a fundamental concern in epidemiology and public health, these findings have major public health implication for food safety and quality as the likely accumulation of Co and Cd in the body through diets over a long period of time can further complicate the current public health crisis in Nigeria.

Introduction



Amaranthus hybridus also known as African spinach or pigweed is a nutritious leafy vegetable, a member of the Amaranthaceae family widely cultivated and consumed in Nigeria. It is used for a variety of purposes ranging from food to medicine (Omosun *et al*., 2008). The central stem of the plant is light greenish or tan-green, and ribbed, the leaves are ovate or elliptic-ovate, smooth or slightly undulate a

long the margins, and pubescent or hairless, there may be red tints along the margins of the leaves and elsewhere. The leaves and stem can be eaten raw or cooked and used as a spinach substitute.

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Seeds are used as a cereal substitute and used in porridges and bread. (PFAF, 2019) In Nigeria, the plant leaves combined with condiments are used to prepare soup sauce for rice and yam, In Congo, they are eaten as spinach or green vegetables while in Mozambique and in West Africa they boiled and mixed with a groundnut sauce and eaten as salad (Akubugwo *et al*., 2007).



An Amaranthus hybridus (African Spinach) plant



Soup Made from Amaranthus hybridus (African Spinach)

The green vegetables have long been recognized as the cheapest and most abundant potential source of protein because of its ability to synthesize amino acids from a wide range of virtually unlimited and readily available primary materials such as sunlight, water, carbon dioxide, atmospheric nitrogen like in legumes (Adeyeye and Omolayo, 2011).

Amaranthus hybridus is widely consumed in Nigeria and they are highly valued due to the appreciable amount of nutrients and mineral elements they provide in diets to supplement the daily requirement by the body (Oyelola et al., 2014). The current high demand for leafy vegetables in the cities and towns has stimulated the growth of market gardening along perennial rivers and streams in major towns and cities of Nigeria and A. hybridus is a common species in waste places, (Inyang et al.,2018). increasing their tendency for contamination.

Heavy metals are individual metals and metal compounds which are all naturally occurring substances which are often present in the environment at low levels. In larger amounts, they can be dangerous and can impact human health negatively, the consumption of food crops contaminated with heavy metals is a major food chain route for human exposure (Khan et al., 2008). Rapid industrialization, urbanization, the haphazard use of variety of chemicals agents and pollution of agricultural lands and air have led to the accumulation of unacceptable levels of heavy metal in the environment, the resulting uptake, transformation and bio-accumulation of heavy metals by food crops grown in these areas leads to the heavy metal contamination of food with a corresponding negative impact on food quality, safety and ultimately the health of the population that consume such food (Khanna, 2011).

As research in medical science unearths new evidence linking heavy metals to more debilitating health conditions, heavy metals which are also known as metalloid in scientific literature are increasingly becoming one of the major public health concerns of the 21st century as countries rise to the challenge of issues relating to food security and food safety. The standard for the evaluation of heavy metals and other contaminants in foods is in report of the Joint FAO/WHO Expert Committee (JECFA). The JECFA is an international scientific expert committee jointly administered by the WHO and the Food and Agriculture Organization of the United Nations (FAO). The committee has

been meeting since 1956 to evaluate the safety of naturally occurring toxicants, food additives, contaminants, and residues of veterinary drugs in food (WHO, 2019). This independent scientific expert committee performs human health risk assessment, food consumption and exposure assessment, toxicology, epidemiology, and provides advice and benchmark for acceptable limits found in food. Another important institution that performs similar role and provides reliable template for standards is the Agency for toxic substance disease registry (ATSDR) a federal public health agency within the United States Department of Health and Human Services charged with protecting communities from harmful health effects related to their exposure to natural and man-made hazardous substances (ATSDR, 2019).

Research objectives

To determine and compare the concentrations of toxic heavy metals most commonly associated with poisoning of humans (lead, cadmium, manganese, copper, chromium, cobalt, nickel, and zinc) in the leaves and stems of Amaranthus hybridus (African Spinach) consumed from the study area.

Statement of problem

African Spinach is a widely consumed vegetable in Nigeria, and they are highly valued due to the quality and amount of nutrients and mineral elements they contain .The current high demand for leafy vegetables like A. hybridus in the cities and towns has stimulated the growth of market gardening along perennial rivers, streams and waste places rich in heavy metals in major towns and cities of Nigeria. Heavy metals are of great public health concern because of their non-degradable nature and their potential to accumulate in different parts of the body due to long biological half-lives. Most heavy metals are extremely toxic because of their solubility in water.

Research questions

This research was expected to answer the following research questions:

1. What is the magnitude of heavy metal contamination in leaves and stem of *Amaranthus hybridus* consumed in the study area?
2. How is the pattern of heavy metal distribution in the leaves and stem of the plant?
3. What are the likely implications on public health?

Hypothesis

Null Hypothesis (H0)

Heavy Metal concentration in samples of Amaranthus hybridus analyzed are within acceptable limits as set by the Joint FAO/WHO Expert Committee on Food Additives and the Agency for toxic substance disease registry (ATSDR).

Alternate Hypothesis (H1)

Heavy Metal concentration in samples of Amaranthus hybridus analyzed are above acceptable limits as set by the Joint FAO/WHO Expert Committee on Food Additives and the Agency for toxic substance disease registry (ATSDR).

Scope and limitations

This study considered only 8 of the many heavy metals. In addition only 9, (3 in each senatorial district) of the 21 Local governments in Kogi state were covered due to security, inaccessibility and resource availability.

Review of literature

Although the use of *Amaranthus hybridus* by a significant proportion of the population is well established, a study published by the American Phyto pathological Society reported an increase in the use of the plant as a leafy-vegetable crop on the African continent (Blodgett and Swart 2002). The limited amount of rainfall in Northern Nigeria and the scarcity of rich soil that can support all year-round farming has compelled many growers of vegetables to site their farms close to areas such as gutters, drainage and polluted rivers which predisposes their produce to heavy metal and fecal contamination. A seasonal potential toxic metal content analysis of Yauri river bottom sediments in

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North Western Nigeria concluded that, based on the pollution load index (PLI) values calculated, the river is polluted with all the elements analyzed with elevated concentrations of some of the heavy metals which were both as a result of environmental pollution and natural causes (Yahaya *et al*.,2012). A study to assess the bioaccumulation of heavy metals in spinach sold at vegetable farms in Katsina, Nigeria, conducted using atomic absorption spectrometer VPG 210 model reported that cadmium was the heavy metal with the highest concentration, closely followed by chromium, and zinc. The result from the study revealed the following; Kofar Marusa site, cadmium 12.5±2.5mg/kg > chromium and zinc both had 4.7±0.62mg/kg, while Kofar Durbi site Zinc 13.2±4.21mg/kg > cadmium 12.5±2.5mg/kg > chromium 4.71 ± 0.62mg/kg. Similarly, at Kofar/Sauri, study site, Zinc had 13.2±4.21mg/kg > Cadmium 12.5± 2.5mg/kg > Chromium 4.71±0.62mg/kg. However, concentrations of heavy metals in the soil of the study sites show chromium had high mean value of 10.19±0.41mg/kg > Zinc 6.13± 0.87mg/kg > Cadmium 5.84±0.83mg/kg: Plant concentration factor (PCF) in the study ranges between 1.40-2.8Mg/l at K/Marusa for Cd, Cr and Zn, K/Durbi 0.45-2.11 and K/Sauri with 0.3-4.0 respectively, The study concluded that measures should be taken in order to prevent the discharge of untreated waste water by the factories nearby which could be the potential source of contamination of vegetable and soil in the farms (Abba and Ibrahim, 2017). A comparative assessment of some heavy metals in *Gongronema latifolium, Amaranthus hybridus, Talinum triangulare, Telfairia occidentalis ,Piper guineense*,and *Ocimum gratissimum* commonly used for making local dishes in Yenagoa metropolis, Nigeria reported that the concentration of cobalt, lead, and cadmium were below detection level while the concentration of other heavy metals in the vegetables ranged from 1.85 - 3.55mg/kg for copper, 1.63 – 14.98 mg/kg for zinc, 5.83 – 186.59 mg/kg for manganese, 8.12 – 31.72 mg/kg for chromium, 5.01 – 16.03 mg/kg for nickel and 307.60 – 1051.31 mg/kg for iron. Analysis of variance showed that there was significant variation ($P<0.05$) among the vegetables analyzed. The study also reported that the concentrations of the heavy metals in the vegetables were found to be below Food and Agricultural Organization/World Health Organization maximum limit with the exception of iron and chromium (Izah and Aigberua, 2017).

A similar study was carried out in two major highways in Lagos, South west Nigeria to determine the level of lead (Pb) and cadmium (Cd) contamination in *Amaranthus viridis.* The samples of the plant were collected at distances of 5, 10, 15 and 20 m from the roadside and analyzed for of lead (Pb) and cadmium (Cd). Levels of Pb and Cd in soil were found to be 47 to 151 mg kg-1 and 0.30 to 1.33 mg kg-1 (dry weight) respectively. Concentrations in leaves ranged from 68 to 152 mg kg-1 and 0.5 to 4.9 mg kg-1 (dry weight) for Pb and Cd, respectively. The pattern and distribution of these heavy metals deposition on the plant, as reflected by the plant concentration factor (PCF) values, indicates a decrease in concentration with increase in distance from the road. Heavy metal concentrations in *Amaranthus* cultivated on soils characterized by heavy traffic were significantly higher ($P \leq 0.05$) than those cultivated on the reference soil. These findings indicate that while the levels of metals in soil were within the critical limits, the range within the plant leaves were above the normal limit for plants suggesting that *Amaranthus* has a way of concentrating metals in their tissues and or that aerial deposition may be a major source of contamination (Atayese, *et al.,* 2008). *Amaranthus hybridus* is a plant with high affinity for heavy metals and as such could be easily contaminated. A study which analyzed the heavy metal uptake by two edible *Amaranthus* herbs grown on soils contaminated with Lead, Mercury, Cadmium, and Nickel was carried out to investigate the abilities of 2 species of the plant *Amaranthus hybridus* (green herbs) and *Amaranthus dubius* (red herbs) and measure their response and ability to accumulate and tolerate varying levels heavy metals in their roots and shoots. Both herbs (red and green) were grown in soil pots contaminated with three mixtures of Cd (II), Ni (II), Pb (II), and Hg (II). The control treatment for the experiment was plants grown in the absence of the heavy metals mixture. The distribution of Cd, Ni, Pb, and Hg in the plants roots, stems, and leaves were analyzed in two stages. The first stage was after 5 weeks of plant growth while the second stage was at 10 weeks of growth. In the red herbs, the Cd concentration in the leaves at the second stage was 150 ppm and was present in higher concentrations than Ni, Hg, and Pb. At the highest contamination level, while in the green herbs plant, the concentration of Hg was the highest in the root, i.e., 336 ppm at the first stage, while the level in the leaves was 7.12 ppm. The study concluded that both the green and red herbs species of

Amaranthus showed an affinity for Ni and Cd with moderate to high levels detected in the leaves, respectively (Chunilall *et al*., 2005). This affinity of the plant for heavy metal accumulation as reported by this study is very vital because it debunks the claim that long period of exposure time is required for sufficient bio accumulation.

The public health effects of heavy metals from food

The relationship between heavy metals and human health is well documented. A recent multi-medium analysis which evaluated the Human health risk assessment of heavy metals in soil–vegetable system reported that diet dominated the exposure pathways by which heavy metals in soil might cause potential harm principally through food-chain transfer. According to the study, the total non-cancer and cancer risk results indicates that the investigated arable fields near waste mining and industrial sites were not suitable for root and leaf vegetables in view of the high risk of elevated intakes of heavy metals and its corresponding negative effect on food quality and safety for local residents and surrounding communities. From the results, Chromium and Lead were the primary heavy metals posing non-cancer risks while Cadmium produced the highest cancer risk (Liu *et al*.,2013). Heavy metal toxicity has proven to be a major threat to human health and there are several risks associated with it. Despite many not having any biological role, the toxic effects of these metals remain persistent resulting in sub optimal functioning of the human body and other harmful effects. Heavy metals can sometimes interfere with metabolic processes or act as a pseudo element of the body. Metal toxicity depends on the dose absorbed, the route of exposure as well as the duration of exposure, i.e. acute or chronic. This can result in various disorders and can also lead to excessive damage to vital body organs due to oxidative stress induced by free radical formation (Jaishankar *et al*.,2014). A recent study which evaluated the impact of heavy metals on children reported that heavy metal exposure have negative effects on children's health including lower birth weight, lower Apgar scores, lower anogenital distance, lower current weight, lower hepatitis B surface antibody levels, higher prevalence of attention-deficit/hyperactivity disorder, higher DNA and chromosome damage and lower lung function. Heavy metals according to the study also influence a number of diverse systems and organs within a child's body, resulting in both acute and chronic effects on children's health. These effects ranged from minor upper respiratory irritation to chronic respiratory, nervous, cardiovascular, urinary and reproductive disease, including the aggravation of pre-existing symptoms and disease (Zeng *et al*.,2016).

A study conducted in China reported that the carcinogenic risk of heavy metals to children which were 30 to 200 times higher than the safe level (1.0×10^{-6}–1.0×10^{-4}), was traceable to Cr, As and Ni pollution which emanated from ingestion of locally produced food. The finding from this study also indicates that 85% of the concentration of most elements was also traceable to ingested food. (Cao *et al*., 2016).

In general, the health risk related to heavy metal exposure from vegetable is due to chemical reactivity of the ions with enzymes, cellular structural proteins, and membrane system. The specific target organs are usually those organs that accumulate the highest concentrations of the heavy metal in vivo. This is however, dependent on several factors which include the route of exposure and the chemical features of the metal i.e. its valiancy state, volatility, lipid solubility etc. (Mahurpawar, 2015) The target organs of heavy metal and corresponding clinical manifestations of chronic exposures are presented below:

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Clinical aspects of chronic toxicities

Heavy Metal	Target Organs	Clinical effects
Cadmium	Renal, Skeletal and Pulmonary	Proteinuria, Glucosuria, Osteomalacia, Aminoaciduria, Emphysemia
Chromium	Respiratory tract	Ulcer, Perforation of Nasal Septum, Respiratory Cancer
Manganese	Nervous System	Central And Peripheral Neuropathies
Lead	Kidneys, Blood, Brain	Hypertension, Renal impairment, Seizures Immunotoxicity and Toxicity to the reproductive organs
Copper	Gastrointestinal (GI) tract, liver, and kidney	Hematemesis, Hypotension, Melena, Coma, Jaundice Damage to liver and kidneys.
Zinc	Kidney, liver, bones, liver, and lungs	Anemia neutropenia, Impaired immune function and adverse effects on the ratio lipoproteins
Nickel	Lungs and upper respiratory tract	Chronic bronchitis, Reduced lung function, and Cancer of the lung and nasal sinus
Cobalt	The respiratory tract and the skin	Hearing and Visual impairment, Cardiovascular and endocrine deficits

Research methodology

Study area

This study was conducted in Kogi State, North Central Nigeria. The State is located at an elevation of 55 meters above sea level and its population is approximately 3,595,789. Its coordinates are 7°45'0" N and 6°45'0" E in DMS (Degrees Minutes Seconds) or 7.75 and 6.75 (in decimal degrees). Its UTM (Universal Transverse Mercator) position is KP55 and its Joint Operation Graphics reference (JOG) is NB32-01(Getamap, 2019) The area has a rainfall pattern which peaks between June and September although there is not much rainfall in Kogi all year long. The climate here is described as a local steppe climate and classified as BSh by the Köppen-Geiger system. The average temperature in Kogi is 26.8 °c (Climate-Data, 2015) The average rainfall annually ranges from 1200 to 1500 mm while the vegetation of the area consists of rain forest on the eastern and typical wood land savanna and grassland to the central and western part of the state. The nature of soils in this area is mainly sandy loam, loamy sand and ultisol. [24] Kogi State has two main rock types, namely, the basement complex rocks of the Precambrian age in the western half extending slightly eastwards beyond the lower Niger Valley and the sedimentary rocks in the eastern half (Emurotu and Onianwa, 2017).

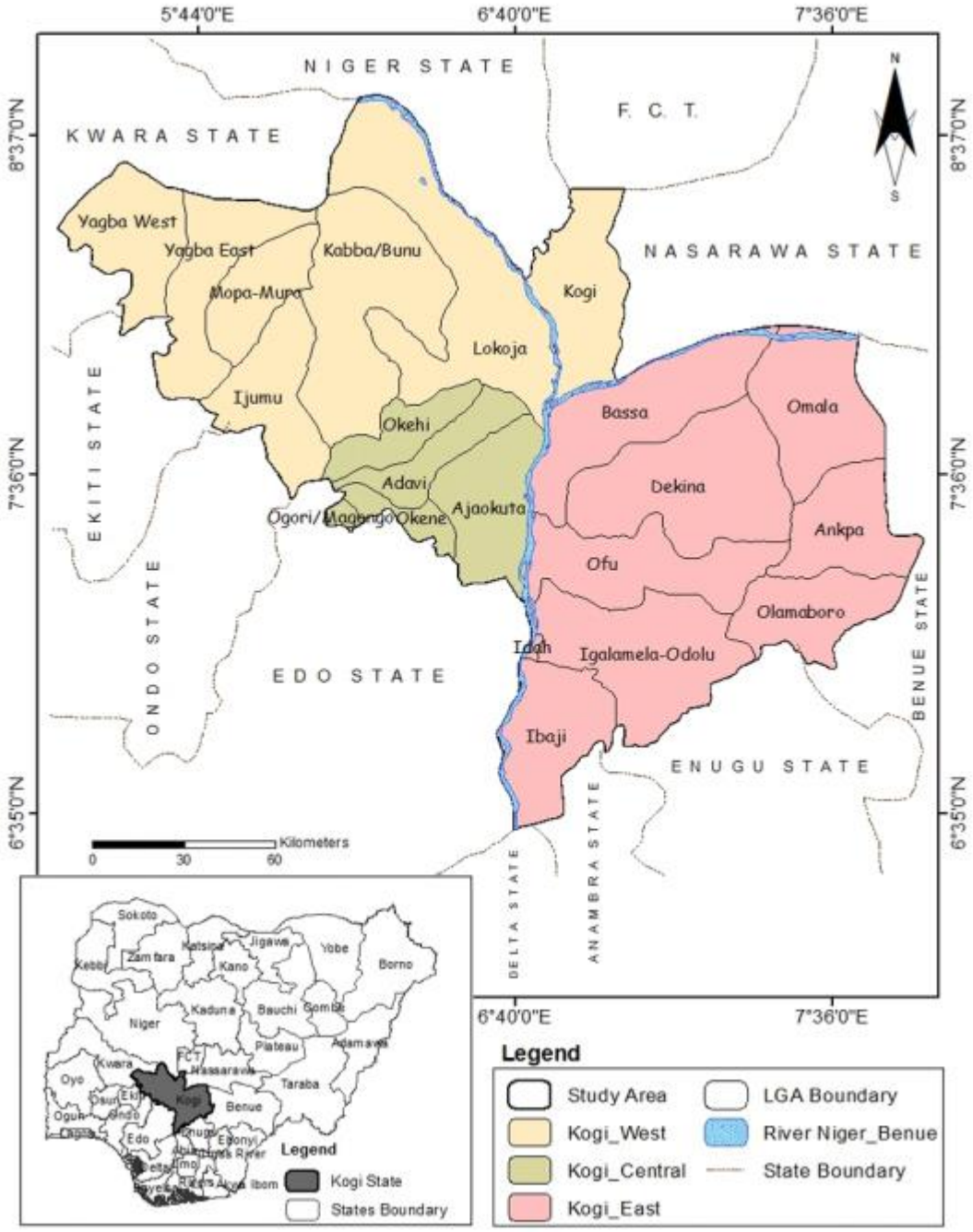


Figure 1. Map Showing the 3 Senatorial Districts of Kogi State and the Local Government Areas (Getamap, 2019)

Research design

The research design employed is as described by *Atayese et al* for the determination of total metal content in plants. The plants were divided into leaves, and stems. The samples were weighed to determine the fresh weight and then dried in an oven at 60^{o} C for 48 hours. The dry samples were then crushed using a porcelain mortar and the resulting powder neatly packed in sample containers for onward `analysis for the heavy metals (Atayese, *et al.*, 2008).

Quality assurance

In order to prevent samples from being contaminated from secondary sources, the applicable quality control and assurance measures were put in place from the point of sampling to ensure the

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reliability of the results. Samples of the plant were also carefully handled to avoid cross-contamination. Glassware and containers used during this research were properly cleaned, and the reagents used were of analytical grades. In addition, deionized water was employed throughout the study and reagent blank determinations used to apply corrections to the instrument readings (Elbagermi *et al.*, 2012)

Sampling technique

Samples of the plant were collected from three major markets in the three senatorial districts using simple random sampling. On a major market day, all *Amarantus hybridus* sellers were informed about the study and their consent obtained. Pieces of paper with NO and a single YES corresponding to the total number of seller's present were written, well shuffled and shared amongst the sellers. The *Amaranthus* of the person who picked YES was picked for processing and analysis. The same procedure was adopted three times in selecting three markets from the list of major market list obtained in each senatorial zone.

Data collection instrument

Atomic Absorption Spectrometry (AAS) determines the presence and concentration of metals in liquid samples. When they are excited by heat in their elemental form, heavy metals will absorb ultraviolet light. Each heavy metal has a unique wavelength that will be absorbed. The Atomic Absorption Spectrophotometer looks for a particular metal by focusing a beam of uv light at a particular wavelength through a flame and into a detector (García and Báez 2012).

Validation of data collection instrument

Atomic Absorption Spectrometry (AAS) is the most widely recommended instrument utilized in analytical procedures for heavy metal. It is a validated, simple, reliable, sensitive and convenient method for quantitative estimation of trace metals and heavy metals in dried vegetables (Rawar, and Rohman2016) (Sharma *et al*.,2009). Standard solutions were frequently run to check the sensitivity of the instrument and the operation conditions used to operate AAS instrument were as recommended by the manufacturer.

Sample processing

Approximately 0.5 g of the powdered *Amaranthus hybridus* was transferred to a 25 ml conical flask; 5 ml of concentrated Tetraoxosulphate (VI) Acid (H_2SO_4) was then added followed by 25 ml of concentrated Nitric acid (HNO_3) acid, and 5 ml of concentrated hydrochloric acid (HCl). The contents of the tube were then heated at 200° C for 1 hour in a fuming hood, and then cooled to room temperature. After this, 20 ml of distilled water was added and the resulting mixture filtered using filter paper No.1 (11cm) to complete the digestion of organic matter. Finally, the mixture was transferred to a 50 ml volumetric flask, filled to the mark, and let to settle for at least 15 hours. The resultant supernatant was thereafter analyzed for heavy metal using atomic absorption spectrophotometer Model No: AAS- 6800N Shimadzu at National Research Institute for Chemical Technology (NARICT) Zaria Nigeria (Atayese, *et al.,* 2008).

Results

Table 1. Standard conditions for AAS: atomic absorption spectrophotometer

Heavy Metal n	λ (nm)
Cadmium	228.8
Chromium	357.9
Copper	324.8
Cobalt	240.7
Lead	283.3
Manganese	279.5
Nickel	232.0
Zinc	213.9

NARICT (2019).

Table 2. Maximum permissible limits for heavy metals in vegetables

Description	Cd	Cr	Cu	Co	Pb	Mn	Ni	Zn
FAO/WHO *Committee* of the *Codex Alimentarius Commission*	*0.1*	*2.3*	*40.0*	-	*0.3*	*500*	*1.5*	*0.6*
Agency for toxic substance disease registry (ATSDR, 1994				*0.05-*	*0.1*	-	-	-

Sources: FAO/WHO Committee of the *Codex Alimentarius Commission* and Agency for toxic substance disease registry (ATSDR*) 1994.*

Table 3. Analysis for cadmium

Sample (ppm)	**Actual Concentration in Leaves**	**Actual Concentration in Stem**
West 1	0.0002	0.0015
West 2	0.0008	0.3348
West 3	0.0032	0.2753
East 1	0.1911	0.0082
East 2	0.0784	0.0065
East 3	0.0284	0.0086
Central 1	0.0068	0.0007
Central 2	0.0028	0.0022
Central 3	0.0014	0.0020

Table 4. Sample analysis for chromium

Sample Stem (ppm)	**Actual Concentration in Leaves**	**Actual Concentration in Stem**
West 1	0.1574	0.1332
West 2	0.6911	0.0776
West 3	0.7130	0.0063
East 1	0.0851	0.0701
East 2	0.0434	0.1043
East 3	0.0467	0.0165
Central 1	0.0707	0.0420
Central 2	0.0414	1.3789
Central 3	0.0302	0.1255

Table 5. Sample analysis for chromium

Sample (ppm)	**Actual Concentration in Leaves**	**Actual Concentration in Stem**
West 1	0.0002	0.0163
West 2	0.0003	0.0209
West 3	0.0114	0.0242
East 1	0.0247	0.0066
East 2	0.0239	0.0033
East 3	0.0241	0.0018
Central 1	0.0183	0.0187
Central 2	0.0194	0.0171
Central 3	0.0190	0.0167

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Table 6. Sample analysis for cobalt

Sample	Actual Concentration in Leaves	Actual Concentration in Stem (ppm)
West 1	0.1498	0.1572
West 2	0.1237	0.1470
West 3	0.1289	0.1636
East 1	0.3168	0.3374
East 2	0.3719	0.3487
East 3	0.3070	0.3104
Central 1	0.3378	0.3341
Central 2	0.3232	0.3328
Central 3	0.3369	0.3243

Table 7. Sample analysis for lead sample

Sample (ppm)	Actual Concentration in Leaves	Actual Concentration in Stem
West 1	0.0666	0.1110
West 2	0.1296	0.1384
West 3	0.0412	0.1473
East 1	0.0137	0. 1317
East 2	0.0401	0.0311
East 3	0.1085	0.0144
Central 1	0.0708	0.0402
Central 2	0.0140	0.1516
Central 3	0.1608	0.1683

Table 8. Sample analysis for manganese

Sample	Actual Concentration in Leaves	Actual Concentration in Stem
West 1	0.0124	1.3810
West 2	0.0014	1.3891
West 3	1.3726	1.4050
East 1	1.4090	2.2339
East 2	2.1933	2.2688
East 3	2.2192	2.0609
Central 1	2.0565	0.1494
Central 2	0.0007	0.1482
Central 3	0.0250	0.1532

Table 9. Sample analysis for nikel

Sample	Actual Concentration in Leaves	Actual Concentration in Stem (ppm)
West 1	0.0089	0.0171
West 2	0.0217	0.0277
West 3	0.0294	0.0140
East 1	0.0076	0.0087
East 2	0.0221	0.0048
East 3	0.0352	0.0158
Central 1	0.0120	0.0033
Central 2	0.0433	0.0066
Central 3	0.0062	0.0172

Table 10. Sample analysis zinc

Sample	Actual Concentration in Leaves	Actual Concentration in Stem (ppm)
West 1	0.1874	0.3451
West 2	0.2073	0.0643
West 3	0.3501	0.0364
East 1	0.0015	0.0013
East 2	0.0255	0.0011
East 3	0.0013	0.0006
Central 1	0.0003	0.0020
Central 2	0.0013	0.0041
Central 3	0.0030	0.0025

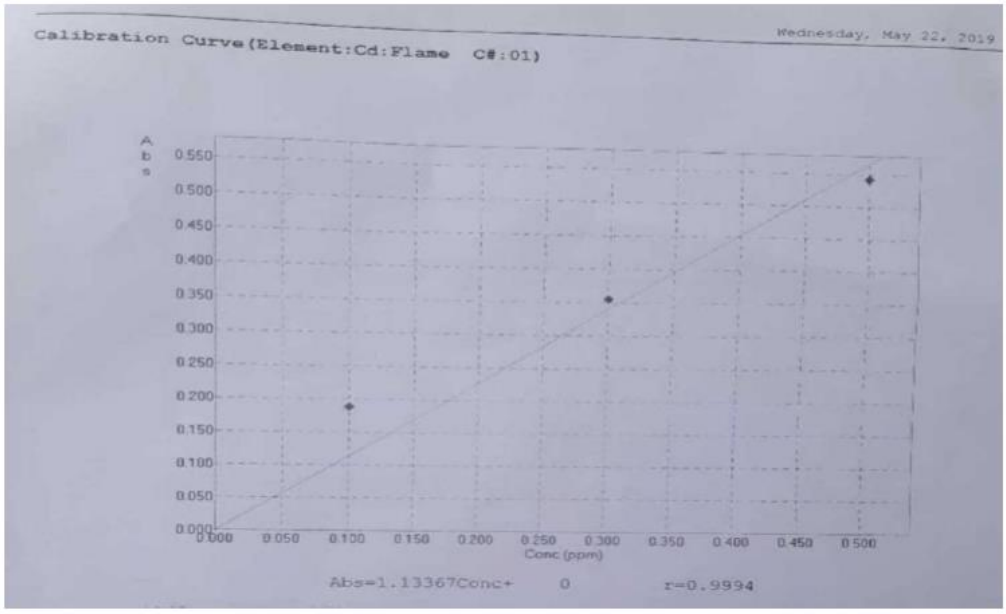


Figure 2. Showing the Calibration Curve of Cadmium

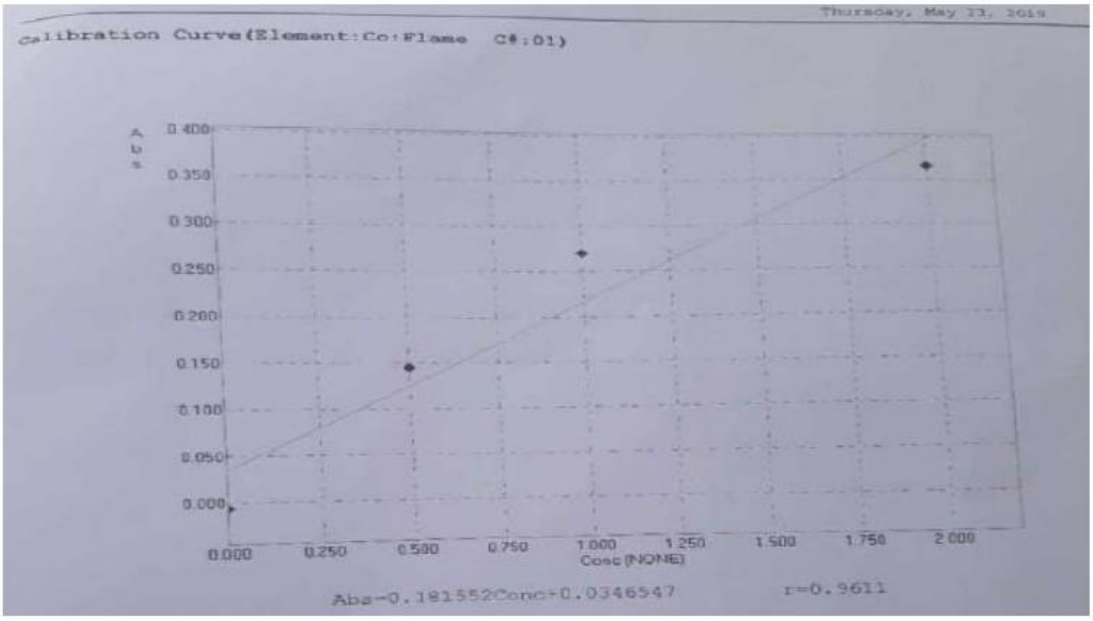


Figure 3. Showing the Calibration Curve of Cobalt

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Discussion

With the exception of Cadmium and Cobalt two heavy metals of public health importance, the results of the analysis for heavy metals using atomic absorption spectrophotometer were within set limits. The results show that while all values were within acceptable limits for Cadmium in the leaves, Cd was found in the stem sample in the western senatorial zone at a range of 0.007 to 0.3358 ppm above the FAO/WHO maximum limit of 0.1ppm (Tasrina *et al*.,2015). This finding agrees with the results of a study on heavy metal contamination of *Amaranthus* grown along major highways in Lagos which reported that the concentration of Cd in *Amaranthus* stem were highest at 4.0 ppm (Atayese, *et al.,* 2008). This also aligns with the results of another study on heavy metal uptake and accumulation by edible leafy vegetable *Amaranthus* hybridus grown on urban valley bottom soils which reported that uptake and accumulation of Cd was higher in the stem of the plant as compared to the leaves, the study reported 0.38 to 1.20 ppm for leaves and 0.6 to 2.5 for stems (Oluwatosin *et al*.,2009). However, this is in contrast with a study published in the *International Journal of Current Research* on the heavy metal (Pb, Cd, Ni, Fe and Zn) concentrations in soils and accumulation in Amaranthus Hybridus grown near solid waste dumpsites. The research reported that leaves rather than stems had higher concentration of Cd. (Eze,2014). This variation could be the result of the location of the study (dump site) as reported by the author.

The presence of Cobalt, another heavy metal of public health concern above the maximum permissible limit set by the Agency for Toxic Substance Disease Registry (ATSDR) is another major finding from this study. The maximum permissible limits for the heavy metals in vegetables set by (ATSDR) is between 0.05 to 0.1ppm 0.1ppm (Tasrina *et al*.,2015). The results indicate high levels of Co in the samples across all three senatorial districts with a concentration of range of 0.1289 to 0.3487 ppm in the leaves and 0.1470 to 0.3719 in the stems. This agrees with the findings of a study on the levels of heavy metals in leafy vegetables grown around waste dumpsites in Akure, Southwestern Nigeria which reported that the presence of Co in the shot of an *Amarathus* Spp ranged from 0.21 to 4.75ppm (Aiyesanmi and Idowu, 2012).

In contrast, another study conducted in Tanzania reported a slightly different result which indicates that cobalt was only found in the roots at an average concentration of 0.14 ppm but was undetectable in the edible parts (Stem and leaves) of plant (Sahu and Kacholi, 2016). This variation could be due to natural and anthropogenic factors, the accumulation and distribution of heavy metals in the plant depend on the plant species, the levels of the metals in the soil and air, the element species and bioavailability, pH, cation exchange capacity, climacteric condition, vegetation period and multiple other factors as reported by (Filipović-Trajković,2012).

Conclusion

The potential consequences of exposure to harmful substances, on either a population or an individual basis, is a fundamental concern in epidemiology and public health. According to the World Health Organization (WHO), Cd exerts toxic effects on the kidney, the skeletal and the respiratory systems, and is classified as a human carcinogen, as a result, exposure to high levels of this metal over a short period of time can result in flu-like symptoms and can damage the lungs while chronic exposure to low levels over an extended period of time can result in kidney, bone and lung disease. (WHO,2019) The presence of this metal above the FAO/WHO maximum permissible limit of 0.1ppm in the vegetable is a major public health concern because of its harmful nature and the large number of people who consume it especially the pregnant women who heavily rely on it for their iron needs.

Co on the other hand is one of the most important essential components for vitamin B12, it is beneficial for humans because it is essential for thyroid metabolism and the maintenance of human health. It is also used to treat different types of cancer and anemia However, absorbing large amount of cobalt over long period of time can result in serious health problems, such as: cardiomyopathy a condition where the heart becomes big and floppy and has problems pumping blood, it can also lead to hearing loss and other auditory problems.(Karpiuk *et al*.,2016). The presence of Co at a high of 0.3487ppm above the maximum permissible limit of 0.1ppm set by the Agency for Toxic Substance Disease Registry (ATSDR) in all three senatorial districts is another serious public health concern for food safety. As one of the most widely consumed vegetable in Nigeria and a staple food in a country

of over 200 million the likely accumulation of Co in the body over a long period of time as a result of consuming vegetables high in Co can have far reaching public health implications which can further complicate the current public health crisis in Nigeria.

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Factors Associated with Choice of Place of Delivery and What Motivates Mothers to OPT for TBA Care in West Pokot County- Kenya

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Abstract

Background: *Skilled birth attendance in Kenya declined from 50% in 1988 to 42% in 2003, remained the same by 2008/9 increased to 62% by 2014. By 2008/09, only 43% of births took place at HFs by SBAs while 58% occurred at home. Socio-demographic factors could be attributed to this.*

Objective: *To determine factors influencing mothers' choice of place of delivery and motivating them to opt for TBA care.*

Methods: *Descriptive cross-sectional study of 375 women. Both quantitative and qualitative data obtained from semi-structured questionnaires and FGDs/KIIs respectively. Statistical techniques; analysis using (SPSS V.20). $p<0.05$ significant.*

Results*: Majority 340 (90.7%) delivered at home. Education ($p<0.001$) and religion ($p<0.003$) were significant predictors. Secondary level education 1.6 times more likely to choose HF delivery. Catholics 4 times and protestants 6 times more likely to deliver at HF compared to non-believers (OR; 95% CI: 3.618(0.715-18.305) and 6.162(1.401-27.102). Socio-cultural beliefs and practices were main impediment to HF delivery.*

Conclusion*: HF delivery found to be low (9.3%) compared 61% national. Level of education and religion impact positively HF delivery whereas socio-cultural beliefs and practices, lack of transport and availability of TBAs main bottlenecks.*

Recommendation: *A comprehensive program on safe motherhood by RH actors to be designed focusing on TBAs and socio-cultural beliefs and practices.*

Keywords: *Place of delivery, skilled birth attendance, socio-cultural beliefs.*

Introduction

Background information

Worldwide, it is estimated that nearly 600,000 women die yearly from complications related to pregnancy and childbirth (about one woman every minute) (6). 99% of these deaths occur in developing countries (15). Maternal death refers to death related to pregnancy and childbirth among women of reproductive age and maternal mortality ratio is defined as the number of maternal deaths per 100,000 live births. Worldwide, more than 50 million women suffer the consequences of poor reproductive health care. Whereas 1 in every 16 women in developing countries will die of pregnancy complications, only one in 2,800 will die of a similar problem in the developed countries (15). Approximately 50% of maternal deaths occur during the first 24 hours after delivery, 25% during pregnancy, 20% between the second day and one week postpartum and 5% can occur any other time later up to six months (15). For every maternal death, another 200 women will develop some form of lifelong morbidity related to pregnancy and child birth. This is a considerable burden of disability and disease, not forgetting the millions of children who become motherless annually (15). Kenya is a good example of this saddening picture according to KDHS reports.

In the year 2015, 6,623 mothers died as a result of pregnancy and childbirth related complications and ranked 138/179 best country to be a mother with a lifetime risk of maternal death of 1:37 (11).

The five major causes of maternal deaths include; haemorrhage (27%), pregnancy-induced hypertension (14%), post-partum infection (sepsis) (11%), unsafe (septic) abortion (9%) and pregnancy related complications; obstructed labour, ruptured uterus, malpresentation (4). All of these complications cannot be managed at home by traditional birth attendants (TBAs) and require timely

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referral to second level health facility or other higher levels for comprehensive obstetric care by skilled attendants.

Skilled birth attendance occurs at a health facility equipped with emergency obstetric services such as blood transfusion, intravenous fluids, antibiotics and skilled attendance (2). The best choice of place of delivery for a pregnant woman includes hospital delivery under skilled attendance. This refers to a qualified midwife or doctor with formal training and in a safe environment (2).

Complications related to pregnancy and childbirth is among the leading causes of mortality for women of reproductive age in many parts of the developing world. The age at which women begin or stop child-bearing, the interval between each birth, the total number of lifetime pregnancies and the socio-cultural and economic circumstances in which women live all influence maternal morbidity and mortality (5). Maternal mortality is a health indicator that shows very wide gaps between the rich and the poor, both between countries and within them. The number of women dying as a result of complications during pregnancy and childbirth has decreased by 34% – from 546 000 in 1990 to 358 000 in 2008. Although the progress is notable, the annual rate of decline of 2.3% is less than half of the 5.5% needed to achieve the target. While the global proportion of births attended by a skilled health worker has increased, in the WHO regions of Africa and South-East Asia fewer than half of all births had skilled assistance. (16). Women in the poorest countries, such as Malawi, and other parts of the world are over 1000 times more likely to die from maternal causes than those in developed countries. For every 30,000 women in Sweden, only one will die from pregnancy-related complications (Ibid).

Most obstetric complications could be prevented or managed if women had access to skilled birth attendance – doctor, nurse, midwife – during childbirth.

The maternal mortality ratio (MMR) in Kenya is one of the highest in the world, standing at 488 per 100,000 live births (9). Addressing the tenacious MMR in Kenya is a great challenge, which requires the collaboration of community, government, and private actors. One of the main indicators in assessing and improving maternal health is the presence of a skilled attendant at birth. In this context, it is important to define skilled attendance, examine the prevalence of skilled attendance at birth, and to assess potential reasons why most women still prefer TBAs instead of skilled attendance at birth. By assessing the access barriers, it becomes possible to provide services that are better able to reach the women who need them most in terms of antenatal care, labour and delivery, and post-delivery care for the mother and the neonate. Without political commitment and investment in maternal health service delivery, declines in maternal deaths are unlikely in the next 10-20 years. It is also doubtful that the fifth Millennium Development Goal- to reduce maternal mortality by 75% by 2015 will be met in Kenya given the worsening trend.

Central Pokot Sub-County of West Pokot County in North Rift region of Kenya is among the counties in Kenya leading with home deliveries and high MMR. One single evidence-based, high impact health intervention measure that can significantly reduce MMR if implemented is increasing skilled attendance at birth (7).

The problem statements

The percentage of skilled birth attendance in Kenya has declined steadily from 50% in 1988 to 45% in 1993 to 44% in 1998 to 42% in 2003 and remaining at 42.6% in 2008 (9).

This worsening trend is also evident in Kenya Health Sector performance profile report 2004/2005 could be attributed to differences in social, cultural, economic and demographic factors which influence the choice of skilled or unskilled birthing process.

In the modern health care sector, traditional birth attendants (TBAs) are not recognized as skilled birth attendants. According to the WHO, TBAs can be defined as “traditional, independent (of the modern health system), non-formally trained and community-based providers of care during pregnancy, childbirth, and the postnatal period” (14).

Traditional practitioners such as TBAs are often favored by women in the community to perform deliveries (8). Hence, despite an increase in efforts to move women to health facilities and skilled personnel attendance, the utilization of TBAs has remained stagnant.

This study examined what factors (social, cultural, economic and demographic) influence choice of skilled or unskilled birth attendance and therefore determine why most of the parturient women still prefer TBAs in this 21st Century with all the dangers associated with home/unskilled delivery.

Research questions

What factors influence women in determining the choice of place of delivery of their babies in Central Pokot Sub-County?

Rationale and justification of the study

Understanding why women prefer home (unskilled) care to skilled attendance in West Pokot County is an unexplored topic. Indeed, research exists regarding the effectiveness of training TBAs, previous government collaborations with TBAs, and the role that they should be playing in maternal and child health (MCH). But few studies have examined client perspectives on TBAs, TBA perspectives on the health care system, and key government health workers' views on the role of TBAs within the national MCH strategy.

Maternal mortality in developing nations Kenya inclusive remains a big challenge. The statistics from Kenya mirrors the world wide literature as evident in the demographic health reports (8, 9). Arid and Semi-Arid Lands (ASAL) for instance the Pokot County have even worse mortality statistics on skilled delivery uptake than other parts of Kenya. There has been limited data to show what factors influence choice of place of delivery among women in this part of Kenya.

This study has therefore endeavored to fill the gap on existing knowledge on whether factors known to affect choice of health facility or home delivery attendance in other areas are operative in Central Pokot Sub-County of West Pokot County.

The findings from this study will lead to the development of a hypothesis, which can further be tested and having been tested, could contribute to evidence-based maternal care interventions which will go a long way in the reduction of maternal and infant mortality rates and improve maternal care services in the study area and beyond through scale-up and replication.

This quantitative/qualitative research study results will be used to inform future policies that a project can employ with regards to integrating or shifting away from TBAs' involvement in MCH services.

Objectives of the study

Broad objective

To determine the factors that influence women's choice of where to deliver their babies in Central Pokot Sub-County. The study seeks to understand the services provided by TBAs and their role within the community. It will also identify their link to the formal health sector and the ways in which they disseminate information and deliver care with regards to maternal health care (MHC) in order to understand both possible interventions and current best practices that lead to their preference by mothers.

Specific objectives

The specific objectives of the study are:

1. To determine the percentage of health facility-based deliveries by skilled birth attendants in Central Pokot Sub-County.
2. To determine the cultural, social and demographic factors associated with choice of place of delivery.
3. To identify additional care that TBAs provide to the mothers before, during and after delivery
4. To ascertain TBAs' awareness about dangers associated with home delivery

Literature review

The world literature shows that the worsening trend in maternal mortality parallels decreased skilled (health facility-based) attendance at birth (5). The literature from Kenya mirrors this world wide literature as evident in the demographic health reports (8, 9). The pillars of safe motherhood initiative

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which include skilled attendance at birth need to be delivered through primary health care (PHC) (1). Safe motherhood aims at attaining optimal maternal and newborn health. Safe Motherhood Initiative was launched at an international consultative conference of United Nation Agencies in Nairobi Kenya in 1987. Skilled attendance at birth forms an important part in achieving the safe motherhood initiative goals. Yet in many parts of the world, women turn to TBAs because skilled health workers are not available or are too expensive, or because TBAs understand their culture and respect the women's needs (3).

Skilled attendance does not include care at birth provided by TBAs, volunteer workers, family members, friends and women themselves without midwifery skills (13).

Methodology

Study Design: Descriptive cross-sectional study.

Study Setting: Pokot Central Sub-County is one of the Sub-Counties of West Pokot County. It is among the Sub-Counties in North Rift. The Sub-County has five Divisions and a projected population of 128,972 people.

Study Population: The study population were women of reproductive age 15-49 years, who have at least delivered once and residing in the villages. TBAs active (conducting deliveries) within the study area and health care (HCPs) engaged in maternal child health (MCH) interventions at the health facilities serving the catchment population also formed part of the study population.

Sample size determination

The sample size was determined using the interpolation formula based on the proportion of expectant mothers who deliver at the health facilities and the precision set at 0.05. Fisher's formula, 1983.

$n = Z^2 p (1-p)/d^2$

Where: - n is the desired sample size

Z =1.96 a statistical constant representing 95% confidence interval

P=prevalence of home deliveries = 0.58 (Reference No. 15 KDHS 2008-09)

d= statistically tolerated error (0.05) or 5% or the level of statistical significance

Therefore, the sample size for the post-natal mothers was obtained using the above formula.

$n=1.96^2 (0.58 \times 0.42)/ (0.05 \times 0.05) =374.3$

The sample size calculated is 374.3. The sample size recruited for the study was 375 women rounded off to the nearest whole number.

Sample selection and procedure

Multistage sampling procedure was employed as follows:

i) Purposive sampling for the two divisions (Sigor and Chesogon) out of the five divisions; Sigor being highland and Chesogon being lowland.

ii) Stratified random sampling was employed to select 2 villages from each division

iii) A sampling frame was then drawn from the four selected villages using the house-hold (HHs) registers kept by the Community Health Workers (CHWs) working in the villages. The number of respondents from each village was then allocated proportionately based on 20% of their population size i.e. the proportion of women of reproductive age (15-49) years demographically.

Village	Population	No. HHs	Women 15-49	Sample Size
Akiriamet	4,001	892	800	87
Ptokou	4,759	986	952	104
Nyangaita	4,207	811	841	92
Cheptulel	4,297	860	859	92
TOTAL 17,264 3,549 3,452				375

iv) Simple Random sampling procedure was then employed for the respondents using SPSS

Data collection Instruments: - The study employed both qualitative and quantitative methods for data collection. The qualitative methods employed were Key informant interviews [KII] and focus

group discussions [FGDs] and quantitative method was through interviewer administered questionnaires.

Findings

Results/Findings

Socio-demographic characteristics

Among the 375 respondents that participated in the study, 214(57.1%) were aged below 30 years and 314(83.7%) were married. More than half 193(51.5%) were illiterate and 182(48.6%) were protestants and majority 257(68.5%) had delivered 5 or less children by the time of the study.

Majority 276 (73.6%) had between 3-9 deliveries and nearly three quarters of the respondents 280 (74.7%) attended ANC during their last pregnancy prior to the study while 25.3% did not attend.

Among those who attended ANC, close to half 137(48.9%) attended ANC 3 times. Among those who did not attend ANC, 50(52.9%) reported distance and cost 32 (33.7%) as the main reasons for non-attendance with majority of the respondents 340 (90.7%) delivered at home during their last delivery prior to the study. For those who delivered at home, availability of TBA services 160(47.1%) and lack of transport to the health facilities 148(43.5%) were the main reasons cited for not seeking health facility delivery services. Majority of those who delivered at home 333(97.9%) were assisted by TBAs. Only 5(1.5%) were assisted by the mother in laws. For those who delivered at the health facility, 25(71.4%) reported safe delivery as a reason.

Nearly half 185(49.3%) preferred to deliver in future at home while 122(32.6%) preferred health facility or hospital delivery although only 35(9.3%) actually had health facility delivery during their last delivery.

Factors that greatly influenced choice of place of delivery (Home or Health Facility) and favoring home delivery included; costs incurred during delivery, distance to the nearest HF, fear of surgery, privacy, age of the birth-attendant and hostile hospital staff.

More than half of the respondents 213(56.8%) prefer to be accompanied by the TBA during delivery even at the health facility and 139 (37.1%) prefer to be accompanied by a close relative

Majority of the respondents 255(68%) reported that means of placenta disposal do affect their choice of place of delivery with home delivery being the preferred choice.

Education level, religion, number of children delivered at home, ANC attendance and household expenditure per month were significantly associated with choice of place of delivery ($p<0.05$)

Those who have had secondary level of education were 1.6 times more likely to seek health facility delivery. It implies that the more educated the woman is, the more likely for them to choose delivery in the health facility. The catholic were almost 4 times more likely to deliver at the health facility and protestants were 6 times more likely to deliver at the health facility compared to non-Christians (OR;95%CI: 3.618(0.715-18.305) and 6.162(1.401-27.102)) respectively.

The study found out that availability of TBA services, cultural practices like placenta disposal and lack of transport to the nearest health facility as the main impediments to health facility delivery, mothers cited lack of privacy, cost incurred during delivery, distance to the nearest health facility, fear of surgery, age and sex of birth attendants and hostile medical staff as reasons for their preference to deliver at home.

The major themes that emerged from KIIs as the main obstacles to health facility delivery were; distance to the health facilities, TBA services, shortage of staff at the health facilities, cultural beliefs and practices, lack of awareness on the importance of health facility delivery among the community and lack of transportation during time for delivery.

Traditional birth attendants (TBAs) although in favour of home delivery, since they belief that they provide a complete package of care to the mother before, during and after delivery which includes; abdominal massage, placenta burial at the right place and conducting rituals but were willing to support

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health facility delivery if fully involved and if an incentive of about KES 500 is given per every mother referred and escorted by the TBA to the health facility for delivery.

Majority of the respondents 255 (68%) reported that means of placenta disposal do affect their choice of place of delivery with home delivery being the preferred choice.

The placenta is disposed of at a designated place (animal shed) and only done by the TBAs among the Pokot community and should not be disposed of into a pit latrine (placenta disposal pit) as it is done at the health facilities. This signifies a blessing to the family and the animals will also multiply and bring prosperity to the family.

This was better illustrated by the response of one of the mothers who said:

"*We burry the placenta (parwa) at the right place where it is supposed to be buried ensuring the correct position depending on the sex of the baby"* indicating at the animals shed. "*We also vary the position in order to influence the sex of the next child depending on the wishes of the family"* she concluded.

It is a general belief among the Pokot that women who have undergone FGM/C are courageous enough to deliver at home since they are not cowards. Health facility delivery is meant for cowards who have not undergone FGM/C and prostitutes and leads to stigmatization.

One of the senior TBAs had this to say:

"*Delivery in the hospital is for women who have not been circumcised since they are cowards. But for us the Pokot, we have been circumcised and can just deliver at home without any fear"*.

There is a general belief among the Pokot community that any woman faithful to her husband should be able to deliver without any difficulties or complication, thus if a mother suggests that she would like to deliver at the health facility, then that is an indication that she has not been faithful and therefore foresees a difficult delivery and this may lead to conflict in the family. *Parpara* is performed at home during delivery to cleanse her.

One of the participants indicated that:

"It is better to have delivery at home so that if a mother had been unfaithful, an old man is called upon to conduct a cleansing ceremony (parpara) that would allow smooth delivery of the baby and that is why we prefer delivery at home…."

Discussion

A total of 375 respondents i.e. women of reproductive age were recruited into the study and the inclusion criteria were women of reproductive age (15-49) years who have had at least one delivery previously.

The results of this study show that most respondents 90.7% delivered at home during their last delivery prior to the study with only 9.3% having gone for skilled health facility-based delivery. This finding reveals that the prevalence of Health facility delivery is too low in Central Pokot Sub-County compared to the national prevalence of 61% (10).

The results show that high level of education, house hold expenditure, religion and ANC attendance influence choice of place of delivery by mothers in Central Pokot Sub-County of West Pokot County. The study shows that household expenditure per month is a good predictor of place of delivery with mothers with an average monthly expenditure of Kshs. 5,000 were more likely to deliver at the health facility than mothers with an average monthly expenditure of Kshs. 2,000. Majority of those who had home delivery also cited cost as a reason for not seeking health facility delivery. The study also showed that mothers with secondary level of education were 2 times more likely to deliver at the health facility compared to those with tertiary level of education. Those with Primary and below levels of education were however less likely to deliver at a health facility. The study also showed that Protestants were 6 times and Catholics 4 times more likely to seek health facility delivery than non-christians (those not attending any church). There is need for further studies to determine what role the Christian teachings play in promoting maternal care or health facility delivery.

Socio-cultural factors and Health Facility based delivery

This study identified a number of socio-cultural factors that contribute significantly to the low uptake of health facility delivery with the following being the main ones among others:

Parpara; a cleansing ceremony to cleanse an expectant mother; anthill soil mixed with water is used to bath the mother as traditional songs are sang while she is in labour. This cleansing ceremony can not be conducted at the hospital and thus mothers would prefer to deliver at home where the ritual can be performed. FGM/C another cultural practice whereby the women belief that those women who have undergone the FGM/C rite of passage are courageous enough and should deliver at home with the assistance of TBAs and there is also the fear that the health care personnel will tamper with the FGM/C scar.

Motivating Factors to mothers to prefer home delivery under TBAs

This study pinpointed a number of factors that motivated expectant mothers to seek TBA care and not health facility-based care under skilled health professionals and are as follows;

TBAs provided psychosocial support to the mothers throughout the birth process unlike hospital staff who dedicated very little time to the mothers in labour, provided massage to the mothers throughout labour until delivery occurred, provide maximum attention to the mother during delivery including feeding the mother before and after delivery and understood their culture and respect it e.g. the disposal of the placenta after delivery

The hospital staffs were reported to be hostile to mothers in labour and the age of the birth attendants at the health facilities also drive away the mothers since they don't want to be assisted by young girls of the same ages like their daughters and being attended by male birth attendants also drove away mothers from the health facilities.

Conclusion

The results of this study show that the prevalence of health facility-based (skilled) delivery is 9.3% in Central Pokot Sub-County of West Pokot County which is very low compared to the national prevalence of 61% currently (10).

Socio-cultural beliefs and practices e.g. placenta disposal was found to be the main impediment to health facility delivery in addition to TBA services and lack of transport. TBAs lack awareness on dangers associated with home delivery and additionally provide placenta burial which does not add any value.

The factors found to affect health facility delivery were;

1. Median household expenditure per month was shown to be a good predictor of place of delivery with mothers with a mean expenditure of Kshs 4,000 more likely to deliver at the health facility than mothers with a mean of Kshs 3,000 who preferred home delivery. This is supported by previous literature review.
2. Mothers with secondary school level of education were twice as much likely to deliver at the health facility than those with tertiary level and those with primary level and below were more likely to deliver at home. This is in contrast to previous literature review.
3. Religion was found to be a predictor too with Protestants more likely to deliver at the health facility than those not affiliated to any church. This finding is supported by literature review prior to this study.
4. Placenta disposal mechanism was found to significantly affect choice of place of delivery by mothers.
5. Socio-cultural beliefs and practices greatly affect choice of place of delivery by mothers (*parpara* and *Sapana)* among others.
6. The most preferred place for delivery is home and thus a lot needs to be done to increase the uptake of health facility-based delivery and thus help curb MMR which still remains high in Kenya.

Figures and tables

Majority of the respondents 340 (90.7%) delivered at home during their last delivery prior to the study

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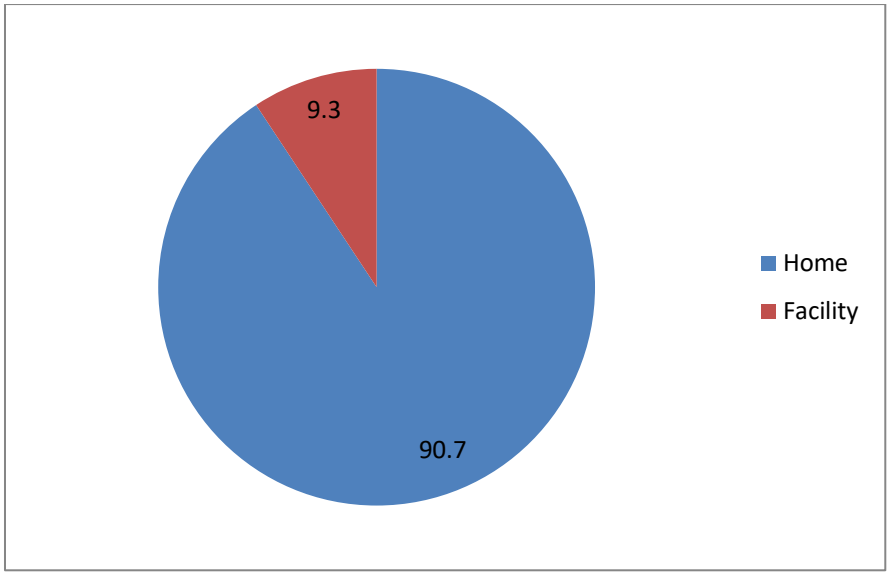


Figure 4.3. Place of delivery

n=375

Table 4.3. Factors associated with choice of place of delivery

Factor	Place of delivery		Chi-square	P=-value
	Facility (%) n =35	Home (%) n=340		
Age-group				
15-19	4(11.4)	18(5.3)	4.453	0.486
20-24	9(25.7)	76(22.4)		
25-29	10(28.6)	97(28.5)		
30-34	7(20.0)	74(21.8)		
35-39	5(14.3)	54(15.9)		
>40	0(0)(0)	21(6.2)		
Distance to facility				
<6	5(14.3)	63(18.5)	0.462	0.927
6-10	12(34.3)	114(33.5)		
11-15	12(34.3)	104(30.6)		
>15	6(17.1)	59(17.4)		
Marital status				
Single	4(11.4)	20(5.9)	1.821	0.402
Marital	27(77.2)	287(84.4)		
Other (sep/div/widow)	4(11.4)	53(9.7)		
Education level				
Illiterate	9(25.7)	184(54.1)	38.123	<0.001
Primary	17(48.6)	146(42.9)		
Secondary	7(20.0)	7(2.1)		
Tertiary	2(5.7)	3(0.9)		
Religion				
Protestant	25(71.4)	157(46.1)	11.737	0.003
Catholic	8(22.9)	73(21.5)		
Pagan	2(5.7)	110(32.4)		
Parity				
1-2	12(34.3)	82(24.1)	5.604	0.133
3-5	18(51.4)	145(42.6)		

6-9 ≥10	5(14.3) 0(0)	108(31.8) 5(1.5)		
No. of children delivered at home 1-2 3-5 6-9 ≥10	18(51.4) 12(34.3) 5(14.3) 0(0)(0)	89(26.2) 144(42.4) 102(30.0) 5(1.5)	19.102	<0.001
ANC attendance Yes No	35(100) 0(0)(0)	245(72.1) 95(27.9)	13.097	<0.001

Factor	Place of delivery		Z-value	P=-value
	Facility median (IQR)	Home median (IQR)		
Median expenditure	4000(3000, 6000)	3000(1500, 4000)	3.038	0.002

Table 4.4. Multiple binary logistic regression

Factor	Regression coefficient (β)	OR (95%CI)	P-value
Education (ref=tertiary) Illiterate Primary Secondary	 -2.175 -1.447 0.445	 0.144(0.016-0.785) 0.235(0.036-1.533) 1.560(0.191-12.737)	0.001
Religion(ref=non-Christ) Catholic Protestant	 1.286 1.818	 3.618(0.715-18.305) 6.162(1.401-27.102)	0.039 0.120 0.016
Home deliveries (≤5)	0.244	1.276(0.478-3.406)	0.627

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