Hygiene and Sanitation Practices in the Collection, Treatment and Preservation of Potable Water in Santa Town, North West Cameroon.

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Abstract

Access to safe drinkable water has improved over the last decades in almost every part of the world, but approximately one billion people in Africa still lack access to safe water and over 2.5 billion lack access to adequate sanitation. In large parts of the world, humans have inadequate access to potable water and use sources contaminated with disease vectors, pathogens or unacceptable levels of toxins or suspended solids. Drinking or using such water in food preparation leads to widespread acute or chronic illnesses and it is a major cause of death and misery in many countries. As such prevention of water borne diseases is a major health goal in developing countries (Fawell J & Chipman K, 2010).

The health burden of poor water quality is enormous with an estimated 37.7 million individuals affected by water-borne diseases; annually 1.5 million children are estimated to die from diarrheal-related diseases each year (WHO, 2012).

The developing countries in the world still face the problem of water scarcity with Africa having the largest number of countries encountering these problems. Due to water scarcity, many families tend to store water in their home for long term use. Most families have inadequate knowledge or are ignorant on the duration of the storage and the type of container or vessel used in the collection and storage of drinkable water.

Inhabitants in Santa town in North West region of Cameroon experience inherent episodes of water shortages all round the year prompting household to fetch, store and consume water from doubtful sources.

A study was carried out to assess the knowledge and practices of the inhabitants of Santa town in the collection and preservation of potable water in order to avert the occurrence of water-borne diseases.

Primary data was collected with the use of a structured questionnaire with open and close-ended questions, administered by the researcher and co-researchers to the study population in the randomly selected quarters using cluster sampling. A sample size of 110 households was recruited for the study.

Results show that 68 (58.18%) of respondents defined drinkable water as water safe enough to be consumed with low risk of harm, 24 (21.8%) defined it as water which originates from pipe borne water while 16 (14.5%) said that it is water from any natural source.

On the criteria used in the identification of unsafe water, 68 (58.18%) said they identified water which is not safe for drinking from its color, taste and odor; on the issue of water protection and preservation from contaminants, 58(52.7%) of the responses were that they lacked containers for their drinking water, 32(29.5%) said they lacked chemicals and filters to treat their water, while 14(12.9%) did not have knowledge in the protection and preservation of potable water while 06 (5.5%) said that the problem they encountered was the presence of children playing around drinkable water sources and water storage containers.

From the data collected, and analysis made it be can be concluded that there exist inadequate knowledge on the protection and preservation of potable water. Their understanding of the notions of hygiene and sanitation, the knowledge and practices on the collection and preservation of potable water are not based on the level of education but on how much public health information they got about drinking water collection, treatment and preservation. So, an up-to-date, knowledge and practices on the collection, treatment and preservation of potable water is necessary for the wellbeing of the Santa community. The Council’s hygiene and sanitation service should take it as duty function.
to organize regular public health education lectures in social institutions in order to enlighten the community.

Introduction

Access to safe drinkable water has improved over the last decades in almost every part of the world, but approximately one billion people worldwide still lack access to safe water and over 2.5 billion lack access to adequate sanitation. In large parts of the world, humans have inadequate access to potable water and use sources contaminated with disease vectors, pathogens or unacceptable levels of toxins or suspended solids. Drinking or using such water in food preparation leads to widespread acute or chronic illnesses and it is a major cause of death and misery in many countries. Reduction of water borne diseases is a major health goal in developing countries (Fawell J & Chipman K, 2010).

WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation (2012), released in early 2013 that in 36% of world population, 2.5 billion people lack improved sanitation facilities and 768 million people still use unsafe drinkable water sources. Inadequate access to safe water and sanitation services coupled with poor hygiene practices, kills and sickens thousands of children every day, and leads to impoverishment and diminished opportunities for thousands more.

Poor sanitation, water and hygiene have many other serious repercussions; children and particularly girls are denied their right to education because their schools lack private and decent sanitation facilities. Poor water quality is deadly and some 5 million deaths a year are caused by polluted drinking water. WHO Report (2012), estimates that safe drinking water could prevent 1.4million children from dying from diarrhea, cholera and other water borne diseases.

The health burden of poor water quality is enormous. It is estimated that around 37.7million individuals are affected by water borne diseases annually 1.5 million children are estimated to die of diarrheal-related diseases each year (WHO, 2012).

The developing countries in the world still face the problem of water scarcity with Africa having the largest number of countries with problems. Due to water scarcity, many families tend to store water in their home for long term use. Most families have inadequate knowledge or are ignorant on the duration of the storage and the type of container or vessel used in the collection and storage of drinkable water.

In Ethiopia, there is limited access to drinking water and basic sanitation, only 24% of the population has access to drinkable water in spite of the large number of water resources available in the country. And only 13% have basic sanitation services as documented by the 2006 United Nations Development Program Report. Due to this situation, hundreds of people fall ill and die daily as a result of drinking contaminated water (WHO, 2010).

Cameroon got fully engaged with the activities toward the attainment of the Millennium Development Goals (MDGs) since their inception in 2000. She has made notable progress, and much more needs to be done to improve the situation especially in rural areas. In 2006, 70% of the population had access to safe drinkable water and the coverage in urban centers was 88%, significantly better than the 47% in rural areas (MDGs, Potable Water, 2001).

This study therefore assesses the situation of access to potable water and sanitation of a Health District in Cameroon within the context of MDGs and ascertains whether she is on the tract to meeting the MDGs in these domains and proposes actions to be taken to bring it closer to these objectives.

Water Wiki-net (2012) reports that the Cameroon government, although endowed with abundant fresh water sources, still faces a lack of comprehensive information, weak enforcement capacity and poor coordination amongst agencies to sustainable water management. The biggest problem in Cameroon is not the availability of water but it is the poor management and development of water resources coupled with inadequate political will and commitment. This results in the shortage and scarcity in some areas in Cameroon. Also the patchiness of information available on the quality and methods of preservation of drinkable water is the major cause of diseases in some regions of Cameroon (Wiki-net, 2012).

In the North West Region and particularly in the Santa community, potable water has been a night mare over the years. The unavailability of potable water has led to an increase in diarrheal-related conditions; as out of 141 patients who came in for consultation during the researcher’s public health
placement in the Santa Health District for two months, 65 patients (30.80%) were diagnosed with diarrheal-related diseases. This was due to limited water supply at certain points in time. Hence people here use water from streams, wells and springs for drinking and this water contains leaves, amoebae, spirogyra and debris with poor environmental sanitation. They also store water collected from these sources for long term use in utensils and different kinds of vessels. This led the researcher to hypothesize that there was deficit knowledge on the quality of drinkable water and on the frequency at which they have to wash their utensils and vessels before its collection and preservation.

Research Question:

What is the knowledge and practices of the inhabitants of Santa Health District in the collection and preservation of potable water so as to avert water borne diseases?

Study Objectives:

The general objective of the study was to assess the knowledge and practices of the inhabitants of Santa Health District in the collection and preservation of potable water.

The specific objectives of the study were:
1. To assess the knowledge of the inhabitants of Santa Health District on the collection, treatment and preservation of potable water.
2. To determine the practical measures employed in the collection, treatment and preservation of potable water.
3. To identify the problems faced in the collection, treatment and preservation of potable water.
4. To ascertain the information they need from health personnel to complement the practice in the collection and preservation of potable water.

Study Design:

A descriptive cross sectional study design was employed for the study where-in primary data was collected at one point in time from inhabitants of the Santa health area in order to collect responses on the collection, treatment and preservation of portable water.

The target population for this study comprised of youths, men and women who have lived in this area for the past 6 months irrespective of their sex, religion, occupation, nationality and socio economic status.

Sample Size: The sample size was calculated using the formula below:

\[ N = \frac{(z)^2 \times p(1 - p)}{(e)^2} \]

- \( N \) = the required sample size
- \( Z \) = confidence interval of 95% (\( z = 1.96 \))
- \( p \) = the population of households (15%)
- \( e \) = random error of 5% (type 1 value of 0.05)
- \( N \) = 110 respondents.

Primary Data Collection Instrument:

The instrument employed for primary data collection was a structured questionnaire with open and close-ended questions, administered by the researcher and co-researchers to the study population in the randomly selected quarters using cluster sampling.

Data Analysis Tools:

Data was coded using a coding guide developed for the study and entered in CsPro, cleaned and exported to SPSS windows version 16.0 for analysis.

- Descriptive statistics was employed to analyze the households’ perceptions and practices.
Bivariate analysis was used to evaluate the association between explanatory and outcome variables;

**Method for Data Presentation:**

Data collected was analyzed using the above software and presented in graphics and frequency tables.

**Presentation and Analysis of Results:**

Results show that concerning respondents' knowledge of drinking water, 68 (58.18%) defined drinkable water as water safe enough to be consumed with low risk of harm, 24 (21.8%) defined it as water which originates from pipe borne water while 16 (14.5%) said that it is water from any natural source.

On criteria used in the identification of unsafe water, 68 (58.18%) said they identified water which is not safe for drinking from its color, taste and odor, 32 (29.1%) said only the color of water while 6 (4%) said from its taste and odor and 3 (2.7%) said it is from the odor of water.

On their sources of potable water when there is shortage of water supply, 58 (52.72%) said they got water from springs, 22 (20%) get their water from well while 8 (16%) got theirs from streams and 6 (5.4%) said they got water from different taps around the municipality.

**Treatment of water collected from others sources before consumption.**

![Figure 1: Distribution of respondents according to whether they treat water collected from other sources before consumption.](image)

Out of the 110 respondents 54 (49.1%) acknowledged that they treated their water before consumption while 56 (50.1%) said they don’t treat.

**4.2.5: Water treatment techniques used.**

![Figure 2: Frequency distribution of respondents on the treatment techniques they use.](image)
Figure 2 above indicates the various techniques used by those who treat their water; 61% of the respondents treated their water by boiling followed by chlorination (22%). Five households (4.5%) used sedimentation.

**Knowledge of Respondents on the protection and preservation of Potable Water.**

All the respondents acknowledged that portable water should be kept in containers and covered.

**Frequency of cleaning (washing) the containers.**

![Pie chart showing frequency of cleaning](chart1.png)

**Figure 3:** Distribution of respondents according to how often they wash their containers or vessels before collection of potable water.

Figure 3 shows that the majority 62 (56.3%) washed their containers every week, 24(21.8%) said they washed their containers whenever they wanted to fetch water while 19(17.2%) washed theirs every day and 5 (4.5%) said they washed containers every month.

**Storage duration of drinkable water by households.**

![Bar chart showing storage duration](chart2.png)

**Figure 4:** Storage duration of drinking water by households.

From figure 4 above, 52(47.2%) stored drinkable water as long as possible, 38(34.5%) said they stored drinking water for 3 days while 9(8.2%) said they stored water for 1 week and 6(5.4%) stored it for 5 days.

The responses as to why they stored water for the chosen length of time, the following reasons were advanced:

- Stored drinkable water as long as possible because of the shortage of water supply.
- Stored drinkable water for 3 days reason being that after 3 days water contains some micro organisms.
- Those who stored for 5 days to one week did not give any reasons for doing so.
Water-borne diseases that result from drinking water from doubtful sources.

![Figure 5](image)

**Figure 5:** Respondents’ knowledge on diseases that arise as a result of consuming unsafe water.

Out of 110 respondents, 72% said cholera can be contracted after consuming unsafe water while 28% said that it was dysentery that is contracted after consuming unsafe water.

**Problems Faced in Protecting and Preserving Potable Water.**

![Figure 6](image)

**Figure 6:** Respondents’ notions about the problems encountered in protecting and preserving potable water.

From the above figure, 58(52.7%) of the responses were that they lacked containers for their drinking water, 32(29.5%) said they lacked chemicals and filters to treat their water, while 14(12.9%) do not have knowledge in the protection and preservation of potable water while 06(5.5%) said that the problem they encountered was the presence of children playing around drinkable water sources and water storage containers.

**Practical Guidelines Needed from Care Providers to Compliment the Practice of Protection and Preservation of Potable Water**
From figure 7 above, 58% said that nurses should teach people on the different methods to treat water while 29% said nurses should organize seminars to sensitize the population on the protection and preservation of water and 13% of respondents said nurses should move in the community to oversee how people treat their water before consumption.

**Discussion of Findings.**

**Knowledge on the quality of potable water.**

Looking at the knowledge that respondents had on the quality of potable water, 58.13% said potable water is water safe enough to be consumed with low risk of harm while 21.8% said it is water which originates from pipe-borne water and 14.5% said is water from any natural source. Concerning the measures employed by respondents to identify water which is not safe for drinking, 90% said they identified unsafe water from its color, taste and odor while some said only from the color of water and others said only from its taste and odor. According to Fawell J.K (2010) the complexity of water quality is a subject in the many types of measurements of the water quality indicators. And these indicators are color odor and taste, that is, water should not have color, odor and taste. Also, the majority of households intimated that during shortage of water supply they collected their potable water from the springs (58%) and the minority collected theirs from the wells (10%), streams (16%) and pipe borne water from quarters where it is available (6%).

Figure 2 shows the findings on the treatment of water collected from other sources and treatment techniques employed; 46% of them acknowledged that they treat water while 64% said they drink it as such after collection with no treatment subjected to it. This will predispose them to the occurrence of water-borne diseases since the water contains micro-organisms and other chemical compounds. WHO (2003) stated that the public in general, judge the quality of water supplied based on the appearance, taste and odor at the point of its use. Although appearance, taste, odor are useful indicators of the quality of potable water; their presence may not necessarily make water unsafe to drink. In the same way, the absence of any unpleasant qualities does not guarantee water to be safe for consumption. It is evidently true that drinking water should be aesthetically pleasing, ideally looking clear, colorless and well aerated with no taste and odor.

**5.1.3 Knowledge on the Protection and Preservation of Potable Water**

Concerning the protection and preservation of potable water, all the 110 respondents were aware that containers and vessels should be covered with a good lid. This will help to prevent contamination of water by house flies and other vectors that carry fecal matter on their appendages from nearby latrines.

Figure 3 presents findings on the practice of washing of containers and vessels before collection of potable water. 17.2% and 4.5% of the respondents said they washed their containers and vessels every
day and every month respectively before collection of water while 56.3% washed theirs every week. This indicates that they knew that it is important to wash their containers but they did not know that they have to wash them whenever they have to collect water.

Concerning the maximum duration of storing potable water, 47.2% of the respondents said they stored drinking water as long as possible, reason being that they always have shortage of potable water supply. Others said they stored theirs for 1 week, 3 days and 5 days respectively.

According to Extension Water Quality Specialist, Dorothy L. Miner, storing water at least for three days for drinking is recommended. When the duration of shortage is long, there will be an increased growth of anaerobic microorganisms. This is detrimental to the health of the household. Concerning diseases that arise as a result of consuming unsafe water, 72% said cholera and 28% dysentery can result. This indicates that they knew relatively much about the consequences of consuming unsafe water and potential diseases that accrue.

5.1.4: Problems Faced in the Protection and Preservation of Potable Water

Concerning the problems faced by the respondents in the protection and preservation of potable water, 52.7% complained that they do not have containers or vessels to keep their potable water; 29.5% said they lacked chemicals like chlorine to treat their water; also they lack filters to filter their water as well as firewood to boil water.

Out of 110 respondents, 44% had deficit knowledge on collection, treatment and preservation of water and 34% said their problem in preserving and protecting drinking water was the fact that children played around drinkable water sources. According to the respondents the government should deploy hygiene and sanitation technicians to the community to provide health education lectures and distribute containers, chemicals and filters to treat their water since they always have shortages of water supply. Also in different households, family members should keep water away from children and always be around when a child wants to drink water or the elderly one should practice giving water to the younger ones; to avoid children play with the preserved water or sending fingers or putting strange objects inside water containers that can end up contaminating the water. That is why Gleick, P.H (2006) stipulated that lack of containers to keep potable water is a real problem in the rural areas and people in these settings drink unsafe water; this predisposes them to water borne diseases.

Practical Guidelines needed to Complement the Practice on Protection and Preservation of Potable Water

Looking at table 7, out of 110 respondents, 58% proposed that health personnel should teach people on the different methods to treat water; 29% proposed that nurses should organized seminars to sensitize them on the protection and preservation of water, so people should be aware of the importance of drinking potable water, 13% underlined that nurses should move in the community to see if people treat their water before drinking and to educate them on the importance of potable water to their lives.

Health personnel can take an active role in the protecting and preserving their community’s drinkable water by understanding where their drinkable water comes from and finding out about its quality and teach them ways to prevent their water from becoming contaminated. Also regular sanitation campaigns lay strong emphasis on information, education and communication for effective behavior change. (Pandve, H.T, 2008).

Respondents recommended that the Santa Rural Council should construct more taps in the different quarters; they should treat water in the water catchment before supplying it to the different areas in the municipality. Since the Santa locality relies principally on the community water catchment which is not enough for all the community, the council should solicit for assistance from the government for another catchment to be constructed to satisfy the population desires.
Conclusion

This research was geared at assessing the knowledge and practices of inhabitants of Santa Health District on the collection, treatment and preservation of potable water, and how these practices influences the occurrence of water-borne diseases.

From this study, it was found out that:

- Respondents are not well educated on the protection and preservation of potable water;
- 72% of respondents do not treat water collected from streams or springs which is the main reason for public health education for the prevention against water borne diseases.
- 64.2% of the respondents stored their potable water as long as possible well above the stipulated duration for the preservation of drinking water.

From the data collected, and analysis made it be can be concluded that there exist deficit knowledge on the collection, treatment and preservation of potable water as evidenced by the diverse responses gotten from them. Their understanding of the notions of hygiene and sanitation, the knowledge and practices on the collection, treatment and preservation of potable water are not based on the level of education but on how much information they got via public health education concerning drinking water collection, treatment and preservation. So, an up-to-date, knowledge and practices on the collection, treatment and preservation of potable water is necessary for the wellbeing of the Santa community. The Council’s hygiene and sanitation service should take it as duty function to organize regular public health education lectures in social institutions in order to enlighten the community.

References

Attitudes and Practices of Health Care Workers Towards HIV Positive Patients at the Federal Medical Centre Owo Ondo State Nigeria

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Abstract

PROBLEM: Nigeria has an estimated 3.6 million people with HIV/AIDS and is home to one out of every 11 people with HIV/AIDS worldwide. In Nigeria, as elsewhere, AIDS is perceived as a disease of “others” – of people living on the margins of society, whose lifestyles are considered “perverted” and “sinful.” Discrimination, stigmatization, and denial are the expected outcomes of such values, affecting life in families, communities, workplaces, schools, and health care settings.

OBJECTIVE: The study was designed to determine the attitude and practices of health care workers towards HIV positive patients at the Federal Medical Centre Owo, Ondo State, Nigeria.

METHODS: The study was carried out at Federal Medical Centre Owo in Ondo State, Nigeria. A descriptive cross-sectional survey of all seven categories of health-care workers in the centre was conducted. Each category of health care workers; Doctors, Nurses, Pharmacists, Physiotherapists, Medical Laboratory Scientists, Health Information Managers and Medical Imaging Scientists was taken as a sample unit. Sample size proportional to the size of each unit was selected using simple random sampling in order to make the calculated overall sample size. Data was obtained through the use of structured, self-administered questionnaire. Summated scores were used to assess respondents’ attitudes and practices towards HIV positive patients. Data analysis was done using the Statistical package for Social Science (SPSS) version 17. Data were presented using descriptive statistics of frequencies, percentages, pie and bar charts. Inferential statistics of Chi-square was used to test for associations between various factors and the attitude and practices of health care workers towards care for patients with HIV. Statistical level of significance was set at P-value <0.05.

An approval to conduct the study was obtained from Research Ethics Committee of Federal Medical Centre, Owo. Participants were allowed to give their consent in writing before participating in the study.

OUTCOME: A considerable percentage (31.8%) of 252 respondents has varying degrees of poor attitude, while almost half (48.8%) have poor practices towards HIV positive patients. Exposure to blood and other body fluids or injury as a result of work in the last one year, was found to be significantly associated with the attitude of health care workers towards HIV positive patients (P<0.05). It was also revealed in this study that, there is a statistically significant association between sex, professional status of health care workers and practices towards HIV positive patients (P<0.05). This study also showed that 37.7% gave varying degrees of poor responses to the preventive measures towards discrimination against HIV positive patients.

This study recommended the inclusion of HIV/AIDS education in the training curriculum of schools attended by all health care workers, continuous education/counsel of health care workers on HIV/AIDS, creation of HIV/AIDS policies in all hospitals, further research on the study, and that all health care workers should serve as examples in the crusade against discrimination of HIV positive patients.

Chapter One

Introduction

AIDS is an abbreviation for Acquired Immune Deficiency Syndrome. Acquired means something you get, Immune-Deficiency stands for lack of defence against infections agents, and Syndrome means a set
of conditions or illnesses. AIDS develops in people who are infected with a virus called Human Immuno-deficiency Virus (HIV). AIDS is caused by a virus which belongs to the family of retroviruses, now called the Human Immune deficiency Virus (HIV). When HIV infects the body, it causes the natural immune system (defence against disease) which normally enables a person to fight off diseases. This is achieved by attacking helper/inducer L-lymphocites directly, thus preventing them from stimulating the B-cells which function in producing white antibodies (T and B cells are immune-competent cells that cooperate to produce anti-bodies for natural self defence).

The Human Immune Deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) are posing a serious challenge to mankind. No one precisely knows when it first afflicted humans, nor can anybody predict how soon there will be a breakthrough in finding a solution to the problem. Silverman (1993) noted that the AIDS epidemic has placed unprecedented demands and severe strains on health care providers of all disciplines.

Nigeria has an estimated 3.6 million people with HIV/AIDS and is home to one out of every 11 people with HIV/AIDS worldwide. In Nigeria, as elsewhere, AIDS is perceived as a disease of “others” – of people living on the margins of society, whose lifestyles are considered “perverted” and “sinful.” Discrimination, stigmatization, and denial are the expected outcomes of such values, affecting life in families, communities, workplaces, schools, and health care settings.

The spread of HIV has increased significantly in Nigeria since the official report of the first case in 1986. The results of periodic national surveys showed a progressive increase in the adult HIV seroprevalence rate from 1.8% in 1991 to 4.6% in 2008 (NPC and ICF Macro, 2009).

Currently, there are a total of 3.6 million people living with HIV/AIDS (PLWHA) in Nigeria (UNICEF, 2012) and may be subjects of discrimination and stigmatization in the health facilities, and work place and by family and communities (Alubo et al., 2002). These discriminatory or unethical behaviors by health care practitioners against PLWHA have been documented in some countries and may create an atmosphere that interferes with effective prevention and treatment by discouraging individuals from being tested or seeking information on how to protect themselves and others from HIV/AIDS (Tirelli et al., 1991; Danziger, 1994; Aisien and Shobowale, 2005; Sadoh et al., 2006).

Rationale of the Study

A search was conducted using search engines (such as Google and Google Scholar), academic databases (such as PubMed/Medline, Sociological Abstracts, academic search premier, education full text), and Government of various countries’ reports. The search of the literature was carried out starting with combinations of the following search terms: HIV/AIDS, Patients living with HIV, health care workers, attitudes and practices towards HIV positive patients, stigma and discrimination, consequences on HIV/AIDS patients, the scope of knowledge, limitation of study, delimitation of study etc... (all words, anywhere in article).

Critical analysis of all the papers/articles reveals that, health-care professionals in Nigeria may engage in discrimination against, and stigmatization of People Living With HIV/AIDS (PLWHA) (Alubo et al 2002, Adelekan et al 1995). However, it was discovered that, the target population in the previous studies had been mostly limited to Doctors and Nurses, while the prevalence, character of, and factors contributing to these practices are, however, largely undocumented. The study was therefore designed to address the knowledge gap, with an extension of the study population to other health-care professionals who are directly or indirectly involved in the clinical activities surrounding the management of HIV positive patients.

General and Specific Objectives of the Study

General Objective of the Study

To determine the attitudes and practices of health care workers towards HIV positive patients at Federal Medical Centre Owo Ondo State Nigeria.
Specific Objectives of the Study

1. To determine the attitude of health care workers towards HIV positive patients
2. To identify the practices of health care workers towards HIV positive patients
3. To assess factors associated with good attitude of health care workers towards HIV positive patients
4. To determine the predictors of appropriate practices of health care workers towards HIV positive patients

Chapter Two
Review of Literature

As of 2012 in Nigeria, the HIV prevalence rate among adults ages 15–49 was 3.1 percent. Nigeria has the second-largest number of people living with HIV (World fact book, 2012). The HIV epidemic in Nigeria is complex and varies widely by region. In some states, the epidemic is more concentrated and driven by high-risk behaviors, while other states have more generalized epidemics that are sustained primarily by multiple sexual partnerships in the general population. Youth and young adults in Nigeria are particularly vulnerable to HIV, with young women at higher risk than young men. There are many risk factors that contribute to the spread of HIV, including prostitution, high-risk practices among itinerant workers, high prevalence of sexually transmitted infections (STI), clandestine high-risk heterosexual and homosexual practices, international trafficking of women, and irregular blood screening (US. DS, 2008).

Stigma has been identified as a complex, diverse and deeply rooted phenomenon that is dynamic in different cultural settings. As a collective social process rather than a mere reflection of an individual’s subjective behaviour, it operates by producing and reproducing social structures of power, hierarchy, class and exclusion and by transforming difference (class, race, ethnicity, health status, sexual orientation and gender) into inequality (POLICY Project, 2003). Fear and moral judgement are considered to be the root sources of HIV/AIDS stigma. HIV/AIDS is associated with many different fears. People may fear the casual transmission of the virus, the loss of productivity of people living with HIV, that resources may be wasted on people living with HIV, living with the disease, or imminent death. Similarly, moral judgement may cause stigma. People living with HIV are often seen as self-blaming and convinced that they deserve it because the transmission of the virus is linked to stigmatized behavior, which allows people to understand HIV/AIDS in terms of the concept of blame. It is important to note that HIV/AIDS stigma can be experienced not only by people living with HIV/AIDS but also by people who are suspected to be living with HIV/AIDS (POLICY Project, 2003).

Discrimination is an action based on a pre-existing stigma; a display of hostile or discriminatory behavior towards members of a group, on account of their membership to that group. Stigma and discrimination impede both willingness and ability to adopt HIV preventive behavior, to access treatment and to provide care and support for people living with HIV. Fear of stigma impedes prevention efforts, including discussions of safer sex and preventing mother-to-child transmission. Because of the separation between 'us' and 'them', people avoid confronting their own risk and adopting preventive behaviors (POLICY Project, 2003).

Since the beginning of the HIV epidemic, stigma and discrimination have been identified as the major obstacles in the way of effective responses to HIV. HIV related stigma and discrimination is a complex social process that interacts with, and reinforces, the preexisting stigma and discrimination associated with sexuality, gender, race and poverty (Herek et al 2004; Niang et al 2003; Parker & Aggleton 2003; Pilot 2006). HIV/AIDS-related stigma and discrimination occur everywhere, but they may have more serious consequences in healthcare settings (Banteyerga et al 2005).

A disadvantage stemming from stigma goes beyond what are often understood as discriminatory actions. For People Living with HIV/AIDS (PLWHA), they can include internalized stigma, lowered self-esteem, depression, and changes in behavior (e.g., not using the available services) because of the fear of stigma (Deacon & Boulle 2006; Kinsler et al 2007). It was indicated that higher perceived HIV stigma...
scores amongst clients with HIV/AIDS were significantly and negatively correlated with the quality of life (Holzemer et al 2009). Stigma reduced participation in programs to prevent mother-to-child transmission of HIV (PMTCT). (Deacon & Boulle 2006; Kinsler et al 2007; Nyblade & Macquarrie 2006; Letemo 2005; Adebajo et al 2003; Sadoh et al 2006; Mahendra et al 2007; Banteyerga 2004; Li et al 2007).

Service providers in healthcare institutions are expected to provide social and psychological support to persons living with HIV/AIDS in order to help them cope with stress and to reduce the stigma directed against PLWHA. However, HIV/AIDS-related stigma and discrimination have been extensively documented amongst healthcare providers. There have been many reports from healthcare settings of HIV testing without consent, breaches of confidentiality, labeling, gossip, verbal harassment, differential treatment and even denial of treatment (Banteyerga et al 2005; Nyblade & Macquarrie 2000; Nyblade & Macquarrie 2006; Letemo 2005; Adebajo et al 2003). People who feel stigmatized by healthcare providers face problems getting tested for HIV and accessing optimal healthcare services. The fear of stigma impedes prevention efforts, including discussions of safer sex and PMTCT (Banteyerga et al 2005; Adebajo et al 2003; Banteyerga 2004; Ford et al 2004; Sayles et al 2009; Gari et al 2010; Ayene 2010; Maru 2008; Wolfe et al 2006; Obermeyer & Osborn 2007; Calin et al 2007; Davey & Teklu 2006).

Utilization of voluntary counseling and HIV testing (VCT) services and disclosure of HIV status are constrained because of the anticipated stigma and the actual experiences of people living with HIV. Resources like medicine, transport to health services, food and other amenities may be withheld because of a perception that people living with HIV are hopeless cases and will die anyway. These represent just some of the barriers created by stigma and discrimination. On the positive side, the process of disentangling stigma reveals many opportunities for interventions. (Munaaba & Owor, 2004)

In many countries, stigmatization is expressed through laws and policies directed at those living with HIV that claim to protect ‘the general population’. Examples of such discriminatory legislation include limitations on international travel and migration, compulsory screening and testing for HIV, compulsory notification of AIDS cases, prohibition of people living with HIV from certain occupations, and even isolation of people living with HIV from the general population.

In most cases discriminatory practices, such as the compulsory screening of ‘risk groups’, both further the stigmatization of these groups and create a false sense of security among individuals who are not considered members of such groups or who are at high-risk of contracting HIV. Conversely, enabling programmes and laws can have an unintended discriminatory effect on the beneficiaries rather than an enabling one. For example, healthcare workers may perpetuate stigma during treatment, counselling and care of people living with HIV. (Adebajo et al 2003; Munaaba & Owor et al., 2004)

People living with HIV/AIDS (PLWHA) in Nigeria have been found to be subject to discrimination and stigmatization in the work place, and by family and communities (CRH 2001; Alubo et al 2002). PLWHA may also face discrimination from those employed in the health-care sector (CRH 2001). Discriminatory or unethical behavior by health-care professionals against PLWHA, as documented in other countries (JUNPH 2001; Danziger 1994; Tirelli et al 1991; Devroey et al 2003; Richter 2001), may create an atmosphere that interferes with effective prevention and treatment by discouraging individuals from being tested or seeking information on how to protect themselves and others from HIV/AIDS (Mann et al 1994; IRIN 2002; Parker & Aggleton 2002). Furthermore, discriminatory practices and violations of international principles of medical ethics may serve to legitimize other forms of discrimination against people living with HIV/AIDS.
Chapter Three
Methodology

3.1 Study Area

Federal Medical Centre, Owo is located in the Owo Local Government Area of Ondo State in Nigeria. The hospital provides health care services at the primary, secondary and tertiary levels to the people within its catchment areas which are Ondo, Kogi, Edo, Ekiti and Osun States and its surrounding States. It also receives patients from all states of the Federation because it is situated a stone’s throw from the highway that links Abuja to Lagos. It is also an approved training centre by both the West African Postgraduate College and National Postgraduate College to train Resident Doctors in some specialist area of Medicine. It is a 250 bed tertiary health centre with average monthly attendance, by all groups, at the outpatient department put at 5,200 and the bed occupancy not less than 80% at every point in time.

3.2 Study Population

All Doctors, Nurses, Medical Laboratory Scientists, Pharmacists, Physiotherapist, Health Information Managers and Medical Imaging Scientists who are in the employment of Federal Medical Centre Owo, and were available at the time of data collection excluding those on leave (annual, study, leave of absence, etc.) during the period. The target population is health care workers who have direct or indirect involvement in the management of patients with HIV positive patients.

Doctors are medical practitioners who are directly involved in various phases of care for HIV/AIDS patients, which include diagnosis and treatment including counseling. The Nurses equally have direct contact with such patients and are deeply involved the administration of drugs, bed-side nursing and psycho-social care.

The Medical Laboratory Scientists are health professionals who are concerned with the collection of various tissues samples (including blood) from patients for laboratory investigation in order to arrive at a diagnosis or to monitor treatment progress, and their role in the management of HIV/AIDS patients is conspicuous. The Pharmacists also have a role to play in the correct pharmacotherapy of HIV/AIDS patients. They play a vital role in the correct dispensing of drugs and to ensure that the drugs are taken at correct dosages and at correct intervals. Pharmacy-counseling is equally an indispensable role they play in such HIV/AIDS patients.

Physiotherapists are health professionals who specialize in the management of patients with non-invasive physical modalities/techniques (including the use of hands to touch patients) to treat, prevent complications and rehabilitate patients for the purpose of restoring functions. The basis of their role is hinged on patho-kinesiology. They are, most of the time invited to treat HIV/AIDS patients at the chronic stage of the condition.

Health Information Managers (also known as Health Records Officers), are health professionals who are trained in the area of collecting, keeping, storing and retrieving of patients confidential health information. Their role in the information management of patients with HIV/AIDS cannot be over-emphasized. Medical Imaging Scientists (also known as Radiographers) are involved in the radio-diagnostic/imaging procedure of patients with various conditions. They are involved in the management of HIV/AIDS patients in conditions like pulmonary tuberculosis, a co-morbid disease commonly associated with HIV/AIDS, when there is a necessity to screen the patients for the condition.

All the above-highlighted health workers participated in the study.

3.3 Study Duration

The chronological order of activities and the time frame within the year 2014 for the project work are as summarized in the table below. The total time period required for the completion of the study as deducible from the activity chart below was seven months (March 2014 to September 2014)
### 3.4 Sample Size Determination

The minimum sample size was calculated using the **Leslie and Kish formula** for descriptive studies

\[ N = \frac{P (1-P) Z^2}{D^2} \]

- Where \( N \) is the minimum sample size needed
- \( D \) is the level of error that can be tolerated (0.05 chance of error)
- \( P \) is the estimated prevalence rate (0.2) of good attitude among health care workers
- \( Z \) is the standard variate corresponding to confidence level. At confidence level of 95%, \( Z= 1.96 \)

\[ N = \frac{0.2(1-0.2) 1.96^2}{0.05^2} \]

\[ N= 246 \]

To allow for a non-response rate of 10% (25 respondents), the sample size was increased by 25 to make **271** respondents. The Head of clinical services’ records of Federal Medical Centre Owo, was consulted; in conjunction with the Heads of Departments’ records in order to be well informed about the number of staff in each professional group working in the hospital. The sample size is consistent and realizable when compared with the target population.

### 3.5 Sampling Method

<table>
<thead>
<tr>
<th>S/N</th>
<th>PROFESSIONAL GROUP</th>
<th>NUMBER OF STAFF</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Doctors</td>
<td>200</td>
<td>Clinical services record</td>
</tr>
<tr>
<td>2</td>
<td>Nurses</td>
<td>350</td>
<td>Clinical services/Director of Nursing record</td>
</tr>
<tr>
<td>3</td>
<td>Medical Laboratory Scientists</td>
<td>50</td>
<td>Clinical services/HOD Laboratory services record</td>
</tr>
<tr>
<td>4</td>
<td>Pharmacists</td>
<td>39</td>
<td>Clinical services/HOD Pharmaceutical</td>
</tr>
</tbody>
</table>
The total staff strength at Federal Medical Centre Owo is about **1200** (as recorded in the staff record in Medical Director’s office), out of which **741** are involved in clinical activities. The sample size proportional to each professional group was calculated using the formula—

\[
\text{Number of staff in each profession } \times \text{Estimated sample size}
\]

\[
\text{Total number of staff in professional groups}
\]

The sample size of each professional group was therefore calculated thus:

- **Doctors** = \(\frac{200}{741} \times 271\) = **73 Doctors**
- **Nurses** = \(\frac{350}{741} \times 271\) = **128 Nurses**
- **Medical Laboratory Scientists** = \(\frac{50}{741} \times 271\) = **18 Medical Laboratory Scientists**
- **Pharmacists** = \(\frac{39}{741} \times 271\) = **14 Pharmacists**
- **Physiotherapists** = \(\frac{16}{741} \times 271\) = **5 Physiotherapists**
- **Health Information Managers** = \(\frac{75}{741} \times 271\) = **27 Health Information Managers**
- **Medical Imaging Scientists** = \(\frac{11}{741} \times 271\) = **4 Medical Imaging Scientists**

The above calculations implies that, from the hospital staff list, 73 Doctors, 128 Nurses, 18 Medical Laboratory Scientists, 14 Pharmacists, 5 Physiotherapists, 27 Health Information Managers and 4 Medical Imaging Scientists were selected using simple random sampling method.

### Problems of Sampling Plan

Random sampling that was adopted in this study refers to that method of sample selection which gives each possible sample combination an equal probability of being picked up and each item in the entire population to have an equal chance of being included in the sample. This applies to sampling without replacement i.e., once an item is selected for the sample, it cannot appear in the sample again. However, the problem encountered is associated with the replication of the random sampling in seven categories of sample units which was spread across seven categories of health care workers (Doctors, Nurses, Medical Laboratory Scientists, Pharmacists, Physiotherapists, Health Information Managers and Medical Imaging Scientists). The problem was also compounded by duty schedule of some health care workers (like Nurses and Health Information Managers) who run shift duty, in which the random sampling was constrained with associated stress, due to the fact that, not all the intended participants of such departments were easily available at the same time for easy random sampling/questionnaire administration. The duo constraints demanded more time to combat and solve, and this caused a little extension in the time required to collect data of the required sample size.

### 3.6 Study Methods And Data Collection

The data for this cross-sectional descriptive survey/study were obtained through the use of structured, self-administered health-care professional survey questionnaire which include questions on respondent demographics; practices regarding informed consent, testing, and disclosure; treatment and care of
patients with HIV/AIDS; and attitudes and practices about treatment and care of HIV positive patients, including informed consent, testing, and disclosure. Risk of exposure of health care workers was assessed with responses of “Not at all,” “Moderately so and “Very much so”. Attitudes, practices, and suggested discrimination-preventive measures were assessed by a response of “Yes”, “No” and “Don’t know” with statements regarding testing, treatment, and care of patients with HIV.

All responses were coded appropriately in order to ensure easy measurement of outcomes. The maximum score attainable under questions related to attitudes of health care workers towards HIV positive patients was 5. Maximum score attainable under questions related to health workers’ practices towards HIV positive patients was 10, while the maximum score attainable under questions related to responses of participants towards preventive measures was 4. All participants were scored in each question segment according to the stated scoring standard using summated scoring system; hence, measurement of outcome is determined using the defined procedure.

The research assistants were properly trained on the data collection procedure and the necessary explanation on how to collect data without bias was clearly explained (to ensure study result of high validity and general acceptability). The questionnaires were written in English. Medical experts reviewed the questionnaire for content validity. The instrument underwent pilot testing among 20 participants in the facility and suggestions regarding clarity and appropriateness were incorporated.

3.7 Research Questions

The study was designed to answer four research questions. They include;

(1) What is the attitude of health care workers to HIV positive patients at Federal Medical Centre, Owo?
(2) Is the practice of health care workers towards HIV positive patients similar to that of non-HIV patients?
(3) Is there need for improvement in the attitude and practice of health care workers towards HIV positive patients?
(4) What are the factors associated with the attitude of health care workers towards HIV positive patients?

3.8 Data Analysis

Data analysis was done using the Statistical package for Social Science (SPSS) version 17. Data were presented using descriptive statistics of frequencies, percentages, pie and bar charts. Respondents answered “yes” “no” and “don’t know” to questions on attitude of health care workers towards HIV patients. Each right response was scored 1, while each wrong response was scored 0. Summated scores were used to arrive at each respondent’s attitude with a possible score range of 0 to 5. Higher scores indicate higher level of good attitude with score of 5 as the highest score for good attitude.

Equally, respondents answered “yes” “no” and “don’t know” to questions on practices of health care workers towards HIV positive patients. Each right response was scores 1 while each wrong response was scored 0. Summated scores were used to arrive at each respondent’s practice with a possible score range of 0 to 10. Higher scores indicate higher level of good practice with score of 10 as the highest score for good practice.

Respondents also answered “yes” “no” and “don’t know” on questions about preventive measures against discrimination. Each right response was scored 1 and the wrong response was scored 0. Summated scores were used to determine respondent’s response with range from 0 to 4. Higher scores indicate good acceptance of the suggested preventive measures with score of 4 as the highest score. The study’s principal objective was to describe health care workers’ attitudes and practices towards HIV positive patients. However, inferential statistics of Chi-square was used to test for associations between various factors and the attitude and practices towards care for patients with HIV. Statistical level of significance was set at P-value <0.05.
3.9 Study Design

A descriptive Cross-Sectional design was used. Each category of health care workers; Doctors, Nurses, Pharmacists, Physiotherapists, Medical Laboratory Scientists, Health Information Managers and Medical Imaging Scientists in the employment of Federal Medical Centre, Owo, participated in the study. They involved those who were available and consent to participate in the study. Each professional group was taken as sampling unit, and sample size proportional to the size of each sample unit was selected using simple random sampling.

3.9.1 Inclusion Criteria

The inclusion criteria were health care professionals who are directly or indirectly involved in the management of HIV positive patients. This includes all health care professionals whose professional duties are required in the management of HIV positive patients.

3.9.2 Exclusion Criteria

The exclusion criteria include health care professionals who are on leave, National Youth Service Corp (NYSC) members, industrial attachment students and those who did not give their consent to participate in the study.

3.9.3 Ethical Considerations

CONSENT

An approval to conduct the study was obtained from Health Research Ethics Committee of Federal Medical Centre, Owo. Participants in the study were informed in writing about the study. They were also guaranteed the confidentiality of whatever information given by them in the study tool. A statement of informed consent was clearly written on the questionnaire, which was signed by the respondent before filling the questionnaire.

3.9.4 Confidentiality

Data collected was used only for research purposes and were kept confidential on a password-protected computer. Names and addresses were not included in the data collection instrument, and thus collected data was not being leaked to any person. Research assistants were also trained to keep information confidential. Serial number and codes by which the data components can be traced were generated for the purpose of revisiting. This was maintained throughout the period of the study, and the data will be kept for a period of three years after the submission of the project to the faculty.

3.9.5 Beneficence

Findings were communicated to the host management. Advocacy efforts will be instituted at departmental level.

3.9.6 Non-Malference to the Participants

No harm was done to participants as a result of this study.

3.9.7 Limitations

1. The principal investigator is a known co-worker with many of the respondents’ health care workers. This might have led to respondents’ bias in the study.
2. Not all the health care workers that participated in the study are directly/equally exposed to the treatment procedures of HIV positive patients.

In order to reduce the bias that may arise from (1) above, two trained research assistants who are not well-known to the health care professionals were incorporated, to distribute and collect the questionnaires.
Chapter Four
Presentation of Results

A total of two hundred and seventy one (271) respondents were interviewed out of which two hundred and sixty one (261) questionnaires were recovered giving a response rate of 96.3%.

<table>
<thead>
<tr>
<th>Table 1: Socio-demographic characteristics of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARACTERISTICS</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>&lt;30</td>
</tr>
<tr>
<td>30-34</td>
</tr>
<tr>
<td>35-39</td>
</tr>
<tr>
<td>≥40</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Marital Status</td>
</tr>
<tr>
<td>Single</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Religion</td>
</tr>
<tr>
<td>Christianity</td>
</tr>
<tr>
<td>Islam</td>
</tr>
<tr>
<td>Ethnic group</td>
</tr>
<tr>
<td>Yoruba</td>
</tr>
<tr>
<td>Igbo</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>

Table 1 above shows the socio-demographic distribution of the respondents. As regards age, 28 (10.7%) were below 30 years, while 71 (27.2) were ≥40 years old. The mean age of the respondents was 36.3678± 6.63519. The median age was 35 while it ranged from 23 to 59 years. In all, 101 (38.7%) of the respondents were males, 248 (95%) were Christians and 222 (85.4%) were Yoruba.

<table>
<thead>
<tr>
<th>Table 2: Occupational characteristics and risk of contracting HIV of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARACTERISTICS</td>
</tr>
<tr>
<td>Professional status</td>
</tr>
<tr>
<td>Doctor</td>
</tr>
<tr>
<td>Health Information Management</td>
</tr>
<tr>
<td>Medical Imagine Scientist</td>
</tr>
<tr>
<td>Medical Laboratory Scientists</td>
</tr>
<tr>
<td>Nursing services</td>
</tr>
<tr>
<td>Pharmacists</td>
</tr>
<tr>
<td>Physiotherapists</td>
</tr>
<tr>
<td>How long have you worked in this hospital in years</td>
</tr>
<tr>
<td>≤5</td>
</tr>
<tr>
<td>≥6</td>
</tr>
<tr>
<td>My risk of contracting HIV infection at work</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>
In table 2 above, Doctors, 27 (10.3%), and nurses 128 (40.0%), represents the highest percentage while Medical Imaging Scientists 4 (1.5%) represents the least percentage of respondents. The table also shows that above average, 132 (50.6%) have worked for less than five years in the hospital. Almost equal percentage exists for high risk 101 (38.7%) and moderate risk 100 (38.3%) of exposure to HIV infection.

<table>
<thead>
<tr>
<th>Moderate</th>
<th>100</th>
<th>38.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>53</td>
<td>20.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Attitude</th>
<th>Chi-square X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>19 (67.9)</td>
<td>9 (32.1)</td>
<td>1.634</td>
</tr>
<tr>
<td>30-34</td>
<td>62 (72.9)</td>
<td>23 (27.1)</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>48 (67.6)</td>
<td>23 (32.4)</td>
<td></td>
</tr>
<tr>
<td>40 and above</td>
<td>49 (63.6)</td>
<td>28 (36.4)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>68 (67.3)</td>
<td>33 (32.7)</td>
<td>0.058</td>
</tr>
<tr>
<td>Female</td>
<td>110 (68.8)</td>
<td>50 (31.3)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Bar chart showing attitudinal scores of respondents towards HIV positive patients.

Figure 2: Pie chart showing percentage distribution of good and poor attitude.

The pie chart above shows that 68.2% of the respondents have good attitude while 31.8% have varying degrees of poor attitude towards HIV positive patients.

Table 3: Attitudes of health care workers towards HIV positive patients.
The table 3 above shows that, among respondents aged less than 30 years, 19 (67.9%) and among respondents aged between 35-39 years, 48 (67.6%) have good attitude towards HIV positive patients. The table also reveals that, 40 (70.2%) among singles have good attitude while 168 (67.7%) among Christians and 10 (76.9%) among Muslims have good attitude towards HIV positive patients. There was no significant association between age, sex, marital status, religion of health care workers and attitude towards HIV positive patients.

Considering the accidental exposure to blood and body fluids, 85 (63.9%) of those who reported to have had accidental exposure to blood and other body fluids or injury as a result of their work in the last one year, and 91 (74.6%) among those who reported not to have had any accidental exposure to blood and other body fluids have good attitudes.

There was a statistically significant association between exposure to blood and other body fluids in the last one year and the attitude of health care workers ($X^2 = 3.395, P=0.044$).

*Figure 3:* Bar chart showing the practice scores of respondents towards HIV positive patients
Figure 4: Pie chart showing the percentage distribution of good and poor practices towards HIV positive patients

Considering the figure 3 above, out of 252 respondents, above average, (51.2%) have good practices; while 48.8% has varying degrees of poor practices towards HIV positive patients.

Table 4: Practices of health care workers towards HIV positive patient

<table>
<thead>
<tr>
<th>Variables</th>
<th>Practices</th>
<th>Chi-square X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good n (%)</td>
<td>Poor n (%)</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>14 (53.8)</td>
<td>12 (46.2)</td>
<td>0.315</td>
</tr>
<tr>
<td>30-34</td>
<td>44 (52.4)</td>
<td>40 (47.6)</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>33 (48.5)</td>
<td>35 (51.5)</td>
<td></td>
</tr>
<tr>
<td>40 and above</td>
<td>38 (51.4)</td>
<td>36 (48.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38 (38.0)</td>
<td>62 (62.0)</td>
<td>11.545</td>
</tr>
<tr>
<td>Female</td>
<td>91 (59.9)</td>
<td>61 (40.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>31 (56.4)</td>
<td>24 (43.6)</td>
<td>0.754</td>
</tr>
<tr>
<td>Married</td>
<td>98 (49.7)</td>
<td>99 (50.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>124 (51.9)</td>
<td>115 (48.1)</td>
<td>0.889</td>
</tr>
<tr>
<td>Islam</td>
<td>5 (38.5)</td>
<td>8 (61.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Professional status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>24 (37.5)</td>
<td>40 (62.5)</td>
<td>14.756</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>Health Info Managers</td>
<td>18 (66.7)</td>
<td>9 (33.3)</td>
<td></td>
</tr>
<tr>
<td>Medical Imaging Scientists</td>
<td>1 (25.0)</td>
<td>3 (75.0)</td>
<td></td>
</tr>
<tr>
<td>Medical Laboratory Scientists</td>
<td>12 (75.0)</td>
<td>4 (25.0)</td>
<td></td>
</tr>
<tr>
<td>Nurses</td>
<td>65 (52.8)</td>
<td>58 (47.2)</td>
<td></td>
</tr>
<tr>
<td>Pharmacists</td>
<td>8 (61.5)</td>
<td>5 (38.5)</td>
<td></td>
</tr>
<tr>
<td>Physiotherapists</td>
<td>1 (20.0)</td>
<td>4 (80.0)</td>
<td></td>
</tr>
</tbody>
</table>

The table 4 above shows the distribution of frequencies, percentages, Chi-square values and the P-vales of health care workers with good and poor practices for various factors. There was no significant association between age, marital status, religion and practices of health care workers towards HIV positive patients (P>0.05). However, there was a statistically significant association between sex, professional status of health care workers and practices towards HIV positive patients (P<0.05).

Table 5: The frequencies of respondent’s suggestions towards preventive measures against discrimination.

<table>
<thead>
<tr>
<th>PREVENTIVE MEASURES</th>
<th>FREQUENCY N= 252</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
</tr>
<tr>
<td>1. Education/Counsel/Advice to HCWs</td>
<td>252</td>
</tr>
<tr>
<td>2. Policies on HIV and AIDS at health facilities</td>
<td>240</td>
</tr>
<tr>
<td>3. Stronger laws against discrimination</td>
<td>222</td>
</tr>
<tr>
<td>4. Punishment of health personnel if they discriminate</td>
<td>164</td>
</tr>
</tbody>
</table>

Table 5 above shows that all the respondents (252) who answered questions on preventive measures agree that education/counsel/advice should be given to health care workers while 88 disagree with the punishment of health personnel if they discriminate.
Figure 5: Pie chart showing the percentage distribution of good and poor responses to the preventive measures.

The pie chart above shows that, 62.3% gave good responses towards measures against discrimination, while 37.7% gave varying degrees of poor responses to the preventive measures against discrimination.

Figure 6: Bar chart showing response scores of respondents towards preventive measures against discrimination.


Chapter Five
Discussion Conclusion and Recommendation

5.1 Discussion

In this study, a total of 271 respondents were interviewed out of which 261 questionnaires were recovered giving a response rate of 96.3%. Majority (32.6%) of the respondents fell within the age of 30-34. The age range was 23 to 59 with a mean of 36.4±6.6 years, and 160 were females. There were 204 married respondents and majority (95%) were Christians while 85.4% were Yoruba by tribe.

Occupational characteristics and the risk of contracting HIV of the respondents revealed that, most of the respondents (49%) were nurses while Medical Imaging Scientists have the lowest number (1.5%). Over half (50.6%) of the respondents have worked in the hospital for less than 5 years while 49.4% have worked for more than 6 years. Almost equal percentage exists for high risk (38.7%) and moderate risk (38.3%) of contracting HIV infection at work.

Attitude of health care workers revealed that statistically significant association exists between exposure to blood and other body fluids or injury as a result of work in the last one year, and their attitude towards HIV positive patients. This is in agreement with the findings of Maria-Rosa et al (2005) which reported similar result. This may be as a result of occupational experiences of such health workers which have given them the orientation that, not all exposure to blood and other body fluids can result to contracting of HIV. But there was no significant association between ages, sex, marital status, religion and attitude towards HIV positive patients among health care workers which disagrees with the findings of Muhammad et al (2010), which reported that the level of discriminatory attitude increases with age, and importance of religion, and also reported that sex, religion and marital status were significantly related to discriminatory attitudes. The differences in the results may be as a result of cultural differences in the study locations.

This study also revealed that, there was statistically significant association between sex, professional status and practices of health care workers towards HIV positive patients (P<0.05). This corroborates the findings of Umar et al, 2012, which reported that professional status demonstrated significant association, influencing respondent’s behavior to People Living with HIV/AIDS (PLWHA), and the findings of Muhammad et al (2010) which reported an association between sex and practices towards HIV positive patients. This work did not show any significant association between age, marital status, religion of health care workers and practices towards HIV positive patients.

It was also revealed in the study that 31.8% of 252 respondents have varying degrees of poor attitudes toward HIV positive patients. This is analogous to the findings of Sadoh et al, 2006 which reported that health care workers manifested certain degrees of attitude that are potentially discriminatory of People Living with HIV/AIDS. This may be as a result of their bias knowledge of HIV/AIDS which culminates to their wrong attitude towards HIV positive patients.

From this study, almost half (48.8%) of 252 respondents showed varying degrees of poor practices towards HIV positive patients. This is in tandem with the research findings of Amoran (2011) which reported similar varying degrees of discriminatory practices among health care workers in tertiary health care facilities of Northern Nigeria. This anomaly may be as a result of fear associated with health workers’ risk of contracting HIV while managing HIV positive patients.

Considering the respondents’ responses towards the preventive measures against discrimination, the result revealed that 37.7% of 252 respondents gave varying degrees of poor responses. This implies that, this group of people may not likely agree with all the measures that may be put in place in order to eradicate or at least, reduce discrimination against HIV positive patients to the barest minimum. This is in agreement with the findings of Reis et al, (2005) which showed similar degree of responses to the preventive measures adoptable by health care workers towards discrimination against HIV/AIDS patients in Nigeria. The reason for this may be attributed to the skepticism of health care workers that some of the preventive measures against discrimination may have negative consequences on their personality.
5.2 Conclusion

Following the results obtained from this study, the following conclusions can be deduced;

- There is a considerable degree of poor attitude among health care workers towards HIV positive patients at Federal Medical Centre Owo.
- Exposure to blood and other body fluids or injury as a result of work, is a determinant of attitude of health care workers towards HIV positive patients at Federal Medical Centre Owo.
- The prevalence of poor practices among health care workers towards HIV positive patients is considerably high at Federal Medical Centre Owo.
- Sex and professional status are probable determining factors of good or poor practices of health care workers at Federal Medical Centre Owo, towards HIV positive patients.
- There exist divergent views among health care workers concerning the measures adoptable in combating discrimination against HIV positive patients.

5.3 Recommendations

1. It is imperative that HIV/AIDS education is included in the curriculum of schools attended by all health care workers to promote shared and better knowledge of the disease.
2. Continuous education and counsel to health care workers should be more effectively carried out in various hospitals where HIV positive patients are being managed.
3. It is recommended that all health facilities should have a policy on HIV and AIDS.
4. There is a need for the scale of research to be broadened in future with an extension to other hospitals in the state and the country at large, both private and public, to explore the prevalence of discrimination against HIV positive patients, and to find out the challenges faced by the health care workers in the management of HIV positive patients with the motive of providing the necessary solutions.
5. All health care workers must see discrimination-free attitude and practices towards HIV positive patients as their obligations, knowing full well that, they are expected to be exemplary figures in the crusade to fight discrimination against HIV positive patients.

References


Attitude and Practices of Health Care Workers Towards HIV Positive Patients at the Federal Medical Centre Owo Ondo State Nigeria

Questionnaire

I am a student of Public Health at Texila American University Guyana. I am conducting a survey on Health Care Workers (HCWs). This study is designed to determine the attitude and practices of health care workers towards HIV positive patients at Federal Medical Centre Owo.

Informed Consent

- Your participation in this interview is completely voluntary.
- If some questions are difficult or make you uncomfortable, you can skip them. You may also decide to stop the interview at any point.
- All information that you provide for this study will be kept confidential. This questionnaire will not have your name on it. Your responses to the questions are identified only by number, and never by name.

Daniel Ebenezer Obi
Researcher Respondent's
Signature

SECTION A: SOCIODEMOGRAPHIC DATA (Please Tick As Appropriate)

1) Age (last birthday) in years .................
2) Sex
   1. Male ( )
   2. Female ( )
3) Marital Status
   1. Single ( )
   2. Married ( )
   3. Co-habiting ( )
   4. Separated ( )
   5. Divorced ( )
   6. Widowed ( )
4) Level of education
   1. None ( )
   2. Primary ( )
   3. Secondary ( )
   4. Tertiary ( )
5) Religion
   1. Christianity ( )
   2. Islam ( )
   3. Others (please specify).................................
6) Ethnic group
   1. Yoruba ( )
   2. Igbo ( )
   3. Hausa ( )
   4. Others (please specify).................................

SECTION B: OCCUPATIONAL DATA (Please tick as appropriate)

7) Department..............................................
8) Job description (tick as appropriate)
1. Doctor (Consultant/CMO/PMO)
2. Doctor (Senior Registrar/SMO)
3. Doctor (Junior Registrar)
4. Doctor (House officer)
5. Assistant Director Nursing Services/Deputy Director Nursing Services.
6. Chief Nursing Officer/Principal Nursing Officer
7. Senior Nursing Officer/Nursing Officer
8. Pharmacist
9. Physiotherapists
10. Chief Med Lab Scientist/Assistant Director MLS/Deputy Director MLS
11. Intern Med Lab Scientist/MLS 1/Senior MLS/Principal MLS
12. Health Information Managers
13. Medical Imaging Scientist

9) How long have you worked in this hospital (state actual number of years)…………………..
10) How long have you worked in any hospital or health facility………………………
11) What is your present post……………………………..

12) Risk of Exposure of Health Care Workers (HCWs) to HIV

<table>
<thead>
<tr>
<th>Risk of exposure to HIV</th>
<th>Not at all</th>
<th>Moderately so</th>
<th>Very much so</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Doctors, nurses and other HCWs have a risk of contracting Blood Borne Viruses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(such as HIV) while caring for patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I worry about contracting HIV/AIDS at work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I feel I’m at risk of HIV infection outside my work environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I feel I’m adequately protected against HIV infection in my workplace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. My job involves use of needles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My job involves exposure to blood and body fluids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. My job involves direct care of HIV patients</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13) My risk of contracting HIV infection at work is…… (Tick as appropriate)
   1. High ( )
   2. Moderate ( )
   3. Low ( )

14) Have you had accidental exposure to blood and other body fluids or injury as a result of your work in the last one year?
   1. Yes ( )
   2. No ( )

15) If yes, which type?

<table>
<thead>
<tr>
<th>Type of exposure</th>
<th>Yes</th>
<th>No</th>
<th>No of times it occurred in the last one year</th>
<th>Procedure that led to injury listed below</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Needle stick injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Splash of blood &amp; body fluids on open wound</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Splash of blood &amp; body fluid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
on mucosal lining
4. Splash of blood and body fluid on intact skin
5. Cuts from broken bottle
6. Cuts from scalpel
7. Others (please specify)

List of procedures
1. Recapping of needles 4. Surgical operation 7. While disposing of used needles
2. Suturing of laceration 5. Phlebotomy 8. Leaking or torn gloves

SECTION C: ATTITUDE OF HCWs TO HIV POSITIVE PATIENTS

16) Attitude of health care workers to HIV positive patients.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The quality of life of patients HIV/AIDS can be improved with counseling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Patients with HIV/AIDS should be on separate ward in a hospital or clinic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I can refuse to treat a patient with HIV/AIDS to protect myself and my family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The treatment of opportunistic infections in patients with HIV/AIDS wastes precious resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Treatment with anti-retroviral drugs is a waste of resources</td>
<td></td>
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</tbody>
</table>

17) Attitude of health care workers to HIV/AIDS

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Staff and health care workers should be told when a patient is HIV positive so they can protect themselves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. There are instances when it is appropriate to test a patient for HIV without the patients knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. All prospective health care worker should submit to mandatory HIV testing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Relatives/sexual partners of patients with HIV/AIDS should be notified of patient’s status even without his/her consent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The charts/beds of patients with HIV/AIDS should be marked so clinics workers know patients status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. A health professional with HIV/AIDS should not be working in any area of health care that require patients’ contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. All surgical patients should be routinely tested for HIV on admission to hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. All obstetric patients should be routinely tested for HIV on admission to hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. All patients should be routinely tested for HIV on admission to hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18) Health workers’ practice towards HIV positive patients

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The quality of life of patients HIV/AIDS can be improved with counseling</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Patients with HIV/AIDS should be on separate ward in a hospital or clinic</td>
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<td></td>
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<tr>
<td>3. I can refuse to treat a patient with HIV/AIDS to protect myself and my family</td>
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<td></td>
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<tr>
<td>4. The treatment of opportunistic infections in patients with HIV/AIDS wastes precious resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Treatment with anti-retroviral drugs is a waste of resources</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22
1. Have refused a patient with HIV/AIDS admission to hospital
2. Have observed others refuse a patient with HIV/AIDS admission
3. Have refused to care for a patient with HIV/AIDS
4. Have observed others refusing to care for a patient with HIV/AIDS
5. Have verbally mistreated a patient with HIV/AIDS
6. Have observed others verbally mistreat a patient with HIV/AIDS
7. Have given confidential information to a family member
8. Have observed others give confidential information to a family member
9. Have given confidential information to a non-family member
10. Have observed others give confidential information to a non-family member.

19) Protective measures taken when patient is known or suspected to be HIV positive

<table>
<thead>
<tr>
<th>Measures</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No extra protection, treated like any other patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extra gloves</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Use of masks</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Separated from other patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Be careful</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. Wash/sterilize instruments after use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Use different instruments for HIV patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Use only disposable instruments.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Invasive procedures not performed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. HIV status clearly marked on chart or file.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Others specify</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20) What should be done to prevent discrimination against HIV positive patients by health care workers (HCWs)?

<table>
<thead>
<tr>
<th>Measures</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education/Counsel/Advice to HCWs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Policies on HIV and AIDS at health facilities.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Punishment of health personnel if they discriminate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Others (please specify)</td>
<td></td>
<td></td>
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</table>
### ANNEXURE

**TABLE OF REVIEWED PAPERS/ARTICLES**

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>FIRST AUTHOR</th>
<th>YEAR</th>
<th>COUNTRY</th>
<th>TYPE OF STUDY</th>
<th>MAIN RESULTS</th>
<th>CRITICAL COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes of Healthcare Providers to Persons Living with HIV/AIDS in Lagos State, Nigeria</td>
<td>Adebajo SB</td>
<td>2003</td>
<td>Nigeria</td>
<td>Descriptive Study</td>
<td>The results shows discrimination towards PLWHA</td>
<td>It affects the attitudes of PLWHA towards accessing treatment</td>
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<tr>
<td>Caring for people with AIDS in a Nigerian teaching hospital: Staff attitudes and knowledge</td>
<td>Adelekan ML</td>
<td>1995</td>
<td>Nigeria</td>
<td>Descriptive study</td>
<td>Health professionals may engage in discriminatory attitude towards PLWHA</td>
<td>There is need for situation improvement</td>
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<td>Acceptance and stigmatization of PLWA in Nigeria</td>
<td>Alubo O</td>
<td>2002</td>
<td>Nigeria</td>
<td>Descriptive study</td>
<td>PLWHA are being stigmatized</td>
<td>None</td>
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<tr>
<td>Predictors of HIV Testing amongst Patients in East Gojjam, Northwest Ethiopia-a case–control Study</td>
<td>Ayene A</td>
<td>2005</td>
<td>Ethiopia</td>
<td>Case-control study</td>
<td>Fear of stigma prevents prevention efforts</td>
<td>It causes discouragement of PLWHA</td>
</tr>
<tr>
<td>Perceived Stigmatization and Discrimination by Healthcare Providers towards Persons with HIV/AIDS</td>
<td>Banteyerga H</td>
<td>2005</td>
<td>Ethiopia</td>
<td>Descriptive study</td>
<td>Stigma impedes optimal health care services by PLWHA</td>
<td>Stigmatization is an impediment for persons with HIV/AIDS</td>
</tr>
<tr>
<td>Disclosure of HIV amongst Black African Men and Women Attending a London HIV Clinic</td>
<td>Calin T</td>
<td>2007</td>
<td>United Kingdom</td>
<td>Case-control study</td>
<td>Stigmatization impedes disclosure of status by PLWHA.</td>
<td>None</td>
</tr>
<tr>
<td>Discrimination against</td>
<td>Danziger R</td>
<td>1994</td>
<td>Poland</td>
<td>Descriptive</td>
<td>Likelihood of</td>
<td>Significant result</td>
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<tr>
<td>Study</td>
<td>Location</td>
<td>Method</td>
<td>Finding</td>
<td>Implication</td>
<td></td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>Voluntary HIV Testing, Disclosure, and Stigma amongst Injection Drug Users in Bali, Indonesia</td>
<td>Indonesia</td>
<td>Case study</td>
<td>Stigmatization impedes going for HIV test</td>
<td>Stigmatization should be discouraged</td>
<td></td>
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<tr>
<td>HIV Positive Status Disclosure to Sexual Partner amongst Women Attending ART Clinic at Hawassa University Referral hospital, SNNPR, Ethiopia</td>
<td>Ethiopia</td>
<td>Case study</td>
<td>Stigmatization is a social problem for PLWHA to disclose status to partners</td>
<td>None</td>
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<tr>
<td>HIV-related Stigma and Knowledge in the United States: Prevalence and Trends</td>
<td>United States</td>
<td>Case study</td>
<td>Stigma and discrimination associated with sexuality, gender, race and poverty</td>
<td>Stigma and discrimination is a social process</td>
<td></td>
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<tr>
<td>Measuring the Degree of Stigma and Discrimination in Kenya: An Index for HIV/AIDS Facilities and Providers</td>
<td>Kenya</td>
<td>Exploratory study</td>
<td>The degree of stigma and discrimination is considerably high</td>
<td>Significant result</td>
<td></td>
<td></td>
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<tr>
<td>Assessment of VCT Utilization and Willingness for Provider- Initiated HIV Counseling and Testing amongst Tuberculosis Patients in Addis Ababa</td>
<td>Ethiopia</td>
<td>Masters Theses</td>
<td>The fear of stigma impedes prevention efforts, including discussions of safer sex and PMTCT</td>
<td>Fear of stigmatization impedes discussion of PMTCT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative studies of orphans and non-</td>
<td>Uganda</td>
<td>Comparative studies</td>
<td>Disentangling stigma reveals many opportunities</td>
<td>De-stigmatization i has positive impacts</td>
<td></td>
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</tr>
<tr>
<td>Study Title</td>
<td>Author(s)</td>
<td>Year</td>
<td>Location(s)</td>
<td>Study Type</td>
<td>Findings</td>
<td>Implications</td>
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<tr>
<td>----------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>&quot;It's Raining Stones&quot;: Stigma, Violence and HIV Vulnerability amongst Men Who have Sex with Men in Dakar, Senegal</td>
<td>Niang CI</td>
<td>2003</td>
<td>Senegal</td>
<td>Case study</td>
<td>HIV related stigma and discrimination is a complex social process</td>
<td>Men who have sex with men are highly vulnerable</td>
</tr>
<tr>
<td>Can we Measure HIV/AIDS-related Stigma and Discrimination? Current Knowledge about Quantifying Stigma in Developing Countries.</td>
<td>Nyblade LC</td>
<td>2006</td>
<td>United States</td>
<td>Descriptive</td>
<td>Stigma reduced participation in programs to prevent mother-to-child transmission of HIV (PMTCT)</td>
<td>Stigma and discrimination is of high significance in Developing countries</td>
</tr>
<tr>
<td>HIV/AIDS-related stigma and discrimination: A conceptual framework and an agenda for action.</td>
<td>Parker R</td>
<td>2002</td>
<td>United States</td>
<td>Exploratory study</td>
<td>Discriminatory or unethical behavior may create an atmosphere that interferes with effective prevention and treatment by discouraging individuals from being tested or</td>
<td>Discriminatory attitudes are unhealthy</td>
</tr>
<tr>
<td>Title</td>
<td>Author(s)</td>
<td>Year</td>
<td>Country</td>
<td>Study Type</td>
<td>Findings</td>
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</tr>
<tr>
<td>----------------------------------------------------------------------</td>
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<td>------------</td>
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<tr>
<td>HIV/AIDS-related stigma: A literature review</td>
<td>Policy project</td>
<td>2003</td>
<td>South Africa</td>
<td>Literature review</td>
<td>Explanation of Stigma</td>
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<tr>
<td>Attitude of Healthcare Workers to HIV/AIDS</td>
<td>Sadoh AE</td>
<td>2006</td>
<td>Nigeria</td>
<td>Descriptive study</td>
<td>Stigma reduced participation in programs to prevent mother-to-child transmission of HIV (PMTCT)</td>
<td></td>
</tr>
<tr>
<td>Using Case Vignettes to Measure HIV-related Stigma amongst Health Professionals in China</td>
<td>Li L</td>
<td>2007</td>
<td>China</td>
<td>Case study</td>
<td>Stigma reduced participation in programs to prevent mother-to-child transmission of HIV (PMTCT).</td>
<td></td>
</tr>
<tr>
<td>Commentary Factors Affecting HIV/AIDS-Related Stigma and Discrimination by Medical Professionals</td>
<td>Deacon H</td>
<td>2006</td>
<td>United States</td>
<td>Descriptive study</td>
<td>For People Living with HIV/AIDS(PLWHA), they can include internalized stigma, lowered self-esteem, depression, and changes in behavior (e.g., not using the available services) because of the fear of stigma</td>
<td></td>
</tr>
<tr>
<td>HIV Stigma and</td>
<td>Holzemer</td>
<td>2009</td>
<td>United States</td>
<td>Correlational</td>
<td>It was indicated that higher</td>
<td></td>
</tr>
</tbody>
</table>

Note: Stigma should not be allowed among health professionals.
<table>
<thead>
<tr>
<th>Quality of Life.</th>
<th>WL</th>
<th>Study</th>
<th>perceived HIV stigma scores amongst clients with HIV/AIDS were significantly and negatively correlated with the quality of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiretroviral scheme draws poor response</td>
<td>IRIN 2002 Nigeria Descriptive study</td>
<td>Discrimination prevents good attitude towards seeking information on HIV/AIDS</td>
<td>None</td>
</tr>
<tr>
<td>Report on the global HIV/AIDS epidemic</td>
<td>JUNH 2002 Switzerland Descriptive study</td>
<td>Discrimination and unethical behavior exist among health care professionals</td>
<td>None</td>
</tr>
<tr>
<td>Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections</td>
<td>JUNH 2004 Switzerland Update study</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>HIV and discrimination</td>
<td>Tirelli U 1991 United States Descriptive study</td>
<td>Discrimination is associated with HIV</td>
<td>None</td>
</tr>
<tr>
<td>Utilization of PMTCT Services amongst Pregnant Women in Western Region.</td>
<td>Worku T 2008 Western region Case study</td>
<td>Stigma is a negative factor that discourages pregnant women from utilizing PMTCT</td>
<td>None</td>
</tr>
</tbody>
</table>
An Assessment of Medical Waste Management in Bawku Presbyterian Hospital of the Upper East Region of Ghana.

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Abstract

Background

Medical waste unlike other ordinary waste poses serious health risk to the handlers, health staff, patients and the community. The area of medical waste management is neglected in most health care facilities in Ghana. The main objective of the study was to assess the Medical Waste management practices in Bawku Presbyterian Hospital of the Upper East Region of Ghana.

Methods

The study used structured questionnaires, observation checklist and key informant interview guide to collect data from management staff and waste workers.

Results

It was observed that there was low knowledge about medical waste among waste workers. Medical waste is not segregated, waste containers not coded/labelled, no secured storage area for waste, no budget specifically for medical waste management and no waste management manual in the hospital.

Conclusion

This study has shown that, waste management in the hospital is poor and has health implications to the handlers, staff, patients and visitors.

Keywords: medical waste, Bawku Presbyterian Hospital, waste segregation, waste storage.

Introduction

Health care services generates waste just like other human activities which has to be managed and dispose in a safe manner to avoid or reduce risks it poses to the health of the healthcare providers, clients and the community within the operational area.

In the management of waste, a healthcare waste has the higher priority due to their hazardous nature. According to World Health Organization (WHO) some part of healthcare wastes are considered most hazardous that can affect human health and pollute the environment badly (World Health Organization (WHO), (2005). In a healthcare setting that has unsafe health care waste management practices, may result an exposure to infectious wastes by Healthcare workers (HCWs), patients, clients that could in turn create infection due to blood borne pathogens.

A good proportion of waste generated by health facilities is not hazardous and can be managed like any other household waste. This constitutes about 75% to 90% of all waste generated in health institutions. However, the remaining 10% to 25 % is hazardous and requires special arrangements for management.

Waste management in Ghana is a multi-sectorial approach involving the Ministry of Local Government and the Environmental Protection Agency playing key roles as implementer and regulator respectively. The District, Municipal and Metropolitan assemblies which are directly under the Ministry of Local Government on the one hand and the offices of the Environmental Protection Agency on the other are responsible for ensuring that waste are managed properly and safely. The definite responsibility
for ensuring that waste is disposed of, however, lies with the person or institution that generates the waste in line with the local government policy of waste management (Ministry of Health, 2006).

Therefore, health care institutions are responsible for the waste that is generated by their activities and are required to take practical steps to ensure their separation, storage, treatment and safe disposal while enjoying the collaboration and support of the relevant stakeholder ministries and agencies (Ministry of Health, 2006).

In the management of waste, healthcare waste is given a higher priority due to the hazardous nature of it. World Health Organization (WHO) recognised that, some part of healthcare wastes are considered most hazardous and very dangerous to human health and pollute the environment badly (World Health Organization (WHO), (2005)). A working environment that have unsafe health care waste management practices may result an exposure to infectious wastes by Healthcare workers (HCWs), patients, clients that could in turn create infection due to blood borne pathogens.

Safe medical waste management in a health facility depends on a devoted waste management team, good administration, careful planning, underpinning legislation, organizational commitment, adequate funding and full participation by trained staff (World Health Organization (WHO), (2005)). In addition some authors indicated the importance of other aspects, including the use of appropriate technology for disposal (Lee et al., 2014; Diaz et al., 2014). Others suggested that, an internal management system and training program for related personnel (Silva et al., 2014; Abdulla et al., 2008).

In order to improve medical waste management and develop a management strategy for the Bawku Presbyterian Hospital, it is important to understand and evaluate current practices in medical waste management. Information regarding medical waste management in the hospital is currently insufficient.

The main objective of the study was to assess the Medical Waste management practices in Bawku Presbyterian Hospital of the Upper East Region of Ghana.

The specific objectives are:
1. To assess the knowledge of health care personnel regarding biomedical waste management.
2. To assess the current system of practice of biomedical waste management in terms of segregation, storage, collection, transportation, and disposal in Bawku Presbyterian Hospital.
3. To make recommendations to management for the improvement of medical waste management in Bawku Presbyterian Hospital.

Bawku Presbyterian Hospital was selected to conduct the study because, no studies have been conducted on medical waste management in the municipality and this hospital is the largest and serving the entire municipality. The area of biomedical waste management is neglected in terms of research and studies in Ghana. The results of this study could be a factor to rectify the situation of medical waste management, especially after the presentation of the results to the stakeholders in the healthcare industry.

**Literature Review**

**Medical Waste**

Medical wastes have been defined as any solid waste that results from the treatment, diagnosis, or immunization of humans and/or animals at hospitals, veterinary and health-related research facilities, and medical laboratories (George, 2013).
<table>
<thead>
<tr>
<th>Type</th>
<th>Classification and Description</th>
<th>Content/Examples</th>
</tr>
</thead>
</table>
| **A** | General/Normal Waste  
This type of waste is not harmful and is similar to domestic waste except for the fact that it is produced within the hospital environment and therefore requires special handling. It includes waste from corridors, lawns, offices, workshop, stores, waste from kitchen, etc. | Paper, cardboard, plastic materials including those from points of generation, kitchen waste, ash, sawdust, pieces of wood etc. |
| **B** | Infectious Waste  
These types of waste from the hospital have physical and chemical characteristics similar to those of industrial hazardous waste and waste generated by both in-patients/outpatients and animals which is likely to contain pathogenic micro-organisms. It includes materials that can be infectious to patients, health care workers and the public. It therefore requires special management both inside and outside the hospital until it is finally disposed of. This may further be classified under the following sub classification: |  
1. Laboratory waste generated by microbiological investigation.  
2. Potentially infected blood and human and animal tissues. (e.g. Hepatitis B, HIV) |
| **1** Sharps  
These are sharp-edged wastes with puncture and/or cutting properties that pose risk of injury and infection. They may be stained or contaminated with blood or body fluids from injection rooms, surgical equipment etc. | Needles, syringes, surgical blades, scalpels, test tubes, ampoules, glass instruments, pipettes etc. |
| **2** Patients Waste/ Culture/ Specimen  
These are wastes generated from in- or out-patient activities and may be contaminated or stained with blood or body fluids from surgical operations, injection room (other than sharps) etc. Clinical specimen, laboratory culture and human tissue. |  
1. Stained or contaminated Material (e.g. soiled cotton wool, used bandages/dressings, gloves, linen, blood transfusion bags, urine, faeces).  
2. Culture plus specimen (e.g. experimental specimen (animals), tissue culture, urine, stool)  
3. Urine, faeces (stool) from Laboratory Experimental specimen (animals) |
| **3** Pathological/Organic Human/Animal Tissues  
This type of waste includes amputations, other body tissues resulting from surgical operations, autopsy (post-mortem), and birth. These require special treatment for ethical and aesthetic reasons. |  
1. Internal body organs, amputated limbs, placentas foetus.  
2. Human liquid wastes (e.g. urine, blood products/blood)  
3. Effluents from mortuaries |
| **C** Pharmaceutical Waste  
These are wastes generated from the pharmacy |  
1. Expired drugs (solid/liquid, plastic or glass containers)  
2. Residues of drugs in chemotherapy that may be cytotoxic, genotoxic, mutagenic or |

Table 1. Classification of Medical Waste in Ghana (Source: Ministry of Health, 2006)
Chemical Waste
This is basically made up of spent chemicals from research and analytical laboratories, and pharmaceutical companies.

Acid, Alkali, organic substances, solvents, and heavy metals.

Radiological Waste
Any waste material (solid or liquid) produced from image processing at the radiology department.

1. Chromo sulphuric acid
2. Glacial acetic acid
3. Photographic developer
4. Fixer solution
5. X-ray photographic film

Acid
1. Hydrochloric acid
2. Oxalic acid

Alkalis
1. Sodium hydroxide
2. Potassium hydroxide

Volatile and Organic Solvents
Ethanol, Methanol, Xylene, Chloride tape

Heavy Metals
Lead

Radioactive Waste
Liquid, solid, or pathological waste contaminated with radioactive isotopes of any kind.

1. Gloves, solid-papers, Swabs, cotton, needles (sharps), equipment etc.
2. Liquid-patient excreta, gastric content rest of solution administered to patient,

Colour Coding of Biomedical Waste

Biomedical waste is stored in colour coded waste containers and plastic bags to facilitate efficient segregation of waste. The recommended colour coding scheme for Ghana (adapted from W.H.O.) is as follows:

Black: This is for general waste (e.g. kitchen waste, paper, cardboard, sweeping etc)

Yellow: This is used for infectious waste (e.g. sharps, patient waste, human/animal tissue and cultures/specimens) with the biohazard label - Radioactive waste with the radioactive symbol.

Brown: Brown code is for hazardous waste (e.g. vaccines, expired drugs, chemicals etc). Small amounts of chemical wastes generated may be added to the infectious waste.

Methods

Study Design

The study design was a descriptive cross-sectional study and this is deemed to be appropriate since it measures or estimate the variables attribute of the target population at a particular point in time. The choice for the descriptive cross-sectional design was informed by the aim to describe the Medical Waste Management in Bawku Municipal Hospital not only using quantitative data but also qualitative data. The study was carried out in January 2014 in the Bawku Presbyterian Hospital of Ghana.

Target Population

The study participants included an environmental health officer, waste labourers, management members and key unit heads who are directly concerned in the study.
Data collection Technique

Site visits, key informant interviews and survey questionnaires were employed to collect information regarding knowledge of biomedical waste management, medical waste generation, separation, collection, storage, transportation, and disposal. During site visits, an observation checklist was used based on Ghana ministry of Health medical waste management policy and guided by the literature.

With respect to identifying biomedical waste management problems facing the hospital, key informant interview guide was used for all the management members, key unit heads and environmental officer in-charge and the waste workers head.

Data Processing and Analysis

The quantitative data from the structured interviews was coded and a master sheet prepared before the beginning of data collection to make the data ready for entry into the master sheet using SPSS version 16.0 programme.

On the other hand, qualitative data from the key informant interviews were edited every break of day to get the clear transcriptions of the interviewees’ accounts. The various emerging themes were identified and classified.

Ethical Consideration

A formal permission was obtained from management of the hospital to conduct the study on health care personnel in the hospital. The objective of the study was explained to each study participant and they consented to participate.

Results

Knowledge of health care personnel regarding biomedical waste management.

Hospital Management

Knowledge and practices of hospital Management staff in relation to medical waste is presented in Table 2. Responding to the issue of availability of specialised waste worker, 5 (45.45%) said there are specialised waste worker, while the other 6 (54.55%) of them stated otherwise. Concerning the necessity and provision of personal safety tool Although all managers claimed that they provided all necessary personal safety tools to their waste-workers, on interviewing workers during the field survey it turned out that only 15% of the waste workers indicated that safety tools were available and, even the tools were not as complete as they should be.

All of the management members and key waste management personnel confirmed that, there were no waste user manuals available. About 5 (45.45%) of the managers and key waste managers in the hospitals claimed to be raising awareness of workers about dealing with medical waste and 6 (54.55%) stated otherwise. With respect to workers being monitored regarding the usage of personal protection tools, 7 (63.64%) of the managers claimed they have been monitoring them, while 4 (36.36%) stated otherwise. Concerning training of waste worker in dealing with biomedical waste, 6 (54.55%) indicated that they are trained and only once in a year, while 5 (45.45%) stated otherwise.

About availability of budget for medical waste management, only 4(36.36%) said they had dedicated budget for waste handling but said it was not allocated enough within the hospital cleaning budget; while 63.64% stated that, there was no budget for medical waste management in the hospital. This is confirmed from a key informant interview which one nurse incharge stated that ‘’we have requested several times from the stores for safety boxes and they are not available and only rubber bins were given for our sharps ‘‘Ward incharge’’. 36.36% said there was a department responsible for waste collection in the hospital and 63.64% stated otherwise.
Table 2: Hospital management (Source: field survey, 2014).

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency N =11</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows importance of availability of specialized waste-workers</td>
<td>11</td>
<td>100.00</td>
</tr>
<tr>
<td>Provide personal protection tools for workers</td>
<td>11</td>
<td>100.00</td>
</tr>
<tr>
<td>Monitoring the usage of personal protection tools</td>
<td>7</td>
<td>63.64</td>
</tr>
<tr>
<td>Training of workers in dealing with biomedical waste</td>
<td>6</td>
<td>54.55</td>
</tr>
<tr>
<td>Medical waste user manual available</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Workers are sensitised about knowing and dealing with medical waste.</td>
<td>5</td>
<td>45.45</td>
</tr>
<tr>
<td>Workers supervised during waste collection</td>
<td>7</td>
<td>63.64</td>
</tr>
<tr>
<td>Medical waste budget available</td>
<td>4</td>
<td>36.36</td>
</tr>
<tr>
<td>Allocation of biomedical waste budget adequate within hospital cleaning budget</td>
<td>4</td>
<td>36.36</td>
</tr>
<tr>
<td>Waste management department responsible for biomedical waste available within the hospital</td>
<td>4</td>
<td>36.36</td>
</tr>
<tr>
<td>Number of waste workers adequate</td>
<td>7</td>
<td>63.64</td>
</tr>
</tbody>
</table>

Waste-workers’ knowledge of dealing with medical waste

Table 3 shows the knowledge of waste-workers about dealing with medical waste. It was found that only 5(33.33%) of the waste workers were able to identify the types of medical waste they were collecting. This observation contradicts majority (54.55%) of management claim that waste workers are being trained on medical waste management. Majority 11 (73.33%) considered it necessary to sort medical waste and 7 (46.67%) indicated they understand the reasons behind sorting medical waste.

With respect to risks that workers could be exposed to during handling medical waste, a good number of them 12 (80%) of them are aware of these. With regard to knowledge of adequate disposal procedures of liquid waste, expired medicines, expired blood units and human tissue remains, they indicated 40%, 13.33%, 6.67% and 53.33% respectively. Concerning workers who believed that throwing expired blood units, expired medicines and human tissues into the normal domestic rubbish collection was an adequate disposal procedure were respectively 46.67%, 86.67% and 13.33%.

Table 3: Waste workers knowledge on medical waste (Source: Field Survey, 2014)

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency N =15</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to identify medical waste</td>
<td>5</td>
<td>33.33</td>
</tr>
<tr>
<td>Identifies the need to sort medical waste during collection</td>
<td>11</td>
<td>73.33</td>
</tr>
<tr>
<td>Know reasons for sorting biomedical wastes</td>
<td>7</td>
<td>46.67</td>
</tr>
<tr>
<td>Aware of risks in handling medical wastes</td>
<td>12</td>
<td>80.00</td>
</tr>
<tr>
<td>Adequate knowledge of disposal procedures of liquid waste</td>
<td>6</td>
<td>40.00</td>
</tr>
<tr>
<td>Adequate knowledge of disposal procedures of expired blood units and by-products waste.</td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td>Adequate knowledge of disposal procedures of human tissue remains</td>
<td>8</td>
<td>53.33</td>
</tr>
<tr>
<td>Adequate knowledge of disposal procedures of expired medicines</td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td>Believes throwing blood waste in domestic waste is an adequate disposal procedure</td>
<td>7</td>
<td>46.67</td>
</tr>
<tr>
<td>Believes throwing of human tissue remains in domestic waste is an adequate disposal procedure</td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td>Believes throwing expired medicines in domestic waste is an adequate disposal procedure</td>
<td>13</td>
<td>86.67</td>
</tr>
</tbody>
</table>
Medical Waste Management

Separation of medical waste

Table 4 show the responses of waste workers responses on the separation of biomedical waste. Among the 15 waste workers interviewed, 13 (86.67%) indicated that waste is not separated prior to disposal to the larger storage containers in the hospital; while 2 (13.33%) responded that, the waste is separated before disposal. All the study participants said wastes from the various units are disposed into the large storage containers without segregation (See Figure 1).

Figure 1: Mixed medical waste with ordinary waste (Source: Field survey, 2014).

With regards to the body that is in charge of the process of waste separation 4 (26.67%) the respondents indicated, that medical staff is carrying on the process of separation, 8 (53.33%) indicated that the cleaning workers were responsible, 2 (13.33%) said both the medical and cleaning staff are doing the separation and 1 (6.67%) did not know who carry on the process of separation (See Figure 2).

With respect to the item on the location of separation; 2(13.33%) indicated that the separation takes place at the beginning and near the source of waste and 13 (86.67%) said they do not know.

Table 4: Waste Labourers views on waste segregation (Source: Field survey, 2014)

<table>
<thead>
<tr>
<th>Item</th>
<th>Response</th>
<th>Frequency/Percentage N=15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical waste segregated</td>
<td>Yes</td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>13 (86.67%)</td>
</tr>
<tr>
<td></td>
<td>Don’t know</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Category of staff segregating medical wastes</td>
<td>Labourers</td>
<td>8 (53.33%)</td>
</tr>
<tr>
<td></td>
<td>Medical staff</td>
<td>4 (26.67%)</td>
</tr>
<tr>
<td></td>
<td>Both medical &amp; Labourers</td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td></td>
<td>Don’t know</td>
<td>1 (6.67%)</td>
</tr>
<tr>
<td>Place of waste segregation</td>
<td>Beginning near the source</td>
<td>2 (13.33%)</td>
</tr>
<tr>
<td></td>
<td>After waste is collected</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td></td>
<td>Do not know</td>
<td>13 (86.67%)</td>
</tr>
</tbody>
</table>
Containers and bags to collect waste

All the waste labourers said there are no bags being used but waste containers are available and not enough. With regards whether the wastes containers are defined and distinguished; it is noted that only 3 (20%) indicated that it is defined and distinguished but that is only pertaining to sharps containers, while 12 (80%) indicated that it is not defined or distinguished.

With regards to how easy waste containers are transferred from the wards to the large storage containers, 1 (6.67%) said it was easy and the rest indicated no. Wastes are disposed in ordinary waste containers, except in some cases for disposal of sharp instruments which are collected and incinerated. For the truncated human parts, placentas and embryos resulting from abortions, they are dealt with through cultural and religious ways, where they are delivered to their owners to be buried.

From observations during field work, hazardous waste and waste resulting from the high-risk laboratory dishes in the hospital, such as used test tubes, dishes or blood samples are not treated using autoclave until it is sterilized at a certain temperature to get rid of remaining bacteria and to be disposed of with regular and medical waste.

During survey observation in most of the wards and other areas of the hospital where medical waste is generated, the waste bins are either not having covers or not closed tightly and this could be a source of infection to clients and healthcare workers. They can also be seen with waste overflowing and accumulation suggesting infrequent emptying of the bins to the large storage containers. A routine program must be developed for the collection as part of a plan of health care waste management.

Waste storage in the hospital

Concerning waste storage place, all indicated that there is no place for the storage of waste, whether ordinary or medical, but wastes are transferred from within the various departments to two (2) large storage containers by the waste labourers as indicated by the waste labourers and through observation(see Figure 3). This is clear from the study that shows 12 (80%) of the cleaning workers said that the medical waste is transferred using the ordinary waste bins. The other 3 (20%) indicated that needles are put in sharps boxes and kept at incinerator. This is an indication that there is no special place for storing the medical waste in the hospital. It is usually put in a corner till it is transferred to the landfill for final disposal. In addition, all of them answered that the two big storage containers put at a corner where all waste from various department are poured into inside the hospital is not protected.
The other point of interests is that, all the cleaning labourers said there is no special mark distinguishing ordinary waste from the hazardous health waste of the two big containers and every waste is poured into them. It is worth to note that it is not allowed to transfer ordinary and medical waste together in the same vehicle, but it is supposed to allocate vehicle for each of the medical waste and ordinary waste.

Concerning the duration of waste stored in the big container in within the hospital before they are transferred by waste vehicles to the landfill, 11 (73.33%) of the waste labourers indicated that, it takes more than week, 2 (13.33%) said it takes more than two weeks and the 2 (13.33%) indicated that they do not know.

It is clear that there is no medical waste burning inside hospital as 13 (86.67%) indicated that and the other 2 (13.33%) said they do not know. This is a positive practice and the issue respiratory problems associated with inhalation of smoke will not be a problem.

![Figure 3: Waste storage place (Source: field survey, 2014)](image)

**Sharp Boxes**

Most of the respondents, 12 (80%) said vessels used to discard needles do not predispose them to pricks and this is a positive indicator as risk on workers safety will reduce, while 20% stated otherwise. On the other hand, 4 (26.67%) said that these vessels are not difficult to open while 11 (73.33%) indicated it is difficult to open, and this is a good indicator for the health protection of both employee and waste pickers. But another interesting observation in the field indicated that, these safety boxes are carried to the incinerated and left there for many days before incineration is done with some boxes eventually damage (see Figure 4). Another positive aspect observed is that, the World Health Organisation (WHO) yellow boxes are used for the sharps at most places in the hospital and therefore everyone seeing such a box knows the content and will be very careful in handling it.
Transport of waste inside the hospital

With regards to the presence of means for the transfer of medical waste, all survey participants indicated that there is no means of transport to transfer waste to big storage containers from the various units. When asked how the medical waste is transported to the storage containers, they all said they carry on their heads (See Figure 5).

Figure 5: Waste worker carrying medical waste to storage site (Source, field survey, 2014)
Hygiene and sanitation

Hygiene and sanitation in hospitals are important items that help in proper healthcare waste management. With regards to the issue the interruption of the water supply during the past two years, 13 (86.67%) indicate yes while 2 (13.33%) said no. This is an indication that, the water supply system is good in the ward as the presence of water is important for cleaning the bins, carts and storage facilities and other equipment used in medical waste management. For the item on the cleanliness of the toilets in hospitals, 7 (46.67%) answered that toilets are not clean and 6 (40%) said always clean, while a 2 (13.33%) indicated sometimes (See figure 6). This is an indication that, the toilets are not clean sometimes. This will increase the risk of infection of workers, patients and visitors.

For the item on the causes of dirtiness of the toilets, 8 (53.33%) answered that the patients are the reason for the toilets to be dirty, 2 (13.33%) answered that visitors are the reason, and 5 (33.33%) answered workers are the reason.

![Cleanliness of toilets](Image)

Figure 6: Cleanliness of toilets (Source: field survey, 2014).

Training

Regarding training on medical waste management, 10 (66.67%) answered they received training, while 33.33% answered that they do not receive training.

For those who said they have received training (N=10), all of them said they receive training for a duration of 1-3 days.

The item on the training of new staff, those who said they have received training (N=10), 7 (70.0%) said that new staff is trained; while 3 (30.0%) answered that they are not trained.

Discussions/Conclusion

The study has demonstrated that medical waste management in Bawku Presbytery hospital is facing many challenges because this sector is almost neglected in terms of segregation, collection, transport, treatment and final disposal. Moreover there is no formal waste management policy direction put in place by management. Currently, the management of infectious waste is normally governed by the activities of largely untrained and uneducated waste handlers from poor backgrounds. The management of hazardous or general wastes is below acceptable medical waste standards.

Although the management members and key unit heads responded having specialized waste workers in the hospital is very important, background checks revealed that all those who are responsible for handling the waste are not specialised waste workers. A study done in Yemen saw only 20.0% of administrators in government hospitals confirmed the importance of having specialized waste-workers (Al-Emad, 2011). Most of the managers reported that they supervised the use of personal safety tools by their workers, on the contrary actual field observations and workers’ reports revealed that less than half of the managers
exercised such supervision. This observation is disturbing because; most waste workers do not care to protect themselves and if not properly monitored, they could be exposed to the risk of infections.

Dealing with waste management is capital intensive and this study has shown that there was no specific plan and budget to deal with waste management in the hospital. A similar result was found in Lebanon, where 93% of the hospitals had no budget for waste management or a budget that was judged to be insufficient (Moawad, 1997). To ensure sustainability and clarity in these management practices, perfect policies, plans and budget for medical wastes management are encouraged. These need to be incorporated into routine continuing education, employee training and hospital management evaluation processes. The municipal assembly could require waste management plans from all hospitals as a condition for licensing (Basel Action Network (BAN), 2014). This is an indication of lack of commitment in dealing with medical waste in the hospital and must be seriously considered for making specific budget for biomedical waste management.

Another area to worry about in this research is the inadequate knowledge of waste workers on biomedical waste. It was found that only 5(33.33%) of the waste workers were able to identify the types of medical waste they were collecting. This observation contradicts majority (54.55%) of management members claimed that waste workers were being trained on medical waste management. A similar study done in Bagepalli Taluk to assess the knowledge and practice on bio-medical waste management among the health care providers working in PHCs revealed that majority 79 (65%) had an overall average level of knowledge, while 29 (24%) respondents had a good knowledge (Nagaraju et al, 2013). In the case Bawku hospital, this finding could be attributed to inadequate training in safe handling of medical waste and therefore they had little knowledge regarding identification of types of medical waste, the necessity of sorting waste.

Biomedical waste separation is one of the most important aspects of medical waste management. In the study, among the 15 waste workers interviewed, 13 (86.67%) indicated that waste is not separated prior to disposal to the larger storage containers in the hospital. According to a study conducted in the HCFs in the West Bank and Gaza Strip by Environment Quality Authority (EQA) (2005) it was found that only one third of the HCFs in Gaza Strip, have special bags in use for Health Care Waste (HCW) separation; all other facilities consequently collecting all types of HCW together with domestic waste. Sharp items in particular are being collected in special boxes (and sometimes special plastic bottles) as a result of the WHO donating a certain number of boxes; but again this is happening in only a limited number (38%) of HCF. In Bawku hospital, there is no mechanism established to separate the waste from one another, whether within the wards or whether, after collection in a special assembly in the container outside the ward.

The result of the study established that, Bawku hospital has no secured waste storage place and even where the waste is gathered into large storage containers it left there for several weeks before it is conveyed out for final disposal. Similar studies done in developing countries on healthcare wastes management indicated that segregation, collection of waste using recommended colour coding container and storage of waste in secured area were not satisfactory (Mostafa et al., 2007; Coker et al., 2008; Patwary et al., 2011). According to W.H.O. regulations, the storage of waste within the hospital in cold areas should not exceed 72 hours in winter and 48 hours in summer. But, in the hot areas, storage should not exceed 48 hours in winter and 24 hours in summer (World Health Organization (WHO), (2005). Regarding the WHO regulations of medical waste transfer and storage within a hospital setting, it is clear that there exist a huge gap in Bawku hospital. This must be critically looked at by ensuring that wastes do not stay more than at least 72 hours to ensure the safety of the workers, staff, patients and visitors of the hospitals.

In this survey, all the waste workers indicated that there is no means of transport to cart the waste from the various wards and departments to the big containers. The transportation of the waste is done by carrying on their heads. This is not a good indicator because if waste transferring is difficult, there will be an increased possibility of drop of the waste and thus polluting the place around and thus increasing some
of health problems of the workers. The liquid waste, which contains pathogens, blood and hazardous chemicals, about 10 (66.67%) of the waste labourers said it is disposed in the public sewer system without disinfection. It is likely that the remaining part is disposed off together with solid waste as found in study done in West Bank and Gaza Strip hospitals (Environmental Quality Authority, 2005). A study also done in Accra Metropolis on medical waste disposal practices in some Hospitals and Clinical Laboratories saw that, all the laboratories dispose of their liquid waste into the drains through the sinks and of those who disinfect the liquid waste before disposal were just 10% while majority of them, 90% just poured the liquid waste down the drain without any treatment (George, 2013). This is a direct infringement on the EPA recommended guidelines. The transfer of health-care waste from various departments/units to the storage containers within the hospital must be by wheeled vehicles or by other vehicles or containers fitted with hand wheels that are not used for any other purpose. The transfer means must meet the following standards:

1. Easy loading and unloading.
2. The absence of sharp edges that can cause severe damage to the waste bags or containers during loading and unloading
3. Easy cleaning and must be clean and disinfected every day using the appropriate method. All bags must be closed tightly and must be sound at the end of transport operations (World Health Organization (WHO), (2005). By these WHO standards, there is a gap in Bawku hospital concerning the availability of means of transport to transfer waste to the storage site within the hospital.

Regarding training on medical waste management, 10 (66.67%) answered they received training and those who received the training said it took a duration of 1-3 days only. It is worth to say that the hours spent in training will reduce the potential of infection. Training must be in the field of health and safety of workers and their understanding of the potential risks associated with health-care waste, also it must include appropriate training for workers and the provision of equipment and protective clothing and the development of effective occupational health program.

Conclusively, this study has shown that waste management in the hospital is poor and has health implications to the handlers, staff, patients and visitors and the following recommendations are made to improve the waste management system

- There is need for sustained cooperation among all key actors (Municipal Assembly, the hospital and waste managers) in implementing a safe and reliable medical waste management strategy, not only in legislation and policy formulation, but also particularly in its monitoring and enforcement.
- There should be an obligation for the hospital to ensure a safe and hygienic system of medical waste handling, segregation, collection, storage, transportation, treatment and disposal, with minimal risk to handlers, public health and the environment using colour coding containers, strong waste bags, acquiring means of internal waste transport vehicle and provision of adequate waste protective tools for waste workers.
- All staff and waste handlers in the hospital should be well trained at the beginning of their appointment and regularly updating their knowledge and skills in the form of seminars and workshops.
- Adequate medical waste management budget should be allocated within the general hospital budget.
- The formation of a dedicated committee on medical waste management and ensuring regular meetings.
- Economical, appropriate and environmentally sustainable technological options for waste treatment, which can be well operated and maintained, should be explored for medical waste management.
- There should be a hazardous waste landfill specially designed for the final disposal of treated hazardous healthcare waste.
Competing interests

The author declares that there is no competing interest.

References

A comparison of knowledge of diabetes mellitus between patients with diabetes and healthy adults: A survey from north Malaysia

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Source

Abstract
The purpose of this study was to assess and compare the knowledge of diabetes mellitus possessed by patients with diabetes and healthy adult volunteers in Penang, Malaysia. A cross-sectional study was conducted in. A 240 sample randomly selected (120 patients with diabetes mellitus and 120 healthy adults at a shopping complex participated in the survey. Data collection was done through face-to-face interviews. A30 items questionnaire facilitated data collection about diabetes mellitus. The results showed that patients with diabetes mellitus were significantly more knowledgeable than the healthy group on the following aspects: risk factors, symptoms, chronic complications, treatment and self-management, and monitoring parameters. Educational level was the best predictive factor for diabetes mellitus and public awareness. In conclusion, knowledge about diabetes mellitus should be improved among the general population. The study has key practice implications as it served as a baseline for the design of educational programmes for diabetics and a health promotion programme for the healthy population in general, and especially for those at high risk.

Introduction
Tang et al (2008), Mohieldein et al (2011) and Foma et al (2013) agree that diabetes mellitus is one of the diseases most commonly encountered by healthcare professionals. The disease remains to be an expanding global health crisis. The worldwide incidence of type 2 diabetes is projected to increase sharply from the 71 million in 2000 to 366 million by 2030. The greatest burden of this condition is felt in low and middle-income countries, and these nations account for about 80% of all cases of diabetes. It has been proven right that obtaining information about the level of awareness about diabetes in a population is the first step in formulating a prevention program for diabetes. An understanding of the level of public awareness of disease conditions is helpful for health educators to plan for future programmes. Some research findings indicate that patients may have better knowledge about the disease, which plays a great role in prevention of both complications and high prevalence rates (Foma et al, 2013), while others argue against (Farrel et al, 2006 quoted by Mashige et al, 2008). Malaysia, is part of the affected region, hence its researchers undertook the study under review to compare knowledge of diabetes mellitus between patients with diabetes and healthy adults.

Body
The authors aimed at comparing the knowledge of diabetes mellitus possessed by patients with the disease and healthy adult volunteers in Penang, Malaysia. This article is significant, considering that diabetes mellitus is a growing public health concern and its prevalence has intensified exponentially to pandemic levels. This was echoed by the International Diabetes Federation (IDF) 2010, which reported that the disease then affected over 300 million people worldwide and was expected to cost the global economy at least US $376 billion in 2010, or 11.6% of the total world healthcare expenditure. A further 344 million people are at risk of developing type 2 diabetes, which is the most
common form of the disease. If nothing is done to reverse the epidemic, the IDF predicts that by 2030, 438 million people will live with diabetes at a cost projected to exceed US $ 490 billion. The World Health Organisation (WHO) projected that diabetes’ deaths will double between 2005 and 2030. With evidence supporting the benefits of adequate knowledge in the prevention of type 2 diabetes, knowledge about the disease, symptoms, risk factors, symptoms, complications, treatment, self-management and preventive measures, may be an important determinant of intention to modify health behaviours of diagnosed and healthy people (Morrison, Lowe &Collinst 2010).

After a detailed introduction highlighting the burden of type 2 diabetes pandemic, its socio-economic effects, the authors turned their attention to the methodology. To establish the probable difference between diabetics and healthy respondents, researchers used a cross-sectional design. A cross-sectional study gives general description of the scope of a problem; provides prevalence estimates; often based on population (or community) sample, not just those who sought care. The indication is useful in health service evaluation and planning. In cross-section studies, data are obtained at once, less expense and quicker than cohort because no follow-up. However, it was not clearly stated whether the research is quantitative or qualitative. Nevertheless, the large sample selected (120 patients and 120 healthy respondents) suggests the study was quantitative survey, which is appropriate. Quantitative research gathers data which can be processed statistically and represent a wide target population, which can be generalised (Cohen, Manion & Morrison, 2007). A quantitative study also ascertains that certain factors correlate with each other (correlation and covariance). Though non-probability samples tend to be avoided in quantitative surveys, the researchers used a purposive sampling method, which is a qualitative technique.

Ethical considerations

The inclusion criteria avoided under-age respondents, while using the age range between 21 and 64 years. The study excluded those whose mental ability was challenged. The mention of confidentiality, anonymity, none maleficence, avoidance of coercion, avoidance of over-intrusive questions could have enhanced the credibility and adherence to the research process.

Data collection

The data was taken from 240 participants that made the sample, half of which were patients with diabetes mellitus from a diabetic clinic at a general hospital, and the other half were healthy adults from the shopping complex both in Penang. The sample was randomly selected from a population which was not specified in number. Each participant was interviewed face-to-face, using a 30 items research tool. Interview methods of data collection are useful in that the presence of the interviewer can clarify queries from the respondents and can stimulate the respondents to give full answers to an on-the-spot supervisor (Cohen, Manion, & Morrison 2007). However, interviews are time consuming and are mainly used when people have problems of reading and writing. Since one of the inclusion criteria was ability to understand the questionnaire, one may assume that respondents’ literacy could allow them to fill-in the research tool themselves. The tool had five sections, which are: general knowledge; risk factors; symptoms and complications; treatment and management; and monitoring, which enhanced the validity.

Statistical data analysis

Data were analysed using the SPSS 14.0 software and Microsoft Excel. The following statistical tests were performed to test for significance: $x^2$ to assess the difference between diabetic and healthy groups, student’s t-test to test mean age, the Mann-Whitney U-test was used for gender and marital status and Kruskal-Wallis test was used to assess the effect of age, race, educational level, employment status, income level, source of information, years with disease on the total knowledge score, with a 0.05% level of significance. The statistical tests were appropriate, in line with what each tested for significance. However, in many studies of such level, analysis of variance is mostly used to assess difference between groups. In public health studies, most researchers used relative risks to estimate the relative risk of acquiring disease for those who are exposed compared with those who are unexposed or less exposed. This ratio of incidence proportions is called the risk ratio (or relative risk),
and a ratio incidence rate is called the rate ratio. The relative risk ratio better expresses the risk run by lack of knowledge and developing the type 2 diabetes.

**Results**

Using a variety of statistical methods, the researchers demonstrated a number of interesting findings. Data were arranged in a frequency distribution table, which showed that there was no significant difference between the diabetic and healthy groups for age, gender, race, marital status, education level, employment status or income.

Diabetic group performed better in the knowledge of risk factors, symptoms, chronic complications, treatment, self-management, and monitoring. There was a significant difference between the diabetic and healthy groups for mean total knowledge: diabetics had a mean of 24.4 versus the one of the healthy 20.2. Results showed that 85% of respondents with diabetes had from good to very good knowledge of the disease confirming Khan et al (2008) who found that family history of diabetes mellitus was statistically associated with awareness about diabetes mellitus. The majority of people who are aware of diabetes are only so because a family member is affected. These were the same findings in the study of Al-Maskari et al (2013) that patients’ general awareness of diabetes symptoms and complications was relatively high, perhaps because they had experienced these symptoms themselves or observed them in fellow-patients. The study also shows that a history of diabetes in first degree relatives has a positive impact on diabetes knowledge. Having a close relative with chronic disease may be a good source of health information, but such informal sources cannot be relied upon. In the research under review, of the total respondents, among the diabetics, there were significant differences of knowledge associated with educational level, employment status and income level. However, there was no significant difference associated with age, race, gender or marital status. These results somehow contradict Upadhyay, Palaian, and Shankau (2007) whose findings revealed a low level of knowledge, attitude and practice among the diabetes patients.

Among the healthy group, there was a significant difference of knowledge associated with educational level and employment status, but no significant difference associated with age, race, gender, marital status or income level. This means that respondents who had a high education, with better jobs had better good knowledge of diabetes mellitus than their less educated with low status jobs. The data is consistent with previous studies from other parts of the world, which showed the association between level of education and the increase in diabetes mellitus knowledge (Kamelet al., 1999; Caliskan et al., 2006; Powell et al., 2007; AlShafaee et al., 2008) quoted by Mohieldein, Alzohairy, and Hasan (2011) whose findings showed the knowledge of risk factors and symptoms of diabetes mellitus at 63.4% and 80.8% respectively. Their study revealed serious levels of unawareness about the complications of type 2 diabetes (47.7%) among Saudi non-diabetic population in Al-Qassim region. Only 41.2% of participants showed to have knowledge that one of the complications of diabetes is high blood pressure. In fact, hypertension is a common comorbid condition, occurring at least twice as frequently in patients with diabetes mellitus as in the non-diabetic population (Feldstein et al., 2002). This lack of knowledge regarding hypertension as a complication of diabetes mellitus, may lead to expect the limited knowledge about the fact that diabetic patients may develop a silent form of my cardiac infarction. To raise the awareness of diabetes, a formal, structured approach should be designed to deliver the necessary educational information to the less developed areas. This has been proven that even a small reduction in the average blood pressure or serum cholesterol of a population would produce a large reduction in the incidence of cardiovascular disease for example. This mass (population) approach should be directed towards socio-economic, behaviour and lifestyle changes. To have an impact on the population, primordial, population strategy and high-risk strategy should be implemented together as they are complementary.

Logistic regression modelling was used to determine significant predictors of overall knowledge of diabetes mellitus. In the final model, educational level and number of years with the disease were the most important predictors of knowledge of diabetes, and could predict it 93.3% of the time. This was an appropriate statistical test, and the model agree with findings of Khan et al (2009) who found education and age to be the most important predictors of knowledge. In the healthy group, logistic
regression modelling with a maximum likelihood ratio of 86% confirmed that educational level was the most significant predictor variable correlated with increase in the knowledge of the disease. It is noteworthy that in the healthy group, 55.8% of respondents showed from good to very good knowledge of the disease. A few healthy adults obtained their knowledge from health professionals, a situation which calls the later for more involvement in disease prevention interventions. Interventions could be health promotion, early diagnosis and treatment, disability limitation and rehabilitation.

Conclusion

The main points of the article have been to show the burden of non communicable, particularly diabetes mellitus; specifically, authors wanted to compare knowledge between patients of the disease and a healthy group in Malaysia. The disease is a public health concern of the 21st century by among others, the World Health Organisation (WHO). The regions with the greatest potential increase in the future are Africa and Asia, where diabetes is estimated to become two to three times more common (WHO 2005, 2011, & Hjelm & Mufunda 2010). Research (Foma et al 2013) has established that awareness of various aspects of diabetes mellitus is essential for the prevention, management and control of the disease.

The results showed that patients with diabetes mellitus were significantly more knowledgeable than the healthy volunteers about risk factors, symptoms, chronic complications, treatment and self-management, and monitoring parameters. The results concurred with Foma et al (2013) who reported that several studies have consistently shown that awareness of diabetes mellitus in the general population is low. Authors theorise diabetics’ good knowledge to be a reflection of adequate health education received by diabetic patients. The lack of significant difference between diabetic and healthy adults in the mean score of general knowledge of pathology highlights the need for more concerted effort towards educating the patients with diabetes about the basics and path physiology of the disease. Education programmes for healthy population may include: healthy lifestyle, risk factors, diet, exercise, and screening. This model, can be used in community-based and/ or institution-based (hospital) interventions. Furthermore, the data indicated that, there is need of more efforts for educating general population about diabetes and its associated secondary complications. Concerted efforts are needed to educate the general public about preventable and modifiable risk factors especially in high-risk groups. Those efforts should be coupled with screening for diabetes as part of routine medical care. These conclusions are in line with the 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of non communicable Diseases (NCDs), whose objectives to curb the burden of NCDs include to promote interventions to reduce the main shared modifiable risk factors: tobacco use, unhealthy diets, physical activity and harmful use of alcohol.

The article has advanced knowledge in the field, as it has proven wrong the popular belief that healthy populations are more knowledgeable about diabetes than those diagnosed with the disease. Diabetics come from the general population, there is no way that they can be less knowledgeable about the disease, when in addition to the knowledge that every citizen has, they (diabetics) will have added life experience from the ill-health. This realisation will assist policy makers, health educators, and public health officials to come up with interventions which will target the right group – population, at risk groups with a focus on primordial and primary prevention. Such have been established as cost-effective and life-saving programmes applicable even in low and middle-income nations. The practice implications of the study are that it served as a baseline for design of diabetes’ education programmes. On the basis of these results, continuing professional development can be offered for health professionals, to keep them abreast with emerging re-emerging diseases. The article was written in a clear, thorough and useful explanation of the topic was given.

The initial weakness of the research was the claim that diabetic patients had better knowledge about the disease. The other was the use of non-parametric statistical tests, whose deficiencies include: usually do not state hypotheses in terms of a specific parameter; make few (if any) assumptions about the population distribution, thus called distribution-free tests, thus not generalisable; generally not as sensitive as parametric tests; are more likely to fail in detecting a real difference between two treatments (Gravetter & Wallnau, 1995 p. 373). There were no hypotheses or research questions given at the beginning of the study to lead the whole process.
The strengths of the study include the proof of the socio-economic burden of the disease, need for an urgent response, and the presentation of a clear summation of the issue. It is also important to mention the use of a clear language, thorough presentation of data and provision of explanation of the subject matter. Tables and figures were clearly labelled and succinct. There was a systematic presentation of the article, including a separation between results and discussion, which shows adherence to research process. It also allowed researchers to integrate their findings in the context of a broader scholarly debate about knowledge of diabetics and their healthy counterparts about the disease.

Acknowledgements

Researchers acknowledged adherence to the principle of respondents’ anonymity through removal/disguise of identifiers.

Literature Cited In The Article


References Used in the Article Review


Comparing Data Reported using the National Health Management Information System and data Declared/Validated on the PBF Declaration forms in Fundong Health District

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Introduction

The Cameroon Government through the Ministry of Health (MOH) introduced the National Health Management Information System (NHMIS) tool in the country in 1995 to harmonize the data collection process within the health system at all levels(1). Before this time, the MOH had no harmonized tool for health information and the different health facilities within the health system had varied data collection tools. The major role of the NHMIS involved data collection to show case the country’s health status, data quality enhancement and proper definition of each indicator therein, thorough data analysis at all levels of the health system and informed decision making by actors, timely feedback at all levels, enabling access of data at all levels to development partners and prompt epidemiological surveillance and timely intervention in the case of an epidemic (2). The elements of an effective SNIS are its relevance, how it satisfies clearly defined and quantified public health goals, its performance, does it work with efficient methods and tools and competent professionals? its usefulness, how is it used by its targeted audience (decision makers, health professionals, community stakeholders) and its consistency, are the various stakeholders and information sources well-coordinated?

The setting of institutional mechanisms and incentives in order to introduce an evidence base decision making process has been seen by many scholars as important and a major need. Thus Performance based financing at implementation had as one of its principles to strengthen the health system not leaving out the SNIS. In this light, the data reported in the project at the level of the health facility is supposed to be consistent with data reported in the NHMIS. This study sought to find out if this is actually the case on the field.

The Cameroonian government with the support of the World Bank fund is currently piloting PBF in 4 regions in Cameroon (Littoral, East, North-West and South-West).

The health sector support Investment Project (HSSIP) in Cameroon is currently implementing PBF in public, private and faith-based organization (FBO) facilities across 26 districts in the Littoral ,Northwest, Southwest and East regions of Cameroon, covering a total population of 2.5million.

Four of these 26 districts are in the Northwest region that is Fundong, Ndop Nkambe, and Kumbo-East were this survey will be carried out.

The PBF project in Cameroon has the following key features:

- Performance contracts are signed between a Performance Purchasing Agency (PPA) and health facilities. These performance contracts govern results-based payments to facilities, and performance bonuses from facilities to their health workers.
- The purchased outputs from health facilities include service output indicators for priority services. These outputs are verified by the third parties (i.e. the PPA).
- Facilities have the management autonomy to use PBF payments based on priorities identified in their business plans, including to offer health worker performance or retention bonuses or to purchase inputs.
- Facilities have the management autonomy to decide the level of performance bonuses to their health workers within limits defined by the contracts between the PPA and health facilities.
- Facilities also have the management autonomy to hire and fire staff hired with PBF revenues.
- Facilities have the autonomy to procure medicines from government-approved distributors and retail outlets, and not be obliged to procure their medicines from any single source.
Alongside the implementation of this PBF project, the World Bank is conducting an impact evaluation in 3 of the 4 regions (East, North-West and South-West).

The study has a pre-post with comparison design, relying primarily on experimental control. Individual health facilities in health districts included in the project in each region have been randomized to one of the 4 study groups (T: PBF with health worker performance bonuses; C1: Same per capita financial resources as PBF but not linked to performance; C2: No additional resources but same supervision and monitoring as PBF arms and T and C1; C3: Status quo).

**Problem Statement**

The NHMIS tool has played a major role in the collection of vital health information and other relevant data in the Cameroon Health System at all levels. At the level of the health facilities, the head of the health facility or other related health personnel do not have a good mastery of this tool. This tool is required to be filled by health facilities on a monthly basis and transmitted to the District Health Service for onwards transmission to the Region. Unfortunately enough, the data that is filled on this tool is most often not consistent with those reported in other projects. Most chief of health units always fill this tool just to satisfy the purpose of filling and do not really take time off to cross check data with the impression that reports sent to the Regional and Central level are not fully exploited. The NHMIS is fragmented by other reporting tools in vertical programmes and Health Units head see it as a lot of work filling and completing the NHMIS.

With the advent of PBF, District Medical Teams have evaluated on this tool to see the timeliness and completeness rate of health facilities effectively reporting using this tool. In performance based financing health facilities are supposed to report to the project using the declaration validation form for project indicators. The main question that arises is whether the data that health facilities declare to the PBF Project using the declaration validation forms is concordant with the data that is reported using the NHMIS tool.

**Operational Terms**

The following operational terms have been used in this case study:

**Under Reporting**: These are health facilities reporting less in the NHMIS compared to data in the PBF declaration validation forms in absolute terms for the same indicators with an error margin greater than 10%.

**Consistency**: These are health facilities having concordant data for the same indicators in the NHMIS and PBF declaration validation forms with an error margin within 10%.

**Over reporting**: These are health facilities reporting more in the NHMIS compared to data in the PBF declaration validation forms in absolute terms for the same indicators with an error margin greater than 10%.

**Level of Consistency**: Level of consistency has been set at 90%

**Conceptual Model/Framework**

**Logic model**

This study uses a logic model to describe specific activities and interventions of PBF and describe how they improve the collection and use of health data. A logic model describes the main components of an intervention and how they are intended to work together to reach measurable objectives.

The use of a logic model allows for critical assessment of program impact pathway theory and assumptions; appropriateness and completeness of activities (process); and indicators of outputs (direct products of program activities), outcomes (specific changes in program participants’ behavior, knowledge, skills, and level of functioning), and impacts (the fundamental intended or unintended change occurring in health facilities, communities or systems as a result of program activities).
Figure 1. Logic model for strengthening the reporting and use of health data

The logic model presented in this article maps out how the intervention inputs and activities are expected to influence the outputs and eventual outcome of regular data reporting and use in program review, planning, advocacy, policy development and other decision making processes.

**General Objective**

To compare the data that is reported using the NHMIS and that declared using the PBF declaration/validation forms for some selected indicators in Fundong Health District during the Period January to July 2014 for consistency.

**Specific Objectives**

- To compare the data validated by district supervisors to data declared in the NHMIS.
- To compare the reporting trends for data validated and data reported in the NHMIS by status of health facility.
- To assess reporting using both tools by category (T, C1 and C2)
- To make feasible recommendations for improvement

**Methodology**

At the outset 6 indicators that were reported in the NHMIS that are defined same in the PBF declaration/validation forms were identified and selected. The NHMIS tool was obtained from the DHS Fundong and part obtained from the Regional Delegation of Health covering the period January to July 2014. A questionnaire was created in EPI-info and data reported on the NHMIS for the selected indicators were entered on this application. Data declared in the PBF project for the aforementioned indicators was equally entered on this tool. This data was then analyzed on EPI-info by running frequency. P-values could not be used for this study because we had a sample of 14 health facilities. Three cut off categories (under reporting, consistent, and over reporting) were used to interpret the results.

**Results obtained**

**Status of Health Facility**

Of the 14 health facilities that were involved in the study in Fundong Health District, 8 (57.1%) were Public while 6(42.9%) were confessionals.
Qualification of Staff

In all there were 9 state registered nurses (SRN) and 5 Nursing Assistant (NA) as facility heads for the 14 health facilities that were under study. The qualification of the staff was stratified by status of health facility and it was observed that out of the 9 state registered nurses, 6 (66.7%) were from the Public whereas 3 (33.3%) were of the confessional. Out of the 5 nursing assistants that existed, 2 (40%) were public and 3 (60%) were confessionals. From this, it can be deduced that the Public had more SRN (6) than the confessionals (3) meanwhile the confessionals had more NA (3) than the Public (2).

Table 1: Qualification of Staff stratified by status of health facility

<table>
<thead>
<tr>
<th></th>
<th>SRN</th>
<th>NA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>6(66.7%)</td>
<td>2(40%)</td>
<td>8</td>
</tr>
<tr>
<td>Confessionals</td>
<td>3(33.3%)</td>
<td>3(60%)</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>5</td>
<td>14</td>
</tr>
</tbody>
</table>

Comparing Data Reported Using the SNIS and the PBF Declaration/Validation forms

The table below shows the state of reporting in the NHMIS compared to the PBF data which is verified and validated. This has been done per indicator and reporting was categorized into 3 groups. Either a health facility is underreporting, reporting consistently in both tools or over reporting. From the analysis below the indicator in which the highest level of consistency was recorded in both tools was FP: Permanent methods (94.9%) as reported by the 14 health facilities in the study. For the 6 indicators that were considered in this case study, only FP: permanent methods was above 90% consistency. In reality, we expect a 100% consistency even though for this study, the level of consistency was set at 90%.

Table 2: Summary State of reporting in the NHMIS compared to validated data from January to July 2014 per indicator

<table>
<thead>
<tr>
<th>Indicators</th>
<th>% of HF Under reporting in NHMIS</th>
<th>% of HFs with Consistent Data both tools</th>
<th>% of HFs Over reporting in NHMIS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children Completely Vaccinated</td>
<td>27,6</td>
<td>55,0</td>
<td>17,4</td>
<td>100,0</td>
</tr>
<tr>
<td>Deliveries</td>
<td>32,0</td>
<td>53,0</td>
<td>15,0</td>
<td>100,0</td>
</tr>
<tr>
<td>FP: Pills and Injectables</td>
<td>19,4</td>
<td>72,5</td>
<td>8,1</td>
<td>100,0</td>
</tr>
<tr>
<td>FP: IUCD and Implants</td>
<td>4,2</td>
<td>87,7</td>
<td>8,1</td>
<td>100,0</td>
</tr>
</tbody>
</table>
State of Reporting by Status of Health Facility

From the tables below it can be observed that public health facilities were seen to be more consistent in reporting using the NHMIS than the confessionals. On the other hand, confessionals were seen to be underreporting using the NHMIS than the public health facilities while Public health facilities were observed to over report using the NHMIS. This case study therefore portray that public health facilities have the tendency of inflating figures in the NHMIS than when they are reporting using the PBF declaration validation form. They report well on the PBF declaration/validation forms because they are aware that this data will be verified and validated but are nonchalant with the NHMIS since they know that this data is not verified. Conversely confessional health facilities tend to underreport using the NHMIS. This could be interpreted that Confessional health facilities tend to conceal relevant information.

Table 3: State of Reporting for Children Completely vaccinated by Status of Health Facility Cumulative January to July 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>State of Reporting</th>
<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>Children Completely Vaccinated</td>
<td>% of HF Under Reporting</td>
<td>13,3</td>
</tr>
<tr>
<td></td>
<td>% of HFs with Consistent Data</td>
<td>28,5</td>
</tr>
<tr>
<td></td>
<td>% of HFs Over Reporting</td>
<td>14,3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
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</tr>
</tbody>
</table>

Table 4: State of Reporting for Deliveries by Status of Health Facility Cumulative January to July 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>State of Reporting</th>
<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>Deliveries</td>
<td>% of HF Under Reporting</td>
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</tr>
<tr>
<td></td>
<td>% of HFs with Consistent Data</td>
<td>35,6</td>
</tr>
<tr>
<td></td>
<td>% of HFs Over Reporting</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
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</tbody>
</table>

Table 5: State of Reporting for FP: Pills and Injectables by Status of Health Facility Cumulative January to July 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>State of Reporting</th>
<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>FP: Pills and Injectables</td>
<td>% of HF Under Reporting</td>
<td>15,3</td>
</tr>
<tr>
<td></td>
<td>% of HFs with Consistent Data</td>
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</tr>
<tr>
<td></td>
<td>% of HFs Over Reporting</td>
<td>6,1</td>
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</table>

Table 6: State of Reporting for FP: IUCD and Implants by Status of Health Facility Cumulative January to July 2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>State of Reporting</th>
<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>FP: IUCD and Implants</td>
<td>% of HF Under Reporting</td>
<td>2,1</td>
</tr>
<tr>
<td></td>
<td>% of HFs with Consistent Data</td>
<td>49,0</td>
</tr>
<tr>
<td></td>
<td>% of HFs Over Reporting</td>
<td>3,1</td>
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</table>

FP: Permanent Methods  
STI treated
**Table 7:** State of Reporting for FP: Permanent Methods by Status of Health Facility Cumulative January to July 2014

<table>
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<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of HF Under Reporting</td>
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</tr>
<tr>
<td>FP: Permanent Methods</td>
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<td>57,1</td>
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<td></td>
<td>% of HFs Over Reporting</td>
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</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 8:** State of Reporting for STIs treated by Status of Health Facility Cumulative January to July 2014

<table>
<thead>
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<th>State of Reporting</th>
<th>Status of HF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of HF Under Reporting</td>
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<tr>
<td>STI Treated</td>
<td>% of HFs with Consistent Data</td>
<td>24,5</td>
</tr>
<tr>
<td></td>
<td>% of HFs Over Reporting</td>
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</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

**Reporting by Category**

The figures below present the state of reporting by category of health facilities per indicator.

**Figure 3:** Reporting for Children Completely Vaccinated by Category of Health facility
Figure 4: Reporting for Deliveries by Category of Health facility

Figure 5: Reporting for FP: Pills and Injectables by Category of Health Facility

Figure 6: Reporting for FP: IUCD and Implants by Category
Conclusion

Our study portray that out of 6 indicators only 1(16.6%) attended 90% consistency for the 14 health facilities in the study meaning that the data reported in the NHMIS compared to the PBF declaration validation form is grossly inconsistent. Public health facilities were observed to be over reporting in the NHMIS while confessionals were under reporting. Summarily the data reported in the NHMIS is not consistent with the data reported in the PBF declaration validation form implying that data from NHMIS is not reliable.

Recommendations

The Regional Delegation of Health should train and retrain health facility heads and other health personnel on proper reporting in the NHMIS.

Health facilities should always compare data reported in the NHMIS with data reported in other vertical programmes with similar indicators like PBF.

The Regional Delegation of Health in collaboration with the PPA should refresh health facility heads on generating data from the NHMIS, analyzing and use the data in decision making in relation to their business plan.

The District Medical Team should carry out supervision of NHMIS at the level of the health facility regularly for consistency with other programmes.
References

A study to determine the factors affecting the effective management of third stage of labour in some selected health facilities in Adamawa State Nigeria

Article Review by Ukwo Joy Michael
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Email: - michael.ukwojoy@yahoo.com

Introduction

Most maternal deaths are avoidable through the use of known interventions. However, those interventions are often inaccessible to many of those in need. As with most African communities, Hemorrhage (of which postpartum hemorrhage is most common) is the leading cause of maternal mortality in Adamawa State. Postpartum hemorrhage is mainly caused by complications arising during the third stage of labor. Effective management of the third stage of labor has the potential of significantly reducing maternal mortality. The process, component and the effects of services offered in the management of third stage of labour in Adamawa state has been under-investigated. Understanding the process and effects of management of third stage of labour and factors associated with poor outcomes is key to designing effective policies and programme to reduce maternal deaths and improve maternal health status[i]. The aim of this research is therefore to fill the gap in present understanding of factors associated with maternal deaths that occur as a result of the management of the third stage of labour in Adamawa State in order to make evidence-based recommendation for improved programmatic intervention.

Methodology

The study design involved cross-sectional as well as retrospective methods which permitted analysis at different levels. Cross sectional approach was used to highlight descriptively the trends of the variables under study while case-control design was used to probe for hypothesized associations. A multistage cluster sampling method was used. Two Local Government Areas were purposively selected from each of the three senatorial zones of the state. Each senatorial zone represents the social, cultural and economic units in the State and samples drawn from them are generalizable across the State.[1] All the tertiary and secondary public health facilities in the LGAs were included in the sample. A list of all public and private health facilities in each Local Government Area (LGA) was obtained from the Health Management Information System (HMIS) unit of the Ministry of Health. From the list of each LGA, two public primary health facilities comprising of one urban and one rural primary health facilities with highest delivery rates were selected. Similarly, two private health facilities comprising of one private for-profit and one private not-for-profit health facilities with high delivery rates were selected. In each health facility, the personnel in –charge of deliveries were identified and interviewed. All delivery records for the period of one year (July, 2013 to June, 2014) were obtained from selected primary health care facilities and same were obtained for the period of six months (January to June, 2014 from the secondary health care facilities) In-depth interviews were administered to health personnel in-charge of deliveries in each of the selected health facilities. Delivery process was observed by some trained observers in some selected health facilities

Result:

Finding from the research shows there are a high numbers of deliveries in the 29 health facilities visits with a total of 10278 deliveries recorded within 6months with a maternal death of 21 with a ratio of 204 per 100,000 live births. Poor reporting and detail documentation of maternal death was observation in the register domicile at the health facilities which makes it difficult to conduct surveillance and response of
maternal death. Interview with in charge of health facilities indicate that Over 90% maternal death occur in secondary and tertiary health facilities. Although the immediate cause of deaths were not explicitly recorded the delivery registers, other records and responses during interviews showed that the main causes of deaths are: Complications during third stage of labour, Infection, Obstructed labor and Eclampsia. The most commonly reported complications of labour were: Prolonged/Obstructed labour (0.9%), Hemorrhage (Postpartum, and antepartum) (0.8%) and Retained placenta (0.8%). Uterine antony was not quantitatively reported. Respondents to interviews have associated it with postpartum hemorrhage and also with aged and multigravida. Most of the reported hemorrhage is the postpartum hemorrhage. There were also some reported cases of intrapartum hemorrhage.

Management of third stage of labour

All the health personnel interviewed were aware of active management of third stage of labour and its basic components. However, there are some slight variations in the details of implementation of the components. Observation of the implementation of active management also showed that same variations exist among different health workers. The major difference is in the timing of the administration of uterotonic medications. While the standard practice is to administer uterotonic medication immediately after the delivery of the anterior shoulder, some health personnel do administer the medication just after engagement of the baby and before even the delivery of the head begins. However, the skilled personnel are not always available in all the health facilities. Another major barrier to the management of active 3rd of the labour is lake of available maternal lifesaving medicine and supplies like mistropotol and oxytocin.

Conclusion

Proper management of 3rd stage of labour in secondary and tertiary health facilities will significantly reduce maternal death. Also maternal medicine and supplies in combination with the skill birth attendance is very key to achieve a comprehensive maternal death reduction programs. In line global best practice detail report and recording keeping will aid good maternal death surveillance and response.

Reference

Knowledge, Attitude and Practices of Breastfeeding of Mothers in Rural and Urban Settings in the Federal Capital Territory, Nigeria

Article Review by Ogundana Adejoke Esther Aderonke
Master of Public Health, Texila American University
Email: - jbuddy09@gmail.com

Statement of the Problem

According to World Bank (2008), the percentage of children under 6 months that were exclusively breast fed in Nigeria was reported to be 17.20% in 2004 and 13.10 % in 2008. This indicates a decline in the practices of exclusive breastfeeding among mothers in the urban and rural settings in Nigeria. Also, a recent survey by the Federal Ministry of Health in Nigeria reveals that 13.1% of Nigerian children under six months are exclusively breastfed.

Hence the need to assess the knowledge, attitude and practices of breastfeeding among mothers in Nigeria using the rural and urban settings in the Federal Capital Territory as a case study.

Introduction

Breastfeeding is a very important way of providing the needed food and nourishment for the healthy growth and development of babies or infants. It is also relevant in the reproductive health of mothers.

Breastfeeding is an attitude inherited from generations in Nigeria. There are so many cultural beliefs attributed to breast feeding in communities in Nigeria which may have affected breast feeding practices. It was a culture in our society for a woman to breast feed her baby for 3years before weaning the baby but now most nursing mothers breastfeed their babies for 1 year while some breastfeed for less than a year.

WHO gave the recommendation that mothers worldwide are to breastfeed their infants exclusively for the first six months to achieve optimal growth, development and health, after which complementary foods that are nutritious could be given to the baby and to continue breastfeeding until two years or beyond.

In 2009, a review of the evidence on exclusive breastfeeding was conducted by WHO and UNICEF with the findings advocating that exclusively breastfeeding infants with only breast milk and no other foods for six months has several advantages which includes; lower risk of gastrointestinal infection for the baby, rapid maternal weight loss after birth, and delayed return of menstrual periods in the mother.

Rationale of the Study

A recent survey by the Federal Ministry of Health in Nigeria reveals that 13.1% of Nigerian children under six months are exclusively breastfed.

This was also confirmed by the report of World Bank (2008) which shows a reduction in the percentage of children under 6 months who were exclusively breastfed in Nigeria from 17.20% in 2004 to 13.10% in 2008.

This study is aimed at assessing the knowledge, attitude and practices of breastfeeding among mothers in Nigeria; as this will help discover possible gaps relating to breastfeeding among mothers in Nigeria and to provide recommendations that would be useful in addressing the gaps.

Study Objectives

General objective:
To assess the level of knowledge, attitude and practices of breastfeeding among mothers in urban and rural settings in Nigeria’s Federal Capital Territory (FCT).
Specific objectives:

i. To identify 10 health facilities i.e. primary health care (PHC) and comprehensive Primary health care (CPHC) in the Federal Capital Territory, Nigeria.

ii. To administer structured questionnaire to 40 nursing mothers at the identified PHCs and CPHCs.

iii. To ensure that a sample size of 400 nursing mothers were randomly selected for the purpose of this study at the identified health facilities.

Literature Review

The millennium development goal four is targeted at achieving a 2/3 reduction in child mortality by the year 2015, goal five is aimed at improving maternal health by reducing by ¾ the maternal mortality ratio by the year 2015. To achieve these goals aimed at child and maternal health, there is a need for achieving optimum breastfeeding of infants.

Agunbiade and Ogunleye (2012) in their research work stated that successful breastfeeding is essential in overcoming infant malnutrition which will in turn help in achieving the millennium goal four. The World Health Organization gave the report that countries in West and Central Africa have the highest record of child malnutrition and mortality rates worldwide. WHO further reported that 3 million children under the age of five years die every year, 56% of these deaths would have been averted if the children were not malnourished.

WHO in their record recommended that “promoting and supporting breastfeeding could be the single most important child survival intervention in West and Central Africa”.

Maduforo and Onuoha (2011) recorded in their research work that optimum breastfeeding practices contribute to the reproductive health of the mother; it also influences rapid maternal weight loss after birth, and delayed return of menstrual periods in the mother.

It is therefore evident that breastfeeding is relevant to the mother’s health as well. Achieving optimum breastfeeding practices among mothers will inevitably contribute to achieving the millennium goal five.

Agunbiade and Ogunleye (2012) reported from their research work that; the initiation and duration of breastfeeding practices among mothers can be influenced by multiple factors that are interconnected which includes political, cultural, health, economic factors and psychosocial.

Awi and Alikor (2006) in their research which was focused on the possible barriers to timely initiation of breastfeeding among mothers reported that; initiating breastfeeding early within thirty minutes of delivery has improved infant and maternal bonding. They also recorded how this can be achieved as reported from an experimental study conducted which revealed that babies who are left with their mothers after delivery start breastfeeding within the first half hour after delivery. They also stated that early initiation of breastfeeding establishes early lactation; it also prevents post-partum haemorrhage. Another added advantage of this is that infant that sucks directly from the breast have an outpouring of 19 different gastrointestinal hormones. This also applies to the mother; the hormones includes cholecystokinin and gastrin which are responsible for stimulating growth in the baby’s and mother’s intestinal villi, therefore increasing the surface area and absorption of calories with each feeding. This benefit of breastfeeding in infants and mothers can also be enhanced if breastfeeding starts earlier and lasts longer.

Alutu and Orubu (2005) reported in their research work that 98% of mothers in both rural and urban settings started breastfeeding almost immediately after delivery. It was also observed from their report that there were variations in the duration of exclusive breastfeeding among the mothers. Alutu and Orubu also discovered in the study that 16.7% of urban and 16.1% of rural nursing mothers initiate bottle feeding for their babies as early as 3 weeks of delivery.

In his research work, Mbada et al (2013) observed that out of nursing mothers in semi urban communities in Nigeria 71.3% had good knowledge of breastfeeding while 54% had positive attitude of breastfeeding.
Complementary feeding practices and poor breastfeeding are major close causes of malnutrition in the first two years of life in children. This was pointed out in a research conducted by Kimani-Murage et al (2011).

Interventions promoting optimal breastfeeding could prevent 13% of deaths while optimal complimentary feeding could prevent 6% of deaths in countries with high mortality rates (Gareth et al, 2003). Inadequate breastfeeding and complementary feeding practices have been observed and widely documented in developing countries. Only 39% of infants in the developing countries, 25% in Africa are exclusively breastfed for the first six months, while 6% where never breastfed in developing countries (Lauer et al, 2004).

Agho et al (2011) reported that the Baby Friendly Hospital Initiative (BFHI) was established by the Nigerian government in six states of the country. This was to emphasis the importance of breastfeeding as a factor relevant to infant nutrition, child mortality and morbidity which has been known and thus documented for a long time in the public health literature.

The aim of the BFHI in the six states was to focus on providing supportive environment for mothers and infants for breastfeeding and also to promote breastfeeding practices that are appropriate according to the WHO/UNICEF laid down standard on breastfeeding; achieving this aim should help to reduce infant mortality and morbidity rates (Salami L., 2006).

WHO/UNICEF reported that despite the intervention by the Government in establishing the BFHI, the mortality rate of child and infant continue to increase and be a major health issue affecting Nigeria. The Federal office of statistics in Nigeria reported that infant mortality rate from 1999 to 2003 (the five most recent years) is about 100 deaths per 1,000 live births.

In his recommendation for a close marking of the understanding of factors that could be associated with exclusive breastfeeding in Nigeria, Agho et al (2011) reiterated that this is essential in the development of effective and efficient interventions which will improve the rates of exclusive breastfeeding also bringing about a reduction in infant mortality.

Several factors that are said to be responsible for poor practice of exclusive breastfeeding as recommended by WHO/UNICEF; most especially in Nigeria. These factors which are common to both urban and rural settings were highlighted by Aloysius et al (2011) in his research these include; poverty, single parenting, working mothers, cultural issues, lack of belief in the benefits of exclusive breastfeeding, babies inability to suck early, multiple births and peer/family pressure.

Klein et al, (2005) recorded a high incidence of teenage mothers in our communities both rural and urban. He described the practice of exclusive breastfeeding of the infant by a teenage mother as an extra burden which might invariably fail, and this reflects in the impact on the infant as the risk of malnutrition and vulnerability to infections increases being so young. This could also be influenced by socio-economic factors.

The attitude and practices of breastfeeding by mothers is being faced with a great threat as reported by Davies, (1997) in his research. He further described the threat which is lack of adequate knowledge of exclusive breastfeeding as having a direct and serious influence on the practice of exclusive breastfeeding even on adequate breastfeeding. This also results to inability to apply the knowledge in breastfeeding.

Mothers who work either in the formal or informal sector face the challenge of practicing exclusive breastfeeding which is non-compatible with the reality of working outside the home. This constitutes an economical barrier, since effective exclusive breastfeeding for six months requires that the mother and her infant should be in close proximity through the period. The mother is also expected to use expressed milk only for a short duration (Isaton, 1998).

In the outcome of his research work which involved 480 nursing mothers, Ajibade et al, (2013) reported that 65% have heard of exclusive breastfeeding before from health facilities, family and friends and the media, while 35% declared that they have never heard of exclusive breastfeeding before. A poor practice of exclusive breastfeeding was also recorded by him as only 20% of the mothers practice this while 80% do not practice this at all. In his discussion he further buttressed that the practice of
breastfeeding among mothers in the community is not synonymous to the knowledge of the same. This also reveals the disparity which could exist between the knowledge of breastfeeding among mothers and the actual and ideal practice of it.

Alade et al (2013) reported that the practice of exclusive breastfeeding among mothers in the rural area is poor despite the high level of knowledge that was exhibited by the mothers. Nursing mothers in the rural areas still have a misconception about the effects of exclusively breastfeeding their children, this hence calls for an improved health promotion and education which will target the misconceptions and help reform the attitudes of mothers to exclusive breastfeeding in the rural areas.

Oche et al (2011) described that the educational level of mothers in Kware, northern Nigeria had no influence on the practice of exclusive breastfeeding; he also pointed out that there no difference in the attitude towards exclusive breastfeeding between mothers who had formal education and the ones who had informal education. It was also evident in his reports that mothers who are full time housewives practices exclusive breast feeding more compared to mothers who are civil workers. This was attributed to full time housewives having more time to be with their children than mothers who work outside the home.

In his research work on appraisal of nursing mothers’ knowledge and practice of exclusive breastfeeding in Yobe state Nigeria; Ajibuah (2013) reported the use of animal milk by 17.8% of the mothers, while 30% gave water and 4.3% commenced breast milk for their infants immediately after delivery. These practices were supported by divers’ cultural beliefs and traditions in the community.

It was observed that early initiation of breastfeeding in Nigeria is on the increase but the duration, attitude and practice of exclusive breastfeeding among the women who delivered their babies in a health facilities and outside the facility has remained very low (Ogunlesi, 2010).

The quality of breastfeeding practices among mothersis greatly being influenced by expectations and networks of supports. These factors exert pressure the nursing mothers and can make the breastfeeding experience pleasurable for them or otherwise (Blum, 1999).

Breastfeeding practices and attitudes depend greatly on the settings, culture and tradition of the community. The promotion of sustainable breastfeeding practices in our communities is being faced with socio cultural and socio economic factors which mitigates the successful implementation of the intervention (Spencer, 2008).

The report from Grassley and Eschiti (2008) showed the importance of grandmothers’ influence on breastfeeding practices and attitudes of nursing mothers. This is possible because of their roles, their experiences and knowledge over the years which could influence mothers to initiate breastfeeding early and also continue for over a year.

Oweis, Tayem and Froelicher (2009) reported that perspectives of breastfeeding mothers should be investigated with focus the barriers to breastfeeding and the promotion of healthy breastfeeding practices. This research work will aim at establishing the missing link between the knowledge, attitude and practices of breastfeeding mothers in rural and urban settings in the Federal Capital Territory, Nigeria which is observed in the literatures reviewed above.

**Methodology of Study**

**Study area**

This study was conducted in Nigeria’s Federal Capital Territory. XXX area councils in the state were covered in the course of the study.

The Federal Capital Territory, Abuja is the capital of Nigeria. It covers a land area of 713km2 with an estimated population of 979,876 (NDHS 2013). The federal Capital Territory has six (6) area councils with the chairman (area council chairman) who is a representative of the government over seeing the affairs of each area council.
**Study population**

The specific samples used in this study are pooled from among nursing mothers who attend immunization clinics at the health facilities which are the PHCs and CPHCs.

A total of 10 PHCs and CPHCs across 10 area councils (covering the rural and urban settings) in the FCT are used in this study.

**Study duration**

This study was conducted over a period of two (2) months.

**Sampling method**

Random sampling method was employed in the selection process for the samples used in this study.

**Sample size**

A sample size of 400 nursing mothers who attend immunization clinics at selected health facilities were randomly selected for the purpose of this study.

10 health facilities (PHCs and CPHCs) were identified and randomly selected out of the 27 functioning PHCs and CPHCs according to World Health Organization standard in FCT. 40 nursing mothers were selected randomly from each of the health facility.

**Study tools**

Structured questionnaire was administered to the selected nursing mothers. Specific questions tailored towards assessing the knowledge, attitude and practices of breastfeeding among mothers were included in the questionnaire. Questions that focus on obtaining demographic data of respondents were also included.

**Collection of data**

Some health care workers who had been sensitized on the purpose of the study were employed in administering the questionnaire with the respondents.

**Data analysis**

The Statistical Package for Social Scientists (SPSS) version 16 was used for analyzing the data collated in this study.

Chi-square tests was also conducted using the SPSS version 16; on each cross tabulation of variables used in the analysis.

Out of 400 respondents 8 did not give back their filled questionnaire; hence a total of 392 respondents filled accurately and submitted their questionnaire.

Respondents demographic and socio economic situations are presented in frequency tables below;

<table>
<thead>
<tr>
<th>Age group</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
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<td>&lt;20yrs</td>
<td>45</td>
<td>11.5</td>
<td>11.5</td>
<td>11.5</td>
</tr>
<tr>
<td>20-25yrs</td>
<td>107</td>
<td>27.3</td>
<td>27.3</td>
<td>38.8</td>
</tr>
<tr>
<td>25-30yrs</td>
<td>159</td>
<td>40.6</td>
<td>40.6</td>
<td>79.3</td>
</tr>
<tr>
<td>30-35yrs</td>
<td>68</td>
<td>17.3</td>
<td>17.3</td>
<td>96.7</td>
</tr>
<tr>
<td>35yrs and above</td>
<td>13</td>
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<tr>
<td>Total</td>
<td>392</td>
<td>100.0</td>
<td>100.0</td>
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</tr>
</tbody>
</table>
### Table 2 Sex

<table>
<thead>
<tr>
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<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>F</td>
<td>392</td>
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<td>100.0</td>
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</tbody>
</table>

### Table 3 Marital Status

<table>
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<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Single Mother</td>
<td>10</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>372</td>
<td>94.9</td>
<td>97.4</td>
</tr>
<tr>
<td></td>
<td>Separated</td>
<td>3</td>
<td>.8</td>
<td>.8</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>7</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
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</tbody>
</table>

### Table 4 Education

<table>
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<tr>
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<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>No Education</td>
<td>29</td>
<td>7.4</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>Primary Level</td>
<td>84</td>
<td>21.4</td>
<td>28.8</td>
</tr>
<tr>
<td></td>
<td>Secondary Level</td>
<td>185</td>
<td>47.2</td>
<td>76.0</td>
</tr>
<tr>
<td></td>
<td>Tertiary Level</td>
<td>78</td>
<td>19.9</td>
<td>95.9</td>
</tr>
<tr>
<td></td>
<td>Post graduate</td>
<td>16</td>
<td>4.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>392</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Table 5 Occupation

<table>
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<th>Frequency</th>
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<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Trader</td>
<td>86</td>
<td>21.9</td>
<td>21.9</td>
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<tr>
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<td>Public Servant</td>
<td>44</td>
<td>11.2</td>
<td>33.2</td>
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<tr>
<td></td>
<td>Self Employed</td>
<td>119</td>
<td>30.4</td>
<td>63.5</td>
</tr>
<tr>
<td></td>
<td>Private Employment</td>
<td>55</td>
<td>14.0</td>
<td>77.6</td>
</tr>
<tr>
<td></td>
<td>Not Employed</td>
<td>88</td>
<td>22.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>392</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

43 women out of the 392 respondents did not breastfeed their baby for 6 months without water (see table 6 below)
Table 6 Breastfed for 6mths without water

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>YES</td>
<td>349</td>
<td>89.0</td>
<td>89.0</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>43</td>
<td>11.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>392</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Using the Chi-Square tests, a cross tabulation of the women’s education versus number of children by the women was significant at a P value of < 0.05 (see Table 7a & 7b)

Table 7a Number of children vs. Education Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>No Education</th>
<th>Primary Level</th>
<th>Secondary Level</th>
<th>Tertiary Level</th>
<th>Post graduate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>14</td>
<td>54</td>
<td>25</td>
<td>7</td>
<td>106</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>25</td>
<td>67</td>
<td>29</td>
<td>4</td>
<td>130</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>21</td>
<td>30</td>
<td>17</td>
<td>1</td>
<td>76</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
<td>9</td>
<td>24</td>
<td>3</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>5</td>
<td>51</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>82</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>90</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>84</td>
<td>185</td>
<td>78</td>
<td>16</td>
<td>392</td>
</tr>
</tbody>
</table>

Table 7b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>64.589a</td>
<td>32</td>
<td>.001</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>55.894</td>
<td>32</td>
<td>.006</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>19.599</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>392</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 27 cells (60.0%) have expected count less than 5. The minimum expected count is .04.

In the analysis of the women’s knowledge about breastfeeding, a cross tabulation of the women’s knowledge about breast milk versus the level of education was significant at P value <0.05 (see Table 8a & 8b)
Table 8a Knowledge about breast milk vs. Education Cross tabulation

<table>
<thead>
<tr>
<th>Knowledge about breast milk</th>
<th>No Education</th>
<th>Primary Level</th>
<th>Secondary Level</th>
<th>Tertiary Level</th>
<th>Post graduate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know that breast milk is important as the first and ONLY food for the baby immediately after birth</td>
<td>24</td>
<td>73</td>
<td>163</td>
<td>67</td>
<td>12</td>
<td>339</td>
</tr>
<tr>
<td>I know that breast milk cannot be sufficient after birth so I need to give formula supplement</td>
<td>3</td>
<td>6</td>
<td>13</td>
<td>7</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>I know that the first breast milk I produce is not good so I must express it away and must not give my baby until later</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>84</td>
<td>185</td>
<td>78</td>
<td>16</td>
<td>392</td>
</tr>
</tbody>
</table>

Table 8b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>5.937a</td>
<td>8</td>
<td>.654</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>4.261</td>
<td>8</td>
<td>.833</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.427</td>
<td>1</td>
<td>.513</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>392</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 6 cells (40.0%) have expected count less than 5. The minimum expected count is .94.

Significance was also observed in the analysis of the women’s knowledge about breast feeding versus their actual practice of exclusive breastfeeding for 6 months (see Table 9a & 9b)
Table 9a Breastfed for 6mths without water vs. Knowledge about breast milk Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>Knowledge about breast milk</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I know that breast milk is important as the first and ONLY food</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for the baby immediately after birth</td>
<td></td>
</tr>
<tr>
<td>Breastfed for 6mths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>without water</td>
<td>YES</td>
<td>314</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>339</td>
</tr>
</tbody>
</table>

Table 9b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>69.666a</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>43.420</td>
<td>2</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>.036</td>
<td>1</td>
<td>.849</td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>392</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.52.

Cultural values relating to breast feeding was analyzed and a significance was observed in the cross tabulation of cultural beliefs versus the practice of exclusive breast feeding (see Table 10a & 10b)

Table 10a Breastfed for 6mths without water vs. Culture about breastfeeding Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>Culture about breastfeeding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breastfeeding baby at birth is not allowed in my culture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My culture does not allow exclusive breastfeeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My culture has nothing to do with exclusive breastfeeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In my culture the baby must be given concoctions and herbs as he</td>
<td></td>
</tr>
<tr>
<td></td>
<td>breastfeeds</td>
<td></td>
</tr>
<tr>
<td>Breastfed for 6mths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>without water</td>
<td>YES</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

Cultural values relating to breast feeding was analyzed and a significance was observed in the cross tabulation of cultural beliefs versus the practice of exclusive breast feeding (see Table 10a & 10b)
The analysis of how cosmetic issues affect the practice of exclusive breast feeding show significance (see Table 11a & 11b)

Table 11a Breastfed for 6mths without water vs. Breast feeding effect on the breast Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>Breastfeeding effect on the breast</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breastfeeding can make my breast to be flat or saggy</td>
<td>Breastfeeding will not allow me to dress smartly</td>
</tr>
<tr>
<td>Breastfed for 6mths</td>
<td>YES</td>
<td>3</td>
</tr>
<tr>
<td>without water</td>
<td>NO</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

Table 11b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>6.108</td>
<td>3</td>
<td>.106</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>4.229</td>
<td>3</td>
<td>.238</td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>2.188</td>
<td>1</td>
<td>.139</td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>392</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An analysis of husbands encouraging their wives to breast feed and the practice of exclusive breast feeding among the women was significant (see Table 12a & 12b)
Table 12a Breastfed for 6mths without water vs. Husband’s encouraging wives to breastfeed Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>Husband encouraged to breastfeed</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>346</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td>Breastfed for 6mths</td>
<td></td>
<td>382</td>
<td>10</td>
</tr>
<tr>
<td>without water</td>
<td></td>
<td></td>
<td>392</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>36.615a</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correctionb</td>
<td>30.675</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>20.396</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td>20.396</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>36.521</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 1.10.

b. Computed only for a 2x2 table

In laws encouragement on exclusive breast feeding plays important roles in achieving the actual practice of exclusive breastfeeding by the women (see Table 13a & 13b)

Table 13a Breastfed for 6mths without water vs. In-laws encouragement to breastfeed Cross tabulation

<table>
<thead>
<tr>
<th>Count</th>
<th>In-laws encourage to breastfeed</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>340</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td>29</td>
<td>14</td>
</tr>
<tr>
<td>Breastfed for 6mths</td>
<td></td>
<td>369</td>
<td>23</td>
</tr>
<tr>
<td>without water</td>
<td></td>
<td></td>
<td>392</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 13b Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>62.297a</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correctionb</td>
<td>56.988</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>37.195</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td>37.195</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>62.138</td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Computed only for a 2x2 table
a. 1 cell (25.0%) have expected count less than 5. The minimum expected count is 2.52.
b. Computed only for a 2x2 table

**Observations and Findings**

**Respondents’ profile**

Age (Table 1): Among the respondents mothers under the age of 20 years are 11%, 20-25 years are 27%, 25-30 years are 41%, 30-35 years are 17%, and above 35 years are 3%.

Marital status (Table 3): Single mothers among the respondents are 3%, married are 95%, separated are 1%, and divorced are 2%.

Level of education (Table 4): Respondents who had no education among the respondents are 7%, those with primary education are 21%; mothers with secondary education are 47%; while mothers with tertiary and postgraduate level of education are 20% and 4% respectively.

Occupation (Table 5): Traders among respondents are 22%, public servants are 11%, those that are self-employed and those who work for private organizations are 30% and 14% respectively; while the non-employed are 22%.

**Knowledge of the mothers (respondents) about breast milk and their educational levels (Table 8a)**

339 mothers (respondents) are knowledgeable about the importance of breast milk as the first and only food for the baby immediately after birth out of which 93% are educated and 7% had no education.

30 mothers have the knowledge that breast milk cannot be sufficient for their babies after birth and hence they supplement with baby formula. 90% of these are educated while 10% had no education.

23 mothers have the knowledge that the first breast milk after delivery is not good and must be expressed away not to be given to the baby; 91% of these mothers are educated and 9% had no education.

**Knowledge of the mothers about breast milk and their actual practice of breastfeeding for 6 months without giving the baby water (Table 9a)**

(Out of 392 respondents 349 mothers breastfed their babies for 6 months without giving water while 43 did not breastfeed for 6 months without giving water).

90% of mothers who practiced breastfeeding their babies for 6 months without giving the baby water had knowledge that breast milk is important as the first and only food for the baby immediately after birth.

4% of mothers who practiced breastfeeding their babies for 6 months without giving the baby water had knowledge that breast milk cannot be sufficient for the baby after birth so they give baby formula as supplement.

6% of the mothers who practiced breastfeeding their babies for 6 months without giving the baby water had knowledge that the first breast milk produced after birth is not good and must be expressed away not to be given to the baby.

**Practice of breastfeeding for 6 months without giving water by mothers and their cultural beliefs (Table 10a)**

6 mothers had belief in their culture which does not allow breastfeeding a baby at birth; 83% of them practiced breastfeeding for 6 months without giving water.

17 mothers believed in their culture which does not allow exclusive breastfeeding; 47% of this mothers practiced breastfeeding for 6 months without giving water.

361 mothers believed in a culture that has nothing to do with exclusive breastfeeding; 92% of the mothers practiced breastfeeding for 6 months without giving water.

8 mothers had cultural beliefs that babies must be given concoctions and herbs alongside with breastfeeding; 50% of this group practiced breastfeeding for 6 months without giving water.
Practice of breastfeeding for 6 months without giving water by mothers and their dressing/cosmetic concerns (Table 11a)

1% of mothers who practiced breastfeeding for 6 months without giving water had concerns that breastfeeding can make their breast to be saggy.

2% of mothers who practiced breastfeeding for 6 months without giving water had concerns that breastfeeding will not allow them to dress smartly.

5% of mothers who practiced breastfeeding for 6 months without giving water had concerns that breastfeeding will make them to be too cautious of their look and dressings.

92% of mothers who practiced breastfeeding for 6 months without giving water had no concerns about breastfeeding affecting their look or dressing in anyway.

Practice of breastfeeding for 6 months without giving water by mothers and husbands encouragement for breastfeeding (Table 12a)

99% of mothers who practiced breastfeeding for 6 months without giving water received encouragement from their husbands.

1% of mothers who practiced breastfeeding for 6 months without giving water do not receive encouragement from their husbands.

Practice of breastfeeding for 6 months without giving water by mothers and in-laws encouragement for breastfeeding (Table 13a)

97% of mothers who practiced breastfeeding for 6 months without giving water had encouragement from their in-laws

3% of mothers who practiced breastfeeding for 6 months without giving water did not receive encouragement from their in-laws.

Discussions

This research work is focused on assessing the level of knowledge, attitude and practices of breastfeeding among mothers in urban and rural settings in Nigeria’s Federal Capital Territory (FCT). It is evident in this study that the practice of breastfeeding among mothers is tied to some factors which also affect mother’s attitude to breastfeeding most especially exclusive breastfeeding.

It is evident from the observations that education is a key factor that relates to the knowledge of mothers about breastfeeding; this factor could be very useful in improving the practice of breastfeeding among mothers if worked upon.

It is observed from the assessment conducted in this study that the quality of knowledge mothers have as relates to breastfeeding affects their actual practice of the same; for example more mothers who had the knowledge that breast milk is important as the first and only food for the baby immediately after birth breastfed their babies exclusively for 6 months.

Other factors responsible for possible gaps in the practice of breastfeeding among mothers identified in this study include cultural beliefs, dressing or cosmetic concerns, lack of partner involvement and lack of encouragement from in-laws.

Evidently, mothers who had cultural beliefs that does not allow or accept exclusive breast feeding practiced exclusive breastfeeding less than mothers whose cultural beliefs had nothing to do with breastfeeding in anyway.

The practice of exclusive breastfeeding is being sabotaged among some mothers by their dressing or cosmetics concerns. It is obvious that mothers who had no concerns about breastfeeding affecting their look or dressing in anyway breastfed for 6 months exclusively more than mothers who had concerns about their breasts being saggy or not being able to dress smartly or being too cautious of their looks and dressings.
As evident in this study, most of the mothers who breastfed exclusively had partner support while others do not. Hence, lack of partner involvement or husband’s encouragement affects breastfeeding practice among mothers.

Support or encouragement from in-laws is another important factor relevant to the practice of breastfeeding among mothers. Most families in Nigeria are being influenced greatly by in-laws most especially mother-in-laws. From the findings of this study it is obvious that in-laws support and encouragement plays an important role in achieving successful exclusive breastfeeding practice by most mothers.

It is therefore important that intervention effort towards improving breastfeeding practice among mothers in Nigeria must include reaching to in-laws of these mothers.

**Conclusion**

The gaps affecting the practice of exclusive breastfeeding among mothers identified in this study are more with factors that fuel insufficient or wrong knowledge about breast milk and breastfeeding, factors that affect attitude of mothers to exclusive breastfeeding and factors that directly affect the practice of exclusive breastfeeding by mothers.

It has also been established in this study that the knowledge of mothers about exclusive breastfeeding and their attitude to the same affects their actual practice of exclusive breastfeeding.

**Recommendations**

To address the gaps identified in this study, below are recommendations with focus on addressing each gap identified:

- To improve the quality of knowledge mothers have about breastfeeding, health talks focusing on benefits of exclusive breastfeeding should be intensified in all health facilities. Role models in the media could also be used to dramatize the benefits of exclusive breastfeeding.
- Sensitization via the media on importance of breast milk to babies, the benefits of exclusive breastfeeding to babies and mothers should be intensified in all the communities to address the gap of cultural beliefs.
- Sensitization on healthy living should be presented in health facilities during ante natal care visits to help mothers understand how to take care of their bodies and look good even while breastfeeding.
- Partner involvement in ante natal care visits should be encouraged in the health facilities. If partners attend ante natal clinics with their wives, it will be possible for them to provide necessary support for the wife to achieve exclusive breastfeeding.
- Mother-in-laws and other members of the family could be reached via the media with sensitization on their expected roles in achieving successful breastfeeding practices by mothers. Role models could be used for this purpose.

**Project Summary**

This study was conducted to assess the knowledge, attitude and practice of breastfeeding among mothers in Nigeria, to discover possible gaps where present and to provide salient recommendations that will be useful in addressing the gaps identified.

It was observed in this study that the knowledge of mothers about exclusive breastfeeding and their attitude to the same affects their actual practice of exclusive breastfeeding.

The gaps observed by this study in the practice of exclusive breastfeeding among mothers are being fueled by the following factors; wrong / inadequate knowledge of mothers about breast milk and exclusive breastfeeding, cultural beliefs, dressing / cosmetics concerns, lack of partner involvement and lack of encouragement from in-laws.
References


[5]. Aloysius N. Maduforo and Romanus O. Onuoha; (2011) Relativities of exclusive breastfeeding between urban and rural lactating women in Imo state JORIND 9 (1) ISSN 1596 8308


[26]. UNICEF global databases, 2014
An Overview to Voluntary Harmonization Procedure (VHP) - Approach to Clinical Trial Application (CTA)

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Abstract

The clinical trial application (CTA) approval in the European Union (EU) member state has been subject to national legislation. Due to this the assessment of a CTA that was filed simultaneously in several EU member states often resulted in varying final decisions and unnecessary delays. Sometimes country-specific modifications to the application often occurred due to changes requested by the different regulatory/competent authorities (RA/CA) and ethics committees (EC). Sometimes a clinical trial might even be approved in one member state and rejected in another. The whole procedure could be extremely time-consuming and the country-specific modifications risk the scientific value of clinical trial results. The Voluntary Harmonisation Procedure (VHP) offers sponsors of multinational clinical trials involving three or more EU member states a harmonised procedure for the regulatory assessment of clinical trial authorisation applications. The Voluntary Harmonisation Procedure makes it possible to obtain a coordinated assessment of an application for a clinical trial that is to take place in several European countries.

Keywords: Clinical trials, Voluntary Harmonisation Procedure (VHP), Clinical trial application (CTA), Regulatory authority approval, European Union (EU)

Introduction

The clinical trial application (CTA) process to perform a clinical trial in Europe takes place on a country-by-country basis. Therefore, a sponsor must apply for approval in each country in which it intends to have study sites. While the processes are similar in most countries, there are slight differences and in some cases, additional material must be submitted in many European countries, a sponsor must submit a copy of the insurance coverage obtained to cover the clinical study. E.g. the regulatory authority that governs therapeutics in the UK is the Medicines and Healthcare products Regulatory Agency (MHRA). To file a clinical trial application in the UK, a sponsor must reside or have a legal representative in the EU. The specific requirements for each country in the EU are outlined in a guidance document published by the European Commission.

Traditional Clinical Trial Application (CTA);

The guidance for CTA is outlined by European commission (EC), the detailed guidance is based on Article 9(8) of Directive 2001/20/EC of the European Parliament and of the Council of 4 April 2001 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the implementation of good clinical practice in the conduct of clinical trials on medicinal products for human use.

Major parts of a clinical trial application (CTA)

A clinical trial application consists of several major parts:
- Covering letter: This should contain EudraCT (European Clinical Trials Database) number, the title and number of the study protocol, and information on any special issues such as first-time use in humans, use of special populations, or unusual trial design.
- Clinical trial application form: The form is available from the EudraCT website.
• Protocol: The protocol should include an evaluation of the anticipated benefits and risks, a justification for including any subjects who may not be able to provide informed consent (if applicable), and a description of the plan to provide additional care once patients leave the study, if different from normal medical care.
• Investigator's Brochure (IB) or Summary of Product Characteristics (SmPC)- provide the SmPC when a drug has been commercialized. The IB should be prepared from all available information and evidence that supports the rationale for the proposed clinical trial and safe use of the investigational product.
• Investigational Medicinal Product-related data: Include the Investigational Medicinal Product Dossier (IMPD). This contains summaries of information related to the quality, manufacture and control of the investigational product. It should include chemical, pharmaceutical and biological data, non-clinical pharmacology and toxicology data, previous clinical trial and human experience data, and overall risk and benefit assessment. In cases where the investigational product has a marketing authorization in another EU member state or it has been approved in another pharmaceutical form, the sponsor can provide an abbreviated IMPD.
• XML file of the application form: Provide the complete data set.
• Applicable fee.

The specific requirements for each country in the EU are outlined in a guidance document published by the European Commission.

Country-specific modifications to the application often occurred due to changes requested by the different CA and EC. In some cases, a clinical trial might even be approved in one member state and rejected in another. The entire procedure could be extremely time-consuming and the country-specific modifications risk jeopardising the scientific value of clinical trial results. In response, a requirement was identified for harmonisation of the assessment of multinational clinical trial applications in the EU. This requirement was guided by the need to protect clinical trial participants, ensure high quality research and bring innovative medicines to patients as quickly as possible.

Voluntary Harmonization Procedure (VHP)

In 2004, the EU Heads of Medicines Agencies (HMA) established a Clinical Trials Facilitation Group (CTFG) to coordinate the implementation of the EU clinical trials directive 2001/20 EC across the member states. In 2009, the CTFG proposed a voluntary harmonisation procedure (VHP) for assessing multinational CTAs. The latest version of this procedure streamlines the assessment of multinational CTAs to be conducted in the EU in order to enlarge the scope of the pilot phase and shorten the timelines. To date, all EU member states have accepted and are implementing the VHP except Poland, where there are some country-specific requirements that need to be fulfilled to facilitate successful clinical trial applications. The VHP committees composed of representatives of the different national agencies.

The Voluntary Harmonisation Procedure is a procedure which makes it possible to obtain a coordinated assessment of an application for a clinical trial that is to take place in several European countries.

The EU Heads of Medicines Agencies (HMA) agreed in 2004 to establish a clinical trials facilitation group (CTFG) to co-ordinate the implementation of the EU clinical trials directive 2001/20 EC across the member states. This document is produced by the CTFG in order to propose a harmonised procedure for assessing multinational clinical trials (CT) by the National Competent Authorities (NCA) in EU.

When the clinical trials directive came into force in the European Union (EU) in 2004, the Heads of Medicines Agencies established the Clinical Trials Facilitation Group (CTFG) to support the authorization of clinical trials across the member states. One important request to the European Medicines Agency was to issue alerts to national competent authorities (NCAs) — the agencies that assess clinical trial applications in each member state; for example, the Medical Products Agency in Sweden and the Paul-Ehrlich-Institut (PEI) in Germany — from the clinical trials database EudraCT which was
established through the directive and is not currently publicly accessible] whenever there was a negative decision or withdrawal about a clinical trial in any of the member states. Through the alerting system we found that there were divergent decisions being made about the same clinical trials in different member states.

The assessment is conducted and coordinated between the national competent authorities (medicines agencies) of the countries in which the trial is to take place following which the application is submitted to the countries involved. It is an offer through which sponsors can obtain a harmonised assessment of an application. The actual trial must still be authorised at national level, and it is therefore not a centralised authorisation. Provided that the VHP assessment reaches consensus, the scientific content of the application must not be changed when submitted to the national competent authorities. However, it may be adapted to meet national requirements.

**VHP steps**

The VHP will comprise three phases:

- Phase 1: Request for VHP and validation of the application
- Phase 2: Assessment step: review of a CTA by the NCAs of the participating MS
- Phase 3: National step, with formal CTAs to all concerned NCAs

Phase 1 and 2 are actually composing the submission phase to the CTFG. Phase 3 is the formal submission of a CT to each NCA according to the national regulations.

**Request for VHP and validation of the application**

In the request for VHP, the applicant should shortly describe the key features of the CT and indicate which EU countries will be involved in the MN-CT. The request for VHP should also contain all the documentation required for the assessment of the CTA by the MS.

2.1.1 At any time, the applicant informs the VHP-C by sending the request for VHP to VHP-CTFG@VHP-CTFG.eu via E-mail/Eudralink, highlighting important features of the MN-CT and the documentation required for the assessment of the CTA

2.1.2 Upon receipt of the request and VHP-documentation, the VHP-C creates a new file in the VHP database and allocates a VHP number

2.1.3 The complete VHP-documentation is forwarded electronically by VHP-C to the P-NCAs immediately after receipt

Within 5 working days after receipt, the VHP-C informs the applicant whether all requested MS will participate. Validation of the dossier will also be performed and the applicant will be informed of any deficiencies or, if complete, the start date of the VHP.

All timelines in the VHP are calendar days with one exception: the 5 working days between initial 4 submission and confirmation by the VHP-C (0) and the 5 working days when submitting VHP-substantial amendment (VHP-SA)(7.1).

In those MS declining participation in the VHP, a national CTA in parallel to the VHP or after the VHP is possible.

**VHP CTA assessment step**

Of note, the timelines proposed hereby are maximum timelines. Whenever possible for the P-NCAs, the timelines can be shorter.

Important: during the entire VHP, any contact from the applicant to the P-NCA should be avoided and the VHP-C being the only contact for the applicant to ensure that all P-NCA receive identical information.

**VHP Assessment Step I (Day 1-Day 30)**

- In the absence of grounds for non-acceptance (GNA)/ request for further information (RFI), a statement will be sent by the VHP-C to the applicant (copy to all P-NCAs), not later than day 30, stating that no
GNA/RFI have been expressed by any P-NCA during the VHP assessment phase and that the P-NCAs unanimously consider the CTA (with date & version #) acceptable for this MN-CT. The final step, i.e. submission of a CTA in each participating MS, can then start (See Section 6.3 National step)

In case of GNA/RFI:
- A consolidated list of GNA will be forwarded to the applicant by the VHP-C via E-mail/Eudralink on day 30 with a request for response to the GNA/RFI and/or for the revised CT documentation by E-Mail/Eudralink by day 40 at the latest
- If the applicant decides to proceed, the VHP assessment step II starts on receipt of the responses together with a revised CT documentation by the VHP-C.
- The VHP file will be closed with a notice to the applicant and the P-NCAs if no response from the applicant is received within the allotted time

**VHP Assessment Step II (Day 40-Day 60)**

The applicant's response document is immediately dispatched by the VHP-C to all P-NCAs for review. After a 7-day period, the VHP-C compiles the P-NCAs assessments.
- If consensus is achieved, i.e. the revised version of the CTA is considered approvable by all P-NCAs on day 50, the VHP-C sends to the applicant a statement by electronic mail (copy to all P-NCAs), mentioning that all GNA/RFI have been resolved and that the P-NCAs unanimously consider the revised CTA (with date & version #) as approvable.
- If no consensus is among the P-NCAs a teleconference will be organised (between day 50 and day 57), during which all P-NCAs are invited to express their views and possible solutions to the remaining issues so that a final decision can be given at the end of the meeting:
  - Unanimous decision of the MS that the revised version of the CTA is approvable: an electronic letter to the applicant will be sent on day 60, mentioning that all GNA/RFI have been resolved and that the P-NCAs unanimously consider the revised CTA (with date & version #) as approvable. Comments to facilitate the national submission in the MS might be added. The final step, i.e. submission of a CTA in each participating MS can start (See Section 6.3 National step).
  - Unanimous decision of the MS that the revised version of the CTA is not approvable: an electronic letter will be sent to the applicant on day 60 with the remaining GNAs and proposed solutions for national submissions or a VHP-resubmission. Comments to facilitate national submissions in the MS or a VHP-resubmission might be added.
  - In the case that not all P-NCA agree, that all GNA/RFI have been resolved, the open points and the names of MS, which consider GNA/RFI as unsolved, will be forwarded to the applicant. Also the list of MS, which consider all GNA/RFI as re-solved, will be forwarded. The open points have to be resolved before or in the national procedure, the timelines for the submission of the CTA (20 days) and the approval by the NCA (10 days) do not apply for the MS with unsolved GNA.

**“National step” Formal CTA**

The acceptability statement following the VHP does not imply that the MN-CT is authorised by the P-NCAs. Once the applicant has been notified that the CTA is considered acceptable (at the end of the VHP assessment Step I or II), a CTA has to be submitted in each participating MS as outlined in the Clinical Trial Directive (2001/20/EC) and in the Detailed guidance for the request for authorisation of a clinical trial on a medicinal product for human use to the competent authorities, notification of substantial amendments and declaration of the end of the trial (ENTR/F2/BLD 2003. current version). In his covering letter for the CTA, to the NCAs the sponsor should remind the NCAs that this MN-CT has undergone the VHP and add the E-Mail with the VHP approval. Generally, no changes between the final CTA and the CTA approved during the VHP will be accepted.
However, if at the end of the VHP process, a NCA has considered GNA as unsolved or if the solutions proposed by that NCA are not acceptable for the sponsor, the sponsor may decide to skip the filing of a CTA in that MS. Or if the sponsor decides to apply in a MS that was initially not part of the VHP, the NCA of the new MS may accept the decisions taken in the VHP, without changes by the sponsor to the documents that have been agreed in the VHP.

Submissions of the CTA to the NCAs should not be later than 20 days after receipt of the VHP acceptability statement by the applicant.

It is agreed by the MS, that after a positive VHP a decision of the NCA should be issued within 10 days and that no scientific discussion on the agreed documents of the VHP (e.g. Protocol, IB, IMPD) will be started again.

The applicant should notify a list of the dates of authorisation of the MN-CT to the VHP-C, when available.

### VHP application

Any clinical trial sponsor, commercial or non-commercial, can apply for a VHP if they are planning to submit a clinical trial application to at least three EU member states. When we first offered the procedure, we stated that the multinational clinical trial had to be either a first-in-human clinical trial or a trial for a critical product (that is, an investigational medicinal product with a novel mode of action, a novel manufacturing process or novel administration). However, the only restriction we now have is that the application has to be destined for at least three EU countries.

We decided not to charge application fees for participating in the VHP because we were concerned that this would discourage sponsors to use the process. As the assessment of the trial will be done once, we came to the conclusion that a sponsor should be charged by the NCAs only.

### The Pharmaceutical approach and the VHP

Despite the fact that all members of the EU (excluding Poland) have accepted the VHP as a valid approach to gaining clinical trial approval, there are still many sponsors and contract research organisations (CROs) that have yet to use it. Prior to the introduction of the VHP two years ago, it was expected that the new procedure would be immediately accepted and used across the pharmaceutical industry. While there is evidence that the VHP is being increasingly adopted, some companies have shown reluctance due to a number Firstly, there is a perceived risk associated with the fact it is a new procedure.

Sponsors are not familiar with the process and are afraid that it might not be as effective as expected. As a result, they prefer to use established processes that have been more commonly used. Another factor that has resulted in limited adoption of the VHP to date is that it is free of charge. Many sponsors believe that non-paid approval procedures are of low value compared to submissions which are subject to a fee.

### Results of the Voluntary Harmonisation Procedure 2009 – 1/2013(HMAs Clinical Trials Facilitation Group Status 30.1.2013)

![Number of VHP submission per year in EU](image)

**Figure 1:** Number of VHP submission per year in EU
VHP for challenges with Europe’s clinical trial directive

VHP offers what many stakeholders have requested: a ‘one stop shop’ to gain a positive decision for a multinational clinical trial. The current legal framework does still require the sponsors to apply to each NCA for national authorization of their clinical trials. However, we think that we have used the current framework in a pragmatic way to solve many of the problems that sponsors have with the clinical trials directive. We are now confident that we offer a highly attractive alternative to the system of separately applying to each member state. The process needs to more efficiently use our resources. But, as this is a voluntary procedure for both the sponsors and the member states, it can be improved very quickly by the agreement of all. We do not have to change laws to change the way we conduct the VHP.

One of the major issues of the clinical trials directive that the VHP does not solve is the fact that as well as applying to the NCA in each member state to gain approval of a clinical trial, sponsors also have to apply to the respective ethics committees. It may be a good idea to submit applications to the VHP and the ethics committees at the same time. But we are only just starting to have discussions with some of the relevant organizations in the member states to determine whether ethics committees would be involved in the VHP assessments as well.

Disadvantages of VHP

Guidance document outlining the Voluntary Harmonisation Procedure was published in February 2009 by the Clinical Trials Facilitation Group, set up by the Heads of Medicines Agencies in the European Union to co-ordinate the implementation of the clinical trials Directive, 2001/20/EC.

One effect of the Directive’s translation into national law has been divergence in the national assessment of multinational clinical trials (MN-CTs), with protocol changes and the subsequent amendments required in other member states making some applications a ―never-ending story‖, as Professor Heiko von der Leyen of the Hannover Clinical Trial Centre in Germany described it at the TOPR symposium.

Reasoning that harmonising procedures for CTA assessment after the applications had been filed would be difficult and perhaps even counterproductive, coming at the end of an already lengthy process, the CTFG’s guidance proposed a Voluntary Harmonisation Procedure that would occur before the initial phase of national assessment.

The VHP is an incremental process whereby Phase 1 constitutes a ―pre-procedural‖ or ―request for a VHP‖ step; Phase 2 is an assessment step, involving the review of the draft CTA by the national...
competent authorities (NCAs) of participating member states; and Phase 3 occurs at national level, with formal clinical trial applications to all of the concerned NCAs.

The procedure is also completely electronic, which helps to speed up the evaluations. In a best-case scenario, von der Leyen noted, the VHP should mean approval of the CTA in multiple member states within two months.

**Conclusion**

VHP has been positive and the process to operate in accordance with version 2 of the CFTG’s guideline. Efficiencies have been realised, particularly with respect to the resolution of GNA from multiple MS at a single well defined time in the procedure. It is not possible to say whether fewer questions were received than if separate national procedures had been followed. However, the CTFG has indicated that some consolidation of questions can occur prior to sponsors receiving questions. We have found the impact on study start-up timelines to be neutral. We anticipate that greater efficiencies and scientific benefits may be obtained when seeking authorisation of large studies involving more countries than in the three case studies described, such as for large Phase III studies.

A co-ordinated assessment procedure for clinical trials in the EU is one of the key options on the table in the European Commission’s ongoing revision of Directive 2001/20/EC, which is expected to produce a concrete legislative proposal next year.

Between 2007 and 2010, there was a 15% decline both in the number of MN-CTs with EU sites and the number of EU subjects participating in those studies, he noted. More specifically, there were 5,028 clinical trial applications across the EU in 2007 and only 4,193 in 2010. The VHP would perhaps have been more widely and readily accepted if more efficient promotional activities had been conducted. However, many cases have proven that the VHP is a low-risk and highly beneficial procedure, with more than 50 successful applications completed to date. As more concrete results come to light demonstrating the usability of the procedure and a greater understanding of its benefits and use are communicated, it can be expected that the VHP will become increasingly adopted by the industry.

**References**

[9]. Guidance document for a Voluntary Harmonisation Procedure (VHP) for the assessment of multinational Clinical Trial Applications Version Sponsor 1.1. Pilot Phase proposed by CTFG.

Comparative Assessment of Five Laboratory Techniques in the Diagnosis of Pulmonary Tuberculosis in Abuja

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Abstract

A total of 340 specimens from 192 (56.5%) male and 148 (43.5%) females attending tuberculosis clinics in Abuja metropolis were analysed by five different laboratory techniques (ZN Direct, ZN Bleach, LJ slants, BACTEC and Serology TB) for the diagnosis of Mycobacterium tuberculosis. Comparative analysis of results at P=0.05, revealed that there was a statistical significant (X²=127.1, P<0.001) difference between the diagnostic performance of the five laboratory techniques. A follow-up analysis based on the 95% confidence interval of pair differences in proportion between the five techniques indicated that the BACTEC assay was the major source of the difference(P<0.001) in pair methods. Comparison of the 95% confidence limit of pair differences in diagnostic specificity of Mycobacterium tuberculosis between ZN-BACTEC and other methods confirmed (P<0.001) the high detection rate of BACTEC. It was observed that BACTEC had the highest detection rate (61.2%), followed by LJ (31.2%), then ZN Bleach (30.3%) and ZN Direct (28.8%), while Serology had only 25.3% ZN BACTEC appeared to the most reliable, and time effective combination. ZN Bleach should be encouraged in poor resource settings in lieu of the conventional three standard smears for ZN Direct. The use of Serologic TB kit alone for the diagnosis of tuberculosis should be discouraged.

Keywords: Mycobacterium tuberculosis, BACTEC, Laboratory and Serology.

Introduction

Pulmonary tuberculosis is an infection caused by the human tubercle bacillus called Mycobacterium tuberculosis. It is a long, curved rod at least 1-4um long and arranged either singly or in small clumps. [1]. They do not grow on ordinary media, preferring egg media such as Lowensterin-Jensen media. The most important source of Tuberculosis (TB) is an untreated Pulmonary Tuberculosis (PTB) patient. When such a person coughs, spits or sneezes, tiny droplet nuclei containing the tubercle germs are released. Transmission is through inhalation of these droplet nuclei. It is also transmitted by swallowing the bacteria from hands and infected utensils and materials. Mycobacterium tuberculosis is contagious but only 5% - 10% of infected normal individuals develop active disease [2]. The clinical signs and symptoms of Tuberculosis include: Chronic cough productive of mucoid or purulent sputum, pneumonia, fever worse at night, night sweats, chest wall pains, breathlessness, localized wheeze frequent cold, loss of weight etc.

Pulmonary tuberculosis remains an important socio-economical and medical problem throughout the world. According to the Centre for Disease Control and Prevention [3], the incidence of pulmonary tuberculosis is expected to increase from 7.5 million cases per year in 1995 to 11.9 million in 2005. The case fatality rate is estimated at 55% for untreated people and 15% for the treated patients.
Mycobacterium tuberculosis (MTB) infects about one-third of the world’s population (i.e. 1.8 billion people) and causes more death worldwide than any single infectious diseases. It is the leading cause of infectious mortality worldwide accounting for three million (3million) deaths per year [4]. Majority of these individuals live in developing countries where the prevalence of Human Immunodeficiency Virus (HIV) infection is also high. However, eight million people are newly infected annually and each active TB patient is capable of infecting 10-15 persons yearly [5]. TB is associated with poverty, overcrowding, alcoholism, stress, drug addiction and malnutrition. The disease spreads easily in overcrowded, badly ventilated places among people who are undernourished. The population at risk are the prisons, hospitals, overcrowded homes, homeless shelters, schools, medical clinics etc [6]. A diagnosis of active disease is based on clinical manifestations of an abnormal chest radiograph, Acid-fast Bacilli (AFA) in sputum or bronchoscopic specimens and recovery of the organism. Assays based upon amplification of mycobacterial gene in clinical specimens are also currently being tested. According to the prevalence of tuberculosis, there are four times more cases of sputum negative pulmonary TB than sputum positive. In such cases, usually a therapeutic trial of ant tubercular drugs is instituted by many physicians. It is unlikely that some patients with inactive disease or radiographic abnormalities entirely unrelated to tuberculosis have been treated unnecessarily. It is observed that about half of such patients actually have active TB and need treatment. Therefore the need for the comparative assessments of the diagnostic techniques.

AIM OF THIS STUDY

To have a comparative assessment of five laboratory techniques used in the diagnosis of pulmonary tuberculosis using culture as gold standard.

OBJECTIVES

1. To obtain data for a comparative assessment of five laboratory techniques used for the diagnosis of pulmonary tuberculosis.
2. Establish the clinical significance of potential variations in the vive laboratory techniques.
3. Outline a test algorithm to minimize the laboratory variations in the diagnosis of pulmonary tuberculosis.

Materials And Methods

STUDY SITE

This study covers seven major hospitals in Abuja, FCT. The hospitals include Maitama District Hospital, Asokoro District Hospitals, Wuse General Hospital, Gwagwalada Specialist Hospital, Kubwa General Hospital, Gwarinpa General Hospital and Zankli Medical Centre all in Federal Capital Territory Abuja.

The Hospitals were chosen based on patient attendance, geographical location within Federal Capital Territory and the Directly observed therapy (DOT) Programme being run by these hospital. A total of 340 volunteers were registered for this study from the patients attending the above –named hospitals.

CHOICE OF KITS

Before the serology kit was selected, questionnaires were drafted and sent to various health institutions where TB diagnosis is carried out. The results from the questionnaires were collated and analyzed from which Clinotech Diagnostic was chosen.

SAMPLES COLLECTION:

Both blood and sputum samples were collected from each patient. Three sputum samples (1st –on-Spot, overnight and 2nd –on-Spot) were collected from each patient in samples pots, and these were tested for mycobacterium tuberculosis by direct sputum examination (Ziehl-Neelsen), and culture. The
blood samples were collected from each patient and centrifuged. The sera were separated and stored at -20°C in freezer, prior to analysis.

**SPUTUM MICROSCOPY**

The microscopy was carried out using ZN staining methods. Two different Ziehl Neelsen (ZN) staining methods were used on the sputum samples. The direct Ziehl Neelsen and the short-term bleach digestion methods.

**DIRECT METHOD:**

Three consecutive sputum samples from each patient were analyzed. The first “On Spot” sample was collected in a sterile container. A second specimen container was given to the patient to collect an early morning “Overnight “Sample. The third sample “2nd Spot” was collected when patient comes to clinic with the “overnight “sample. The direct ZN method of microscopy was done by making a smear of the sputum samples (1cm x 2cm) on new, grease – free glass slide. The slide was placed on a hot plate at 85°C for 15mins to dry. The smear was then flooded with carbol fuchsin and allowed to stand at room temperature for 5mins. Gentle flame was applied form underside of the slide was then washed with distilled water, tilted to drain, decolourised with 3% acid alcohol and then rinsed with distilled water again. Finally, after tilting to drain, the slide was flooded with Malachite Green for 1min. and then rinsed with deionised water. It was allowed to air dry and examined microscopically under oil immersion lens (x100).

**SHORT –TERM BLEACH DIGESTION OF SPUTUM METHOD**

Equal volume 95ml of domestic bleach (5% NaOCl) was added to the 1st on spot sputum sample in a sample pot. The sample pot cap was closed and contents shaken by hand for about 20 seconds. The container was then tilted at an angle of 450 for 30 mins to allow for sedimentation. The sediment was withdrawn using a 2ml pipette and then a drop of the sediment was placed on a labelled slide to make a smear. The slide was air dried and stained according to the ZN’s methods as in “direct” above.

**SPUTUM CULTURE**

Both liquid and solid media were used for the culture of the sputum samples. However before the culture, the sputum samples were treated using sodium hydroxide (Modified Petroff) method of sputum decontamination.

**SPUTUM DECONTAMINATION (MODIFIED PETROFF METHOD)**

The decontamination process is as follows:-

To a know volume (5ml) of sputum was added twice the volume (10ml) of 4% NaoH in a container, capped tightly and shaken to digest the mixture was allowed to stand for 15mins at room temperature with occasional shaking. The mixture was thereafter Centrifuged at 3000g for 15mins. The supernatant was poured off and sediment resuspended in 15ml of sterile saline. It was centrifuged again at 3000g for 15mins, the supernatant was decanted and sediment was inoculated onto each culture medium immediately.

**SPUTUM CULTURE ON LOWENSTEIN JENSEN (LJ) MEDIUM**

The decontaminated sputum sample from each patient was cultured using a sterilized wire loop onto the surface of a protein-enriched Lowenstein-Jensen medium. The cultured LJ medium was then incubated at 35-37°C using the mermmet incubator for a period of six weeks (42days) before being discarded. Within this period, a raised, dry cream (buff) coloured colonies characteristic of mycobacterium tuberculosis was observed for the isolates were identified by ZN staining method as in “Direct” above.
CULTURE ON BACTEC MGIT 960 SYSTEMS

The mycobacterium growth indicator tube (MGIT) contains 7ml of modified middlebrook 7H9 Broth base. It is a liquid medium for the cultivation of mycobacterium. The decontaminated/processed specimen (sputum) was inoculated into the MGIT tube and placed into the BACTEC MGIT 960 system for continuous monitoring and incubation at 37oC as recommended by the manufacturer and tested until positive samples were detected within the recommended 42 day testing protocol. Positive tubes identified by the BACTEC MGIT 960 instrument was stained with the direct ZN method as earlier enumerated to obtain the ZN-BACTEC results.

PRINCIPLES OF THE PROCEDURE (BACTEC)

A fluorescent compound is embedded in silicone on the bottom of 16 x 1000mm round bottom tubes. The fluorescent compound is sensitive to the presence of oxygen dissolved in the broth. Initially, the large amount of dissolved oxygen quenches emissions from the compound and little fluorescence can be detected. Later, actively respiring microorganisms consume the oxygen and allow the fluorescence to be detected.

Tubes entered into the BACTEC MGIT 960 System are continuously incubated at 37oC and monitored every 60 min for increasing fluorescence. Analysis of the fluorescence is used to determine if the tube is instrument positive; i.e., the test sample contains viable organism. An instrument positive tube contains approximately 105 to 106 colony forming units per millilitre (CFU/ml). Culture vials which remain negative for a minimum of 42 days (up to 56 days) and which show no visible signs of positivity are removed are removed from the instrument as negatives and sterilized prior to discarding.

The BACTEC MGIT Growth Supplement is added to each MGIT tube to provide substances essential for the rapid growth of mycobacteria. Oleic acid is utilized by tubercle bacteria and plays an important role in the metabolism of mycobacteria. Albumin acts as a protective agent by binding free fatty acids which may be toxic to Mycobacterium species, thereby enhancing their recovery. Dextrose is an energy source. Catalase destroys toxic peroxides that may be present in the medium. Contamination is reduced when supplementing the BBL MGIT broth base with BACTEC MGIT Growth Supplement/BBL MGIT PANT antibiotic mixture prior to inoculation with a clinical specimen.

TB SEROLOGY (CLINOTECH DIAGNOSTICS)

About three millilitres (3ml) of whole venous blood was drawn from the autecubital fossa of all patients whose sputum has been collected they were centrifuged using DIAN YUAN Bucket bench centrifuge. The sera were then separated and stored at 20oC in the GHT freezer model MXM 2706.

PROCEDURE

The test device and specimen was brought to room temperature prior to testing. Then the test device was removed from the pouch and placed on a clean, dry level surface. 100ul of specimen was pipetted into the sample application well. The results were read at 15mins after sample application.

PRINCIPLE OF CLINOTECH DIAGNOSTICS

Clinotech TB diagnostics is a direct binding, double sandwich antigen immunochromatographic test for the detection of TB antigens conjugated to a colloidal gold particle and recombinant TB antigens immobilized on the membrane. Once the specimen is applied to the sample well, the colloidal gold particle conjugated antigens forms sandwich complexes with TB antibodies present in the specimen. The complexes pass through the membrane, which is pre-coated with recombinant TB antigens on the test line (T) and anti-TB antibodies on the control line ©. As the complexes move along the membrane, the immobilized TB antigens on the membrane, if any antibodies to tuberculosis are present the TB antigens capture them in turn. The produces a pink/purple band in the test line (T), indicating a positive result. The remaining complex that did not bind anti-TB anti bodies in specimen continues to migrate and capture
anti-TB antibodies in specimen continues to migrate and capture anti-TB antibodies immobilized on the control line ©. This control band indicates that the test has been performed properly.

**DATA ANALYSIS:** Data were analyzed using chi square, at 95% confidence limit (Brown and Swanson, 1994)

**Results**

Table 1 show the age and sex distribution of volunteers who participated in this study. From the result, we observed that of the 340 individuals 192 (56.5%) were males while 148 (43.5%) were females. The age bracket of 21-30 years was the most represented with 144 (42.4%) followed by 31-41 years (19.5%), then 10-20 years (14.9%).

In table 2, the diagnostic performance assessment of the five laboratory techniques (ZN Direct, ZN Bleach, LJ medium, BACTEC MGIT 960 and Serology) reveals that there was a statistical significant difference (X²=127.1, P <0.001) between the various methods.

The 95% confidence interval of pair differences in proportion between the five laboratory techniques in table 3 indicated that only pair methods involving BACTEC MGIT 960 system were statistically different (P<0.001) in their performance. This pointed to the fact that the BACTEC method was responsible for the difference observed in table 2.

Table 4 presents the 95% confidence interval of pair difference in diagnostic specificity to Mycobacterium tuberculosis between ZN-BACTEC and other methods. A statistically significant difference (P<0.001) between pair methods was observed. This infers that ZN – BACTEC specificity to Mycobacterium tuberculosis was higher (P<0.001) than that of other methods.

**Table 1:** Age And Sex Distribution Of Patients AGE

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 20 years</td>
<td>27 (7.4%)</td>
<td>25 (7.5%)</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>66 (19.4%)</td>
<td>78 (23%)</td>
</tr>
<tr>
<td>31 - 40 years</td>
<td>47 (13.8%)</td>
<td>22 (6.5%)</td>
</tr>
<tr>
<td>41 - 50 years</td>
<td>30 (8.8%)</td>
<td>14 (4.1%)</td>
</tr>
<tr>
<td>51 – 60 Years</td>
<td>154 (4.9%)</td>
<td>6 (1.8%)</td>
</tr>
<tr>
<td>61 and above</td>
<td>9 (2.7%)</td>
<td>3 (0.8%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>192 (56.5%)</strong></td>
<td><strong>148 (48.5%)</strong></td>
</tr>
</tbody>
</table>

**Table 2:** Diagnostic Performance Of The Five Laboratory Techniques And Chi-Square (X²) Of Significance In Performance

<table>
<thead>
<tr>
<th></th>
<th>ZnDirect</th>
<th>ZnBleach</th>
<th>LJ</th>
<th>Bactec</th>
<th>Serology</th>
<th>Total</th>
<th>X²</th>
<th>P_value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>98 (28.8%)</td>
<td>103 (30.3%)</td>
<td>106 (31.2%)</td>
<td>208 (61.2%)</td>
<td>86 (25.3%)</td>
<td>601 (176.8%)</td>
<td>127.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Negative</td>
<td>242 (71.2%)</td>
<td>237 (69.7%)</td>
<td>234 (68.8%)</td>
<td>132 (38.8%)</td>
<td>254 (74.7%)</td>
<td>1099 (323.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>340 (100%)</td>
<td>340 (100%)</td>
<td>340 (100%)</td>
<td>340 (100%)</td>
<td>340 (100%)</td>
<td>1700 (500%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X² tabulated = 18.5
X² calculated = 127.1

P_v <0.001

X² calculated > X² tabulated. Therefore there is a statistical significant
(P_v < 0.001) difference between the five methods.
**Table 3:** 95% Confidence Interval Of Pair Differences In Proportion Between The Five Laboratory Methods And Their Chi-Square (X2) And P Values

<table>
<thead>
<tr>
<th>PAIR METHODS</th>
<th>95% CIP</th>
<th>X2</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>1.4 – 1.6</td>
<td>0.2</td>
<td>0.625</td>
</tr>
<tr>
<td>1/3</td>
<td>2.3 – 2.5</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>1/4</td>
<td>32.3 – 32.5</td>
<td>71.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1/5</td>
<td>3.4 – 3.6</td>
<td>1.1</td>
<td>0.25</td>
</tr>
<tr>
<td>2/3</td>
<td>0.9 – 1.1</td>
<td>0.1</td>
<td>0.75</td>
</tr>
<tr>
<td>2/4</td>
<td>30.8 – 31.0</td>
<td>79.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2/5</td>
<td>4.9 – 5.1</td>
<td>2.1</td>
<td>0.175</td>
</tr>
<tr>
<td>3/4</td>
<td>29.9 – 30.1</td>
<td>61.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>3/5</td>
<td>5.8 – 6.0</td>
<td>2.9</td>
<td>0.075</td>
</tr>
<tr>
<td>4/5</td>
<td>35.8 – 36.0</td>
<td>88.5</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**KEY**
1 = ZN DIRECT  
2 = ZN BLEACH  
3 = LJ MEDIUM  
4 = BACTEC  
5 = SEROLOGY

**Table 4:** 95% Confidence Interval, Chi-Square (X-) And P Values Of Pair Differences In Diagnostic Specificity To Mycobacterium Tuberculosis Between ZN-BACTEC And Other Methods

<table>
<thead>
<tr>
<th>PAIR METHODS</th>
<th>95% CIP</th>
<th>X2</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6</td>
<td>13.5 – 13.7</td>
<td>13.75</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2/6</td>
<td>12.0 – 12.2</td>
<td>10.67</td>
<td>0.001</td>
</tr>
<tr>
<td>3/6</td>
<td>11.1 – 11.3</td>
<td>9.14</td>
<td>0.006</td>
</tr>
<tr>
<td>4/6</td>
<td>18.7 – 18.9</td>
<td>24.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5/6</td>
<td>17.0 – 17.2</td>
<td>22.1</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**KEY**
1 = ZN DIRECT  
2 = ZN BLEACH  
3 = LJ MEDIUM  
4 = BACTEC  
5 = SEROLOGY  
6 = ZN-BACTEC

**Discussion**

The rapid diagnosis of tuberculosis is important if necessary control and prevention steps are to be taken in due time, the spread of the disease limited, and the administration of inadequate therapy avoided and the cost of hospitalization reduced. Clinical and radiological findings permit only a presumptive diagnosis of tuberculosis. For mycobacterial culture, use of both a liquid and a solid medium is recommended. The combination of both media should allow detection of growth within 14 days of receipt of the specimen in the laboratory.
The recently introduced fully automated BACTEC MGIT 960 has been shown to be a viable alternative to Lowenstein-Jensen slant for the rapid and reliable laboratory diagnosis of tuberculosis from this study. In contrast to BACTEC 460 system, BACTEC MGIT 960 is a non-radiometric assay and there is no need for each test and establishment of reading schedule. Therefore it is less labour-intensive and hence may free laboratory staff for other duties. In addition, the capacity of BACTEC MGIT 960 is much higher and therefore its application will be more useful for laboratory dealing with large numbers of specimen daily.

In this study five different diagnostic techniques for Mycobacterium tuberculosis were assessed. These include, ZN Direct, ZN Bleach, Lowenstein-Jensen slants, BACTEC MGIT 960 system and Serology using Clinotech diagnostic test kits. The study indicated that BACTEC MGIT 960 system displayed the highest detection rate (61.2%) to mycobacteria. This was follow by Lowenstein-Jensen slant (31.2%), ZN Bleach (30.3%), ZN Direct (28.8%) and Serology (25.3%). This clearly shows that serology has the least detection rate. A statistical significant difference (P<0.001) was found between BACTEC MGIT 960 and others.

In the course of this study, a total of 100 randomly selected BACTEC MGIT 960 instrument-negative vials (at the end of the 42 days protocol) were examined by AFB Smear. N false – Negative samples from this random terminal AFB Smear. No false-Negative samples from this random terminal AFB Smear of the instrument-negative tubes were detected. However, in this study, of a total of 92 samples which were positive for ZN Direct, ZN Bleach, LJ and BACTEC MGIT 960, only 34 showed positive for Serology. The remaining 52 samples out of the 86 samples that indicated positive for Serology may be false-positive. This study also suggests a higher sensitivity of ZN Bleach to ZN Direct.

The mean time to detection (TTD) of Mycobacterium tuberculosis isolates from this study were 14.1(6-26) days for BACTEC MGIT 960 and 20.2 (12-40) days for Lowenstein-Jensen slant.

Conclusion

The newly introduced BACTEC MGIT 960 system is a dependable, high-capacity, compact, fully automated continuous monitoring instrument for the recovery of mycobacterium from human clinical samples. When used in combination with a solid medium, the BACTEC MGIT 960 system shows high performance for the detection of mycobacterium complex while providing greater recovery of mycobacterium other than tuberculosis (MOTT). Despite the advantages of the broth-based cultivation system, traditional solid media still play a role in the recovery of mycobacterium from clinical samples. The combination of a solid and liquid-based culture system increase the sensitivity of cultivation for mycobacterium. This combination should therefore be considered to be the “gold standard” rather than the conventional use of LJ alone. This finding agrees with that of [3], [4] and [5]. The use of serology test kits alone for the diagnosis of tuberculosis should be discouraged as the result cannot be reliable. However in poor resource settings, the use of ZN bleach should be encouraged rather than the conventional three standard smears for ZN Direct because of its higher performance. Finally, although AFB smears should be done on all BACTEC MGIT 960 instrument-positive samples to eliminate false instrument – positive cases, the BACTEC MGIT 960 system appears to be the most reliable diagnostic technique of the five being assessed in this study.

References


The Impact of Social and Cultural Factors on Population Health

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Abstract

Background – Chronic disease has now become a major contributor to mortality, the increase in risk factors has had serious impact on health. Much attention has been paid to healthy lifestyle and the need for behavior change. Behavior is transitioning in many developing countries due to urbanization, improved income and access to technological advances. This has resulted in increase in risk factors such as excessive alcohol consumption, smoking and inactivity. More persons are seeking processed and prepackaged meals and consuming more food leading to obesity.

Objective – The objective of the project is to provide a critical look at the social and cultural factors and how they impact health. To explore how health promotion and there interventions impact on the prevalence of these risk factors.

Method – This study will explore at least 10 published articles on this topic the impact of risk factors on health and strategies used to reduce the occurrence of these factors. This review will provide information required to provide recommendations to address prevention of risk factor development.

Results – Results across different studies show that lifestyle behavior influences the development of risk factors. Unhealthy behavior like smoking, excessive alcohol consumption and inactivity is associated with obesity, elevated blood pressures and ultimately the development of chronic illnesses like cardiovascular disease and cancer.

Conclusion – Risk factors such as smoking, alcohol consumption and inactivity influence the occurrence of chronic illnesses. Surveillance for risk factors must be done and health education must be used as an intervention strategy to prevent the development of risk factors to reduce mortality.

INTRODUCTION

The rate of increase of morbidity and mortality rates in the developing countries are higher than those of the developed countries. Chronic disease have seen a remarkable increase in the last 20 years in particular; heart disease, diabetes, cancer and respiratory disease. Close to 50% of the deaths from chronic disease are premature and approximately 80% will be in the developing countries. This represents over 50% of all deaths in developing countries. A large number of the studies than have been done on socioeconomic status and chronic disease risk factors have been done in high-income (developed) countries. Chronic diseases has now become the primary cause of mortality and has now emerged to be of main concern in developing countries. Cardiovascular disease is now the leading cause of deaths developing countries

Chronic diseases have long latency periods and therefore changes in lifestyle behaviors can reduce or eliminate these factors. Chronic medical disease with alcohol and substance abuse disorder are major contributors to increasing health care costs. Based on current trends the situation is not likely to improve with deaths now totaling over 40 million per year. On the current trajectory chronic disease will continue to increase as the global burden for infectious disease decreases. In some cases it is expected that this increase in disease will be 5 times greater than the decline in infectious diseases. One can compare this with the expected scenario where infectious disease are expected to decrease by approximately 40% even in those countries that are most affected.

The biological risk factors associated with chronic disease are high cholesterol, hypertension and obesity and the aforementioned behavioral risk factors such as alcohol abuse, smoking, poor diet and lack
of physical exercise. The presence of these risk factors accelerate the pace towards morbidity and mortality. Studies have shown that behavioral change can impact significantly in decreasing the global burden of disease.

The mortality rate from chronic disease is greater in developing than in developed countries. Resource constraints negatively impact health systems development and the increase in chronic disease is also associated with poor diets and earlier onset of drinking in developing countries. Eighty percent (80%) of all deaths and 40% of all disabilities are due to chronic disease and these are directly related to social factors Smoking, alcohol and poor diet and lack of physical activity. Approximately 9% of the US population are found to be affected by substance abuse with 10% of these persons seeking treatment. Approximately 40% of these are thought to be impacted by chronic diseases. Chronic disease is higher among the female population and there is a marked increase with age. A total of 70% of all US deaths is related to chronic diseases, approximately 33% of these individuals have been diagnosed with diabetes, elevated blood pressure and cholesterol levels.

In excess of 75% of health care cost is related to chronic medical conditions hence the rationale for this study. The objective of the study is to provide a critical look at the social and cultural factors and how they impact health. To explore how health promotion and there interventions impact on the prevalence of development of risk factors.

METHODOLOGY

This is a secondary research paper which reviewed the findings of literature that has already been published on this topic. The research studies chosen for this literature review focused on the determinants of health and the social and cultural risk factors that contribute to the development of disease. Journals from National Centre for Biotechnology Information (Pubmed database), Pubmed Central, JSTOR, Proquest, Highwire and EBSCO were the main sources of electronic literature research. The literature selected for review were based on current publications no older than 10 years.

LITERATURE REVIEW FINDINGS

An analysis conducted in 2008 looked at mortality rates in men over a 40 year period and examined the trends of increase in chronic diseases, the study looked at the epidemiology and economic impact of these disease. The study explored the relationship between cardiovascular and chronic non-communicable diseases and economic growth in countries in The Organization for Economic Co-operation and Development (OECD).

The study revealed that economic growth had a positive impact on the decline in mortality rates. The correlation showed a three-fold rise in correlation between the impact of economic and social factors when compared with other factors such as age. Conversely in lower income countries it showed that increase in urbanization and investments compares with higher mortality rates due to heart disease and other non-communicable disease. These rates are reduced in middle income and decreased in higher income.

The study concluded that social and economic factors play a major role as determinants of mortality in chronic non-communicable and heart disease. It also notes the impact on rising health care costs particular in low income countries that further amplifies the economic resource issues. The study highlighted the fact that income levels affected behavior, it is interesting to note that in China and India, countries with the greatest economic growth they also are the countries with the highest increase in chronic diseases. The study also highlights the opposite effect for western countries i.e. persons adopt healthier lifestyles.

Another contributing factor highlighted by the study is that of technological change, the current trend is from labour intensive to more sedentary jobs, the call centers in India as a typical example. Large urban populations have positive influence on food prices as people tend to consume more as the cost of food becomes more affordable. Shifts in workforce gender also contribute to purchase of prepackaged and food
outside the home. The combination of bulk prepared fast foods and inactivity has resulted in creation of risk factors such as inactivity and poor diets that have influence chronic disease prevalence rates. The study identifies five factors as contributing to increase in chronic disease

1. Dietary changes as a result of globalization
2. Trade from outside countries showing preference to unhealthy food
3. Marketing strategies that promote unhealthy lifestyle
4. Advances in technology leading to mass production
5. Increases in sedentary behavior due to implementation of technology

Multistage stratified sampling method was used to select participants in a four month survey that began in August 2010 and covered all Chinese provinces. Interviews were completed on 98,712 persons and biological data gathered from 52,601. Biological data collected included height, weight and glucose levels. In addition information on eight risk factors was collected. The eight risk factors collected were; excessive alcohol consumption, lack of exercise, inadequate dietary consumption of fruits and vegetables. Obesity, hypertension, elevated cholesterol and fasting glucose levels. The three most prevalence risk factors were inadequate consumption of fruits and vegetables, hypertension and obesity. Women had an average of 1.6 risk factors, there was a positive association between multiple risk factors, poverty, increase in age and illiteracy

Chronic non communicable disease had the highest mortality rate among Chinese women with cardiovascular, cerebrovascular and cancer having the highest prevalence. This has been attributed to the increase of behavioral risk that include smoking, alcoholism, poor diet and exercise approximately 19% have been diagnosed as obese

A 3 year study began in 2003 and looked at cardiovascular risk factors in India and the effect of risk reduction. A total of ten thousand five hundred and forty three persons were selected, first using random then a stratified random selection were and interviewed using a standard questionnaire. Risk factors associated with hypertension and heart disease were examined. The study concentrated on the age group 30 to 50 years. Greater than 50% of the study population were male.

The study noted that there was an association of risk factors with hypertension. There was 12.3 % possibility of increased blood pressure in individuals with greater than 3 risk factors. An intervention group was selected and risk reduction strategies were implemented. The number of persons with hypertension decreased by 5.9% to 4.7% and increased by 4.5% in the uncontrolled group. The interventions were related to diet, smoking and exercise. In the control group restriction were placed only on smoking.

The results showed risk factor associated with an increase in blood pressure of 3.6Hg. The odds ratio with 2 risk factors for coronary heart disease was 1.34 and for more than 3 risk factors it was 1.79 at the 95% confidence interval. As it relates to the risk factor the percentage with low risk increased by 6.5% in the intervention population but decreased by 17.8 % in the control group. The individuals in the intervention group with hypertension that had greater than 3 risk factors had a reduction of 5% and showed increase of 4.5% in the control group. The study was successful in showing a reduction of risk factors in the intervention group.

A review of data was done from a health promotion programme that conducted a risk analysis survey in 2010 in South Africa. The survey focused on risks such as; obesity, the use of alcohol and smoking. This survey target adults 18 years and older. The survey attempted to link the results of the risk assessment with cost of health care for each individual based on insurance recovered costs.

A total of 69,380 persons were included in the survey. A separate cohort of data collected from age group 54-69 was analyzed. The study looked at the total cost inclusive of the individual contribution based on insurance coverage. This basically provided a mapping of health care cost against chronic disease diagnosis and risk factors (risk factors were defined as body mass index of greater than or equal to
25, excessive alcohol consumption of 3 or more alcoholic beverages per day, smoking included current and past smokers). The results show an average BMI of male 27.1 and 25.6 for female. Approximately 33% of respondents were smokers, however those classified under excessively drinking were rare. An increase in health care cost was positively associated with increase in BMI above 25. The study showed that there was a 22% increase in costs for obese persons who are smokers when compared with the corresponding non-smoking age group. In the excessive alcohol consumption category cost associated with health care did not increase despite the presence of increased chronic illnesses. The findings were similar for both age groups analyzed, the older population showing severe obesity associated with up to 51% increase in expenditure and smoking with a 20% increase. The study also showed that for ages below 30 there was no association between risk factors and health care costs.

An analysis of baseline data obtained from a cross-sectional study of a randomized clinical trial on 563 persons diagnosed with alcohol or drug abuse in the USA was done. Participants were recruited between September 2006 and September 2008 and were enrolled in a primary health care disease management programme (Addiction Health Evaluation and Disease management – AH.EAD).

The eligibility criteria for the adults incorporated in the study were as follows:
1. Drug or alcohol dependent
2. In excess of 30 days of drug use or alcohol use
3. Willingness to participate

A total of 184 or 33% of the studied population had chronic disease. There was a number of medical conditions that were reported, with Hepatitis being the most common single condition and accounted for approximately 33% of the respondents. A total of 118 or 21% of the respondents reported hypertension and 20% asthma.

Twenty eight percent (28%) received addiction treatment within the last 3 month period. A multivariate regression analysis used to analyze the data, found no existence of significant positive correlation between chronic disease and the use of addiction treatment. This indicated poor use of addiction care.

Associations noted by the study were:
- “positive association of treatment with health insurance”
- “negative correlation between recruitment from detoxification and outpatient days”
- “positive association between psychiatric comorbidity (e.g. anxiety and utilization of addiction treatment”.

The lack of significant correlation between major chronic diseases and the utilization of addiction treatment might be as a result of the complex link between these variables.

A 16 year prospective cohort design involving 5100 adults in Britain between the ages of 42-63 years was used to examine the extent to which health behavior in midlife impacted on aging. The participants health behaviors in this study were assessed in 1991-1994 and they did not have cancer, coronary artery disease or stroke. Healthy behaviors were defined as no history of smoking, alcoholism, and involvement in physical activity and a daily diet consisting of fruits and vegetables. Successful aging is regarded as good mental, physical, and no respiratory or cardiovascular diseases.

A total of 549 participants had died and 953 had aged successfully. From the study it was deduced that healthy behaviors were found to be moderately correlated and there was a clear indication of the need for healthy behaviors for successful aging.

Cross-sectional data from a national risk factor survey done in 2005 in Argentina was utilized to investigate the correlation of socioeconomic (SES) and chronic disease risk factors. These chronic risk factors are body mass index (BMI), hypertension and diabetes. The study was done in Buenos Aires on adults 18 years and over. A total of 1,510 participants were included.

The questionnaire collected information on physical activity, smoking, diabetes, height, weight, and blood pressure. A BMI in excess of 30kg/m2 was considered to be obese. The frequency of consuming
vegetables and fruits were used to determine participants' diet. Participant's level of physical activity was categorized as intense, moderate or low dependent on their response to specific questions. The socioeconomic variables utilized were education and income levels.

The study showed that women with lower education and income levels were more likely to be obese and diagnosed as hypertensive. Persons with secondary education only were twice as likely to be diabetic when compared with those that had completed tertiary level education. Those with less than secondary level were four times as likely to be diabetic. There was no significant association of education and income with other behavioral risk factors (diet, exercise and smoking). There was however an association noted between income and fruit and vegetable consumption.

**DISCUSSION**

As globalization increases new markets and the era of free trade explodes so does the transfer of behavioral practices. Increase in technology has seen a transition to more processed foods the cost of these are lower due to high utilization of technology and mechanization and for the most part this way of life has become more affordable.

Developing nations are caught in a dilemma as one hand they need to improve trade to countries to enhance economic growth whereas on the other this impact on social factors such as diet, exercise, alcohol consumption that has resulted in an alarming increase in chronic non-communicable disease. The flip side of this is that improved trade also reduces costs for other goods and services that impact positively on non-communicable disease, yet there is a tendency to opt for those that have negative influence, a lot of this can be related to marketing as this drives sales. Globalization has been attributable to the rising risk of chronic diseases the effect of growth in the economy and technology have influenced populations risks.

While the world focus is now on controlling infectious diseases and with little change expected in that focus, the mortality rates associated with chronic disease will continue to rise. Approximately 30%-60% of chronic disease are attributable to behavioral risk factors. There is an increase in behavioral risk factors, this is particularly disturbing as the incidence are higher in developing countries. Deaths from complications due to smoking (6.4 million) are estimated to be 50% higher than those by HIV by 2015. Age and literacy level are directly associated with the development of risk factors. The onset of chronic illnesses is gradual therefore middle age persons with history of risk factors are more likely to present with chronic illnesses.

It is recognized that healthy lifestyle is directly associated with decreased mortality and morbidity. The presence of multiple risk factors is significantly associated with the development of chronic disease. There is also an association of hypertension with multiple risk factors and smoking is a risk factor in several chronic diseases. Studies have shown that the odds ratio for pre-hypertensive individuals with 2 or more risk factors for cardiovascular disease is considerably higher. This risk can be reduced with the implementation of appropriate risk reduction programmes. Many of the risk factors associated with chronic disease can be adapted based on behavior change.

There is not much study on socioeconomic status and it relates to the development of chronic risk factors. Studies in developed countries are showing that increase income levels are associated with decrease in chronic risk factors. Obesity is associated with rising health care costs, studies also confirm the link between income and death from chronic disease, although the risk factors exists, the ability to access health care does play a role in mortality reduction in this group. Unfortunately this is not always the case in developing countries as initially with the increase in income levels individuals will tend to adopt unhealthy lifestyles however there may be behavior change as awareness of healthy lifestyle behavior is achieved. Physical activity is a difficult to measure variable since one has to rely on the individual to report on this behavior.
CONCLUSION / RECOMMENDATIONS

In conclusion, studies have shown that economic flows have impacted social behavior resulting in higher food consumption and advances in technology have led to a sedentary behavior and thus pose a very real threat to the development of chronic disease.

Countries must implement effective policy to reduce risk factors. There will need to be a shift in focus to incorporate chronic health care. This will require all stakeholders to be involved, a crucial stakeholder will be the private sector (cigarette and alcohol manufacturers). Public health practitioners must begin to look at the interaction between social and economic factors and prevention strategies must align with reducing these risk factors. As we design intervention strategies we must embrace research in this area as we explore what interventions are likely to work given the complexity of factors involved.

Chronic illnesses evolve over time this provides an opportunity to target risk factors and reverse the trend. It is apparent then that resources must be aimed at reducing risk factors through surveillance and health promotion. Surveillance systems must be designed to monitor risk factors, there must be investment in primordial prevention strategies. The global strategy for monitoring chronic disease has been designed by WHO, countries will need to implement these strategies. Health systems strengthening with particular focus on health promotion and education has to be a key component within countries as we respond to the growing epidemic.

Policy makers must be able to recognize that by reducing risk factors; increasing exercise and discouraging tobacco and alcohol use can result in decreased mortality and morbidity. Health education must be aimed at risk reduction, there needs to be a coordinated inter-sectorial approach to the reduction or elimination of these risk factors. It is important that public health practitioners target risk reduction as a means of reducing the development of chronic disease and also mortality rates. A formalized approach needs to be encouraged in primary health care setting for individuals with chronic disease and addiction to seek addiction treatment.

REFERENCES


Attitude and Behaviour of Users of Motorcycle Towards the Use of Crash Helmet in Ado-Ekiti, Nigeria.

Article Review by Pius Izundu Okpoko
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Abstract

Introduction: There is a major and growing public health concern in preventing serious injuries and deaths from motorcycle crashes. The judicious use of motorcycle crash helmet is a proactive approach to preventing head injury among motorcycle users. The objective of this study is to determine the attitude and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.

Method: This is a cross-sectional study design that made use of quantitative survey method involving data collection and analysis. There were 283 voluntary adults who were randomly recruited within Ado-Ekiti metropolis. A semi-structured questionnaire was administered to participants who also consented to the survey.

Results: There were 283 returned and analyzable questionnaires out of 321. The modal age group was 21-30 years (42%). There were more males, 209 (73.9%). Majority of the respondents were single (55.1%). There were more Students, 92 (32.5%), in the study. Two hundred and forty respondents (84.8%) believed that it is necessary to use crash helmet. The frequency of self-reported helmet use was 171 (60.4%). Seventy percent of respondents believed that helmet use should be made compulsory. Various reasons for non use of helmet include too heavy 99 (35.0%), fear of contracting disease 93 (32.9%) and not protective 24 (8.5%).

Conclusions: This study highlighted that a far greater number of respondents believed that the use of crash helmet is necessary for safety and should be made compulsory. Nevertheless, the discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet use were the main negative factors militating against helmet use.

Key words: Attitude, Behaviour, Crash helmet, Head injuries, Motorcycle, Users.

List of Abbreviations
FRSC: Federal Road Safety Commission
PAC: Public Awareness Campaign
RTA: Road Traffic Accident.
MHU: Motorcycle Helmet Use.
WHO: World Health Organisation

Glossary
Attitudes – they are mental habits acquired from social experiences that predispose individuals to react to situations, persons or specific objects in a definite way. An attitude is deemed an enduring system that includes a cognitive component, an emotional (feeling) component and an action tendency (TAU, 2014).
Head injury – this is a damage to any of the structures of the head as a result of trauma. While the term „head injury” is most often used to refer to an injury to the brain, head injuries may also involve the skin (scalp), skull, muscles, blood vessels, and other organs of the face or head. A head injury does not always mean that there is an associated brain injury (MedicineNet.com, 2014).
Helmet - a motorcycle helmet is a type of protective headgear used by riders of motorcycles and pillion passengers. The essential goal of a crash helmet is motorcycle safety; to offer protection to the rider's
head in an event of accident, thus preventing or reducing head injury or saving the rider's life (Wikipedia, 2010).

Informed consent – this is the principle that guides that participants in a study should be informed about the risks involved in a study; its benefits and purposes also, as they affect their participation before they decide whether or not to be involved, and this planned participation should be entirely voluntary (Green and Thorogood, 2009).

Pilot study – this refers to a mini study which is conducted in preparation for a planned project; essentially to test an aspect of the study design, e.g. in a quantitative study, and to allow necessary adjustment to be made prior to final commitment to the design (AQR, 2011).

Positivism – this refers to epistemological research approach that tends to assume that a stable reality exists which essentially can be known and also understood through empirical methods (Green and Thorogood, 2009).

Questionnaires in surveys – they are widely used tools for obtaining information (data) for analysis during research study.

Social diagnosis – it is made through socio-medical surveys and by researching into domestic and social conditions of individuals (TAU, 2014)

Variables in research – they are basically grouped into two: independent (explanatory) variable and dependent (response or outcome) variable.

**Introduction and Background**

Motorcycle is used in this part of the world for several reasons which include commercial purposes, private and pleasurable means of easy commuting. It is also a major cause of head injuries following a road traffic accident. Peden et al. (2004) observed that the main risk factor for severe head injury among commercial motorcyclists and their passengers is non-use of crash helmet. Injuries and fatalities resulting from motorcycle accidents are a growing public health problem in developing countries (Sood, 1988). Falope (1991) noted that relatively few developing countries have enacted and are enforcing motorcycle helmet laws.

There is a major and growing public health concern in preventing serious injuries and deaths from motorcycle crashes. It was estimated that motorcycle accidents claimed 4,502 lives in 2010, while motorcycle-related deaths increased by 55% since year 2000 (CDC, 2014). The Centre for Disease Control and Prevention (2014) observed that an estimated 37 per cent of crash deaths among motorcycle riders and 41 per cent of crash death for motorcycle passengers are preventable through the use of crash helmets.

This study seeks to determine the attitudes and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.

The objectives of this study are:

1) To determine the attitude and behaviour of users of motorcycle towards the use of crash helmet in Ado-Ekiti, Nigeria.
2) To review Literature on the use of crash helmet and Motorcycle-related accidents in developed and developing countries.

**General Considerations**

**Literature Review**

**Studies on Motorcycle Accidents and Helmet use**

Various literatures have visited general issues relating to road traffic accidents and their untoward impact on life. Other related studies took a deeper course into motorcycle accidents and the use of crash helmet as a preventive measure to reducing severity of head injury. Akinlade (2000) while researching on the knowledge, attitudes, and practices of road safety and first aid among commercial motorcyclists in a district of Oyo State, Nigeria, noted (from the public health point of view) that road traffic accidents have
been recognized as a worrisome health problem in both developing and developed countries. He further submitted that there is an increasing rate of road traffic accidents in developing countries like Nigeria, but a reduction in the developed world. In consonance with the study done by Ogbeide et al. (1994) it was noted that some major causes of road traffic accidents can be attributable to human errors and inabilities, adverse road conditions, poor road signs and mechanical defects of vehicles. Furthermore, the age of the motorcyclist, general medical and mental fitness of the rider, degree of alcoholic consumption and educational level of the motorcyclist, all serve as most important human factors in road traffic accidents (Lin et al., 2003; Sexton et al., 2004; Elliot, Baughan and Sexton, 2007).

Adewale (2009) in his write up observed that wearing an approved, correctly-fitting-standard, crash helmet while riding a motorcycle helps to reduce head or neck injury and also increases a rider’s chances of surviving a crash. He also noted that, on the contrary, users of motorcycle do give flimsy excuses for not using crash helmet and prefer using improvised helmets like dried pumpkin shells or empty paint plastic keg to avert disturbance from law enforcement agents. Some excuses that are often heard from users of motorcycles include high risk of contracting infection from helmets and the inconveniences associated with the usage of crash helmets (Salaudeen et al., 2012).

**Head injuries; a leading cause of mortality and disability**

Head injuries sustained, following a road traffic accident, have been implicated as a major cause of death and disability among users of motorcycles. The World Health Organisation (2006) observed that head injuries result in much higher medical costs when compared with other types of injuries. Importantly, the social costs of head injuries for survivors, their families and communities are very high. This is owing to the fact that they frequently require long term care and specialised medical care during the management of the cases. Moreover, there is a resultant negative impact on the country’s health care costs and the general economic situation. WHO (2006) indicated that in some low-income and middle-income countries head injuries are estimated to account for up to 88% of deaths among motorcycle users. In European countries, they contribute around 75% of such fatalities (WHO, 2006). It is known that these mortalities and disabilities can be prevented through judicious use of crash helmet by motorcycle users (Salaudeen et al., 2012). In West African region, there is an upward trend in the number of motorcycle users both for commercial and recreational purposes.

**Motorcycle Helmet legislation to increase use in Nigeria**

It is known that laws that demand the strict use of crash helmets while riding motorcycle increases their use (Braddock et al., 1992). Consequently, injuries from motorcycle accidents, death and medical costs are reduced. A fewer number of motorcyclists (less than 50%) wear helmets in Nigeria and some other West African countries when they are not compelled by law, while compliance improves dramatically when the laws are in effect and are adequately enforced (Adewale, 2009). In Nigeria, the Federal Road Safety Commission is the body that sees to adherence to road safety laws. Also, the traffic police officers contribute to the enforcement of the crash helmet law in the country. Meanwhile, various laws had been enacted at different times by the Local, State and Federal governments of Nigeria to curb the untoward excesses of motorcycle riders but sustained implementation of the said laws has always been a challenge. Examples of such laws include the National Road Traffic Regulation of 2004 and FRSC Establishment Act 2007.

**The Head, its delicate contents and injury**

The brain is a very fragile organ which is encased within the skull. Just behind the skull, and adherent to it, is a tough, fibrous membrane called dura mater. There are other coverings of the brain (meninges) which are the arachnoid mater and the pia mater as we approach the brain from the bony skull. The cerebrospinal fluid bathes and cushions the brain and the spinal cord.

In an event of a motorcycle accident without a crash helmet, there could be an open or a closed injury which ultimately can damage the coverings of the brain and the brain, itself. It is worth noting that most traumatic brain injuries are of closed type with a resultant haematoma in most cases. Crash helmet serves
as an additional protective layer to the head and its delicate contents. Motorcycle riders who do not wear a crash helmet run a much higher risk of sustaining head and traumatic brain injuries.

**Bringing behaviour change through social marketing**

Non-adherence to traffic laws governing crash helmet use is a major factor implicated in head injury resulting from motorcycle accident (Oginni, Ugboke and Adewole, 2007; Ogunmodede et al., 2012). The users of motorcycle do give flimsy excuses for not using crash helmet and prefer using improvised helmets like dried pumpkin shells or empty paint plastic keg to avert disturbance from law enforcement agents (Adewale, 2009). These materials do not prevent traumatic impact to the brain that can result to head injury in cases of accidents. In a drive to bring behaviour change in situations of harmful behaviour, social marketing has been suggested. TAU (2014) described social marketing as the process of motivating people (through application of marketing techniques) to voluntarily adopt behaviour which is beneficial to them. The adoption of beneficial behaviour is considered over potentially harmful ones. This applies to the use of crash helmet by motorcycle riders which serves a huge benefit to them. Meanwhile, it is worth noting that a slogan of the Public Awareness Campaign (PAC) that strives to increase helmet-use rates and improve traffic safety knowledge throughout Vietnam is „Wear A Helmet. There Are No Excuses“. This seeks to decrease traffic accident fatalities and modify road safety behaviour.

**Methods**

Literature search strategy:

Efforts were geared towards thorough literature search, and the search was conducted in order to identify the following:

(a) Literature on the use of motorcycle crash helmet and related-accidents in West African sub-region.

(b) Available data on motorcycle accidents in sub-Saharan Africa, especially, West African region

(c) Literature on attitude, perception and use of crash helmet.

The literature search was done to cover the period, 1980 – 2014, for all related publications in English language.

Electronic searches for information/data bases such as EBSCO, PUBMED, Cochrane library, and also some international organisations, like WHO, were carried out. Searches were done using some key words as seen below (Box 1).

**Box 1**: Literature search strategy.

```
“attitude” OR “behaviour” OR “perception” OR “crash helmet use” OR “motorcycle accident” OR “motorcycle riders” OR “commercial motorcycle” OR “head injury” OR “laws of helmet use” OR “enforcement of law” OR “compliance with law” OR “available literatures in motorcycle accident” OR “developing countries” OR “sub-saharan africa” OR “west african region”.
```

Study Setting

The present study was carried out at randomly selected motorcycle parks and busy locations in Ado-Ekiti metropolis where people commute on daily basis. The subjects were motorcyclists and other users of motorcycle who were randomly selected.

Ethical Clearance

Necessary basic procedure was observed in obtaining ethical clearance. Also, written consent (in form of a „ticked consent“) was obtained from the participants after due explanation of the survey and assurance of anonymity and confidentiality.

Study Design

This was a cross-sectional survey that made use of semi-structured, pre-tested questionnaire which was given to volunteers to complete.
Epistemological Approach
The research was a quantitative study that assumes positivism. It is known that positivism shapes reality to be objective and combines a deductive approach with precise measurement of quantitative data to predict human behaviour (Neuman, 2000).

Inclusion Criteria
Voluntary adults and younger age groups who gave their consent.

Exclusion Criteria
Children who are not independent to commute with motorcycle.
Those with severe mental/psychiatric illness were also excluded.

Sample Size Estimation
The sample size was calculated using the simplified formula by Glenn (1992):
\[ n = \frac{N}{(1 + Ne^2)} \]
Where \( n \) = sample size, \( N \) = population size, and \( e \) = the level of precision required. The estimation assumed accuracies of 95% confidence interval and a 5% significance level. The study required an estimated 321 respondents.

Data Collection
The researcher and trained assistants distributed the questionnaire and collected data within the month of August, 2014. The content of the questionnaire was carefully translated in local language to participants who were unable to read English without altering the meaning of each question.

Results
There were 283 complete and analyzable questionnaires out of 321 questionnaires administered. The modal age group was 21-30 years (Table 1 and Figure 1). There were more males, 209 (73.9%), than females, 74(26.1%), in this study (Figure 2). Majority of the respondents were not married (single). They constitute 55.1% (156 out of 283) of the returned and analyzable questionnaires (Figure 4). This is followed by respondents who were married, 116(41.0%). A total number of 16(5.7%) respondents only had primary education, 126(44.5%) secondary education, 113(39.9%) tertiary, while 28(9.9%) had no formal education (Figure 5). Students, 92(32.5%), were the majority of the respondents, but closely followed by employed 90(31.8%) and not-employed 80(28.3%), while apprentice constitutes 21(7.4%).

Out of the 283 respondents in the study, 240(84.8%) believed that it is necessary to use crash helmet, while 43(15.2%) did not believe that it is necessary. Males in the affirmative constitute 88.0%, while 12.0% had a negative response. On the other hand, 75.7% among the female respondents believed in the necessity of helmet usage but 24.3% declined. The frequency of self-reported helmet use was 171(60.4%) of the entire respondents, while 112(39.6%) had never used helmet. Statistically significant difference in helmet use was obtained between males and females in this study (p=0.034).

Meanwhile, the returned questionnaires also revealed that out of the respondents that admitted that they had used crash helmet, 57(33.3%) always use helmet, 75(43.9%) occasionally use helmet and 39(22.8%) rarely use helmet. There was no statistical significance between literacy and the use of helmet and the frequency of usage (p>0.5). Various reasons for non use of helmet include too heavy 99(35.0%), fear of contracting disease 93(32.9%), not protective 24(8.5%), and other reasons not included in the options 6.7(23.7%) – see figures 3 and 6. The discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet usage were the main negative factors militating against helmet usage.

Discussion
It is not uncommon to witness or hear about cases of motorcycle accidents in this part of the world. Majority of these cases involve riders and passengers who were found without crash helmet. Increasingly motorcycle use for commercial purposes has also increased rate of motorcycle accidents in most
developing countries, especially in West African sub region. Notwithstanding, the use of crash helmet remains discouraging. Available reports from low income countries have documented low rate of motorcycle crash helmet use (Nzegwu et al., 2008; Solagberu et al., 2006).

In this present study, majority of respondents (84.8%) agreed that it is necessary to use crash helmet, although about 50.5% always use the safety gadget. Bianco et al. (2005) reported 33% helmet use while studying on adolescents” attitude and behaviour towards motorcycle helmet use in Italy. A similar report, though involving self reported helmet use among pillion passengers in Ilorin (Nigeria), indicated 36.4% helmet usage (Salaudeen et al., 2012). Consequently there appears to be a gradual increase in the acceptance and use of crash helmet. It is worth noting that most educational programme on behaviour change, as regards crash helmet use, focus more on motorcycle riders. This could explain the low level of helmet use among motorcycle passengers as seen in some studies (Corad et al., 1996; Salaudeen et al., 2012; Zhang, 2004). The present research covers both riders and passengers of motorcycle and recorded an increase in the rate of helmet use.

The reasons given by respondents in this study for not wearing crash helmet were predominantly heaviness/discomfort from the safety gadget (35.0%) and fear of contracting diseases (32.9%). In the study which was done by Bianco et al. (2005) it was reported that discomfort from helmet was one of the reasons for not wearing crash helmet. However, the said study found lack of ownership of helmet as a major reason for not wearing helmet. In consideration of this finding, ownership of helmet may be a strong motivating factor for the use of helmet which also tends to reduce the perceived risk of contracting disease. It calls to mind that fear of contracting disease was a predominant reason for non-use of crash helmet in this study.

The model age group in this study was 21-30 years. This is similar to the study done by Oginni, Ugboko and Adewale (2007) who noted a peak age of 25-29 years. In another related research carried out by Ogunmodede et al (2012) in Oyo state, Nigeria, the model age group was 26-30 years and closely followed by 20-25 years. This agrees with the findings that the number of users of motorcycles, including motorcycle-related accidents and injuries, is predominantly high within this age group (Emejulu et al., 2010; Ogunmodede et al., 2012; Oluwadiya et al., 2004).

In consideration of gender, males in the affirmative constitute 88.0%, while 12.0% had a negative response to the necessity of helmet use. On the other hand, 75.7% among the females respondents believed in the necessity of helmet use but 24.3% declined. Hung, Stevenson and Ivers (2006) observed that men are more likely to use a crash helmet than women. On the contrary, Ichikawa, Chadbunchachai and Marui (2003) reported the reverse. Both studies were done outside Nigeria.

Users of motorcycle in Nigeria are aware of the protective effect of crash helmet. About 92% of respondents in this study reported that crash helmet reduces the severity of head injury, Li et al (2008) reported similar finding in China where about 90% of those in the study agreed to the protective effect of helmets against head injuries.

**Conclusion**

This study highlighted that a far greater number of respondents believed that the use of crash helmet is necessary for safety and should be made compulsory. Nevertheless, the discomfort which is associated with wearing a crash helmet and perceived risk of contracting infection from helmet use were the main negative factors militating against helmet use. Statistically significant difference in helmet use was obtained between males and females in this study (p=0.034).

**Recommendations**

Following the findings in this study, it would be advisable to improve on the available educational interventions that will help to bring about behavioural change (to all users of motorcycles) as regards the use of crash helmet.

Acquiring personal crash helmet for fear of contracting infection should be encouraged by making the gadget affordable and attractive to users.
Provisions should be made by various arms of government to engage the youths in more meaningful occupation, and also create safer means of intra-city transportation for the teeming population.

The present research is not without limitation: a more pragmatic approach to this research will give an insight into developing more dynamic and effective educational interventions that would target behaviour modification among users of motorcycle.

Tables And Figures

**Table 1**: Age group distribution of the study population.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=20</td>
<td>55</td>
<td>19.4</td>
</tr>
<tr>
<td>21-30</td>
<td>119</td>
<td>42.0</td>
</tr>
<tr>
<td>31-40</td>
<td>70</td>
<td>24.7</td>
</tr>
<tr>
<td>41-50</td>
<td>30</td>
<td>10.6</td>
</tr>
<tr>
<td>51 and above</td>
<td>9</td>
<td>3.2</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table 2**: Distribution of literacy level and the necessity to use crash helmet.

<table>
<thead>
<tr>
<th>Present educational status</th>
<th>Primary</th>
<th>Count</th>
<th>Do you feel it is necessary to use crash helmet - Q6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% within Present educational status - Q4</td>
<td>3</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Primary</td>
<td>Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>18.8%</td>
<td>81.3%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>Count</td>
<td>15</td>
<td>111</td>
<td>126</td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>11.9%</td>
<td>88.1%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Tertiary</td>
<td>Count</td>
<td>19</td>
<td>94</td>
<td>113</td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>16.8%</td>
<td>83.2%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>Count</td>
<td>6</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>% within Present educational status - Q4</td>
<td>21.4%</td>
<td>78.6%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1**: Age group distribution of respondents.
Figure 2: Distribution of sex of the respondents.

Figure 3: Reasons for not wearing helmet.

Figure 4: Marital status of the respondents.
Figure 5: Distribution of literacy of the respondents.

Figure 6: Reasons for not wearing helmet.

References


The Effect of Telmisartan and Irbesartan on Body Weight and its Contribution to Blood Pressure Control in Hypertensive Black Patients: a Retrospective Cohort Study.

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Abstract

No study has analyzed the extent of weight reducing ability among the “peroxisome proliferator activated receptor-gamma” (PPAR-γ) activating ARBs – Telmisartan and Irbesartan in black hypertensive of African origin. This retrospective cohort study was designed to delineate the extent of weight reducing effect of these PPAR-γ activating ARBs and how it correlates with BP reduction observed with these ARBs in black hypertensive. A total of 26 case notes of patients (15 men, 11 women; mean age 58.9±1.8 years) with diagnosis of hypertension were reviewed and the study attained a power of 96%. The patients whose case notes were reviewed were naïve to ARBs before commencing either telmisartan or irbesartan and did not have any metabolic disease like diabetes or thyroid disease which could interfere with body weight reading. They all took either telmisartan 80mg or irbesartan 150mg for at least a 6 month review period. Body weight were significantly reduced more in the telmisartan (n = 13) treatment group compared to the irbesartan (n = 13) treatment group [change from baseline; -1.51±0.46Kg (-1.68%), P=0.006 vs. -0.96±0.15Kg (-1.05%), P<0.001]. Both treatment effectively controlled blood pressure (mean BP after 6 months treatment: Telmisartan 126/83mmHg; Irbesartan 133/84mmHg). In the telmisartan group there were no correlation between either change in SBP and change in body weight (r = -0.220, P = 0.471) or change in DBP and change in body weight (r = -0.050, P = 0.870), but a significant positive correlation was observed between both change in SBP and change in body weight (r = 0.538, P = 0.058) and change in DBP and change in body weight (r = 0.610, P = 0.027) in the irbesartan treatment group. Both telmisartan and irbesartan reduced body weight in hypertensive black patients and this reduction in body weight may contribute to the power demonstrated by irbesartan to get patients to BP goal. Hence hypertensive blacks could also benefit from the established end-organ protection benefits of both telmisartan and irbesartan.

Key words: Hypertension; Telmisartan; Irbesartan; Body weight; Adiponectin; PPAR-γ.

INTRODUCTION

Hypertension is a global public health problem and has worldwide prevalence estimate of about 1 billion persons (Burt et al., 1995). Hypertension is the cause of about 7.1 million deaths per year and 4.5% of the disease burden which translates to 64 million disability adjusted life years (DALYs) (WHO., 2002). With projection that up to three quarter of the world hypertensive population will be in economically developing countries by the year 2025 (Kearney et al., 2005) of which Nigeria and many African countries are classed among.

Looking at one of the lifestyle modification parameter that has been found to affect BP control (Body weight), the effect of body weight reduction on BP control is well established in studies, as it is known that a 10kg loss in weight would give a corresponding 5-20mmHg reduction in BP (THPCRG, 1997 and He et al., 2000). In the light of recent finding about newer more potent ARB having interaction with PPAR-γ receptor thereby causing a subsequent increase in plasma adiponectin and a decrease in plasma
adiponectin been established as an independent risk factor for obesity, this retrospective study tries to observe the effect on body weight of these newer ARBs to explain the clinical relevance of it interaction with PPAR-\(\gamma\) receptors and proffer a likely mechanism through which these ARBs provide end-organ protection as established in the IDNT (Irbesartan Diabetic Nephropathy Trial) and the ONTARGET (Ongoing Telmisartan Alone and in combination with Ramipril Global Endpoint Trial) Study.

**METHOD**

**Settings**

This study is primarily an explanatory non-interventional retrospective cohort study. The study recruitment took place in two private hospitals in Benin-city Edo State, Nigeria where Telmisartan or Irbesartan were used to treat patients with essential hypertension that presents at the clinic.

The study consists of a qualitative component which involved review of 26 patients case note and this review was conducted to call up demographic information, blood pressure and weight before commencing ARBs, blood pressure and weight after 3, 4 and 6 months of commencing ARBs, underlying condition and any possible end-organ complication as indicated by fresh complain during the cause of treatment with the ARBs.

**Study End-points**

1. The primary end-point of the study is to determine the extent of weight reduction seen in black hypertensive patients placed on telmisartan or Irbesartan
2. The secondary end-point is to determine the correlation if any exist between body weight reducing effect of these ARBs and reduction in Blood pressure in black hypertensive.

**Sample size and Power determination**

Statistical power is the probability of rejecting the null hypothesis while the alternative hypothesis is true. The sample size and power of a paired mean statistic that is normally distributed are interdependent and related by the following formulae:

\[
P \{Z>Z_{\alpha}/2 \text{ OR } Z<-Z_{\alpha}/2 | \mu_1\} = 1 - \phi (Z_{\alpha}/2 - (\mu_1 - \mu_0)/(\sigma/n) + \phi [-Z_{\alpha}/2 - (\mu_1 - \mu_0)/(\sigma/n)])
\]

From literature search, study on the effect of telmisartan on adiponectin levels and weight reduction in hypertensive patients with glucose intolerance showed a mean reduction in weight of 2.2%, thus estimating the standard deviation to be 4.4%. Hence from the study it was calculated that for this retrospective study to have a power of at least 50% at a level of significance of 0.05 to detect a 2.2% difference, 18 patient’s case note would have to be reviewed. All statistics would have to be performed based on data from 18 patients case note each for the different treatment groups i.e. telmisartan and irbesartan treatment group (Makita et al, 2008).

**Ethical Approval**

Ethical Approval was gotten from the Chief Medical directors of the two centers used for the retrospective cohort studies.

**Study Inclusion Criteria**

1. ARB naïve patient with confirmed diagnosis of essential hypertension
2. Age 35 or Older
3. Disease duration less than five years
4. Body weight greater than 70kg

**Study Exclusion Criteria**

1. Co-morbidity with type 1 or type 2 diabetes mellitus
2. Patients who have taken any form of ARB previously
3. Patients with any form of thyroid dysfunction (thyrotoxicosis or thyroid insufficiency)
Study population and Data collection

Study population were know hypertensive patients in two private hospital in Benin – city, Edo state Nigeria. The two hospitals where chosen to give a rounded near representation of hypertensive patients in the state – as one of the hospital is known to attract people of very high means (high class) and the other a mix of low, middle and high class patients. The patients whose case reports were reviewed showed a fair representation of distribution from the six-geopolitical zones in Nigeria eliminating to a reasonable extent ethical variability in study data. 26 medical charts were reviewed and the following information were collected: Name, Age, Sex, and Weight before commencing therapy with ARB, Blood pressure before commencing ARB, Weight and blood pressure after 3 months, 4 months and 6 months respectively.

Statistical Analysis

To determine the primary end-point, a paired t-test statistic was done to compare weight before commencement of treatment for either telmisartan or irbesartan and weight after an average of 6 months from commencement of ARB.

In other to determine the secondary end-point of the study a correlation statistic was performed between reduction in BP and reduction in weight among the two treatment groups.

These statistic was tested at a P<0.05. A P-Value of 0.05 or less was thus considered to be significant. Other statistics were also done on the data collected to determine center of tendency and dispersion and all data was expressed as Mean ± SEM. All statistics were done using SPSS version 20.

RESULT

Comparing the baseline characteristic between the two review groups it can be said that both groups were comparable (Table 1). The outcomes for these patients are summarized in Table 2 and 3.

Table 1: Baseline Characteristics of the patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Telmisartan Group</th>
<th>Irbesartan Group</th>
<th>Confidence Interval %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age - year</td>
<td>60.30±1.52</td>
<td>57.53±2.02</td>
<td>95</td>
</tr>
<tr>
<td>Male sex – no%</td>
<td>8(61.5%)</td>
<td>7(53%)</td>
<td>95</td>
</tr>
<tr>
<td>Body Weight</td>
<td>94.03±3.70</td>
<td>91.30±3.13</td>
<td>95</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>158±4.37</td>
<td>163±5.78</td>
<td>95</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>100±2.64</td>
<td>98±3.19</td>
<td>95</td>
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</table>

Table 2: Outcomes in the Telmisartan Treatment Group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>On therapy</th>
<th>Change</th>
<th>Change %</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Body weight (Kg)</td>
<td>94.03±3.70</td>
<td>92.53±3.73</td>
<td>-1.51±0.46</td>
<td>-1.61</td>
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<tr>
<td>Systolic BP (mmHg)</td>
<td>158.00±4.37</td>
<td>126.00±2.86</td>
<td>-32.00±5.44</td>
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<tr>
<td>Diastolic BP (mmHg)</td>
<td>100.77±2.64</td>
<td>83.08±2.00</td>
<td>-17.69±4.07</td>
<td>-17.69</td>
<td>0.001</td>
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</table>

Table 3: Outcomes in the Irbesartan Treatment Group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>On therapy</th>
<th>Change</th>
<th>Change %</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight (Kg)</td>
<td>91.30±3.13</td>
<td>90.35±3.15</td>
<td>-0.96±0.15</td>
<td>-1.05</td>
<td>0.000</td>
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<tr>
<td>Systolic BP (mmHg)</td>
<td>163.07±5.78</td>
<td>133.38±2.33</td>
<td>-29.69±7.23</td>
<td>-18.21</td>
<td>0.001</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>98.07±3.19</td>
<td>84.23±2.09</td>
<td>-13.85±4.60</td>
<td>-14.13</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Clinical Management

In the two groups, the proportion of patients in whom the expected blood pressure was achieved increased (62% in the Telmisartan 80mg daily group and 53% in the Irbesartan 150mg daily group) and the mean blood pressure decreased over the period of review; the mean blood pressure at visits after base
line was 126/83 mmHg in the telmisartan group and 133/84 mmHg in the irbesartan group. A greater decrease in SBP (-7.4 mmHg) was seen in the telmisartan group over the irbesartan group though not significant (P=0.072) and a greater decrease in DBP (-1.15 mmHg) was also observed in the telmisartan group over the irbesartan group over the period of review though not statistically significant (P=0.712). The distribution of non-review drug used to control blood pressure – are primarily diuretic (hydrochlorothiazide 12.5mg daily) and calcium channel blocker (amlodipine 5mg daily) and was similar across group.

**Primary Endpoint**

The mean weight of patients in the telmisartan review group before commencing telmisartan 80mg daily equals 94.04±3.70kg, mean weight after commencing telmisartan 80mg daily dropped to 92.52±3.73kg and the paired difference in mean weight before and after treatment with telmisartan decreased by -1.51±0.46kg (P=0.006) in the telmisartan treatment group over a six month review period. The reduction in weight across the telmisartan treatment group also had a normal distribution over the 6 months review period fig 1 below.

The mean weight of patients in the irbesartan review group before commencing irbesartan 150mg daily equals 91.30±3.14kg, mean weight after commencing irbesartan 150mg daily dropped to 90.35±3.15kg and the paired difference in mean weight before and after treatment with irbesartan decreased by -0.96±0.15kg (P=0.000) in the irbesartan treatment group over a six month review period. The reduction in weight across the irbesartan treatment group also had a normal distribution over the 6 months review period fig 2 below.

![Fig 1](image1.png) **Fig 1** Histogram of change in weight in the telmisartan treatment group  
![Fig 2](image2.png) **Fig 2** Histogram of change in weight in the Irbesartan treatment group
Secondary Outcomes

In the telmisartan review group there was a positive correlation between change in systolic blood pressure and change in diastolic blood pressure (Pearson correlation = 0.795, P = 0.001). The negative correlation that was seen between change in SBP and change in weight was not significant (Pearson correlation = -0.220, P = 0.471), same was the case between change in diastolic blood pressure and change in weight (Pearson correlation = -0.050, P = 0.870).

In the irbesartan review group there was a positive correlation between change in systolic blood pressure and change in diastolic blood pressure (Pearson correlation = 0.653, P = 0.016). A positive correlation was seen between change in SBP and change in weight (Pearson correlation = 0.538, P = 0.058), same was the case between change in diastolic blood pressure and change in weight (Pearson correlation = 0.610, P = 0.027). A regression plot of change in weight against change in systolic blood pressure in the irbesartan treatment group gave a positive slope, S = 25.32 and R2 = 0.2895 fig 3, while a plot of change in weight against change in diastolic blood pressure gave a positive slope, S = 14.495 and R2 = 0.3722 fig4.

DISCUSSION

It has been established that telmisartan and irbesartan causes increase in plasma adiponectin (Makita et al., 2008 and Clasen et al., 2005) level and low adiponectin level is correlated with obesity (Fasshauer et al, 2004). Makita et al., (2008) noted decrease in weight with telmisartan alongside increase in adiponectin level. A study done with obese zucker rat fed high fat diet alongside irbesartan also recorded decrease in weight and increase adiponectin level (de LasHeras et al, 2009). The DO-IT prospective observational study show a decrease in BMI and other metabolic parameter in hypertensive patients placed on irbesartan over a period of six month (Parhofer et al., 2007). Hence, this retrospective cohort study tried to see if either telmisartan or irbesartan have weight reducing effect in hypertensive black patients and if this correlates with BP reduction recorded with these ARBs.
The primary end-point i.e. body weight reduction was positive for both telmisartan and irbesartan. Telmisartan showed greater reduction in body weight -1.61% than irbesartan -1.05% this is similar with the study by Makita et al, (2008) in which telmisartan showed a -2.2% decrease in body weight. The secondary end-point i.e. correlation of weight reduction to decrease in blood pressure was positive for irbesartan, while no effect was noticed in the telmisartan treatment group.

The distant implication of this study for telmisartan is intricately related to the result seen in both the ONTARGET and the HOPE study (ONTARGET, 2008 and HOPE, 2000). Suffice to say that telmisartan and ramipril demonstrated cardiovascular protection and as such both share license indication for CV protection in hypertensive patients at high risk of cardiovascular complication. It is noted that telmisartan increases adiponectin level (Makita et al., 2008) as well as ramipril (Koh et al 2005). One of the effects of increase in adiponectin level by telmisartan is decrease in weight as decrease in plasma level of adiponectin correlate with obesity (Fasshauer et al., 2004). This study corroborates that in truth telmisartan thus have weight reducing effect in black hypertensive possibly due to its increase in plasma adiponectin level. A study reported in AHA, 2004 vividly shows that adiponectin adheres to blood vessel walls, possibly protecting them by fighting inflammation at cellular level, this result is further corroborated by Ouedraogo et al., (2007) who showed in an animal model that adiponectin helps prevent immune system white blood cells from binding to the inside of blood vessel walls, adiponectin acts not only on leucocytes adhering to blood vessel wall, but also on inflammatory cytokines by reversing effect of cytokines produced by injection of a pro-inflammatory mediator - TNFα and thus halting resulting inflammation. Inflammation is common in cardiovascular diseases, since telmisartan increase adiponectin level, this is possibly the mechanism through which telmisartan was able to show cardiovascular protection in high CV risk patients in the ONTARGET study. This is also true for ramipril which has been found to increase adiponectin level and hence also demonstrate cardiovascular risk protection in high CV risk patients in the landmark trial – HOPE study. This study avidly shows that the benefit of telmisartan in CV risk protection as demonstrated in the ONTARGET study can also be enjoyed by black hypertensive. Telmisartan also sells itself for black patients with metabolic syndrome – a triad of hypertension, obesity and insulin resistance.

For irbesartan the implication of this study is related to the result seen in the IRMA2 and IDNT. In these study irbesartan showed 70% relative risk reduction to micro-albuminuria and reversal of micro-albuminuria in a third of patients population been studied, a decrease in doubling of serum creatinine a marker of worsening kidney state and a delay to ESRD. Studies have shown that irbesartan has the ability to increase serum adiponectin level (Clasen et al., 2005). One of the effects of increased adiponectin level could be decrease in body weight (Parhofer et al., 2007) as adiponectin level has been well correlated with obesity (Fasshauer et al., 2004). The study thus confirms that irbesartan have weight reducing effect in black hypertensive placed on it. A study by Thomas Jefferson University Researchers, 2005, shows that those with low level of adiponectin may also have high level of a protein called albumin which in humans, may be a sign of kidney disease…to prove the relationship, they also studied mice without adiponectin “adiponectin knockout” compared to wild type mice whose levels were normal. The team found that the knockout mice had three times the level of urine albumin than the wild type mice. In a separate study the researchers measured the adiponectin levels of a group of obese African American adolectancers and they found similar results – subjects who had a low level of adiponectin also had the condition known as albuminuria as indicated by high levels of the protein albumin in their urine. Albuminuria is an indicator for kidney disease and since irbesartan increases adiponectin level this possibly is the mechanism through which irbesartan was able to show reversal of microalbuminuria and renoprotection in the IRMA2 and IDNT respectively since it was observed that these effects were independent of it blood pressure lowering effects (Parving et al., 2001 and Lewis et al., 2001). This study thus goes to show that, “the benefits of irbesartan in reversal of microalbuminuria and renoprotection demonstrated in IRMA-2 and IDNT” might also be enjoyed by black diabetic hypertensive.
Amelioration of metabolic picture – a triad of obesity, insulin resistance and hypertension was reported to be improved in patients that were placed on Irbesartan 150mg/day and Telmisartan 80mg/day for 6 months and a greater effect was seen in the telmisartan group than the Irbesartan group (Negro et al 2006).

There was no change in BMI in a study conducted by Deroasa et al., (2006) to assess telmisartan and Irbesartan therapy in type 2 diabetic patients treated with rosiglitazone: effects on insulin resistance, leptin and tumor necrosis factor-α. There was a significant improvement of insulin sensitivity, decrease in leptin and TNF-α in both treatment groups after 6 and 12 months but greater decrease was seen in the telmisartan group than the Irbesartan group. It was observed that no change in BMI was seen in both telmisartan and irbesartan group after 6 and 12 month respectively, this finding can be explained by the study design, in which all patients were placed on rosiglitazone 4mg/day, remembering that TZDs have side effect of weight gain, it possibly explains why there was no change in BMI which is expected as shown in the study by mekita et al 2008.

Mori et al (2012), reports that higher doses of telmisartan gave increase in serum adiponectin level. The increase was evident particularly in a group of patients whose HMW adiponectin levels were less than 4.0μg/dl. A significant improvement in homeostasis model assessment of insulin resistance (HOMA-IR), a measure of insulin resistance, was also observed in the telmisartan 80mg group only. Similarly Clasen et al., (2005) also demonstrated that AT2R activation and Irbesartan induce adiponectin in adipocytes, which was associated with an improvement of parameters of insulin sensitivity in vivo. Irbesartan induced adiponectin stimulation is likely to be mediated via PPAR-γ activation involving post transcriptional mechanism.

**CONCLUSION**

The present study shows that black hypertensive patients placed on either telmisartan or irbesartan would not only benefit with respect to blood pressure reduction but would also with respect to significant reduction in body weight. Body weight reduction correlates with blood pressure reduction with the ARB – Irbesartan. It can also be inferred that the end-organ protection benefits of telmisartan or irbesartan may equally be enjoyed in black hypertensive with either CV risk complication or diabetic nephropathy respectively since the benefits can be attributed to their ability to significantly increase serum adiponectin levels. Therefore that irbesartan or telmisartan can reduce body weight significantly is likely due to its confirmed ability to increase serum adiponectin levels.

**REFERENCES**

“Pharmacovigilance On Sexual Enhancing Herbal Supplements”

Article Review by Stephen Joseph Atta Mensah
M.Sc in Clinical Research, Texila American University
Email: profhenson@yahoo.com

Source

Introduction
The article "Pharmacovigilance on sexual enhancing herbal supplements" by Bhagavathula et al., 2014 is a scientific paper on Pharmacovigilance published in the Journal of Pharmacovigilance –an open access journal. It explores one of the prevailing issues of global interest in the field of pharmacovigilance: Pharmacovigilance of Sexual enhancing herbal supplements. The article is a divided into main parts; the main body and the reference section. This review critically reviews the article's structure, authority, currency, stability, objectivity and it relevance to Clinician and Clinical Researchers. The review will first summarize the article and then critique the article on the basis of its authority, accuracy, currency, relevance, objectivity, stability and the data analysis. The review will analyze all the relevant data and information provided by the article before commenting on the credibility and the reliability of the article. Overall, the article is well written and relevant to Clinicians, Clinical Researchers and the general population.

Article Summary
The article is research paper which explores the facts and evidences that were observed in different countries attempting to demonstrate the importance of strengthening the regulatory system to strengthen the application of Pharmacovigilance principles on the sexual enhancing supplements. It explores one of the prevailing issues of global interest in the field of pharmacovigilance: Pharmacovigilance of Sexual enhancing herbal supplements. It extensively explores pharmacovigilance issues related to the growing demand and use of sexual enhancing herbal supplements globally. The article also advocate for strong pharmacovigilance measures to monitor herbal products. All the relevant information is orderly presented and discussed before inference are drawn. The article also firmly, scientifically analyses both sides of the coin. The article is supported by concrete evidence and supported by facts and figures. The article overall, the article critical explores the topic- “Pharmacovigilance on Sexual enhancing herbal supplements.

Article Structure
The article starts with a brief background on the topic in a short paragraph. This section summarizes the subject of discussion. The main body of the article is logically organized into four headings in short paragraphs. These are; The Problem, Insight of Reasons and Causes, Implications of Herbal Sex Remedies on Consumers, The Pharmacovigilance Program on Herbal Remedies. Each heading or sub-topic outlined by the article is thoroughly explored and supported with data or case studies when necessary. The article is written in clear and easy to understand language. This makes it easy for every reader to clearly understand it. The evidences, data and examples make it easy to follow up the discussion and to clearly understand the article. The article provides a concise conclusion on the topic and then ends with actionable recommendation. It is in PDF format making it easily accessible and manageable. The
references are well cited, both in-text and outside text. It also provides all the necessary information about the article. Overall the article is well structured.

Article Critique

Authority:

The article is a research paper on Pharmacovigilance published in the Journal of Pharmacovigilance – an open access journal. The paper was received on October 2, 2014 and was accepted and published on November 19, 2014 and November 26, 2014 respectively. The article was authored by Bhagavathula A.S, Elnour A.A and Shehab A; renowned researchers in Pharmacy and Internal Medicine from the University of Gondar College of Medicine and Health Science, Ethiopia and the College of Medicine and Health Science, UAE University. The affiliation and credentials of the authors also strengthens the authenticity, credibility and reliability of the article. This shows that the article is from a credible source. The address for correspondence is also provided. This also indicates the credibility of the article. The article provides links to the journal and states the references both in-text and at the reference section. These links upon investigation are correct and reliable. Hence the article is credible and reliable.

Accuracy

The article provides information from known and reliable sources. The sources of the information in the article are accurate and both the in-text citation and the reference list at the reference section are accurate. Each in-text cited number correspondence accurately to the list. The highly esteemed status of the editorial and the reviewing processes that the article was taken through contribute to it accuracy and credibility.

Currency

The article a very current article published on November 26, 2014 in the Journal of Pharmacovigilance, Volume 2 issue 6. It explores one of the prevailing issues of global interest in the field of pharmacovigilance: Pharmacovigilance of Sexual enhancing herbal supplements. The information provided by the article is from current publications and are very relevant to the Clinical Researchers, Clinicians, Pharmacist and the general population. Most of the references are in the 2000’s. Therefore the article is very current.

Relevance

The article is very relevant to the Clinical Researchers, Clinicians, Pharmacist and the general population. The article explores the topic extensively supported by the necessary data and case studies. It explores one of the prevailing issues of global interest in the field of pharmacovigilance: Pharmacovigilance of Sexual enhancing herbal supplements. This makes it easy for the reader to clearly understand the article. The article is of very great importance and relevance to Clinicians and Clinical Researchers. Every part of this article provides so much relevant information to the reader. The information is very practicable and applicable. Overall the article is relevant to Clinical Researchers, Clinicians, Pharmacist and the general population.

Objectivity

The article explore the subject of matter objectively and unbiased. The data and information discussions are very clear and transparent. The article also firmly, scientifically analyses both sides of the coin. Stating what is happening on the ground, supported by facts and figures. This shows that the article is objective and unbiased. Therefore the article is objective.
Stability

The article is a stable article. The Journal of Pharmacovigilance—an open access journal is a stable journal. The source of the article and the sources of the information it provides also confirm it. The article is in the PDF format which also makes it easily accessible. Therefore, the article is stable.

Analysis of Graph and Tables

Not applicable

Recent Advance Related to the topic

Not applicable.

Conclusion

The review has critically reviewed the article: "Pharmacovigilance on sexual enhancing herbal supplements" by Bhagavathula et al., 2014. The review first summarized and reviewed the article's structure. The review also analyzed and critiques the article. The article is well-structured; it is credible, current, accurate, stable and objective. The article provides the relevant information supported by facts and figures which enhances the readers’ understanding. The article is very resourceful to Clinicians, Pharmacist, Clinical researchers and the general population. The article is objective and stable. Overall the article is well written, clear and well structured.
The health status of maternal and children under five in Gozarah district belonging to Herat province west part of Afghanistan by Catchment Area Annual Census (CAAC) survey in 2013.

Article Review by Ehsan Ahmad  
Master of Public Health, Texila American University  
Email: - jibuddy09@gmail.com

Objectives of the research:

- Identifying the number of house hold and total population
- Identifying the number of married women (age 15-49)
- Key health services coverage (Family planning, vaccination)
- Identifying Maternal and children morality rate
- Collecting the information is very significant and use in each level of health facilities in Afghanistan.
- These information help for better health services to decrease mortality

Introduction:

Afghanistan's health status was one of the worst in the world before 2002 (UNICEF 2002) Fortunately after that there are many change during the recent years with some positive intervention and revised Basic Package of Health Services (BPHS) by ministry of public health of Afghanistan and decreased maternal and children mortality rate, The under-5 mortality rate for Afghanistan excluding the South zone for the 2-6 years prior to the survey is 97 deaths per 1,000 births, and the infant mortality rate is 77 deaths per 1,000 births(Afghanistan Mortality Survey(AMS 2010).

The pregnancy-related mortality ratio in Afghanistan based on sibling histories is estimated to be 327 per 100,000 births for the seven years preceding the AMS 2010 survey. With the Gakidou-King recommended adjustment, the pregnancy-related mortality ratio increases to 372 per 100,000 births. This means that for every 1,000 live births, about 3-5 women die during pregnancy, in childbirth, or in the two months after delivery.
The AMS 2010 survey estimates are much lower than previous estimates that were based on a very geographically limited and no representative sample.

Gozarah district is one of the biggest district which is located in south part of Hirat province (20 km far from Hirat city), with 386 villages and 259078 total population (CAAC survey 2013) in whole, considered to be not only insecure areas but remote enough being outside the enclaves of Herat city. The district consists of sand hills and lands, mountainous, farms garden around, boys and girls schools have been established by ministry of education in many villages in different level, 109 health post, five Basic Health Center, five sub health center, one district hospital and one mobile health team have been admitted according ministry of public health Afghanistan BPHS strategy husbandry and cultivations are big business of the inhabitants, outbreaks of pertusis, measles, Tania, CCHF have been reported during the last year in some villages.

The survey started on October and finished on December 2013 totally 386 villages covered in these all villages from 259000 total population collected the information door by door by 60 couples surveyors during 25 days, fully immunized children under two years calculated 70%, maternal mortality rate 391/100,000 and children under five mortality rate is 69/1000 totally in whole villages calculated.

**Content of the project**

The catchment area annual census (CAAC) identifies the number of people in important age groups who require health services. These numbers are essential to interpret data that is collected in health posts and health facilities and will be used at the health post, health facility, provincial and Afghanistan national levels.

In addition, from the CAAC local death rates in these age groups can be determined so that health services can be improved and fewer people will die. It also counts the number of couples who use birth spacing methods and children who are fully vaccinated. CAAC is a process of visiting people’s homes in a community and recording the data. Specific forms and tools are used to facilitate the process. In the bellows are the data tools which used in Gozarah district CAAC survey.

**3.1. Tools**

1. Pictorial tally sheet
2. CAAC Report (CAACR at the level of health post and individual village)
3. CAAC Aggregated Report (CAACAR at the level of health facility)
Pictorial tally sheet

The CAAC pictorial tally sheet is a pictorial form and is used by the Community Health Workers (CHW) and Health Facility (HF) staff to collect information about the number of people by age group who are living in the catchment area of the health post (HP) and HF. Because there may be more than 1 CHW per health post there may be more than 1 CAAC pictorial tally sheet per HP.

The information is recorded by the CHW and HF staff during the first visit to a house. Each house in the catchment area must be visited by the CHW once during the first 3 months of each year. Once the data collection completed, CAAC tally sheet collected by the Community Health Supervisors (CHS) who will sum the totals for each box on a CAAC Report (CAACR). Once all houses in the catchment area have been visited, the census is complete for that year. If during the 3 months there is insufficient space on the tally sheet, a second tally sheet can be used.

CAAC Report (CAACR)

The purpose of the CAACR is to combine the CAAC information for each health post or village. The CAACR completed by the CHS during the 3th month. One CAACR used for each health post or village. The CHS sum all CAAC pictorial tally sheets pertaining to one health post. After 3 months the CHS took the CAAC tally sheet from the CHWs. One copy of CAACR is kept by CHW for his/her use and the second copy is sent to HF for aggregation.

It is very important to be Ensure that all the identifying information for the CAAC is completed (the year of the pictorial CAAC, Include the district name and code, and the province name and code, health facility name and code as well as the health post name and code.

CAAC Aggregated Report (CAAC-AR)

CAAC-AR provides CAAC information at the level of the health facility. This provides denominator information for the health facility as well as selected indicators as described previously.

Community Health Supervisor (CHS) collected all CAACR and once the census is complete, they sum all CAACR to produce the aggregated report CAACAR.
3.2. Methodology and Process

Gozarah district CAA survey started on October and finished on December (three months) the process of the survey started with conducting the meeting with Gozarah and PZ district community health supervisors and district director to seek the available ways, challenges and making the action plan, the action plan has been designed and implanted and included estimated population, Number of couple surveyors, Number of local supervisors, district supervisor, project coordinator, data collector and data entry, training of the surveyors, tolls, performances of the project, result and analysis. according the action plan, the couple surveyors selected base on HF's population, the training of the surveyors have done on HF's level individually to each center, 60 couples surveyor from Community Health workers (CHWs) 12 HF's supervisor selected to do the project survey at the middle of October month the actual survey started and these 60 couples did the survey door by door and 12 HF's supervisor (CHS and Outreach vaccinators), district supervisors (district director), one data collector and one coordinator involved with survey of whole Gozara district villages including deep remote areas, they did survey during three months time. Table 1 shown summary sheet of health status in Gozarah district belonging to Herat province west part of Afghanistan:

Conclusion

CAAC survey is a process of collecting key information for all villages It has done in Gozarha district during three months time, whole area of district has been covered, All the information and data collected at the village and health post level first and then aggregated at health facility level.

60 couples surveyors (Male and Female) involved in the survey totally we collected 386 villages information 44218 house hold (HH) with 259078 total population, fully immunized children 1-2years shown 70%, children under five mortality rate 69/1000, infant mortality rate 56/1000 live birth, maternal mortality rate 391/100000 pregnant women, 39% women used family planning.

This study financially supported by Danish Afghanistan Committee (DAC) organization which have been implemented health services according to Afghanistan Basic Package of Health services since 1993 in this district.

Data has shown that many changes has been occurred as compared with last survey (2005) 36 villages newly established mostly they are Internal Displace People (IDP) that they migrated from other provinces Afghanistan and districts of Herat province and built houses in the area of Gozarah district, due to huge IDP migrant and new villages and town established in the district survey has shown intense increasing population and much higher growth rate population in the district as compared with 2005 CAAC survey.
children mortality rate, infant mortality rate shown much lower that national level (AMS2010) but still maternal mortality shown a little high then the national level. Bellows are some figures which compared the values.

**Figure 1:**

![Total population with growth rate population in Gozarah district Afghanistan Herat province (2001-2013)](image)

- **Figure 2:** Gozarah district infant and Children under five mortality Rate comparison with national level/1000 live birth

- **Figure 3:** Gozarah district MMR comparison with national level/100,000 live birth
Figure 4: Surveyors at the village collecting the data
Table 1 Table of Survey Indicators in Catchment Area Annual Censuses survey based on HFs wise In Gozarah District

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References

[1]. Afghanistan Mortality Survey (AMS 2010).
[3]. Basic Package of Health Services (BPHS) ministry of public health of Afghanistan
[4].
[5]. Gozarah district hospital document
[6].
[7]. Community based health care ministry public health of Afghanistan (Community Health Supervisors manual )
[8]. Gozara survey Catchment Area Annual Census (CAAC0 2005).
Health and Safety in Kenya: Public Health Ethical Issues and Considerations

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Abstract

Kenya is making efforts to be ethical in handling research involving human beings and laws have been enacted to that extent. There is still room for improvement by establishing the code of ethics for public health practitioners and developing an effective curriculum for training public health officers.

The Public health officers’ professional body need to speed up the enactment of the code of ethics in order to hold the public health practitioners to account for their actions and also get protection for their well intended actions to promote good health and prevent disease.

The current ethical debate is the tetanus toxoid vaccine which is laced with HCG hormone at 1 in every four. The government has been ready to explain the reason for the presence of HCG in the vaccine.

Key Words: Public Health, Ethics, National Legislation, NACOSTA, Tetanus toxoid, HCG

Introduction

Public health is defined as “the art of preventing diseases, prolonging life and promoting health through the organized efforts and informed choices of the society, organizations, public and private communities. ” It has also been defined as” the science of protecting and improving the health of communities through education, promotion of healthy life sytles and research for disease and injury prevention and detection and control of infectious diseases.” (CDC,)

The main preoccupation of public health professionals is to try to prevent problems from happening or re-occurring. This is made possible through:

Implementing educational programs
Developing policies
Administering services
Regulating health systems and some health professions
Conducting research

This is different from the approach of clinical professionals whose focus is treating individuals who fall sick or get injured in accidents.

In the furtherance of these responsibilities, the public health professional should not lose focus on the client i.e. the person or people in need of their services. These clients have rights as enshrined in the Kenyan constitution and other existing statutes.

Information Background

Prevention, Detection and Control of Infectious Diseases

Infectious diseases with high case fatality rates are among the reportable diseases and every country under WHO, is obliged to adopt the well guided strategies for the detection of such diseases. This is one of the key functions of Public Health.
To this effect (WHO, 2009), came up with the international health regulations 2005 (IHR 2005), which was designed to help protect all countries (states) from the spread of diseases. The scope of IHR 2005, focuses on all serious public health risks that may spread across international borders. The main purpose of IHR 2005 are to prevent, protect against, control, and provide a public health response to the international spread of diseases in ways that are commensurate with and restricted to public health risks and which avoid unnecessary interference with international traffic and trade”.

The IHR 2005 includes the rights and obligations for countries as concerns national and international surveillance, assessment. And public health response.

The IHR 2005 requires states to provide:
National legislations, regulations and other instruments to meet its requirements
Develop national public health capacities for surveillance and response throughout the country and capacities at specific international points of entry or departure. Coordination of public health communications and assessment across relevant ministries, departments and levels of government (national, regional, local).

Control

The best options for the control of diseases is the interruption of transmission and behavior change using the best practices that are evidence based.

Health Promotion

Health promotion strategies are not specific to a given disease or health problem nor to a specific set of behaviors. They can be applied to a variety of population risk factors, diseases and in various settings. Putting health promotion and assessment efforts in education, community development, policy, legislation and regulations makes them valid for prevention of communicable and non-communicable diseases.

Research

Research in health is needed for the progress towards universal health care coverage. This the most important concept public health is able to offer. In the process of developing systems for universal health coverage, countries can use research to determine the key health issues needed to be addressed by Kenya and any other country. The investment in health research is low in developing countries, but is growing at 5% every year. Through research, evidence based interventions can be reached at which goes a long way in preventing, controlling of diseases and providing better functioning health systems. The different approaches to research are complimentary be it clinical trials which provide information on the efficacy and adverse effects of medical interventions or feedback from real world clinical experiences which are important for comparing and pretesting the use of drugs, vaccines, medical devices and diagnostics (NAS).

Problem Statement

Ethics should be a major component of the Kenyan healthcare system. Ethics should be the most important contributor to the behavior of public health professionals. Ethics should guide the application of processes even before laws are formulated. The laws in public health narrows the discretion of the health care provider. Ethics constrains the behavior of the provider to within the limits of the law (Fox et. al, 2007) and guidelines of their profession.

Kenya has had controversies as concerns vaccinations. The tetanus vaccine has been opposed by some churches in Kenya due to the presence of HCG hormone. The HCG is known to control subsequent pregnancies and as such is opposed. The government has not come out clear why the HCG is included with the tetanus toxoid. There has been rampant labour strikes by the health personnel due to the devolution of health care to the newly created constitutional counties (GOK, 2010). This has created
undue suffering and even death to Kenyan population. The effectiveness of the public health department in the ministry of health is in question. This is because:

- Inspection of foods and eating places is not effective leading to the consumption of uninspected meats
- Clear guidelines in waste disposal are either not there or not adhered to with impunity
- Failure to enforce traffic rules is causing injuries, disabilities and deaths

**Literature Review**

Public health programmes designed to promote health, prevent disease or injuries have always raised questions about the responsibilities:

- The responsibility of individuals to live healthy lives
- The government’s role in creating an environment in which individuals are able to exercise their health related responsibility
- The role of government in coercing or influencing health related behavior or developing education programmes
- The use of incentives economic or otherwise to promote good health
- The relative importance for society of pursuing good health, especially when the existing culture favour autonomy rather than government interventions

In these aspects of public health endeavors, there must be professional code of conduct and ethics binding members of the profession in whatever decisions they make to save life. This approach to use of human beings in public health research came into scrutiny during the Tuskegee syphilis investigations. The community did not know what was the real truth about the programme nor were they asked for consent ( ). Similar issues were raised during the Nuremberg trials ( ). This led to the 4 recommendations guiding physicians in biomedical research involving human subjects. This is known as the Declaration of Helsinki (1964). The result was the international Code of Medical Ethics. (World Medical Organization (1996).

In ethical analysis, there are several aspects of ethic including,

- Professional ethics
- Applied ethics
- Advocacy ethics
- Critical ethics

The public health society then must initiate the process to establish a code of ethics to confront ethical issues. This will confront scandals in the field of public health help establish moral credibility of public health profession Provide the profession with a moral compass and set forth its ideals.

In October 2005, UNESCO adopted the universal declaration on bioethics and Human rights and was expected that member states will incorporate it in their national laws, regulations or policies in order to take effect (UNESCO, 2007).

Kenya and South Africa were chosen as field work destinations due to their significant involvement in genomics and bioethics.

The ethical considerations become more important as the prominence of public health improves. Health promotion and disease prevention programmes in the areas of disease and injury preventions depends on the responsibility of the individual to live healthy life and the government participation in creating the conducive environment for the people to exercise their health related responsibility (Callahan, 2002). In Kenya, the ministry of health is engaged in health promotion programmes to improve the health status of Kenyans. This was established through the Kenya's first National Health Promotion Strategy and Guiding frameworks launched in February 2014. This sets the guidelines for health promotion in Kenya.

There are still issues arising from the programme especially with vaccinations for polio and tetanus. There is the outcry why the tetanus toxoid vaccine is combined with HCG hormone which has negative effects on the fertility of women.
Risk reduction on the public poses some problems, the definition of risk is not very value neutral and as such is controversial. Questions that arise are the degree of risk acceptable by the community. In Kenya in the last one year there has been a number of bills passed through the parliament and the senate that relate to motor vehicle accidents. These include prohibition of night travels for public service vehicles and removal of carrier racks on top of these vehicles. The community has rejected the extent of these risk to injury protections and have to the law courts for redress. It shows that the community finds it too much of risk reduction to the extent that they are inconvenienced by the hike in cost of travelling. (Callahan, 2002).

The most recent research involving human subjects was the resistance to AIDS Virus by a section of commercial workers in Majengo slums in Nairobi city. It was discovered that some of these women has some immunity to the AIDS virus hence scientists from University of London and Kenyan doctors teamed to study the phenomenon. It require consent from the subjects and this led to the establishment of the Bioethical board in Kenya run by the National commission for Science and technology. Through delegation the National commission for science and technology has delegated ethical approval of research to Universities and Research Institutions (NACOSTI, 2009).

The public health practitioner involvement in reducing the socioeconomic disparities especially in occupational health and safety which is having negative impact on health status of communities. Many Kenyans working in various industries get involved in accidents through moving parts of machines they are handling or get poisoned especially those handling dangerous chemicals like in the flower farms. The level of training offered to them in terms of safety at work rests with public health officers. Such workers are protected through the Work Injury Act 2007 (GOK, 2007).

There is need for the public health practitioner to be involved in all the aspects of ethics, Applied ethics where they adopt a more moral and social point of view, Advocacy ethics for the social goals and reforms that would enhance General health and well being of the community, Critical ethics to deal with distinctive issues and problems of public health (Weed, 1998).

**Methodology**

**Research Design**

This research adopted the literature review or secondary data analysis. It analyzed the extent to which Kenya conforms to the world standards in public health practice. This involved the analysis of existing laws, regulations and practices governing public health profession. Some data was obtained from key informants in the public health profession and those who may have participated in clinical trials.

**Research Questions**

To what extent has Kenya come up with laws, regulations and Code of ethics in Public health practice
How does Kenya government handle public health issues raised by the communities

**Broad Objective**

To establish if Kenya Government is compliant in the practice of public health

**Specific Objectives**

To analyze the laws and regulations controlling public health ethics
To analyze the public health code of practice
To Analyze Kenya’s response to public health issues/occurrences

**Data Analysis**

The data is qualitative and as such qualitative methods of analysis has been used
Ethical Considerations

Informed consent was sought from the respondents by either verbal or written

Results and Discussion

Through the NACOSTA, Kenya has established Bioethical committees in various universities and research institutions. This takes care of the protection of the human subjects in bio researches. Hence all research in the country is documented since it is mandatory for the researcher to deposit both the proposal and the research findings with the organization. There is compliance with the Helsinki Declaration on human related/involvement in research (World Medical Organization, 1996).

The ministry of health has a department of environmental health and sanitation that handles hygiene and health promotion and also injuries to human beings. They inspect food restaurants, Buildings and personal hygiene of food handlers according to the Public Health ACT (GOK, 2012).

To date there no clear code of ethics for public health practitioners in Kenya. This leaves a lot to be desired since there is no common action among these group of professionals. Recently there was a move to adopt the American Code of ethics but this is still in process.

To some extent the cross training of medical doctors in Public Health is complication the development of the code of ethics.

The response of Kenyans to public health issues is mixed. The main area of contention is the polio vaccination and Tetanus toxoid vaccine. The older generation above 30 years of age received only one time vaccination for polio while the under five currently are receiving multiple vaccinations of polio yet no clear explanation is not coming forth from the government/Public health Practitioners. There are some religions in the country totally opposed to the polio campaign and the government has resorted to arrests and imprisonment. This shows lack of dialogues and forced public health activity and goes against established public health ethics.

The other issue involves the combined tetanus toxoid and HCG vaccine for pregnant women which is opposed by some medical practitioners and churches yet there is no clear explanation to the community.

This is an indication of lack of transparency in Public health actions.

Lastly but not the least is the frequent strikes by health workers due to the devolution process. There is resistance by some health workers to join the devolved governments and also agitation for higher pay. All these lead to suffering of the sick who go un attended to for days and in some cases leading to death.

Conclusion and Recommendations

Kenya is making efforts to be ethical in handling research involving human beings and laws have been enacted to that extent. There is still room for improvement by establishing the code of ethics for public health practitioners and developing an effective curriculum for training public health officers.

The Public health officers’ professional body need to speed up the enactment of the code of ethics in order to hold the public health practitioners to account for their actions and also get protection for their well intended actions to promote good health and prevent disease.

References

[7]. National academy of sciences (2007) : Public health secrecy and ethics
[8]. NACOSTI (2009) : Bio ethics Committee
Community Based Health Insurance Scheme: Knowledge and Perception of Rural Communities in Abuja Nigeria

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Abstract

Background

In 2010, community based health insurance scheme (CBHIS) was launched in the Federal Capital Territory (FCT) of Nigeria. Little is known about the knowledge and perception of the rural dwellers of the FCT about the scheme. This study aimed to evaluate the knowledge and perception of healthcare consumers towards CBHIS in FCT.

Methods

A descriptive cross sectional study of 287 household heads was done. Systematic random sampling was used. Information was collected using a semi-structured, interviewer administered questionnaire. Data was analysed with SPSS version 21.

Results

Male respondents were 175(61%), 242(84.3%) were aware of the existence of CBHIS, 126(82%) of enrollee also enrolled their dependents. Annual payment of health insurance premium was preferred by 91(59.9%) of enrolled respondents, 92(60.1%) enrolled in the scheme because they perceived it to be a cheap way to access healthcare. No proper understanding was the reason why 33(28.4%) of those aware of the scheme did not enroll themselves or their dependents. Only 124 (55.1%) were satisfied with the overall services provided to them by their health care provider (HCP). More males 102(81.6%) were satisfied with HCP services. Among respondents with secondary/tertiary education 18(81.8%) were satisfied with their HCP compared to 47(38.2%) of those who had no formal education, p<0.001. 47(85.5%) respondents in the richest wealth quintile were satisfied compared with only 13(52%) in the lowest category, p<0.001.

Conclusion

There is a need to educate the community members on principle of health insurance and improve access to health services under the scheme.

Key words: CBHIS, Health insurance, rural communities, knowledge, perception

Introduction

Healthcare systems in many developing countries have failed to provide its population with quality and affordable health services due to the poor state of public health services [1]. The health sector is also under funded as an average of only 3.52% of the entire budget of the Nigerian government was spent on health between 2000 and 2004 which was below the 5% recommended by the World Health Organization [2, 3]. As a result of the state of health systems, there has been an increase in the cost of healthcare which has further impoverished the poor population who fund their healthcare needs through out of pocket payment [4]. In recent years there has been a trend for many developing countries to move towards a new or expanded role for various forms of health insurance schemes as a form of health care financing in order to reduce
the burden of high cost of out of pocket payment for health care and to attain universal coverage, Nigeria as a country not excluded [5].

The community based health insurance scheme (CBHIS) which is a non-profit health insurance programme for a cohesive group of households/individuals or occupation based groups, formed on the basis of ethics of mutual aid and the collective pooling of health risks in which members take part in its management [6, 7]. The CBHIS is one of the Informal sector health insurance programmes of the National Health Insurance Scheme which was established by Act 35 of the 1999 of the Nigerian constitution. The scheme operates on the principal aim to reduce the high dependency on out-of-pocket (OOP) payments which accounts for more than 65% of all health expenditures in the form of user charges and co-payments, which disproportionately affect the poorest in society and has been recognized as an important tool for making health care affordable among the poorest [8, 9, 10].

Government and communities in Sub-Saharan Africa have been seen to show interest in implementing the CBHIS [11, 12, 13]. This is because CBHIS promises a glimpse of hope to the unending health inequality affecting most especially the rural part of the region, providing a means of achieving universal health coverage and this eagerness has resulted in the spread of CBHI schemes [1, 14]. Despite increasing support and spread of CBHIS as reported in several studies across Africa [15 -2] enrollment has remained low [22 – 24%] indicating that CBHIS has continued to fail to reach satisfactory levels of participation amongst targeted population, this could be as a result of poor awareness and sensitization to the targeted population and a lack of understanding of their expectation of the scheme [14, 18, 21- 23].

According to WHO, little attention is being paid to understanding consumers’ preferences in the implementation of CBHIS across the world and the case is not different as only few studies were found to have recently accessed consumers knowledge and perception on CBHIS in Africa [14, 24-25]. A study in Plateau State, Nigeria showed that 71% had good knowledge of CBHIS through mass media, however, there was no CBHIS scheme in the community and the entire state where this study was carried out [18]. The other study found in Nigeria which evaluated the benefit healthcare consumers are willing to pay for, if CBHIS was eventually introduced excluded the communities in which CBHIS has been piloted [25]. This study aimed to evaluate the knowledge of healthcare consumers, access their perception and determine their level of satisfaction towards CBHIS in a community where the scheme has been implemented.

Methods

Study setting

This study was conducted from July to September 2014 in Gwagwalada area council which is one of the six Local Government Area Councils of the Federal Capital Territory of Nigeria. Gwagwalada area council has an area of 1,043 km² and 104 communities which has an estimated 50,867 households and population of 201,496. Majority of its working population are in the informal sector dwelling in rural communities and involve in Fadama farming which is the main economic activity in the area [26].

Study design

A descriptive cross sectional study design was used in this study. This study design was chosen as the most suitable considering the research questions and budget involved.

Sample size

Sample size calculation used based on Williams Cochran’s method for cross sectional survey [27]. In order to achieve a confidence interval of 95% and a power of 80% and to be able to detect a margin of error of 5%, the study sample size was calculated based on the estimated
prevalence rate of knowledge of CBHI of 25% [28]. Assuming a non-response rate of 5%, the required minimum sample was 301 households.

**Sampling methodology**

To identify the individual households to participate in this survey, the FCT demographic and household survey listing of households was used as a sampling frame. The first household was identified using simple random sampling, after which a systematic random sampling was applied to identify the subsequent household until the required sample was obtained. Questionnaires were administered to household heads or their spouses, and in their absence, another senior household member. Eligibility of the individual household included in this survey was individuals aged 18 years or more, consenting and willing to respond to an interview.

**Data collection**

Data collection was through face-to-face interviews using a structured pretested questionnaire that contained both structured and open-ended questions administered to household heads selected using simple random sampling.

The first part of the questionnaire was designed to capture data on socio-demographic characteristics. The second part of the questionnaire evaluated respondent’s knowledge on CBHIS depending on whether or not the respondent had heard of a CBHIS and classified as "aware" or "unaware", “enrolled” or “not enrolled” and whether or not they have benefitted from the scheme in terms of service delivery. Only the knowledge of those who were aware of CBHIS will be evaluated. The third part of the questionnaire evaluated community perception of CBHIS in terms of willingness to be involved in the scheme, satisfaction with service delivery, and payment of premium. An interpreter was also used to translate response from their local gbagyi language to English language.

**Data Analysis**

Data collected were entered into a computer and analyzed using SPSS version 21.0 [29]. Descriptive statistics was employed to describe the socio-demographic characteristics of respondents. Principal Component Analysis (PCA) was used to categorize households into wealth quintiles and inputs into the PCA were gotten from information on household items like ownership of house and other assets like stove, fan, refrigerator, radio, television, air conditioner, piped water in the household, generator, bicycle, motorcycle, upholstered chair, washing machine and sewing machine. Quintiles were used to calculate distribution cut points and each household head was assigned the wealth index score of his/her household. The quintiles were Q1= Poorest, Q2= Second, Q3 = Middle, Q4 = Fourth, Q5 = Richest [30]. Level of awareness was summarized using mean and standard deviation while satisfaction level was summarized using mean score of respondent’s satisfaction score of different healthcare services on likert scale of 1 to 5. Satisfaction score below the mean was classified as “not satisfied” and score above the mean classified as “satisfied”. Association between socio-demographic characteristics and satisfaction level was explored with the Chi-square test and p-value less than 0.05 was considered statistically significant.

**Ethical considerations**

Ethical approval was obtained from the FCT CBHIS Secretariat and Head of Department for health in Gwagwalada area council.
Result

A total of 301 questionnaires were distributed out of which 287 were properly filled and returned, this amounts to a response rate of 95.4% and equals the originally calculated required sample size and so the data presented is based on the response of 287 respondents.

The socio-demographic characteristics of the 287 respondents is found in Table 1 with 115(40.1%) in age group 30-39 years and the least 35(12.2%) in age group 20-29 years. There were 175(61%) male respondents. Islam was practiced by 143(49.8%). Gbagyi ethnic group were 151(52.6%). The married respondents were 236(82.2%) of the population. The mean household size was 6.5 and ranged from 4 to 21 with 190(66%) having household size of 6 and above. Only 22(7.7%) had secondary/tertiary education while 173(60.35) never had formal education. Farming is the predominant occupation of the study population, posing as source of income to 140(48.8%), 60(20.9%) of the respondents didn’t have any source of income and only 13(4.5%) have their income from livestock rearing. About 175(63.4%) earn below the country’s minimum wage of 18,000 naira. Respondents were categorized into 5 using wealth quintile.

| Table 1: Socio-demographic characteristics of the study population (N = 287) |
|-----------------|------|---------|
| **Socio-demographic characteristics** | **Frequency** | **Percentage** |
| **Age group in years** |     |         |
| 20-29             | 35   | 12.2    |
| 30-39             | 115  | 40.1    |
| 40-49             | 87   | 30.3    |
| 50+               | 50   | 17.4    |
| **Sex** |     |         |
| Male             | 175  | 61.0    |
| Female           | 112  | 39.0    |
| **Religion** |     |         |
| Christianity     | 121  | 42.2    |
| Islam            | 143  | 49.8    |
| Traditional      | 23   | 8.0     |
| **Ethnic group** |     |         |
| Igbo             | 6    | 2.1     |
| Hausa            | 94   | 32.8    |
| Fulani           | 36   | 12.5    |
| Gbagyi           | 151  | 52.6    |
| **Marital Status** |     |         |
| Single           | 10   | 3.5     |
| Married          | 236  | 82.2    |
| Divorced         | 14   | 4.9     |
| Widowed          | 27   | 9.4     |
| **Level of Education Completed** |     |         |
| No formal Education | 173 | 60.3     |
| Primary           | 92   | 32.1    |
| Secondary/Tertiary | 22  | 7.7     |
| **Household size** |     |         |
| ≤5               | 97   | 33.8    |
| ≥6               | 190  | 66.2    |
| **Main source of income** |     |         |
| Farming          | 140  | 48.8    |
| Livestock        | 13   | 4.5     |
Table 2 shows the respondent’s knowledge and awareness of CBHIS. In all, 242(84.3%) were aware of the existence of CBHIS. Among the respondents who were aware of CBHIS, 115(47.5%) was through community sensitization, 13(5.4%) and 68(28.1%) were through radio and close relatives respectively. Table 2 also shows that 186 (76.9%) of the respondent have the knowledge that only the enrolled individual pay for the CBHIS and the premium paid is enough to provide healthcare for a one year period. In all, 54(22.3%) have the knowledge that the enrolled individual pays their premium which is only a part of the total cost needed to provide care while the government pay the rest in form of subsidy.

Table 2: Knowledge and awareness of CBHIS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of CBHIS (n= 287)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>242</td>
<td>84.3</td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td>15.7</td>
</tr>
<tr>
<td>Awareness medium (n=242)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td>13</td>
<td>5.4</td>
</tr>
<tr>
<td>Health center</td>
<td>46</td>
<td>19.0</td>
</tr>
<tr>
<td>Close relative</td>
<td>68</td>
<td>28.1</td>
</tr>
<tr>
<td>Community sensitization programs</td>
<td>115</td>
<td>47.5</td>
</tr>
<tr>
<td>Knowledge of who pays for CBHIS (n= 242)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrolled family</td>
<td>186</td>
<td>76.9</td>
</tr>
<tr>
<td>Government</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Government and enrolled individual</td>
<td>54</td>
<td>22.3</td>
</tr>
</tbody>
</table>

Enrollment status of sample population is presented in Table 3. The total number of respondent that were aware of the scheme was 242 out of which 152(62.8%) enrolled into the scheme. 126(82%) of those enrolled also enrolled their dependents while 26(17.1%) did not enroll their dependents. Only 54(35.5%) have enrolled to the scheme for more than one year. Annual payment of health insurance premium was preferred by 91(59.9%) of enrolled respondents while only 138.6% preferred to pay quarterly. A greater number of the respondents were new to the scheme as 74(48.4%) were not due for renewal of their healthcare premium. However, 51(33.3%) had renewed their premium and only 28(18.3%) who were due for renewal had not yet renewed their premium. Willingness to renew healthcare premium was shown by 129(84.3%) of the enrolled population while 20(13.1%) were not sure if they will renew or not and 4(2.6%) were not willing to renew.
Table 3: Enrolment into CBHIS

<table>
<thead>
<tr>
<th>Enrolment status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment in CBHIS (n=242)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>152</td>
<td>62.8</td>
</tr>
<tr>
<td>No</td>
<td>90</td>
<td>37.2</td>
</tr>
<tr>
<td>Dependants enrollment CBHIS (n=152)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>126</td>
<td>82.9</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>17.1</td>
</tr>
<tr>
<td>Period of membership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6 months</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>6 - 12 months</td>
<td>90</td>
<td>59.2</td>
</tr>
<tr>
<td>13 - 24 months</td>
<td>54</td>
<td>35.5</td>
</tr>
<tr>
<td>Preferred mode of payment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>27</td>
<td>17.8</td>
</tr>
<tr>
<td>Quarterly</td>
<td>13</td>
<td>8.6</td>
</tr>
<tr>
<td>Bi-annually</td>
<td>21</td>
<td>13.8</td>
</tr>
<tr>
<td>Annually</td>
<td>91</td>
<td>59.9</td>
</tr>
<tr>
<td>Renewal of premium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>33.3</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>18.3</td>
</tr>
<tr>
<td>Not due for renewal</td>
<td>74</td>
<td>48.4</td>
</tr>
<tr>
<td>Willingness to renew premium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>129</td>
<td>84.3</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Undecided</td>
<td>20</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Figure 4.1 is a bar chart showing respondent’s reason for enrolling into CBHIS. More than half of the respondents 92(60.1%) enrolled in the scheme because they perceived it to be a cheap way to access healthcare, 49(32%) enrolled because they felt the scheme will help them prevent out of pocket spending for healthcare while 7(4.6%) and 5(3.3%) enrolled to stay healthy and get timely treatment respectively.
Figure 2 is showing the reasons why 116 of the respondents who were aware of CBHI did not enroll. As seen in figure 2, 33(28.4%) of those aware of the scheme did not enroll themselves or their dependents because they had no proper understanding on how the scheme works, 29(25%) did not trust the scheme. Those who couldn’t afford the premium needed to be paid for them to enroll into the scheme were 26(22.4%). The reason why 13 (11.2%) refused to enroll was because they don’t see how they benefit when do not fall sick at the end of their cover period. Only 10(8.6%) could not register because they had large family size and 5(4.3%) because of distance to the healthcare center.

Table 4: Experience with healthcare provider (HCP)

<table>
<thead>
<tr>
<th>HCP experience</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare provider (n=242)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community PHC</td>
<td>201</td>
<td>83.1</td>
</tr>
<tr>
<td>Private Clinic</td>
<td>18</td>
<td>7.4</td>
</tr>
<tr>
<td>Traditional healer</td>
<td>8</td>
<td>3.3</td>
</tr>
<tr>
<td>Home</td>
<td>15</td>
<td>6.2</td>
</tr>
<tr>
<td>Use of PHC services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>193</td>
<td>79.8</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>20.2</td>
</tr>
<tr>
<td>Frequency of PHC services per year (n=193)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5</td>
<td>31</td>
<td>16.1</td>
</tr>
<tr>
<td>5 - 10</td>
<td>93</td>
<td>48.2</td>
</tr>
<tr>
<td>10 – 20</td>
<td>69</td>
<td>35.8</td>
</tr>
<tr>
<td>Last visit to PHC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2 months ago</td>
<td>40</td>
<td>20.7</td>
</tr>
<tr>
<td>2 - 5 months ago</td>
<td>68</td>
<td>35.2</td>
</tr>
<tr>
<td>5 - 10 months ago</td>
<td>65</td>
<td>33.7</td>
</tr>
<tr>
<td>10 - 20 months ago</td>
<td>20</td>
<td>10.3</td>
</tr>
<tr>
<td>Referral to another healthcare provider (n=211)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>77</td>
<td>36.5</td>
</tr>
</tbody>
</table>
Data on respondent’s experience with HCP is presented in Table 4 and shows that 201(83.1%) receive healthcare from the community primary healthcare center (PHC) and only 8(3.3%) use the services of the traditional healer. Out of 201 respondents that receive healthcare from the PHC, 193(79.8%) had used the services of the PHC since the inception of the scheme. Likewise, 93(48.2%) of the respondents used the services of the PHC 5-10 times and 31(16.1%) used it less than 5 year a times a year. In all, 68(35.2%) last visited the PHC about 2-5 months ago with most recent visit of less than 2 months ago by 40(20.7%) respondents. Only 77(36.5%) of respondents have been referred to another healthcare provider out of which 46(59.7%) were referred to the General hospital.

Figure 3: Respondent's reason for last visit to PHC

Figure 3 is a bar chart displaying respondent’s reason for their last visit to PHC. Body pain was the reason why 44(22.8%) respondents visited the PHC. Diabetes & HTN was recorded as they reason why 29(15.0%) visited the PHC. Other reasons were antenatal care 27(14.0%) and malaria 26(13.5). Only 4(2.1%) visited the PHC because of diarrhea

Table 5: Respondent’s satisfaction with healthcare provider (HCP) services (n=225)

<table>
<thead>
<tr>
<th>Satisfaction with HCP services</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs Provision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not satisfied</td>
<td>99</td>
<td>44.0</td>
</tr>
<tr>
<td>Satisfied</td>
<td>126</td>
<td>56.0</td>
</tr>
<tr>
<td>Hospital Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not satisfied</td>
<td>104</td>
<td>46.2</td>
</tr>
<tr>
<td>Satisfied</td>
<td>121</td>
<td>53.8</td>
</tr>
<tr>
<td>Waiting time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5 shows respondent’s level of satisfaction with healthcare provider (HCP) services, 126(56%) were satisfied with the services that involved drug provision and dispensing. More than half of the respondents 121(53.8%) were satisfied with hospital services and 94(41.8%) respondents were not satisfied with the hospital waiting time. In all, 124(55.1%) were satisfied with the overall services provided to them by their HCP.

Table 6: Bivariate analysis of respondent’s socio-demographic characteristics and satisfaction level.

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Satisfaction level</th>
<th>Chi square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not satisfied (%)</td>
<td>Satisfied (%)</td>
<td></td>
</tr>
<tr>
<td>Age Group in Years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>29 (85.3)</td>
<td>5 (14.7)</td>
<td>33.77</td>
</tr>
<tr>
<td>30-39</td>
<td>45 (46.9)</td>
<td>51 (53.1)</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>18 (32.1)</td>
<td>38 (67.9)</td>
<td></td>
</tr>
<tr>
<td>&gt;50</td>
<td>9 (23.1)</td>
<td>30 (76.9)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>23 (18.4)</td>
<td>102 (81.6)</td>
<td>79.77</td>
</tr>
<tr>
<td>Female</td>
<td>78 (78.0)</td>
<td>22 (22.0)</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>80 (77.7)</td>
<td>23 (22.3)</td>
<td>82.51</td>
</tr>
<tr>
<td>Islam</td>
<td>21 (17.2)</td>
<td>101 (82.8)</td>
<td></td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Igbo</td>
<td>4 (66.7)</td>
<td>2 (33.3)</td>
<td></td>
</tr>
<tr>
<td>Hausa</td>
<td>20 (35.1)</td>
<td>37 (64.9)</td>
<td>3.95</td>
</tr>
<tr>
<td>Fulani</td>
<td>12 (44.4)</td>
<td>15 (55.6)</td>
<td></td>
</tr>
<tr>
<td>Gbagyi</td>
<td>65 (48.1)</td>
<td>70 (51.9)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>6 (60.0)</td>
<td>4 (40.0)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>78 (41.7)</td>
<td>109 (58.3)</td>
<td>6.96</td>
</tr>
<tr>
<td>Divorced</td>
<td>3 (37.5)</td>
<td>5 (62.5)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>14 (70.0)</td>
<td>6 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Level of Education Completed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal Education</td>
<td>76 (61.8)</td>
<td>47 (38.2)</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>21 (92.6)</td>
<td>59 (7.4)</td>
<td>31.78</td>
</tr>
<tr>
<td>Secondary/Tertiary</td>
<td>4 (18.2)</td>
<td>18 (81.8)</td>
<td></td>
</tr>
<tr>
<td>Household size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤5</td>
<td>49 (62.8)</td>
<td>29 (37.2)</td>
<td>15.52</td>
</tr>
<tr>
<td>≥6</td>
<td>52 (35.4)</td>
<td>95 (64.6)</td>
<td></td>
</tr>
<tr>
<td>Monthly Income in Naira</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Among the respondents in age group 30-39 years, 51(53.1%) were satisfied with HCP services while 45(46.9%) were not. Majority of respondents 29(85.3%) in age group 20-29 years were not satisfied with HCP services while only 5(14.7%) were satisfied, p<0.001. There was statistically significant difference between sex and level of satisfaction as more males 102(81.6%) were satisfied with HCP services and 23(18.4%) were not. Respondents that practiced Islam religion and were satisfied with the services of their HCP were 101(82.8%) as compared to only 23(22.3%) of respondents that practiced Christianity, p <0.001. with regards to level of education 18(81.8%) of the respondents with secondary/tertiary education were satisfied compared to 47(38.2%) of those who had no formal education, P<0.001. Households with ≥6 members were more satisfied with 95(64.6%) compared to only 29(37.2%) of households with ≤5 members, p<0.001. Considering monthly income 46(68.7%) earners of > 18,000.00 were more satisfied with HCP than 74(50.3%) earners of ≤ 18,000.00 monthly, this is statistically significant. Similarly, 47(85.5%) respondents in the richest wealth quintile were satisfied compared with only 13(52%) in the lowest category, p<0.001.

Discussion

The objective of this study was to evaluate the knowledge and perception of healthcare consumers in rural communities in Abuja and also to determine their level of satisfaction with health care providers in the community health insurance scheme (CBHIS). The socio-demographic characteristics of the study population revealed that there were more respondents in the age group of 30-39 years. This could be because this age group holds the youth of the community who are more enlightened and actively involved in community development programs. Unlike the study carried out in rural East and West Africa [12, 18] which recorded more female household heads in the study population. There were more male household heads in this study because in the Northern Nigerian context, the household heads are mostly males and it has been recorded that only 1 in 5 households are headed by female in Nigeria [33]. About half of the study population practiced Islam religion and were of Gbagyi ethnic group as expected in rural setting of Abuja, Nigeria. As reported in some studies on CBHIS in Africa [7, 12, 17 - 18] most of the respondents in this study were married and had little or no formal education. Household size of more than 6 was seen in about 66% of respondent because the study was carried out in a rural area which records more household size than the urban area [33].

Awareness level of CBHIS in the communities under this study was high and can be attributed to the constant sensitization and awareness campaigns organized in the communities by the FCT Health and Human Services Secretariat combined with the brilliant collaboration with the FCT-MDGs office who has initiated various health and agricultural programs in the communities before the introduction of CBHIS. This proves that the role of awareness and sensitization in CBHIS cannot be over emphasized. It gives an advantage to approach the rural community with a face they trust and are familiar with.

More than half of the household heads had enrolled themselves and their dependants. These figures are higher than the national health insurance scheme coverage level in Nigeria which is
estimated as 5\% of the population [34]. The study population saw the need to enroll in CBHIS as it provided cheap access to healthcare and prevents out of pocket spending but there was lack of knowledge of how CBHIS is financed in the FCT as 80\% of respondents felt that the money they pay fully provides the health services they receive from the CBHIS and were not aware that the government pays a huge part of the cost of care in form of subsidy, without which the scheme will not be sustainable. Similarly, some of the respondents were not enrolled in the scheme because of lack of proper understanding of how the CBHIS works and were of the opinion that the enrolled individual or family be refunded the unutilized premium paid for healthcare at the end of the cover period. This finding is synonymous to results from a study where the study population had inadequate knowledge of financing CBHIS [17].

The price for health insurance was perceived to be high by some of the respondent this is because the study population were poor and 63.4\% earn below the country’s minimum wage of 18,000 naira from mostly farming coupled with the design of CBHIS that uses the family as a unit of enrollment which makes it difficult for the poor population to register themselves and their dependants. High price for health insurance being a barrier for rural communities to enroll into CBHIS was also reported in qualitative studies from Senegal, Uganda and Kenya [12, 15, 22]. Another study went ahead to suggest possible premium exemption or waivers for the poorest of the community members as an assurance for equitable enrollment into health insurance schemes [7].

The primary healthcare center (PHC) the only public health facility in most rural communities and serves as the first point of healthcare contact to about 83\% of respondents of this study when they fall ill but access to this PHC is actually limited as only 48.2\% use the services of the PHC 5-10 times a year and just a few had been referred to the only general hospital in the area council. Presence of a healthcare facility in the community where the CBHIS is a critical factor for community members to be involved in the scheme but Gwagwalada area council where this study was conducted has PHC in only 29 out of 104 communities (FCT Baseline data on health services) and as expected, some respondents gave distance to PHC as their reason for not getting involved in CBHIS because they had to travel to a neighboring community to receive healthcare. This shows poor access and inequitable distribution of healthcare facilities and the people in the rural communities are disproportionately affected like in studies from some other African countries [12, 22, 24]. Despite poor access to PHC, more than half of the respondents were satisfied with PHC services. This could be because people in this part of the country are ignorant of what their health rights are coupled with the failing health system and the community members perceived that some form of cheap health care is better than none at all.

Regarding satisfaction level and socio-demographic characteristics, older household heads were more satisfied with PHC services. Reason being that this age group of household heads holds the vulnerable group and they use more of the services of the health center. Household size plays a significant role in respondent’s satisfaction as respondents with larger households were more satisfied with PHC services. This is because the health insurance is cheap and has helped reduce the burden of out of pocket payment for their large household when they visit the health center uninsured. Higher income earners and respondents in the richest wealth quintile showed a significant positive level of satisfaction with healthcare services provided to them under the CBHIS. This high satisfaction level could be attributed to their ability to comfortably pay the premium for health insurance and can afford to pay for subsidized drugs outside the benefit package outlined in the CBHIS.
Conclusion

Findings from this study suggest that although there is a high level of awareness of CBHIS among the study population but there is misconception on how the scheme is financed as community members are under the impression that the premium paid provides the healthcare they receive under the scheme and are not aware of the subsidy paid by the government. There exists a lack of understanding of the principle of risk pooling on which health insurance operates by the community who expects a refund for unutilized health premium. The community members perceive the CBHIS as affordable and protect them from out of pocket payment; the reason behind high enrolment. On the other hand, lack of understanding on how the scheme works, lack of trust and inability to pay premium were hindrances to becoming members of CBHIS by some community members.

Recommendation

Increased access to healthcare facility and improved quality of health services particularly in drug availability, infrastructure and hospital personnel will go a long way to sustain the existence of CBHIS. The Nigerian government needs to dedicate more resources to bridge the gap created by lack of health care centers in the community and improve the bad state of the existing ones in order to keep the CBHIS running and achieve universal health coverage. Comprehensive awareness campaign should be carried out using various medium of awareness to reach out to the community members because people are likely to accept a program if only they understand key concepts and how the program actually runs. Other CBHIS programs should emulate the strategy used by the FCT-CBHIS to create awareness and acceptability of the scheme by going into the community through already established programs and people they trust.

The FCT-CBHIS should carry out a proper feasibility study to determine what community members are willing to pay for their healthcare premium and possibly design healthcare premium for different wealth quintiles of the community.

References


Quality Assurance and Self-Assessment: Approach Methods by Southern University

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Email:- emmanuel.kooma@gmail.com

Introduction

The resources required for open distance learning (ODL) are human, physical, financial, and technological supported by cross cutting issues. This paper focuses on quality assurance and self-assessment as part of the cross cutting functional areas at Southern University.

The Southern University (SU) envisions being a World Class University for the advancement of humanity, serving as a cradle of knowledge and excellence. To achieve this, the University will endeavour to generate and disseminate significant quality knowledge backed by its core values, upholding unbendable and uncompromising standards that contribute to national and global development. The university’s vision is “To be an icon of academic excellence in all disciplines and natural resource based professions in sub-Saharan Africa”.

With the onset of peace in many African countries after many years of instability and insecurity, with the democratization of many African states following decades of totalitarian rule, and following years of corrupt and inept administrations, there is now an acute consciousness of the wasted years of African prosperity. One of the highest casualties of misrule has been education. Education became one of the lowest priorities. Investment in education across the sector diminished.

SU like any other Open Distance Learning (ODL) Universities has observed that with peace and democratization in Zambia, there is population growth, rising prosperity, a thirst for knowledge, and a need to bridge the skills gap, all in the context of rising expectations and diminishing resources. For many, however, for whom life circumstances have rendered university attendance a distant dream, have yet another opportunity and this is the reason SU has come into being.

Challenges of quality Assurance for ODL as Alternative

Increasing access to ODL and consequent rapid expansion of open distance education in Zambia as a viable alternative ODL pauses a tremendous challenge to ensuring quality to develop public confidence. Given these challenges of low level of observed quality culture in some of the existing ODL Institutions in Zambia, SU at its early embryonic stage of development has planned to adopt an evolutionary approach to integrate accepted Ministry of Education (MOE) elements of quality assurance and standards along with the development systems, process and procedures. SU has introduced a prescriptive quality assurance policy as the main focus for running its education programs through having a strategic plan and a concept paper and following all laid down procedures and standards by MOE without compromise.

The University has embarked on recruiting well qualified seasoned Professors, Doctors, Scientists and Academicians with vast experience from UNZA, CBU, Mulungushi, and Rusangu University and from the private sector. The University’s main focus has been on capacity building in respect of institutional organization and staff development, administration course design with the guidance of DODE under MOE and materials development, support functional services, self assessments, student performance assessments and feedback etc.
The University’s implementation of the quality Assurance is successfully gradually growing through its staff and through active participation in its process of development. The new members of the University are to be inducted in Quality Assurance concepts that are not based on perceptions but evolutionary based on learner experience.

A specific quality assurance strategy is usually not universally adoptable (Olojede, 2008) because distance education “Outfit” varies widely from institution to institution and country to another. Hopkins (2003) suggests that the revolution of quality assurance is at three different stages of ODL institutional development; embryonic, evolving and matured stages. The intention of the SU is to always meet the requirements of the accreditation body with transparency and free of corrupt practices to maintain its integrity with wider public confidence.

Quality assurance at SU has been ongoing and incremental along with the implementation of various functions. Lessons learnt are recorded in readiness to developing a quality assurance policy, based on the learner’s and institutional experience. The quality concept of best practice is kept in every one’s mind while developing and implementing the systems, processes and procedures (trust but verify concept).

**Context about Southern University**

Southern University was founded after studying existing institutions of higher learning and identifying gaps in the current set-up. Programmes were developed through consultation with experienced academicians, employment market and extensive bench-marking with highly rated universities in the sub-region. The principle is to bring a new product and service in the Zambian tertiary education. SU is a private institution of higher learning established under cap of the laws of Zambia. Proprietors are mostly Zambians with a few foreigners. Its overall objective is to contribute to national development through training of human resource, technology generation and employment creation.

The SU will contribute and supplement the efforts of other scholarly institutions in Zambia, the sub-region, Africa and the global community. The Board of Directors is not only determined to lead the institution to become one of the best universities in the world but also to distinguish the University from other universities through practical, research and skills based training. The board brings with it a new vision for Zambia by conducting university business differently.

Our university is an English medium institution, combining the history of Southern Province and Zambia and, to a growing extent, the sub-region, Africa and the rest of the world. A full range of undergraduate and postgraduate degrees and diplomas will be offered in six schools to students. Top on our priority is recruitment of highly qualified, experienced, credible and motivated work force to run the different departments of the university.

**Location**

The University grounds are located at farm No 79a that measures 1,852.911 acres (750 hectares) two kilometers from Choma town. Construction of the required infrastructure is expected to commence soon. This will be an on-going process till the university attains excellent infrastructure. While construction is in progress the university has sourced facilities within Choma and Livingstone to run part-time programmes.

**Academic Programs**

1. School of Education
2. School of Humanities and Social Sciences
3. School of Business
4. School of Agriculture Sciences
5. School of Natural Sciences
Political Commitment

The establishment of SU and development of the ODL programs form part of explicit strategy (Strategic Plan) and commitment of the institution to MOE and government policy on higher learning institutions for Zambia. The academic programs were developed under open and distance learning model and articulated by the internal stakeholders and various specialists and approved by the Board of Directors demonstrating a political commitment. The local Deputy Minister under the Office of the vice-president for Southern Province was also briefed and endorsed his positive views for the University to proceed with its programs.

The MOE also approved the SU model of ODL. A team of professionals headed by specialists based on both local and international standards was developed. The main features of the model are:

1. Southern University will retain its academic responsibility for developing and delivering course programs to international and Zambian population.
2. The University will facilitate and provide technical and logistical support learning
3. Currently two Regional Centers exists and were approved by DODE and by the Association for Private Schools of Learning (APSL).
4. The University will provide instructional support services for developing course materials
5. Delivery of learning materials will be in print, online and later in advanced stage the university will adopt web-based learning. In the quest to maintain quality and standards, the development of high quality course materials will be SU commitment to make sure the materials are user friendly, culturally sensitive and the institution will facilitate deep learning impact. The University strategic plan and the concept paper are charting the direction of SU and guide the Authority or leaders, managers and University staff at large towards the institutional common goals

Organizational Structure

The Organizational structure for SU like any other university is governed by the Board of Directors and Board of Trustees drawn from a diversity of professions, mostly existing University lecturers. The university is run, focusing on integrating the study of natural laws, social and environmental dynamics with translation of the same addressing country problems.

Three functional divisions will absorb several key sub-systems such as planning policy and administration program development, course design and materials development, student support services, infrastructure and management of study centers.

Self-Assessment and Evaluation

An operational manual recorded system, process and procedures of operation and management of the University is already in place. The manual includes clearly defined processes, tasks and roles of administrative units, groups and individuals and their easy connectivity.

Capacity building

The staff capacity will continue to be strengthened in developing quality course materials and providing support services through recruiting well qualified potential and committed staff, training of instructional designers and course writers, desk top publishers, managers and support services staff. SU will ensure its staff changes their mindset from traditional learning to ODL to forge a partnership University for benchmarking to provide support for course materials development
Manuals

SU has developed instructional design manual (style manual) and a course writers’ manual to guide the course materials development. The materials developed are subject to a third party review before finalizing. The course materials production are closely monitored for ensuring flawless timely delivery of materials to its students. The system at SU will ensure programs of study component modules and course materials are monitored, reviewed and subject to re-approval periodically. The university review system will ensure that the content of learning materials remain current, relevant, user-friendly and promote form of assessment in light of students feedback.

Admission, Assessment and Examinations

The dissemination of adequate information on admission, administration, course support services, examination, and assessment etc, the University will ensure that potential students make well informed decisions. The final examination will be conducted along with the on campus students using common examination papers and same lecturers mark the examination papers for on and off-campus students. The University envisages expanding its services by widening opportunities for students both internal and international and will make use of the emerging technology.

Course Evaluation

<table>
<thead>
<tr>
<th></th>
<th>10%</th>
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<tbody>
<tr>
<td>Quizzes and assignments</td>
<td></td>
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<tr>
<td>Term paper</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-semester examination</td>
<td>30%</td>
</tr>
<tr>
<td>Final examination</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grading System Score (%)</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>80-89</td>
<td>A-</td>
</tr>
<tr>
<td>75-79</td>
<td>B+</td>
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<tr>
<td>70-74</td>
<td>B</td>
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<tr>
<td>65-69</td>
<td>B-</td>
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<tr>
<td>60-64</td>
<td>C+</td>
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<tr>
<td>50-59</td>
<td>C</td>
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<tr>
<td>45-49</td>
<td>D</td>
</tr>
<tr>
<td>0-44</td>
<td>F</td>
</tr>
</tbody>
</table>

SU tutoring groups will be kept small 20-30 learners per group to ensure quality learning takes place. The demanded ratio of tutors to learners will be 1:16.

Accreditation Standards

The University will observe at least 14 Accreditation Standards such as:

S1- Eligibility, integrity, vision, missions, goals and objectives
S2- Students
S3- Human resources
S4- Curriculum
S5- Infrastructure and facilities
S6-Funding/Finances
S7-Governance
S8-Management System
SU is open to major evaluation in curricular aspects, teaching, learning and evaluation, research, consulting and extension, infrastructure and learning resources, student support services and healthy practices

Quality Assurance Criteria (continuous & periodic)

The SU will develop quality assurance criteria for off shore courses:

1. Details of partners structure
2. Content and delivery of course materials
3. Admission requirements for students
4. Human resources to support the courses
5. Teaching approaches and assessments
6. Course management and evaluation
7. Marking the examinations
8. Financial resources and contracting

Internal Quality Assurance Functional Areas

a. Quality of programs & courses
b. Quality of academic staff
c. Quality of teaching and learning experience
d. Quality of student assessments: internal moderation
e. Quality of support services
f. Quality of resources and facilities
g. Quality of research
h. Quality of review process

External Academic Review

Quality assurance of educational programs at SU shall be assured through external review by:

i. External examiners
ii. External professional bodies
iii. External Accreditation agencies (for professional programs that have credible, recognized professional accreditation agencies/bodies)
iv. Employers
v. Former students (at advanced stage of SU)
vi. Other Universities of SU choice.

Quality Comprehensive Policy Manual

In the bid to boost quality for SU, a comprehensive policy manual will be developed to include:

1. Academic
2. Administration
3. Archives
4. Centre for excellence and learning accreditation
5. Communications
6. Computing services
7. Course material production
8. Facilities and services
9. Financial services
10. Freedom of information and protection of privacy
11. Human resources, library services and record management
12. Office of Registrar, Research and student services
13. Vice Chancellor-Finance and Administration
14. Web sites

Other Policy Areas
a. Organization, Governance and general management
b. Academic Regulations, student affairs, teaching, research and scholarships
c. Exchange agreement
d. Information technology, record and archives

Quality movement at Southern University

The University has two established centers with infrastructure facilities such as computer laboratories that will be provided by network, study cars and tutorial rooms, manuals. The intention of SU is to employ a Director for Support Services for students. All study programs will undergo periodical review to assure quality for their relevance and standard.

It is very critical that distance education should overcome the stigma of inferiority that often attaches to qualifications from such institutions. Quality therefore should in the first instance be a self-serving imperative for Southern University. The University has assured integrity of its qualifications in order to gain the confidence of the general public, government and prospective students. It must earn the respect of its peers as a centre of excellence in research and teaching. The University plans to submit itself to stringent scrutiny and regular internal and external quality assessments.

The process of quality by SU begins with the quality of academics, a distance education institution attracts. Its academics are no less qualified than academics in residential Universities in Zambia. The University has a passion for and commitment to distance education as a mode of learning delivery, empathy with its learners and skills to participate in a learning mode that demands just as much in terms of creativity and professional expertise from the academics as it does from the student. The University will engage in research and constantly researching for effective educational delivery models for its learners.

At SU, quality emphasis is on the basis of many factors: the qualifications of its academic staff, the facilities especially laboratories, library and general administrative facilities, curriculum and the design of the course study materials, whether electronic or in print, the integrity of the examinations. This process will be evaluated by assessing the impact or reception of the graduates of SU in the workplace, perceptions by industry as well as the progress of the University’s Alumni.

Assessing the curriculum, for example may not be so easy. It often implies understanding and acceptance of the underlying ideology or understanding the audience or clients it is directed to. External quality assurance and assessment is assured for the success of ODL at Southern University. SU external quality assurance began with its accreditation as a service provider for ODL programs by the government through registration by the Zambian Ministry of Education

The University further sought even more independent bodies such as DODE and the Private Schools Association for its approval to carry out the ODL programs. The University is to practice a voluntary system that invites peers and experts in various fields, benchmarking standards of
programs offered against other institutions in the country and region. The proposed external quality model is simple in its approach and will strictly be adhered to, across the University; generate confidence and a sense of achievement. It also seeks to achieve international best practice.

The University will continue evaluating itself by use of its strategic plan and concept paper by/with all the internal stakeholders who have a clear Vision and Mission, and clear goals and time frames. SU academic programs seek to advance the same mission and procedures.

Judged against the mission Statement, the institution assessment seeks to answer the following three questions:

- Are we doing the right thing?
- Are we doing the right things in the right way?
- Do we achieve what we are claiming to achieve?

Ton Vroeijenstijn, a Dutch quality assurance expert goes on to say that “… every quality assessment and self-analysis has to start looking at the formulated mission statement, the formulated goals and aims and the formulated outcomes… Without a clear picture about what one is doing, any assessment of quality is impossible. Is the mission clearly formulated and well-known to everybody internally and externally? Is the mission statement operationalised in clear goals and aims?” The benefit of subjecting the University to a quality assurance regime is that the institutional standards can be judged to have a level of excellence that is widely accepted. If the Quality Assurance Protocol and Plans are benchmarked against international standards, the qualifications of the institution will also enjoy international recognition.

The SU is committed to becoming a world-class, engaged University of excellence and innovation and place of scholarship for Zambia and Africa with an equitable, diverse, non-tribal, multicultural university where everyone will experience a sense of belonging and achievement. It is a learning institution where institutional culture, structures and processes are continuously scrutinized and redesigned to remain optimally fit for purpose; an institution that treasures diversity as a source of strength and quality through technology generation directed at reducing poverty, ignorance, social injustice, corruption, climate change and environmental degradation.

To be relevant to the Zambian community the SU will place original research top on its agenda will engage in collaborative research and maintain close ties with a number of universities in Africa and elsewhere in the world. This will provide the SU with an opportunity to share information with other institutions of higher learning as well as private sector partners who will support the University’s core business and in this way achieve scholarly excellence. Quality and type of research shall be based on relevance to the Zambian community and shall take a community participation approach. This is because the quality of education should be viewed in terms of its usefulness to society. To live up to this vision the SU among others will establish the Southern Research Institute (SORI) to manage research matters.

**Conclusion**

Southern University embraces the idea that education is best experienced within a community of learning where quality, competent professionals are actively and cooperatively involved with creating, providing, and improving the instructional program; that learning is dynamic and interactive, regardless of the setting in which it occurs; that instructional programs leading to degrees having integrity and are organized around substantive and coherent quality curricula that defines expected learning quality outcomes. Southern University accepts the obligation to address student needs related to, and to provide the resources necessary for, their academic success and that it is responsible for the education provided in its name.

The institution is ready to undertake the quality and self-assessment and continuous quality improvement (KAIZEN) of their quality assurance, giving particular emphasis to student
learning; and that the University mandatorily will subject its self to peer review for maintenance of quality and better public image upholding un bendable and uncompromising high academic standards to protect the academic integrity of the nation. It will be about quality and not quantity of graduates.

**Choma, 13th October, 2014** [12]

**References**


The relevance of Financial Statements and Its Impact on Organizational Performance: A case study of Atwima Mponua Rural Bank

Article Review by Eric Kwame Buah
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Abstract

This paper investigates the relevance of financial statements on Rural and Community Bank performance. Rural banks are the main source of financial service in rural sub-Saharan Africa and their services are mostly patronized by persons with little or no level of education. The study is therefore examining their level of knowledge on financial performance of the rural bank in which they are investing. The data was collected from a sample of one hundred and eighty respondents using questionnaires and face to face interviews conducted with management staff of the bank and used for analysis. The statistical tools employed in assessing the relevance of financial statements on the performance of Atwima Mponua Rural Bank were Mean distribution, coefficient of variation and regression analysis. The results indicate that the bank has been giving account statement quarterly or yearly to its customers. Findings of the study indicate that the bank posts its annual financial statement to customers or post it on the bank’s notice board. Then, it is found that the bank organized annual general meetings to explain its financial statement to its customers. It is therefore concluded that there is no evidence to ascertain that knowledge on financial statement is relevant to organizational performance. It is recommended that this study will be extended to other rural banks in the country to help assess the findings of this study.

Keywords: Financial Statements, Performance, Atwima Mponua Rural Bank, Case study

Introduction

In recent years, there has been much change in the banking industry mainly due to the influx of foreign bank particularly from neighbouring countries. This has led to a rise in competition in the banking industry making various banks under take mergers and acquisitions and others have become more innovative by introducing more products into the market especially information technology based products. Rural and Community banks (RCBs) are not left out in this technological change.

Rural and community banks (RCBs) have a mission to increase the provision of services in rural areas in a sustainable manner (Ghanaian Times, September 2, 2010). This should be to assist traders, farmers as well as workers with loans to expand their business (Ghanaian Times, September 23, 2010). The banks major target groups are smallholder traders and farmers (Owusu-Frimpong, 2007).

Banks need to put out accurate and timely financial statements which investors can assess and invest in the bank. According to Owen (2013), financial statements are important for the following reasons: financial statements tell the performance and the value of the bank; financial statements help investors to measure banks; and it helps banks to manage well when they can no longer be hands on with all the details. There are three primary financial statements: Income Statement; Income Statement; and Cash Flow Statement.

From Seiford and Zhu (1999), the measurement of bank performance is well researched and has received increased attention over the last decade. There have been a number of empirical studies on banks performance around the world (Lacewell, 2003; Halkos & Salamouris, 2004; Tarawneh, 2006). However, much has not been done on the relevance of financial statements and
its impact in RCB Performance in Ghana. The whole idea of measuring bank performance is to separate banks that are performing well from those which are doing poorly (Berger & Humphrey, 1997). According to Casu et al (2006), bank regulators monitor banks by assessing banks’ liquidity, solvency and overall performance to enable them to intercede when there is need and to gauge the potential for problems. Furthermore, bank performance measurement can also assist to improve managerial performance by pinpointing best and worst practices associated with high and low measured efficiency.

**Statement of the Problem**

Rural and community banks (RCBs) have a mission to increase the provision of services in rural areas in a sustainable manner. This should be to assist traders, farmers as well as workers with loans to expand their business (Ghanaian Times, September 23, 2010). However, due to the recent global financial crisis, it is justified that RCBs performance receives increased research from both scholars and industry specialists.

The two ways of assessing bank performance are the accounting method which is based on financial statement and the econometric method. However, financial measures have long been the basis for business performance measurement. These measures conveyed the performance and attainment in monetary terms, included in the statement of accounts, and carried a high level of collection of information. The financial measures are still widespread amid most of the businesses because non-financial measures such as quality, market share, human resources and customer satisfactions, tend to be subordinated to financial figures. Moreover, the fundamental dependence by managers on financial performance measures dominates organization stratagem predominantly in short run. Furthermore, the financial measures have been used for many years and managers are often contented with them. Whereas it is recognized that the instantaneous outlook for the overall financial markets and subsequent world economic growth prospects appear challenging, the RCBs operating in healthy situation will remain resilient. In assessing the general financial ailment of a company, the financial statements such as income statement and balance sheet, are important reports, as this captures the business’s operative performance and shows its net worth. This study therefore seeks to find out the relevance of financial statements and its impact on organizational performance as assess by RCB customers.

**Objective of the Study**

This paper specifically seeks to find out the relevance of the knowledge on financial statement on the performance of RCBs.

**Related Literature**

**Measurement of Bank Performance**

From Seiford & Zhu (1999), the measurement of bank performance is well researched and has received increased attention over the last decade. There have been a number of empirical studies on banks performance around the world (Lacewell, 2003; Halkos & Salamouris, 2004; Tarawneh, 2006). However, much has not been done on the relevance of financial statements and its impact in RCB Performance in Ghana. The whole idea of measuring bank performance is to separate banks that are performing well from those which are doing poorly (Berger and Humphrey, 1997).

Tarawneh (2006) utilized FRA to investigate the impact of asset management, operational efficiency and bank size on the performance. He established that bank performance was strongly and positively influenced by operational efficiency, asset management and bank size.

Samad (2004) applied Student’s t-test to measure the statistical significance for the measures of performance. The outcomes revealed that banks in Bahrain were somewhat less liquid, less
profitable and were wide-open to higher credit risk as compared to banking industry, in which wholesale banks are the main component. According to Kiyota (2009), foreign banks tend to outperform domestic banks in terms of profit efficiency as well as cost efficiency in Sub-Saharan Africa. This result is not different from the research by Kirkpatrick et al (2007), who found that banks are on average 67% profit efficient and 80% cost efficient.

Financial Performance

In a study conducted by Collis and Jarvis (2006) on financial information and the management of small private companies in the U.K., the most useful sources of information are the periodic management account (i.e. the balance sheet and income statement), cash flow information and bank statements (of course bank statement are another form of cash flow information but generated externally). These sources of information are used by 80% of companies and this demonstrates the importance of controlling cash, which previous research (Bolton, 1971, Birley & Niktari, 1995) suggest is critical to the success and survival of a small business.

In the same research 87% of small companies’ prepared profit and loss accounts and 78% balance sheet. These key financial statements allow management to monitor profitability of the business as well as its net assets. Confirming the usefulness of cash flow information, the analysis shows that 73% use bank reconciliation statement and more 55% use cash flow statements and forecast. However, other competitive performance measures perceived in literature such as ratio analysis, industry trends and inter-firm comparison are not widely used. Collis & Jarvis (2002), then states that this may indicate that small companies experience problems in gaining access to appropriate benchmarks, but could also be the results of competitors filing abbreviated accounts which reduces the amount of information available for calculating ratio and making comparison. In addition, as many small companies operate in the service sector, they occupy niche markets and may be less concerned with competition than those in other markets.

Melse (2004), reports that ratio analysis provides an insight into the financial health of a firm by looking into it liquidity, solvability, profitability, activity and capital and market structure. Jooste (2004) investigates that many authors agree that cash flow information is a better indicator of financial performance than traditional earnings. Largay and Stickney (1980) and Lee (1982) show that profits were increasing, W.T. Grant and Laker Airways had severe cash flow problems prior to bankruptcy. Jooste (2004) further states that users of financial statements around the world evaluate the financial statements of companies to determine the liquidity, assets activity, leverage, profitability and performance. Users of financial statements use traditional balance sheet and income statements ratios for performance evaluation. Therefore, along with traditional ratios, operating cash flow is also important when evaluating a company’s performance (Jooste, 2004). Various literature states that the primary purpose of the cash flow statement is to assess a company’s liquidity, solvency, viability and financial adaptability. According to Everingham et al (2003) operating cash flow ratios are indicators of performance. They determine the extent to which a company has generated sufficient funds;

- To repay loans;
- To maintain operating capabilities;
- To pay dividend; and
- To make new investments without using external financing, (Jooste, 2004).

Methodology and Data

This paper uses mean distribution and coefficient of variation (CV) to assess the relevance of financial statement on the Rural and Community Banks performance in Ghana. The coefficient of variation is defined as the ratio of the standard deviation to the mean, i.e.

$$CV = \frac{s}{\bar{x}}$$

where $s$ is the
Sample standard deviation and $\bar{x}$ is the sample mean. It shows the extent of variability in relation to mean of the population. Distributions with $CV < 1$ are considered low-variance, while those with $CV > 1$ are considered high-variance. Additionally, to examine whether there is linear relationship between knowledge on financial statement and RCB performance, regression analysis is employed to test the hypothesis that knowledge on financial statement of RCB improve performance. Inferences about the hypothesis are made by looking at test statistics and critical values associated with the analysis of variance associated with the regression model. If $P$-value $\leq \alpha$, reject the null hypothesis. If $P$-value $> \alpha$, do not reject the null hypothesis.

The population for this research comprise of all the customers of Atwima Mponua Rural Bank in the Ashanti region. A total of one hundred and eighty (180) customers were selected using the convenient sampling or non-probability sampling for the study. The reason is that, looking at the nature of work at the bank, the researcher interview customers who were willing to answer the questionnaire since some of the customers were feeling reluctant to compromise with the researcher. The researcher therefore, went round all the six branches/agencies to ascertain the needed information. Likert scale where a score of 1 was given for totally disagree and 5 for totally agree was mostly used for the questionnaire.

**Results**

This section presents and discusses the results. Where the likert scale is used, 1 stand for totally disagree, 2 – disagree, 3 – cannot decide, 4 – agree and 5 – totally agree. For instance when the mean score is 3.20, it will be interpreted as 3 because 3.20 is closer to 3 than to 4.

The table 1 below shows the mean distribution on the perception of financial statement. Mean score of 4.61 implies that most of the respondents totally agreed that the bank gives account statement quarterly or yearly to its customers. The CV of 0.14 means that mean score is not far away from the population mean. This is an indication that the distribution is near evenly distributed and it represents the views of the entire customers of the bank.

<table>
<thead>
<tr>
<th>Table 1: Mean Distribution on the perception of Financial Statement</th>
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<tbody>
<tr>
<td>Mean</td>
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<tr>
<td>---------------------------------</td>
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<tr>
<td>The bank gives account statement quarterly or yearly</td>
</tr>
<tr>
<td>The bank post its annual financial statement to customers or post it on the bank’s notice board</td>
</tr>
<tr>
<td>Annual general meetings are organized by the bank to explain its financial statement</td>
</tr>
</tbody>
</table>

Source: field work, 2014

On whether the bank posts its annual financial statement to its customers or posts it on its notice board, the mean was 4.76. This illustrate that most of the respondents chose totally agree. The CV of 0.10 shows that the mean score of 4.76 is not far from the population average. This is an indication that the entire customers of the bank totally agree that the bank post its annual financial statement. From the Table, the mean score for whether annual general meetings are organized by the bank to explain its financial statement was 4.13 and the CV was 0.24. This depicts that the customers agree that annual general meetings are organized to explain the financial statement of the bank.
Table 2: Types of Financial Statement

<table>
<thead>
<tr>
<th>Type of Financial Statement</th>
<th>Ticked (%)</th>
<th>Not ticked (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance sheet</td>
<td>100(55.5)</td>
<td>80(44.5)</td>
<td>180(100)</td>
</tr>
<tr>
<td>The income statement</td>
<td>108(60.0)</td>
<td>72(40.0)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Statement of cash flow</td>
<td>130(72.2)</td>
<td>50(27.7)</td>
<td>180(100)</td>
</tr>
<tr>
<td>The statement of shareholders’ equity</td>
<td>120(66.6)</td>
<td>60(33.4)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Account statement</td>
<td>129(71.7)</td>
<td>51(28.3)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Loan payment schedule</td>
<td>35(19.4)</td>
<td>145(80.6)</td>
<td>180(100)</td>
</tr>
</tbody>
</table>

Source: field work, 2014

The Table above shows the types of financial statement respondents have seen or collected from the bank. It could be observed from the Table that but for loan payment schedule; all the types of the financial statement are known according to the respondents.

Table 3: Items on annual Financial Statement

<table>
<thead>
<tr>
<th>Item on Annual Financial Statement</th>
<th>Ticked (%)</th>
<th>Not ticked (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance sheet</td>
<td>156(86.7)</td>
<td>24(13.3)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Income statement</td>
<td>132(73.3)</td>
<td>48(26.7)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Statement of cash flow</td>
<td>149(82.8)</td>
<td>41(17.2)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Notes forming part of the financial statement</td>
<td>111(61.7)</td>
<td>69(38.3)</td>
<td>180(100)</td>
</tr>
<tr>
<td>Report of Directors</td>
<td>173(96.1)</td>
<td>7(3.9)</td>
<td>180(100)</td>
</tr>
</tbody>
</table>

Source: field work, 2014

This is an indication that respondents have access to financial statement.

According to Collis & Jarvis (2006), the most useful sources of information are the periodic management account (i.e. the balance sheet and income statement). It could be observed from the Table 3 above that balance sheet, income statement, statement of cash flow, notes forming part of the financial statement and report of directors are found on the annual financial statement of the bank. This shows that the bank’s customers have knowledge on financial statement. This results supported studies on financial reporting in developing countries (Hatif & Al-Zubaidi, 2000; Naser & Nuseibeh, 2003) who found that users in developing countries do not perceive themselves as suffering from difficulties in understanding the information in the annual reports.

Table 4: Knowledge on Financial Statement

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>The knowledge of the financial statement can influence your investment in the bank</td>
<td>3.20</td>
<td>1.193</td>
<td>0.37</td>
</tr>
<tr>
<td>The knowledge of a financial statement is relevant to every customer of the bank</td>
<td>3.79</td>
<td>1.008</td>
<td>0.27</td>
</tr>
<tr>
<td>Customers can analyze and interpret financial statement of the bank</td>
<td>3.26</td>
<td>1.042</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Source: field work, 2014

The analysis on the Table 4 above depicts mean score of 3.20 which shows that respondents cannot decide whether the knowledge of the financial statement can influence their investment in
the bank. The CV of 0.37 shows that the sample average is to the large extent closer to the population average. This shows that majority of the customers of the bank cannot tell whether knowledge of the financial statement can influence their investment at the bank. However, when asked whether the knowledge of a financial statement is relevant to every customer of the bank the mean score was 3.79. This implies that most of the respondents agreed that knowledge of a financial statement is relevant to every customer of the bank.

From the Table, it could also be inferred that customers cannot decide when it comes to whether they can analyze and interpret financial statement of the bank. This is an indication that most customers have seen financial statement however, they find it difficult to analyze and interpret it. This may also due to the fact that some of the terms on the financial statements are purely accounting terms which need people with accounting background to understand it.

From Berger & Humphrey (1997), the whole idea of measuring bank performance is to separate banks that are performing well from those which are doing poorly. Banks are assessed based on the information they themselves put out. In view of this the customers were asked to assess the bank based on the items on the Table 5 below.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the real value of total assets of the bank increase over time</td>
<td>4.45</td>
<td>0.779</td>
<td>0.18</td>
</tr>
<tr>
<td>Deposits mobilization of the bank is high</td>
<td>3.93</td>
<td>0.894</td>
<td>0.23</td>
</tr>
<tr>
<td>The loan portfolio of the bank is of acceptable quality</td>
<td>3.67</td>
<td>1.052</td>
<td>0.29</td>
</tr>
<tr>
<td>The bank’s loan recovery is of acceptable quality</td>
<td>3.54</td>
<td>0.861</td>
<td>0.24</td>
</tr>
<tr>
<td>The bank makes high profit</td>
<td>3.47</td>
<td>1.179</td>
<td>0.34</td>
</tr>
<tr>
<td>The bank’s expenditure is low</td>
<td>2.27</td>
<td>0.882</td>
<td>0.39</td>
</tr>
<tr>
<td>There is high risk of losing your investment at the bank look at the bank’s financial statement</td>
<td>2.49</td>
<td>0.931</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Source: field work, 2014

When asked whether the real value of total assets of the bank increase over time, the mean score was 4.45 with standard deviation of 0.779. This shows that most of the respondents agreed that the real value of total assets of the Bank increase over time. With a CV of 0.18, one can say that the entire customers of the bank agreed that the bank’s total assets increase over time. If the bank’s total asset increase over time, it means the bank is in more business (Aboagye & Otieku, 2010).

It can also be inferred from the Table that deposits mobilization of the bank is high with average score of approximately 4. According to the respondents the loan portfolio of the bank is of acceptable quality. According to Aboagye & Otieku (2010), granting of loans is a major function of RCBs. But such loans must be paid back if the institutions are to continue to be in business. The customers however, disagreed that the bank’s expenditure is low. This is congruous to findings by Aboagye & Otieku (2010), who indicate that the operating expenses of the bank need to be low.

The respondents disagreed that there is high risk of losing your investment at the bank look at the bank’s financial statement. This shows that but for the high operating expenses, the bank is performing well financially per the views of the customers.
Hypothesis

Ho = Knowledge on financial statement of RCBs does not improve performance

<table>
<thead>
<tr>
<th>Table 6: ANOVA of the Regression model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>Regression</td>
</tr>
<tr>
<td>Residual</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Field work, 2014

From the results on the Table 6 above, it could be observed that there is no statistical evidence to support the statement that knowledge on financial statement of RCBs does improve performance as the P-value is 0.843. Therefore, the null hypothesis cannot be rejected. From the results we cannot say that financial statement is not relevant to financial performance of an organization, just that the evidence there is not enough to justify that. This also shows that most of the customers of RCBs do not understand or cannot interpret financial statement due to its technical nature.

Summary and Conclusion

This paper looks at the relevance of the knowledge on financial statement to organizational performance using Atwima Mponua Rural bank. The results indicate that the bank has been giving account statement quarterly or yearly to its customers. Also the results indicate that the bank post its annual financial statement to customers or post it on the bank’s notice board. It was also revealed that the bank organized annual general meetings to explain its financial statement to its customers.

The results also show that the bank customers knew the types of financial statements. This they mentioned as: Balance sheet; the income statement; statement of cash flow; the statement of shareholders’ equity; and account statement. The following items were established to be on the annual financial statement of the bank: Balance sheet; income statement; statement of cash flow; notes forming part of the financial statement; and report of directors.

The results also indicate that the customers of the bank cannot tell whether knowledge of the financial statement can influence their investment at the bank. It was also revealed that knowledge on financial statement is relevant to every customer of the bank. Most of the bank customers cannot analyze and interpret financial statement of the bank. It could there be concluded that there is no enough evidence to ascertain that knowledge on financial statement is relevant to organizational performance.

Limitations

The main difficulty encountered in the study was the non-availability of respondents to respond timely to the questionnaire. This situation made it difficult for the researcher to get the perspectives on important issues on which they were interviewed. In addition, the restriction of the study to the Atwima Mponua Rural Bank makes it impossible for the researcher to generalize the findings to cover other rural banks in the country. However, other rural banks with similar situations can make use of the findings.
Recommendation

The findings from the research agree that most of the bank’s customers cannot analyse and interpret financial statements. It is recommended to management of the bank that much time should be taken to explain financial statements to the customers during annual general meetings. This will help the customers to have much knowledge on financial statements.

This study could not analyse the financial statement of the bank which would have enrich it. This was due to the bank management unwillingness to release the statement, since they said it has security imprecations. It is recommended that study of this nature helps to develop the financial industry and therefore such information should be made available to researchers to help assess the performance of the bank well.

Proposal for further Research

An area for further research is to sample from several different rural banks and rural banks located across the nation and the observation compared to what this study has gathered.

References

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