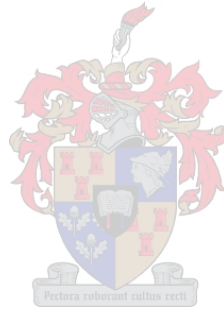


**Knowledge of occupational safety by hospital cleaners and hospital managers
towards HIV and other blood borne pathogens transmission in Abakaliki
region in Eastern Nigeria**

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Assignment submitted in partial fulfilment of the requirements for the degree of
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DECLARATION

By submitting this assignment electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

December 2015

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ABSTRACT

The research focused on the knowledge of occupational safety by hospital managers towards HIV and other blood borne pathogens transmission in Abakaliki region in eastern Nigeria. These pathogens are easily transmissible by needle sticks and other occupational accidents. It is important to identify factors that pre-expose hospital cleaners to occupational risk exposure that can lead to the transmission of HIV, HBV and HCV. The research was conducted in 10 different hospitals. A total of 90 questionnaires were administered to the hospital cleaners that volunteered to participate in the research and 68 questionnaires were returned representing 75.6% of the total questionnaires. The mean age and standard deviation of the respondents in this study was 38.6 + or – 5.4 years.

The researcher conducted a semi-structured interview with all the 10 hospital managers involved with the study and the interviews showed there was a need for an organised training on hospital work and occupational hazards, risk exposures and precautions.

The questionnaires showed the knowledge of hospital cleaners on occupational safety and it was observed the majority of the hospital cleaners were not aware of post exposure prophylaxis for HIV. The workers relatively had good practices put in place to prevent HIV, HBV and HCV transmission but majority of them had not received HBV vaccine due to lack of awareness and availability.

There was a significant positive correlation between the knowledge of the health workers and HIV transmission and the practice put in place by health workers to prevent HIV transmission ($P < 0.05$). This implies as the knowledge of the health workers about HIV transmission increases, the practice put in place by health workers to prevent HIV transmission and Hepatitis B&C increases. Therefore there is need for continuous training on blood borne pathogens transmission such as HIV transmission in the hospitals and its routes of transmission. There is need for awareness creation for HBV vaccine and Post exposure prophylaxis for HIV exposure.

CHAPTER ONE INTRODUCTION

1.1 Introduction

Many general workers in health facilities work with poor safety practices and inappropriate safety tools. These general workers (cleaners) are often employed with little or no knowledge of occupational safety and the risk involved in handling bio-hazard wastes and other body fluids in health facilities makes them vulnerable to HIV transmission. The health facilities wastes do not only expose general workers to HIV but also to other hazards and pathogens such as Hepatitis A, B, and C, Lassa virus, Ebola virus and other blood borne pathogens that can be transmitted via body fluids and excreted (nosocomial infections). It is of concern to observe people work in this poor safety condition and often they are under pressure, low-pay and no insurance cover or welfare packages. It is necessary for them to know how they should protect themselves from such risks of being infected. It is estimated that approximately 3 million health care workers experience percutaneous exposure to blood borne pathogens every year. This results in 16,000 Hepatitis C, 66,000 Hepatitis B virus and 200 to 500 HIV infections annually (Haiduven, De Maio, Stevens. 1992). According to the World Health Organisation (WHO) fact sheet of 2011, 20% of health care activities general waste is hazardous and may be infectious, toxic or radioactive.

1.2 Background of the study

Every year there is an occurrence of 16,000 million injections administered worldwide and many of these injection needles and syringes are not properly and safely disposed. These poorly disposed health-care waste contain harmful pathogens that can infect health workers, patients and the general public.

WHO estimate contaminated needles and syringes are responsible for 21 million hepatitis B Virus (HBV) transmissions, 2 million hepatitis C virus infections and the transmission of 260,000 HIV transmissions recorded in year 2000. If the needles and syringes used in hospitals were disposed of and managed properly/safely, most of these infections could have been prevented. There is also the problem of the re-use of needles and syringes in Africa, Asia, Central and Eastern countries.

In December 2001 the Centres for Disease Control and Prevention (CDC) had voluntary reports of 57 documented cases of HIV seroconversion tentatively associated with occupational exposure to HIV among U.S. health care workers. (U.S. Public Health Service. 2001; (HIV/AIDS surveillance report. Vol. 12, No.1: 2000).

Another 138 infections among health care staff were possibly considered cases of occupational HIV transmission. Occupational transmission of HIV has been globally reported to have been occurring. HIV has no vaccine yet, there is post exposure prophylaxis for the infection and it remains the best practice to keep injured people involving body fluid or blood contaminated materials.

Percutaneous injury normally inflicted by a hollow-bore needle, is usually the most known mechanism of occupational HIV transmission among hospital workers. The CDC estimates more than 380,000 percutaneous needle-stick injuries occur in U.S. hospitals annually; approximately 61 percent are caused by hollow-bore devices.

Information sourced from Occupational safety (2000) shows the number of needle-stick accidents that occur in non-hospital environment, where 60 percent of the health care workers is not known, it might be high in actuality. HCV infection was noted in 3 of 110 Japanese health care workers that were accidentally exposed to needle sticks contaminated with blood containing HCV (Sodeyama, Kiyosawa, and Urushihara.1993).

Before the advent of widespread immunization against HBV, it was estimated 8,700 cases of HBV transmission occurred following percutaneous exposures occurring annually in the United States of America alone (Koziol and Henderson, 1993). The figure mentioned in the United States of America is only a small fraction of the entire transmission of blood borne pathogens transmissions from contaminated needles worldwide.

HIV can be transmitted occupationally to people that work in the hospital environment being exposed to blood and other infectious fluids or splash exposure to the mucous membranes or non-intact skin. These body fluids are blood, synovial fluid, pericardial fluid, cerebrospinal fluid, pleural fluid, peritoneal fluid, amniotic fluid,

semen; vaginal secretions are all considered infectious while urine, saliva, sputum, nasal secretions, faeces, tears, vomitus and sweat are not considered HIV infectious unless there is blood which is visible in them.

People who carry out occupational health care activities should follow standard precautions. These precautions involve using gowns, aprons, surgical masks, protective eye-wears and of importance gloves. Strengthening standard precautions in the hospitals, general workers and other health workers should be trained on safety and how to handle equipment in the hospital to avoid occupational accidents in the hospitals, strict safety standards should be maintained in the hospital environment, it should be ensured hospital staff are immune to Hepatitis B through routine vaccinations against Hepatitis B, there should be post exposure prophylaxis (PEP) available in case of any accidental exposure in the hospital and the PEP choice should conform with the World Health Organisation recent guidelines for PEP. Occupational injuries exposing health workers in the hospitals in Nigeria are mainly caused by poor availability of protective tools and materials for hospital workers. There is a lack of water supply, disinfectants and protective cloths for hospital workers. Workers do not make proper use of safety wear and others make inconsistent use of protective tools and materials. This suggests there should be a proper adoption of standard hygiene practices in the hospitals and protective materials for health care workers that should adequately provide for health care workers in Nigeria (Ansa, Udoma, Umoh and Anah, 2002).

1.3 Motivation for the study

Most of the blood borne pathogens such as HIV is common in sub Saharan Africa and other developing nations where there is lack of basic safety kits for hospital cleaners and other auxiliaries. There is therefore need for proper education and awareness with continuing education on practice of universal precaution and standard procedures for health care workers.

Health care workers do face many risks of exposure to blood borne pathogens and there is need to ensure health care workers are vaccinated against HBV and they are regularly educated on the importance of post exposure prophylaxis once there is

an occurrence of occupational injury due to sharps or needle sticks used in the hospitals. It was also suggested anti-needle devices should be provided for health workers to keep their working environment safer (Wicker, Cinatl, Berger, Doerr, Gottschalk and Rabenau, 2008).

1.4 Problem statement

The research problem is contained in the low level of knowledge of occupational safety towards HIV transmission among general workers in health facilities. However, if they are equipped with the necessary safety knowledge while employed in their specific jobs a safer environment will be created not only for themselves but also for their families. They will take better preventive measures to prevent exposure to HIV transmission via exposure to biohazard wastes.

The research question is: What is the level of knowledge of occupation safety towards HIV transmission among general workers (cleaners) in health facilities? The research will benefit all the stakeholders participating in the research. The Stellenbosch University will benefit from this research in long term because it will assist other researchers to look into this subject topic of the research and provide guidelines to other related research that is going to be carried out subsequently by students. The cleaners will benefit from the research because knowledge gained through the process could guide the development of a programme about HIV transmission where they can learn to protect themselves in their various workplaces from HIV and other blood borne pathogens. The hospitals managers will benefit from this research because it will assist them to develop a code of good conducts and policies that will protect cleaners in their various hospitals and also guide employers to provide protective tools and safety wear for their staff. The employers will also know the relevance of continuous training on occupational safety in their work place and what to do when someone is exposed to percutaneous injury in the hospital.

1.5 Aim of the study

The aim of this project is to identify the knowledge of general workers in health facilities in order to provide suggestions for good conducts to improve safe situation in the profession of cleaning to reduce HIV vulnerability.

1.6 Objectives of the study

The objectives of this research are:

- To ascertain the knowledge of general workers in health facilities about HIV transmission.
- To determine the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work environment.
- To identify gap existing between the knowledge of general workers in health facilities and the practices involved in the workplace.
- To establish good conducts that will protect general workers (cleaners) in health facilities from occupational HIV transmission.

1.7 Research methodology

The research project will utilise data collection methods to collect quantitative and qualitative information. Questionnaires will be administered to respondents to collect quantitative data from them in the hospital. The aim is to establish the knowledge of HIV transmission among cleaners in ten hospitals. Research will be carried out in three public hospitals and seven private hospitals. Gaps will be identified existing between the cleaners' knowledge of HIV transmission and their practice in workplace.

Quantitative data questionnaires will be distributed to cleaners working in the hospitals as a target group; to all cleaners in the seven private hospitals and the three public hospitals. The questionnaires will be collected from cleaners that respond. A total of 10 hospitals will be included in the survey with a minimum of 50 respondents as cleaners.

The hospital managers as the second target group will participate using a qualitative method (semi-structured interview) to gain information. The ten hospital managers will be interviewed both in the three public hospitals and seven private hospitals.

The interview will focus on acquiring the measures put in place in the hospitals by their managers in the form of the provision of protective wear for cleaners working in the hospitals and safety trainings delivered to these cleaners. The interviews will

commence before distributing the questionnaires to the hospital cleaners and at the convenient time for hospital managers. The semi-structured interviews will be based on information acquired from the literature review. The indicators will be; protective wears provided for hospital cleaners and how often they are provided, the incidence of reported hospital injuries in their hospitals, and evidence of training provided by the hospital administration for the hospital cleaners.

The data derived from the questionnaires will be analysed using descriptive statistics for the cleaners working in the ten hospitals selected in Abakaliki (eastern Nigeria). A qualitative method (semi-structured interview) will be used to collect data from ten hospitals managers where cleaners are working. The data will be presented according to qualitative content analysis which means identifying codes, categories and assigning themes in the process.

1.8 Limitations of the study

The research will have the challenge of some cleaners by not understanding the proper meaning of the terms used in this research work because in Nigeria most unskilled labourers such as hospital cleaners are mostly not educated. Taking cognisance of such limitation, the researcher will explain verbally and assist them on the importance of the research, the questions in the questionnaires and what is expected of them.

Another limitation that could be encountered will be that some workers might not truly answer questions in the questionnaires to avoid implicating or hurting their hospital administrators even though animosity and confidentiality is ensured in the research. If this happens honest responses required may not be forthcoming to have a sound research reflection of the problem.

The research will focus on interviews to address hospital management and to know measures put in place to safeguard hospital cleaners from biohazard waste accidents but these hospital administrators might not want to tell the truth over the measures they have put in place in the hospital to ensure cleaners safety. They may feel they will be considered lagging in their duties as hospital managers if they tell

the true nature of things in their hospitals regarding safety of hospital cleaners in their workplace.

1.10 Outline of the chapters

This research will have five chapters:

Chapter one: the background study consisting of research problem, research question, aim of the research and research objectives. This research will focus on knowledge of occupational safety towards HIV transmission and other blood borne pathogens among general workers in the hospitals (cleaners)

Chapter two: The existing knowledge on the subject will be reflected in the literature review emanating from various previous works conducted on occupational risks in the hospital regarding health care workers who are faced by risky exposure to infected blood and body fluids constantly.

Chapter three: The choice of methodology for this study will be used to ascertain the knowledge of occupational safety by hospital cleaners towards HIV and other blood borne pathogen transmission in Abakaliki region eastern Nigeria. There will be an elaboration of the use of qualitative and quantitative methods in this research. Semi structured interviews will be conducted for ascertaining facts from hospital managers and use of questionnaires to establish facts from hospital cleaners.

Chapter four: Presentation and discussion of results will reflect the analysis of data presented in attractive tables. A discussion of the findings will be done to provide depth to results.

Chapter five: The final part of the research will consist of discussion, conclusion, implications and recommendations. This part of the work will coordinate the problem statement together with the objectives and the findings. Recommendations will ultimately be made to provide guidelines ensuring a safer workplace for the hospital workers.

1.11 Conclusion

This chapter introduced the topic: Knowledge of occupational safety by hospital cleaners towards HIV and other blood borne pathogens transmission in Abakaliki region in eastern Nigeria. Further brief review of the background, the aim and objective of the study was recorded; all the steps that will be taken in achieving a successful research are also discussed in this chapter one. The next chapter will be review past work done by other researchers concerning hospital occupational hazard and transmission risk of blood borne pathogens such as HIV, Hepatitis B and Hepatitis C.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

A review will highlight the knowledge of occupational safety towards HIV transmission among general workers in health facilities and the necessary safety knowledge required to prevent hospital injuries. This is focused on improved preventive measures of HIV transmission via exposure to biohazard wastes. The knowledge of occupational safety by cleaners towards HIV transmission is of concern in hospitals worldwide. Hepatitis B, Hepatitis C and HIV are the most known pathogens to be transmitted by blood to healthcare workers.

2.2 Mode of infection

Needle stick injuries are commonly known for exposing health workers to the risk of occupational injuries and as such have an important implication on the morbidity and mortality of health workers through blood borne infectious transmission.

Health care wastes are all litter that are generated from hospitals such as syringes and sharps used in the hospitals (Ilyas, 2000) and those at high risk are doctors, nurses, healthcare auxiliaries, hospital maintenance personnel and even the patients in the healthcare facilities (Park, 2007). It is stated 3 million health workers out of 35 million health workers worldwide experience needle stick and sharps injuries annually (Yacoub, Al Ali, Moukeh , Lahdo, Mouhammad and Nasser, 2010).

In United Kingdom over 100,000 cases of needle stick and sharps injuries are reported annually (Sharps injury information. <http://www.isips.org/sharps.shtml>), this calls for concern and transmission possibilities of about 20 various blood borne pathogens which includes HIV, Hepatitis B, Hepatitis C, this is sourced from the National Institute for Occupational Safety and Health. NIOSH Alert: preventing needle stick injuries in health care settings [DHHS (NIOSH) Publication No. 2000–108] U.S. Department of Health and Human Services, Cincinnati, OH; 1999.

According to Gerberding (2003) hospital workers who are exposed to blood and other body fluids are at risk of HIV transmission. Taking universal standard

precautions, using safe needle devices are the best ways to prevent blood borne infections in the hospital settings. Though there are universal standard precautions put in place the frequencies of needle sticks accidental pricks remains high among people working in the healthcare facilities thereby frequently exposing hospital workers to blood borne pathogens over the past decade.

Waste products realised from hospitals are plenty and are considered infectious wastes which can be classified into pathological waste this includes faeces, urine and body parts, sharps ranging from syringes and needles to scalpels and blades used in the hospital, chemicals; this includes chemicals from the hospital laboratory, solvents and disinfectants, pharmaceuticals which includes expired drugs, contaminated drugs and vaccines, and genotoxic waste which are very hazardous, it includes carcinogenic materials and substances (ability to cause cancer), we also have radioactive waste involving diagnostic materials that are radioactive, we also have heavy metal wastes such as Mercury. It is important to know that various units in a health care facility setting generate various wastes that are hazardous to health workers and therefore all hospital wastes should be handled with care.

2.3 Waste disposal and management

There are numerous risk associated with waste disposal and management in the hospitals, the common practice is treatment and disposal of health care wastes to reduce direct health risks but occupational threats still occurs in these disposal facilities during operations.

The main treatment of wastes practiced in the hospitals is incineration of waste but it has the disadvantage of releasing heavy metals and other pollutants in the air thereby polluting the environment indirectly. Materials containing chlorine and metals, to reduce these harmful effects, should not be put in an incinerator for burning unless modern incinerator operating at 850-1100 C and equipped with special gas cleaning compartment is used. There are other alternatives to treat wastes from hospitals such as autoclaving, microwaving, steam treatment and chemical treatment.

Why is there failure in hospital waste management which puts health workers at risk in hospitals? One basic reason is lack of awareness about occupational health hazard, and poor awareness, there is also inadequate waste management training in various health facilities, low priority and lack of will on matters concerning hospital waste disposal, improper waste disposal systems and lack of regulations on hospital waste management and disposal.

In Karachi 8 hospitals were visited and 2 were separating waste into sharps, pathological waste, chemical, infectious, pharmaceutical and pressurized containers at disposal points. In handling waste, 2 out of the 8 hospitals made provision for safety and protective wears and tools for their housekeepers and waste handlers. Only one out of the eight hospitals organised a training sessions for their housekeepers and waste handlers. Five hospitals out of the eight hospitals had a storage site but still not properly protected from scavengers. Only two hospitals out of the eight had documented guidelines on waste disposal in the hospital. This showed that proper training and awareness is needed in the area of hospital waste disposal and management (Rasheed , Iqbal , Baig and Mufti, 2005).

A study conducted by Akter, Hussain, Trankler and Parkpian (2002) revealed in Bangladesh there is a very poor attitude and practice in handling hospital waste. Their work focused on health effects of practices towards hospital waste management, it was also done to determine the knowledge level of health workers on hospital waste management. Their work involved health care workers, waste pickers and local residents. Bangladesh has no serious laws on the management of waste which was generally dumped on the streets, roadsides and hospital surroundings. Their research revealed many health workers paid little or no attention to waste generated in the hospitals and how they are disposed. The lack of hospital waste management awareness in Bangladesh is putting people working in the hospitals at risk and even the masses in general. There are non-governmental organisations in Bangladesh sensitizing hospital workers on occupational safety and hospital waste management but attention should be focussed on the problem in Bangladesh and other low-income countries in the world.

Waste and by products generated from the hospitals are numerous and are considered as infectious matter which can be classified into a pathological category which includes faeces, urine and body parts, sharps ranging from syringes and needles to scalpels and blades used in the hospital, chemicals which includes chemicals from the hospital laboratory, solvents and disinfectants, pharmaceuticals which includes expired drugs, contaminated drugs and vaccines and genotoxic waste which are very hazardous, it includes carcinogenic materials and substances (ability to cause cancer). There is also radioactive waste involving diagnostic materials that are radioactive or radio therapeutic materials. A heavy metal wastes that contain heavy metals such as Mercury pose a threat to individuals. It is important to know various departments in the hospital setting where various wastes are generated that are hazardous to health workers and therefore all of these should be handled with care. There are various risk associated with waste disposal and management in the hospitals, the common practice in hospitals is treatment and disposal of health care wastes to reduce direct health risks but occupational risks still occur in these disposal facilities during operations.

Steps have been suggested and recommended to alleviate the risk problem in health care facilities; delegating responsibilities, allocation of resources to waste disposal management, building a proper system for disposal of wastes in the hospital environment, radical awareness programmes on occupational risks and exposure involved in the hospitals including safe practices. To provide a safe environment for handling of hospital waste from the point of waste collection, handling, packaging, storing, transporting, treating and disposal of waste. The government should also set out guidelines or codes of good conducts/policies that will help the prevention or reduction of occupational health hazards and risks of exposure involved in healthcare facilities. According to the 2011 WHO fact sheet, 20% of health care activities general waste is hazardous and may be infectious, toxic or radioactive.

Annually there is an occurrence of 16 000 million injections administered world-wide and many of these injection needles and syringes are not properly and safely disposed. These improperly disposed health-care waste contain harmful pathogens that can infect health-care workers, patients and the general public.

Hazardous waste is generated to the quantity of 0.5kg per bed per day in high income countries. In low-income countries, hazardous waste is generated to the quantity of an average of 0.2kg per hospital per bed per day, besides in low-income countries most non-hazardous health care waste are not separated from hazardous health care litter and as such makes the amount of hospital poisonous excess enormous. There is high risk of injury, infection and opportunities for re-use considering the 16000 million injections administered world-wide annually.

WHO estimate contaminated needles and syringes are responsible for 21 million hepatitis B Virus (HBV) transmissions, 2 million hepatitis C virus infections and the transmission of 260,000 HIV transmissions recorded in year 2000. If the needles and syringes used in hospitals were disposed and managed properly/safely, most of these infections could have been avoided. There is also the problem of re-use of needles and syringes in Africa, Asia, Central and Eastern countries.

In June 2000, WHO fact sheets (2011) reported 6 children were diagnosed with the small pox Virus after playing with glass containers of expired smallpox vaccine at the waste dump site in Vladivostok (Russia). Normally these expired vaccines should have been treated before disposal but it was discovered many hospital waste materials were disposed without treatment or decontamination and sterilization. In most developing countries, there are also high risks of needle stick injuries and coming in contact with hazardous waste by scavengers that work in waste dump sites.

The World Health Organisation in 1993, made a global move and drafted a comprehensive guidance document on regulatory framework concerning waste disposal, planning issues, waste minimization and recycling, waste handling, storage and transportation, waste treatment and disposal alternatives and capacity building. This comprehensive guidance document, addressed by WHO in 1993, was aimed at hospital managers/administrators, policy makers, public health workers and environmental health professionals.

2.4 International exposure

According to the WHO fact sheet 2011, 20% of health care activities general waste is hazardous and may be infectious, toxic or radioactive. Hazardous waste in high income countries is generated to the quantity of 0.5kg per bed per day. In low-income countries, hazardous waste is generated to the quantity of an average of 0.2kg per hospital per bed daily. However, in low-income countries most non-hazardous health care waste are not separated from hazardous health care waste and as such makes the amount of hospital litter enormous.

Needle stick and sharps, mostly exposes people working in the hospitals to blood borne infections. A study conducted by Parvin, Farbood and Hajeb (2012) in Iran which focused on needle sticks and sharps injuries among housekeeping workers in the hospital of Shiraz, examined needle stick and sharp injuries among hospital house keepers in the handling and disposal of hospital waste both in government and private hospitals; also looked into strategic ways to prevent these exposures. Parvin, Farbood and Hajeb (2012) conducted their research using a cross-sectional study design to evaluate needle stick and sharps, with preventive measures put in place to protect hospital housekeepers from 2009 to 2012.

Questionnaires were distributed to source data from 92 workers directly in contact with hospital wastes. Analysis of data was done using chi-test, student t-test and where necessary SPSS version 12. Through the analysis of data it was ascertained 90.2% of housekeeping workers were aware of risk exposures involved in healthcare facilities pertaining to blood borne infections transmission; there were 87.5 % of housekeepers working in government owned health facilities and 93.2% housekeepers working in private owned health facilities ($P=0.0444$). There was also 83.7% of house keepers in the health facilities who had participated in educational programs on biomedical waste, management and injury prevention at their health facilities and 16.3% of the house keepers working in health facilities had not been trained in management of biomedical wastes in healthcare facilities ($P=0.0379$). It was ascertained 88.9% of the hospital housekeepers had sufficient safety and protective wears/gears to protect themselves from blood borne infections while discharging their duties in the health facilities where they worked.

Needle stick injuries are commonly known for putting health workers at risk of occupational injuries and as such have an important implication on the morbidity and mortality of health workers via blood borne infections transmission. Health care wastes includes all of it generated from hospitals such as syringes and sharps used in the hospitals (Ilyas, 2000) and those at high risk are doctors, nurses, healthcare auxiliaries, hospital maintenance personnel and even the patients in the healthcare facilities (Park, 2007). It is stated 3 million health workers out of 35 million health workers worldwide experience needle stick and sharps injuries annually (Yacoub, Al Ali, Moukeh , Lahdo, Mouhammad and Nasser, 2010).

In the United Kingdom alone over 100,000 cases of needle stick and sharps injuries are reported annually (Sharps injury information. <http://www.isips.org/sharps.shtml>), this calls for concern and transmission possibilities of about 20 various blood borne pathogens which includes HIV, Hepatitis B, Hepatitis C; sourced from the National Institute for Occupational Safety and Health. NIOSH Alert: preventing needle stick injuries in health care settings [DHHS (NIOSH) Publication No. 2000–108] U.S. Department of Health and Human Services, Cincinnati, OH; 1999.

The world health report: 2002 states the workplace is responsible for 40% of HBV and HCV and 2% to 3% of HIV infections among health workers. These occupational hazards bring about grief and negative socio-economic impacts on the affected health workers; it also serves as a burden for insurance institutions.

Needle stick injuries mostly occur while administering injections, blood sampling, recapping of needles, needles disposal and transfer of body fluids from syringes to containers such as vacuum tube (Norsayani and Noor, 2003). When the focus is on health maintenance of health care workers, occupational safety practice should be considered seriously and as a matter of priority in the healthcare industry (Jovic-Vranes, Jankovic and Vranes, 2006).

There are estimated percentages from 6% to 30% of health care workers who contracted HBV without post exposure prophylaxis (Trim and Elliott, 2003). However, it is believed the estimated rate of HBV transmission in United States of America has drastically reduced since 1980's to the tune of 95%, probably due to the emergence

and impact of post exposure prophylaxis measures taken after risk exposure, application of universal precautions set for healthcare workers, licensing of effective vaccines against HBV (Centres for Disease Control and Prevention). Irrespective of this significant reduction in HBV transmission in USA there are more than 50% of needle and sharp injuries that occur in health care facilities among health care workers are not reported and inadequate reporting of such injuries undermines the potential implications of healthcare occupational hazard and blood borne transmissions (CfDCa P. 2004) (Azadi , Anoosheh and Delpisheh, 2011).

According to Gerberding (2003) health-care workers who are exposed to blood and other body fluids are at risk of HIV transmission. Taking universal standard precautions, using safe needle devices are the best ways to prevent blood borne infections in the hospital settings. Though there are universal standard precautions put in place, the frequencies of needle sticks accidental pricks remains high among people working in the hospitals thereby frequently exposing hospital workers to blood borne pathogens over the past decade.

The Centres for Disease Control and Prevention (CDC) as of December 2001 had voluntary reports of 57 documented cases of HIV seroconversion tentatively associated with occupational exposure to HIV among U.S. health care workers. (U.S. Public Health Service, 2001; HIV/AIDS surveillance report. Vol.12. No.1. 2000).

Another 138 infections among health care staff were possibly considered cases of occupational HIV transmission. Occupational transmission of HIV has been globally reported to have been occurring. HIV has no vaccine yet post exposure prophylaxis for it remains the best practice to keep injured people that are involved with body fluid or blood contaminated materials.

Percutaneous injury normally inflicted by a hollow-bore needle, is usually the most known mechanism of occupational HIV transmission among hospital workers. The CDC estimates more than 380,000 percutaneous needle-stick injuries occur in U.S. hospitals annually; approximately 61% are caused by hollow-bore devices. Information sourced from Occupational safety (2000) shows that the number of

needle-stick accidents that occur in non-hospital environment, where 60% of the health care workers is not known, it might be high in actuality.

Post exposure prophylaxis provided by clinicians should be accessible to all health workers in hospital settings to be immediately administered to injured hospital workers and follow-up medical care and counselling should be provided.

A research conducted by Stephen, Hadler, Irene, Doto, James, Maynard, Joseph, Brian, Mosley, Theodore, Clifton, Himmelsbach and William. (1985) revealed the estimation of risk of contracting hepatitis B virus (HBV) infection among hospital personnel in 5 different hospitals in various parts of the united states of America were examined and the effect of occupational and non-occupational factors on HBV prevalence on 5,697 health workers were ascertained. The health workers (807) that participated in the study tested positive to HBV. The study also revealed health workers with high frequency of blood contact were greater infected amongst the HBV screened health care workers and the infection rate was 1.05 per 100 persons, followed by those with moderate rate of being in contact with blood and followed by those with negligible contact with blood in the hospitals. The frequency of needle sticks injuries had an effect on HBV infection rates. This study provides a clear idea to assessing risk of HBV infection in hospital workers and shows the risk may be mostly correlated with the frequency of blood-needle contact during daily work.

According to Simonsen, Kane, Lloyd, Zaffran and Kane (1999) blood borne pathogens transmissions through infected and contaminated needles and syringes have been in existence but the problem is higher in developing countries especially in Africa. Health workers are increasingly exposed to blood borne infections and as such routine Hepatitis B immunization is highly recommended and also measures to prevent needle stick injuries among health workers (Kane, 1993).

Before the advent of widespread immunization against HBV, it was estimated 8700 cases of HBV transmission occurred following percutaneous exposures occurring annually in the United States of America alone (Koziol and Henderson, 1993). The figure mentioned in the United States of America is only a small fraction of the entire

transmission of blood borne pathogens transmissions from contaminated needles worldwide.

Ninety nine Dutch health workers working in HIV AIDS endemic areas sustained a high rate of percutaneous exposure and up to 61% of them happened in less than twenty one months. The main reasons for these risky occurrences were; lack of professionalism, working under pressure, working with sub-standard hospital equipment. They also argued the rate of occupational exposures in the hospitals can only be reduced but cannot be completely eliminated (de Graaf, Houweling and van Zessen, 1998).

Davidson and Gillies (1993) assessed the knowledge, attitude and perception of health workers regarding risk of occupational HIV transmission in the hospitals even with the existing guidelines put in place to help protect health care workers. Few cases of blood borne pathogen transmission among health care workers are due to sharps and needle stick injuries. It was also realized well trained nurses and doctors had better perception, attitude and knowledge of occupational hazard and prevention when compared to general workers in the hospitals which include hospital attendants, assistants and cleaners. This calls for more training on safe working practices needed in the hospitals especially for staff other than doctors and nurses who are better trained. It was concluded health care workers needed policy guidelines for safe working environment in the hospitals and a proper training on HIV transmission routes to avoid negative attitudes being expressed on HIV, HBV and HCV patients by health care workers treating them having a wrong perception about virus transmission.

Canini, Silvia Rita Marin da Silva, Gir-Elucir, Machado and Alcyone-Artioli (2005) conducted a descriptive study on occupational accidents among health care workers involving contaminated materials. The study investigated records of health workers exposed to percutaneous injuries from hospital waste between January 1997 and October 2001. The records showed a total of 2814 health care workers, 147 were hospital supporting service staff while 156 accidents involved auxiliary cleaning personnel which over a third of the staff involved in the accidents did not receive the Hepatitis B vaccine, this is present where most hospital cleaners and auxiliary

nurses receive little or no training on necessary precautions and medical implications on blood borne transmission and infections. Only 23.1% of the cases received post exposure prophylaxis for HIV prevention. According to records, there was no case of HIV zero conversion but it was suspected chemotherapeutic prophylaxis was still necessary in such accidents to avoid the probability of HIV transmission. There was need for continuous education among health care workers for the prevention of all blood borne viruses in the hospitals during occupational practice.

Denis, Ecochard, Bernadet, Forissier, Porst, Robert and Volckmann (2003) stated early prevention of hospital accidents due to sharps and needles sticks can protect health care workers, according to them the total annual incidence of occupational accidents is 3.5 per 100 workers per year and this involves cleaners and paramedics. They suggested there should be training and awareness focused on occupational hazard prevention to reduce such occurrences in the hospitals.

Prüss-Ustün, Elisabetta-Rapiti and Yvan-Hutin (2005) stated 16000 HCV, 66000 HBV and 1000 HIV cases among health care workers may have occurred consequent to occupational hazard in the hospitals. They also pointed out these exposures can be preventable using vaccines for HBV, post exposure prophylaxis for HIV and use of containers for used sharps. It was also pointed out most of the blood borne pathogens such as HIV is common in sub Saharan Africa and other developing nations where there is a lack of basic safety kits for hospital cleaners and other auxiliaries.

A work done by De Castro, Cabrera, Gilbert, Kaori and Eularito (2009) showed nurses are mostly exposed to occupational accidents in the hospitals. In 2007 during the Philippines annual nursing convention many of them reported they have no workplace code of good conduct or policies to guide them to safer occupational practice to protect them from percutaneous cuts from hospital sharps and needle sticks, one third of the nurses reported no intervention practices were put in place by their employers to avoid occupational injuries in the hospitals. This shows if the employers of health care workers begin to train and implement good working policies, most occupational accidents leading to blood borne pathogen transmission could be prevented.

In Frankfurt there were patients with HBV, HCV and HIV and a correlation was established between the patients and risk exposure faced by health care workers involved in their treatment. When data of percutaneous injuries sustained by healthcare workers in these hospitals where the infectious patients were being treated were analysed; 5.3% (n=709/13358) for HBV, 5.8% (n=1167/20163) for HCV and 4.1% (n=552/13381) for HIV injuries occurred to health care workers in relation to a number of HBV, HCV, and HIV patients being treated. These revealed health care workers do face many risks of exposure to blood borne pathogens and there is a need to ensure they are vaccinated against HBV and are regularly educated on the importance of post exposure prophylaxis once there is an occurrence of occupational injury due to sharps or needle sticks used in the hospitals. It was suggested anti-needle devices should be provided for health workers to keep their working environment safer (Wicker, Cinatl, Berger, Doerr, Gottschalk and Rabenau, 2008).

2.5 Risk of infection

According to the Clinical and Laboratory Standards Institute (2005) the main determinant of the risk of acquiring a blood-borne infection depends on the quantity of blood involved in the exposure, the viral load in the patient's blood at the time of exposure and post exposure prophylaxis administered as at when due. The issue of accidental parenteral inoculation of medical personnel with HIV-infected blood has similarity with HBV transmission.

Table 2.1 and 2.2 shows healthcare workers with documented occupationally acquired AIDS/HIV Infection by type of occupation exposure and type of fluid Involved, reported from 1978 through December 2002, United States (CDC. Issues in Healthcare Settings. Surveillance of Healthcare Personnel with HIV/AIDS as of December 2002 (www.cdc.gov/ncidod/hip/BLOOD/hivpersonnel.htm)).

Table 2.1: Occupational Exposures to HIV infection reported from 1978 through December 2002 United States

Type of Occupational Exposure	Number
Percutaneous (needle stick or cuts)	48
Mucocutaneous (eye, nose, mouth, or skin)	5
Both (above)	2
Undetermined	2
TOTAL	57

Source: (CDC.Issues in Healthcare Settings)
www.cdc.gov/ncidod/hip/BLOOD/hivpersonnel.htm

Table 2.2: Type of fluid involved in Occupational Exposures to HIV infection reported from 1978 through December 2002 United States

Type of Fluid Involved in Exposure	Number
Blood	49
Concentrated virus in laboratory	3
Visibly bloody fluid 1	1
Unspecified fluid	4
TOTAL	57

Source: (CDC. Issues in Healthcare Settings). Surveillance of Healthcare Personnel with HIV/AIDS, as of December 2002
www.cdc.gov/ncidod/hip/BLOOD/hivpersonnel.htm

HBV is found in high concentrations in blood (10⁸ to 10⁹ infectious particles per mL). In contrast, HIV-1 is usually found in concentrations of 10²-10⁴ infectious particles/mL so the likelihood of being infected with HBV is 300 times greater than HIV. HBV is found in blood, bile, breast milk, cerebrospinal fluid, faeces, nasopharyngeal washings, saliva, semen, sweat, synovial fluid, urine, peritoneal fluid, tissue, and blood products. The average volume of blood transmitted in a needle stick prick with a 22-gauge needle is approximately 1 µL, a quantity well enough to contain up to 100 infectious doses of HBV. The transmission risk of exposure to HBV after a needle stick to a non-immune person can be as high as

30% if the source patient is HBeAg positive, but is less than 6% if the patient is HBeAg negative

HCV is found in human blood and it has the same distribution and ability to share routes of infection with HBV. HCV is found in concentrations in human blood of 10² to 10³ particles /mL. The prevalence of HCV infection among healthcare workers is no greater than the general population, averaging 1% to 2%, and is ten times lower than that of HBV infection. Transmission of HCV is basically through high or continuous percutaneous exposures to blood through sexual exposure, health-related work and transfusion (table 2.3).

Table 2.3: Risk of Infection Following Occupational Exposure to Infected Blood among Healthcare Workers

Type of Exposure	HBV	HCV	HIV
HBV			
Percutaneous 18%	18% (6% - 30%)	1.8% (0% - 7%)	0.3% (0.2% - 0.5%)
Mucous membrane (Eye, nose, mouth)	Unknown	— *	0.09% (0.006% - 0.5%)
Non intact skin	Unknown	— *	<0.09%
Concentration in blood (Particles per mL)	10 ⁸ to 10 ⁹	10 ² to 10 ³	10 ⁰ to 10 ⁴

Source: (CDC. Issues in Healthcare Settings). Surveillance of Healthcare Personnel with HIV/AIDS, as of December 2002

www.cdc.gov/ncidod/hip/BLOOD/hivpersonnel.htm

The transmission risk of HBV to health care workers who are not immune to HBV depends on the amount of virus in the contaminated sharp object or needle and also dependent on the presence of or absence of Be antigen (HBeAg) in the patient which the sharp instrument or needle was used up on (Robinson, 1999). In a situation where the blood from HBV patient with small amount of the hepatitis B virus

(titres) is below laboratory detection threshold, there will be very low possibility of viral transmission to another person (Alter, Holland and Purcell, 1972).

HBV infections among health workers can be consequent to non-occupational exposure but evidence based transmission of HBV from mucous membranes or small cracks on the skin is a high risk of exposure for those that recall their past experiences with their exposure to HBV. It is recommended HBV prophylaxis should be administered after the occurrence of an occupational exposure, this is done by administering HBV hyper-immune globulin and recombinant HBV vaccine to the exposed victim.

There has been evidence based studies to determine the efficacy of recombinant vaccine alone as a prophylaxis for people exposed to HBV or the administration of HBV hyper-immune globulin alone on health workers exposed to HBV due to occupational injuries, but the combination of both HBV vaccine and hyper-immune globulin is more effective (rate of efficacy, 85 to 95 percent) than vaccine alone (70 to 95 percent) (Safety of therapeutic immune globulin preparations with respect to transmission of human T-lymphotropic virus type III / lymphadenopathy-associated virus infection MMWR Morbidity Mortal Weekly Report 1986;35:231-233 (Erratum, WR Morbidity Mortal Weekly Rep 1986;35:607).

Past reports show HCV occupational transmission through percutaneous parenteral exposure can take place (Antone, Francis, Bradley and Maynard, 1980; Dienstag and Alter, 1986).

HCV infection was noted in 3 of 110 Japanese health care workers who were accidentally exposed to needle sticks contaminated with blood containing HCV (Sodeyama, Kiyosawa and Urushihara, 1993). HCV seems to be more common among health workers than in entire population at large, but cumulative risk shows that HCV is less transmissible compared to HBV (Forseter, Wormser, Adler, Lebovics, Calmann and O'Brien, 1993; Marranconi, Mecenero and Pellizzer, 1992).

2.6 Transmission risk through exposure

According to the analysis sourced from 21 prospective studies, the transmission risk through occupational exposure to HIV by percutaneous injuries through needles and other contaminated instruments was 0.2% involving 9 infections after 3628 exposures 95 % confidence interval, 0.1% to 0.5% (Tokars, Marcus and Culver, 1993; Henderson, Fahey and Willy, 1990; Cavalcante, Abreu and Fernandes, 1991). These figures and values helps in revealing the average magnitude of risk of transmission of HIV among health workers who reported exposures but it is sure not a reliable way of saying HIV was transmitted to the exposed health workers because there are several variables affecting routes of HIV transmission in people.

The quantity of blood or body fluid involved in the percutaneous exposures is an important factor that determines the risk of HIV transmission in risk exposure. Factors, such as the gauge of needle used, the depth of penetration, the level of self-protection applied such as wearing of gloves applied during the accident; all determine the chances of successful HIV transmission in an occupational risk exposure (Mast, Woolwine and Gerberding, 1993). There are no epidemiologic data to efficiently back up viral titre and its transmissible possibilities but exposures through large-bore hollow needles, deep penetrations and injection of blood shows occupational transmission of HIV in reality.

Mucocutaneous exposures are responsible for an estimated 12% (4 out of 32) of HIV infections recorded due to occupational exposure that were reported to the Centres for Disease Control and Prevention (CDC) by 1992. (Surveillance for occupationally acquired HIV infection -- United States, 1981-1992. MMWR Morbidity Mortal Weekly Rep 1992; 41:823-825). The risk of mucocutaneous exposure has been difficult to quantify, because transmission by this route is rare.

The transmission risk of HBV and HCV through occupational exposure is greater than the chances of the risk of HIV transmission. According to Barry and Zingman, (2013) the risk of HCV transmission through needle stick injury is 1.8%, the risk of HBV transmission ranges from 1% to 30% and this depends on the viral load present at exposure. Transmission of HCV through mucous membrane exposure is

negligible. If there is an occurrence of occupational exposure, the source patient should be checked for HCV HBV and HIV.

2.7 HBV Vaccination and risk reduction

If exposed workers are non-immune to HBV they should be administered with hepatitis B vaccine series alongside with the administration of prophylactic hepatitis B immune globulin (HBIG). The hepatitis B vaccine and the HBIG should be administered within 24 hours and not later than 14 days after exposure. The three-dose HBV vaccine series is given at 0, 1 to 2 months, and 6 months. Hepatitis B antibodies should be obtained 1 to 2 months after completion of the third dose of the vaccine.

Occupational injuries in the hospital should be washed with soap and water but not to be squeezed, mucous membranes should be flushed with running clean water. If HBV vaccine series is administered within 12 to 24 hours of exposure, it will be 70% to 90% effective in preventing HBV infection. The combination of both HBV vaccine and HBIG also gives a high level of efficacy. In non-responders to HBV vaccine, one dose of HBIG is 70% to 90% effective in HBV prevention if given under 7 days (Weinbaum, Lyster & Margolis, 2003) and multiple doses have exhibited 75% to 95% effectiveness. The administration of the three doses of HBV vaccine series should be given at 0, 1 to 2 months, Hepatitis B antibodies is to be given at 1 to 2 months after completion of the third dose of the vaccine.

No matter the risk of exposure to HBV even when deemed non-significant, HBV vaccination should be administered to all non-HBV-immune exposed workers. A person has been previously infected with HBV is immune to re-infection and do not require any form of prophylaxis.

Administration of one dose of HBIG and re-administration of the vaccine series is recommended for non-responders who have not completed a second three-dose vaccine series. Persons who previously completed a second vaccine series but failed to respond then two doses of HBIG are recommended.

There is no vaccine, immunoglobulin nor antiretroviral for Hepatitis C, there equally no post exposure prophylaxis for HCV. When a health worker is found with HCV infection the person is referred for medical management by clinicians.

The most effective measure taken against HCV is early detection and treatment with interferon which is highly effective, it is believed to be 98% effective (Jaeckel, Cornberg and Wedemeyer 2001). The appropriate regimen and duration of treatment for HCV is unclear but it is necessary to observe the patient for a period of 8 to 12 weeks post-infection (Ghany, Strader and Thomas, 2009). Interferon or pegylated-interferon with or without ribavirin is recommended for treatment of HCV.

2.8 Post exposure prophylaxis

Following the exposure of HCV, HBV or HIV the source patient is diagnosed with ELISA and if found positive then a confirmatory test is conducted to source the patient's status. Post exposure prophylaxis is recommended for HBV and HIV exposure, this is according to Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and recommendations for Post-exposure Prophylaxis (2001), once the source patient is positive the health worker exposed should be managed as though the source patient is a chronic infected person.

2.9 Education of health workers

Clinicians are meant to educate the exposed health worker about HCV, HBV and HIV infections and proper counselling should be administered following; abstinence from alcohol intake and other intoxicating substances. The exposed worker should be educated on blood-to-blood contact, such as sharing of needles, razor-blades, toothbrushes, syringes and other sharp objects. Sexual activities should be suspended and the exposed worker cannot donate plasma, blood, organ or semen.

It is also important to know that HBV, HCV and HIV infections are not spread via food or water, sharing eating utensils, hugging, kissing or holding hands, coughing or sneezing. In case of an exposed breast feeding woman, HCV cannot be transmitted by breastfeeding, however, HIV exposed women are advised to stop breast feeding at least for 3 months post exposure period.

All factors that may increase the risk of exposure of HIV, HBV and HCV such as sharing sharp objects, have sex with multiple partners and practices that can disrupt mucous membranes should be discouraged.

Post exposure follow-up for HIV, HBV and HCV is then established especially if any of the blood borne infections tested positive from the source patient. If at any period the serum ALT level of the exposed worker is elevated, the clinician is meant to repeat HCV RNA testing to confirm HCV infection and if found positive then treatment should be commenced with a clinician who is well experienced with the treatment of Hepatitis. Persons exposed to HCV-infected source patient should have regular follow up with HCV RNA testing should be done within 2 weeks of exposure but the accuracy can still be biased because of the possibility of window period (a period when an infection cannot be detected through diagnosis but it is fully present in the individual).

Seroconversion of HCV and detection with ELISA antibody test occurs in 50% of exposed patients within the period of 9 weeks of exposure and about 97% of patients experience seroconversion within 6 months of exposure (Centres for Disease Control and Prevention. Recommendations for preventing transmission of infections among chronic hemodialysis patients, 2009).

Van Gemert-Pijnen, Hendrix, Van der Palen and Schellens (2006) argued the main risk factors in hospital occupational accidents among health workers do not observe protocols put in place to reduce risks of injuries that can transmit blood borne pathogens in the hospitals. Their work showed most health workers lacked the understanding, acceptability and the implementation of protocols such as post exposure measures and HBV vaccines provided for health care workers to protect them from blood borne pathogen infections. They also pointed out most health workers had little or no organisational support to help compliance and they advised that risk management training should be made a priority in the hospitals.

Sharps such as needles used in the hospitals pose a risk to occupational transmission of blood borne pathogens such as HIV to health care workers which

include hospital cleaners that constantly handle sharps and biohazard waste. These biohazard materials can transmit HIV, HCV and HBV, Lassa virus, Ebola virus and Marburg virus. The Centre for Disease Control and Prevention states 384,000 percutaneous injuries take place in United States of America hospitals only and are mainly caused by needle stick injuries (Jayanth, Kirupakaran, Brahmadathan, Gnanaraj and Kang, 2009). They also discovered out of 296 health workers interviewed between 2006-2007, 45 (15%) were class IV or cleaning staff who sustained needle stick injuries in the hospital environment and those mainly affected had less than one year experience ($P < 0.001$). Improper disposal of hospital waste and overflowing containers expose mostly cleaners to this occupational risk of HIV transmission. According to their research, intensive educational efforts were carried out but standard procedures were often not observed by workers. There is therefore need for proper education/awareness and continuing education on practice of universal precaution and standard procedures for health workers.

It is estimated approximately 3 million health care workers experience percutaneous exposure to blood borne pathogens every year. This results to 16000 Hepatitis C, 66000 HBV and 200 to 500 HIV infections annually (Haiduven, De Maio and Stevens, 1992).

Some researchers indicate HIV transmission rate among health care workers is significantly low but Newsom and Kiwanuka (2002) argued occupational injuries leading to blood borne viruses (BBVs) including HIV is significantly high. There is support by the research conducted in a Ugandan tertiary hospital where hundred and eighty (180) questionnaires were received from health workers and hundred agreed to have sustained needle stick injuries within one year. Sixty staff claimed to have induced bleeding from the wound and washed it with bleach. Although 2.8% of them tested HIV positive it was not clear if they all acquired the virus via occupational exposure to HIV since there are other various routes of transmission and being infected.

2.10 The incidence in Nigeria

Nigeria being a developing nation in the sub Saharan Africa is facing a problem related to the aspect of occupational safety in the health care sector. A cross-sectional survey on the epidemiology of percutaneous injuries of health care workers in Ile Ife Nigeria was conducted by Ajibola, Adegboye-Gregory, Moss–Femi, Soyinka–Joan and Kreiss (1994). The exposure from blood and body fluids poses a potential risk to health care workers. The cross sectional survey showed 27% of 474 health workers had needle stick injuries in the previous year. The rate of injuries from hospital sharps was overall 0.6 per person per annum. The main causes of these accidental injuries were due to improper handling and disposal of sharps. Needle stick injuries were blamed for 23% of injuries sustained by health workers in Ile Ife university teaching hospital. The research showed many health care workers were also aware of the protective measures taken to protect or minimize injuries among workers yet these accidents occurred. Protective measures can protect health care workers if strong policies are incorporated in a strategy and implemented in the workplace.

Millions of contaminated infectious needles and syringes are being disposed improperly in the hospital environment in Africa and other low and medium income countries. The consequences are known for handling blood and body fluids of patients in various health facilities especially in Nigeria which is a burden by HIV as the country that has the second largest infected population of HIV positive people in the world, it is also estimated 20 million people are infected with HBV and HCV. In an assessment of injection safety in various selected local government areas in five states in Nigeria; Bauchi, Benue, Cross River, Lagos and Sokoto states, it was discovered up to 80% of health facilities had biohazard wastes (non-sharps) outside suitable disposal containers.

http://www.aidstar_one.com/focus_areas/prevention/resources/reports/infection_safety_assessment_nigeria).

Health personnel are at high risk of occupational infections such as HCV, HBV and HIV through blood, body fluids and medical equipment. A study was carried out in other health care centres to assess the nurses' knowledge and practice of infection control in Primary Health Centres in Delta state Nigeria and the study revealed the

practice of universal precaution was not given proper attention in the health facilities and this is putting nurses at risk of blood borne infection (Egwuenu, and Okanlawon, 2014).

A study research conducted by Diwe and Chineke (2013) supported needle stick injuries as occupational hazard that occurs frequently in the health facilities are accidental and they are mostly percutaneous penetration or mucous membranes penetration by contaminated needles or sharp objects. These needles or sharps are often contaminated with blood borne pathogens such as HIV, HBV and HCV. A cross sectional study was conducted among health workers in Imo state University teaching hospital (IMSUTH) Orlu, Imo state in South Eastern Nigeria. This study was conducted using a semi-structured and an interview administered questionnaire. It was revealed out of 153 research study participants, only 36 experienced at least one needle stick injury in the previous year. The nurses experienced the highest prevalence rate of injuries in the hospital during intra muscular injection 23 out of the 23 affected injured nurses only 10 out of them reported to the doctor or a supervisor; 9 received post exposure prophylaxis for HIV. The researchers' conclusion showed the prevalence of occupational risk in the hospitals occurred mostly among nurses and most often such cases were under reported, findings also showed there was lack of adequate training of hospital workers on safety practices and there was also a high rate of non-use of personal protective devices such as gloves.

Another research conducted in an eastern Nigerian hospital by Ansa, Udoma, Umoh and Anah (2002) showed occupational injuries exposing health care workers in Nigeria hospitals are mainly caused by poor availability of protective tools and materials for hospital workers. There is a lack of water supply, disinfectants and clothing for hospital workers. Workers did not make proper use of them and some workers made inconsistent use of protective tools and materials. According to these researchers, they found health care workers in three different hospitals were constantly exposed to blood and other body fluids; this was unnecessary and the risk was potentially high because most of the blood and body fluids were not screened for blood borne viruses. This supports the idea there is a significant risk of HIV transmission in workplace (hospitals) and this suggests there should be a proper adoption of standard hygiene practices in the hospitals and protective materials for

health care workers should be adequately provided for health care workers in Nigeria.

2.11 Conclusion

This chapter reflected what researchers have found on this subject topic, it enabled an understanding that hospital occupational hazard has been in existence for quite a long period of time and has been a source of HIV and other blood borne pathogens such as Hepatitis C and Hepatitis B through hospital work. This literature review has given the researcher a clear idea on how to go about the study research and methodology to conduct this research, it also gave us a large scale of references and opinions of other researchers on issues concerning occupational risk of exposure in the hospital and has enabled the researcher to go into the next chapter being research methodology which will show how the research will be designed and conducted and all the statistical methods intended to be used in analysing the data. The next chapter will be dealing with the research methodology which will show the research design and all methods that will be dealing with the way the researcher will be sourcing all the information needed to have a successful research study.

CHAPTER THREE RESEARCH METHODOLOGY

3.1 Introduction

This research is a cross sectional study carried out in 10 various hospitals in Abakaliki and its metropolis Ebonyi state located in the South eastern part of Nigeria. These hospitals include 3 public institutions owned by the Catholic Church mission; the other 7 hospitals are private health facilities. The aim was to establish the knowledge of HIV transmission among cleaners in ten hospitals. Gaps were identified existing between the cleaners' knowledge of HIV transmission and their practice in workplace, and this chapter is going to explore the methodology used in asserting these gaps identified in the research study.

3.2 Problem statement

There is a low level of knowledge of occupational safety towards HIV transmission among general workers in health facilities. However, if they are equipped with the necessary safety knowledge while employed in their specific jobs a safer environment will be created not only for themselves but also their families. They will take better preventive measures to prevent exposure to HIV transmission via exposure to biohazard wastes. The question is therefore: What is the level of knowledge of occupational safety towards HIV transmission among general workers (cleaners) in health facilities?

3.3 Objectives of the study

- To ascertain the knowledge of general workers in health facilities about HIV transmission.
- To determine the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work environment.
- To identify gap existing between the knowledge of general workers in health facilities and the practices involved in the workplace.
- To establish good conducts that will protect general workers (cleaners) in health facilities from occupational HIV transmission.

3.4 Research approach

The research project utilised data collection methods to collect quantitative and qualitative information. Quantitative in the sense those questionnaires were designed and distributed to hospital cleaners in order to raise data from them in line with the study research. A qualitative approach was used to raise data from the 10 hospital managers where the study research was conducted and this was done in form of semi structured interview.

Quantitative (questionnaires) is reliable and objective, this approach can use statistics to establish its research findings and quantitative research has the ability of reducing complex problems of number of variables. This research approach determines the relationship between variables and has the ability of establishing cause and effect of the research purpose. Quantitative method of research uses a sample to represent a population which is quite easier to conduct than to work with a whole population for the purpose of research. Quantitative method of research tests hypothesis and can be used in creating new theories.

The disadvantages of quantitative data (questionnaire) are: The use of quantitative method can involve the emotions and feelings of the researcher which will affect the result of the research, it is perceived this type of research method limits the amount of questions that are relevant for a research to be conducted and therefore produces information without explanation. Quantitative approach has the tendency of lacking validity; another important issue with quantitative method of research is there is no way to find out if the respondents are truthful in answering the research questions. There are tendencies even after the explanation of the research study to the respondents, some of them might not really understand the context of the research purpose and may then forget to answer questions within the full context of the situation. In answering questionnaires respondents may reply base on their own interpretation of the questions thereby affecting the findings of the research study. The level of subjectivity by researchers is normally high because they make the research decisions, assumptions and formulates the questions for the respondents. Finally the coding of questions gives chance to much possibility of subjectivity by the researcher.

After weighing the advantages and disadvantages of quantitative method of research, this method was chosen because there was need to use a sample to represent the research targets, also the questions asked in the research needed to be measured to ascertain the objectives of the research study. There was a limit of time allotted for this research and using a quantitative method of research has the advantage of conducting the investigation that was cost effective and quick. Finally the research hypothesis could be tested and this method of research is reliable for this purpose.

A qualitative method was applied in the collection of data for hospital managers to identify the existing practices in hospitals to prevent HIV transmission among cleaners in their institutions. Further to establish if there are established good conducts that protect cleaners from HIV transmission risks. Semi-structured interviews were used in the ten hospitals in Abakaliki region in eastern Nigeria.

This method of research is best used when there is not an opportunity of meeting with the chosen sample, the hospital administrators are involved in managing the hospital and often do not have time to complete questionnaires (quantitative method). The qualitative method is a reliable method of research and asks open ended questions which provides the opportunity of new ways of seeing and understanding the research topic.

The disadvantages of semi structured interviews are: Cause and effect is difficult or impossible to be inferred, this research method cannot guarantee honesty of research respondents. The flexible structure of interview method of research has the ability of limiting reliability; generally open ended questions are not easy to analyse.

The researcher preferred to use a semi structured interview for the hospital managers because of the busy and tight schedule of approaching hospital managers to ascertain information for research purposes. Semi structured interview also allows respondents the freedom of expression in responding to research questions. Ultimately semi structured interviews provide comparable qualitative information.

The researcher met with various hospital cleaners from the selected host research institutions and explained the study research and the purpose of the research and the hospital cleaners whom agreed to partake in the research voluntarily were given quantitative data questionnaires as target research participants; to all cleaners in the seven private hospitals and the three public hospitals. These questionnaires were distributed in a cross-sectional manner covering a multiple group of hospital house keepers from different hospitals, each done once in a brief time. The questionnaires were written in English being the primary official language of Nigeria where the study was conducted and being the south eastern part of the country where the predominant ethnic and local language is igbo; the igbo language was also used in the questionnaires to ensure that research participants who could not understand English language properly participated in the research using the option of Igbo language being their local language. The questionnaires were distributed, completed and collected from cleaners in their hospital venues. A total of 10 hospitals were included in the survey with a minimum of 50 respondents as cleaners.

The hospital managers are the second target group who participate in the study using qualitative method (semi-structured interview) to gain information. This was done in a more specialized label of interview protocol and recorded with a digital recorder which has a memory card, the interview questions were put in script like manner but answered without using pencil and the interviewer went to the administrators' offices and had a face to face interview with them. This method of research would allow more competent responses from the hospital administrators, the hospital names and names of the interviewees were kept anonymous to ensure confidentiality of the research participants and research host institutions. The ten hospital managers were interviewed both in the three public hospitals and seven private hospitals.

The interview had 15 questions and was focused on acquiring the measures put in place in the hospitals by their managers in the form of:

- The provision of protective wears for cleaners working in the hospitals.
- Safety trainings delivered to these cleaners.
- Conditions of employment of the hospital cleaners.

- Policies or code of good conduct put in place in the hospitals to protect staff from getting involved in occupational hazards in the hospital.
- Measures taken by the hospital management when a hospital cleaner gets exposed to blood borne pathogen via occupation hazard.

The interviews commenced before distributing the questionnaires to the hospital cleaners and at the convenient time for the hospital managers. The semi-structured interviews were based on the information acquired from the literature review. The indicators were; provision of protective wears provided for hospital cleaners and how often they were provided, the incidence of reported hospital injuries in their hospitals according to their records, and evidence of training provided by the hospital administration for the hospital cleaners.

The research participants were informed about the research to enable them understand the nature of the research and the aim and consequence of the research. The participants' names and institutions were not divulged.

This research was strictly voluntary and participants could opt out at any stage of the research without consequences. They were clearly written permission letters which were given to all stakeholders participating in this research for proper approval and documentation.

The privacy of the research participants was respected such that they had the choice to answer questions they were comfortable with and they could decline in answering questions they were not comfortable with.

Efforts were made to avoid physical and psychological damage that could emanate from the research and the risk were kept low. Research data will be kept safely locked away for a period of time.

3.5 Sampling

Convenience sampling method was utilised which is a statistical method in obtaining the representative data by selecting research participants because they are easy to

access, this can be achieved by volunteering or selecting participants for a research and the advantage of this type of sampling method is the accessibility and quick way in which data can be ascertained . The limitation remains the risk of the sample not being representative of the entire research population due to biased research volunteers.

A total of ninety (90) copies of questionnaire were administered; only sixty-eight (68) were returned and they were found usable for statistical analysis; representing 75.6% of the total questionnaires; which is the response rate. The mean age and standard deviation of the respondents in this study are 38.6 ± 5.4 years.

The inclusion criteria for the research participant was open to all hospital managers and all hospital cleaners willing to partake in the research irrespective of age, sex, literate level of the individuals. Questionnaires were distributed amongst the selected hospitals and this was independently completed by the hospital cleaners who volunteered to participate in the research. Housekeeping workers in the 10 selected hospitals totalling 960 workers were identified as being at risk of occupational hazards that could lead to the transmission of blood borne pathogens such as Hepatitis B, Hepatitis C and HIV among several other blood borne pathogens using the inclusion criteria of direct engagement in the collection, handling and disposal of bio-medical waste including the handling of sharps contaminated with blood.

The research study had nique information that was gathered through a semi structured interview, it explored the total number of staff working in each of the hospitals where the research were conducted, it had information on number of out-patients and number of in-patients seen at the various health facilities where the research were conducted. The total number of cleaners working in each of the facilities was also ascertained (table 3.1).

Table 3.1: Number of hospitals where the research study was conducted with their staff strength and patient traffic

S/N	HOSPITALS	TOTAL STAFF NUMBER	PATIENTS SEEN DAILY	DAILY IN PATIENTS	NUMBER OF CLEANERS
1	Hospital 1				

The questionnaire contained a demographic section that analysed the sex of the workers, educational level of the research respondents, age ranges of the research participants, employment status of the hospital cleaners and the viral status of the research participants (at least in the past 3 months) (tables 3.2 and 3.3).

Table 3.2: Demographic distribution of the respondents

Demographic Characteristics	No of Respondents	Percentage
Sex		
Male		
Female		
Total		
Educational level of participants		
Primary education		
Secondary education		
Tertiary education		
No formal education		
Total		
Age range of participants		
20-29		
30-39		
40-49		
50+		
Total		
Status of employment		
Employment by your facility		
Employment by contract		
Total		

Table 3.3: Virus status of the participants (at least for the past 3 months)

Virus status of the participants	Yes	No	Total
Participants that know their HIV status			
Participants that know their Hepatitis B status			
Participants that know their Hepatitis C status			

3.6 Questionnaire

Questionnaires (5 point Likert scale questionnaires) were designed for this research and the reason was it gives respondents the opportunity to answer questions in a more classified manner thereby having the options of multiple ways to react over a question asked by the researcher instead of just answering yes or no to a question. A Likert scale questionnaire is also easy to code and total scores are easy to calculate to arrive at an overall result. Answers tend to be consistent because questions lead from one to another in a related manner.

The questionnaires were administered to respondents to collect quantitative data from them in the hospital. A total of ninety (90) copies of questionnaire were administered to the hospital cleaners and the study was conducted in August 2015. The questionnaires included 8 knowledge questions and 12 practical questions and were in the format of Likert scale format. The questions revolved around:

- Workers educational and training conditions.
- Awareness of the importance of hazards associated with medical waste.
- Monitoring and training on occupational health hazard towards HIV prevention and management.
- Vaccination of workers.
- Workers reaction to Needle sticks and sharps injuries in the hospital.
- Protective clothing and safe working materials.
- Occurrence of sharps injuries in the past 12 months.
- Workers beliefs about their work environment safety.
- Workers knowledge of precautions to be taken against occupational injuries.

- Hospital placed precautionary measures against needle stick injuries and prevention towards medical sharps.
- The situation causing the needle sticks and sharps injuries in the hospitals.

The characteristics of the occupational exposures were also asked, including the use of protective measures, immunization status and prophylaxis management following exposure.

Ethical approval from obtained from the 10 hospitals for data collection about biomedical waste management and workers knowledge and awareness about dangers associated with handling waste.

The answers regarding workers awareness were grouped into 'positive' and 'negative' responses. The data was then coded, tabulated and analysed using mean, standard deviation, t-test, degree of freedom and a p-value of < 0.05 was considered statistically significant.

3.7 Conclusion

This chapter indicated qualitative data questionnaires were used to gather the information needed from the hospital cleaners and a semi structured interview granted to all the 10 hospital managers and information gathered through this means used in data analysis and findings of this research study. The next chapter will show all the results extracted from the data collected from the hospital managers and hospital cleaners.

CHAPTER FOUR REPORTING AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter deals with reporting all the data collected from the conducted interview granted to the hospital administrators and the questionnaires distributed and returned from the hospital cleaners. The responses of the hospital administrators are summarized and the questionnaires are statistically analysed using a 5 point Likert scale including the standard deviation, mean, t-test, degree of freedom, total number of responses and the P-value. These results are reported and discussed considering the problem statement and the objectives of the study research which is centred on Knowledge of occupational safety by hospital cleaners and hospital managers towards HIV and other blood borne pathogens transmission in Abakaliki region in eastern Nigeria.

4.2 Semi-structured interview questions for the research study granted to various hospital managers

A total of 10 hospital administrators were interviewed to ascertain their knowledge of HIV and other blood borne pathogens that could be transmitted through occupational hazard in the hospitals. The questions that were asked during the interview with hospital managers are reflected in table 4.1

Table 4.1: Number of hospitals where the research study was conducted with their staff strength and patient traffic

S/N	HOSPITALS	TOTAL STAFF NUMBER	PATIENTS SEEN DAILY	DAILY IN PATIENTS	NUMBER OF CLEANERS
1	Hospital 1	22	18	0	4
2	Hospital 2	13	15	7	3
3	Hospital 3	11	16	4	4
4	Hospital 4	11	10	5	2
5	Hospital 5	14	25	5	4
6	Hospital 6	10	12	3	2
7	Hospital 7	10	20	6	3
8	Hospital 8	250	180	30	26
9	Hospital 9	394	200	35	33
10	Hospital 10	225	150	30	27
Total	10 hospitals	960	646	125	108

Table 4.2: Question: Do you know about various blood borne pathogens such as HIV, HBV (Hepatitis B), HCV (Hepatitis C), Ebola and Lassa virus?

Yes I know about these viruses	100%
No I do not know about these viruses	0%

Table 4.2 indicated all the respondents are aware of the viruses.

Table 4.3: Do you organise safety training or health hazard training for your hospital staff including hospital cleaners?

Yes we organise safety training	40%
No we do not organise safety training	60%

The administrator indicated 40% of them organise safety training while 60% responded in the negative (table 4.3).

Table 4.4: Do you have any occupational safety orientation for your staff before they start working here?

Yes we do have occupational safety orientation for our staff before they start working here	60%
No we do have occupational safety orientation for our staff before they start working here	20%
No we do have occupational safety orientation for our staff before they start working here but we give them verbal instructions on how to work	20%

The majority of responses in table 4.4 said they provide safety orientation for their staff before they commence with their employment.

Table 4.5: What measures have you put in place to create a safe working environment for your hospital cleaners such as; safe bio hazard disposal boxes; hand latex gloves; nose masks

s/n	materials	Yes we provide them	No we do not provide them	We provide them when necessary and on request
1	Biohazard boxes	100%	0	0
2	Hand latex gloves	100%	0	0
3	Nose masks	60%	20%	20%

The whole sample of administrators in table 4.5 attempted to create safe environment for their workers.

Table 4.6: Do you have any insurance cover for your hospital staff including hospital cleaners?

Yes we provide insurance cover for our staff	10%
No we don't provide insurance cover for our staff	90%

It was alarming there was no insurance cover for staff working in this particular section of the institution in table 4.6.

Table 4.7: Is any type of compensation granted to any one that sustains injury or gets infected in the process of working in your hospital environment?

Yes we compensate our staff that accidentally get injured	0
No we do not compensate our staff that accidentally get injured	100%

When an employee in this section of the hospital environment is injured there is no compensation as reflected in table 4.7.

Table 4.8: Do you enforce HIV, hepatitis B virus and hepatitis C virus screening on or before your hospital cleaner's work for you?

Yes we mandate HIV, HBV, HCV screening	10%
No we do not mandate HIV, HBV, HCV screening	90%

The administrators indicated they do not screen their workers for any infection before they are employed (table 4.8)

Table 4.9: Do you vaccinate your staff against hepatitis b virus in your hospital especially hospital employees that are always exposed to body fluids and blood?

1	We vaccinate our staff against HBV	20%
2	Yes we vaccinate against HBV but its optional	30%
3	We do not vaccinate against HBV	50%

The percentages were even distributed between being and optional to be vaccinated ad do not at all in table 4.9.

Table 4.10: Do you give post exposure prophylaxis to workers that get exposed to HIV?

Yes we offer post exposure prophylaxis in our facility	80%
No we do not offer post exposure prophylaxis in our health facility	20%

A positive response was provided in table 4.10 of giving a post exposure prophylaxis to workers.

Table 4.11: Is there any occupational health safety policy or code of good conducts for hospital cleaners in your hospital?

Yes we do have a policy for the safety of our staff	10%
No we do not have a policy for the safety of our staff	90%

Most administrators (90%) said there was no policy or code for good conduct by the cleaners in table 4.11.

Table 4.12: Are there any government agencies that regulate the operations of hospital cleaners and other staff to ensure safety in working practice in the hospitals in Nigeria?

Yes there is /are government agencies that regulate the activities of hospital cleaners and other staff to ensure safety practice in health facilities.	0
No there is /are no government agencies that regulate the activities of hospital cleaners and other staff to ensure safety practice in health facilities.	100%

No Government agencies have been involved to regulate the activities of cleaners in hospitals (table 4.12)

Table 4.13: After this interview would you want to take steps in improving the occupational safety for your staff?

Yes we would like to improve on our safety practices in the health facility	100%
No we would not improve on our safety practices in the health facility	0

A positive response (table4.13) was supplied by the administrators to improve the safety practices in their health facilities.

Table 4.14: Are you comfortable with this research study activity and do you think it will have any impact in the administration of your hospital?

Yes I am comfortable with this research interview granted to me	100%
No I am not comfortable with this research interview granted to me	0

A 100% response was provided in table 4.14 of being comfortable with the interview.

4.2 Questionnaire results

A total of ninety (90) copies of questionnaires were administered; only sixty-eight (68) were returned and they were found usable for statistical analysis; representing 75.6% of the total questionnaires; which is the response rate. The mean age and standard deviation of the respondents in this study are 38.6 ± 5.4 years.

4.2.1 Demographic Characteristics of Respondents

Descriptive statistics involving frequencies and their percentages were used to analyse data on demographic profiles of the respondents. The results of the analysis were presented in table 1.5.

Table 4.15: Demographic distribution of the respondents

Demographic Characteristics	No of Respondents	Percentage
Sex		
Male	12	17.6%
Female	56	82.4%
Total	68	100%
Educational level of participants		
Primary education	17	25.0%
Secondary education	33	48.5%
Tertiary education	15	22.1%
No formal education	3	4.4%
Total	68	100%
Age range of participants		
20-29	26	38.2%
30-39	18	26.5%
40-49	17	25.0%
50+	7	10.3%
Total	68	100%
Status of employment		
Employment by their facility	60	88.2%
Employment by contract	8	11.8%
Total	68	100%

Table 4.15 showed the demographic characteristics of the respondents. In the sex distribution of the respondents, majority of them 82.4% were female, while 17.6% of them were male. The level of education of participants showed that majority of them 48.5% had secondary education, while only 4.4% of them had no formal education. Majority of the participants 38.2% were in the age range of 20-29 years and the number of participants decrease and the age increases. The employment status of the participants showed that the majority of them 88.2% were employed by the facility, while only 11.8% of them had contract employment.

Table 4.16: Virus status of the participants (at least for the past 3 months)

Virus status of the participants	Yes	No	Total
Participants that know their HIV status	49 (72.1%)	19 (27.9%)	68 (100%)
Participants that know their Hepatitis B status	32 (47.1%)	36 (52.9%)	68 (100%)
Participants that know their Hepatitis C status	33(48.5%)	35 (51.5%)	68 (100%)

Table 4.16 showed the virus status of the participants (at least for the past 3 months) in which 72.1% of them knew their HIV status, 47.1% of them knew their Hepatitis B status and 33 48.5% of them knew their Hepatitis C status.

Table 4.17: Knowledge of the health workers about HIV transmission

ITEMS	SA	A	N	D	SD	N	Mean	Stde v	T	df	P- value
The hospital facility is highly infectious	50	10	0	7	1	68	4.49	1.03	11.93	67	0.000*
Sharp objects and needles in the hospital can transmit blood borne diseases.	56	11	0	1	0	68	4.79	0.51	28.94	67	0.000*
One can avoid and prevent hospital work injuries in cleaning jobs 100% by being careful while working.	50	17	1	0	0	68	4.72	0.48	29.55	67	0.000*
I have been trained on Hepatitis C virus, Hepatitis B virus and human immunodeficiency virus mode of transmission	38	13	4	5	8	68	4.00	1.41	5.85	67	0.000*
I know about hepatitis B virus, hepatitis C virus and human immunodeficiency virus and how they can be transmitted through	37	14	10	7	0	68	4.19	1.04	9.44	67	0.000*

ITEMS	SA	A	N	D	SD	N	Mean	Stdev	T	df	P-value
occupational health hazards.											
The chances of occupational health hazards are relatively small or even insignificant.	19	12	21	10	6	68	3.41	1.28	2.64	67	0.010*
I am aware of post exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs.	23	11	8	12	14	68	3.25	1.58	1.31	67	0.196
We are often trained on occupational hazard in our facility.	44	9	6	1	8	68	4.18	1.36	7.16	67	0.000*

* P-value is significant at 0.05 ($P < 0.05$)

Table 4.17 showed the knowledge of workers in health facilities about HIV transmission. Out of the 8-item statements that were designed for the participants, all of them were accepted with mean values significantly greater than the cut-off point of 3.00 ($P < 0.05$) except one of the items, which is "I am aware of post exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs." with mean value of 3.25 which is not significantly greater than the cut-off point of 3.00 ($P > 0.05$). This implies that the workers in the health facilities were highly knowledgeable about HIV transmission but they were not aware of post

exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs.

The research problem statement: Is there a low level of knowledge of occupational safety towards HIV transmission among general workers in health facilities. However, if they are equipped with the necessary safety knowledge while employed in their specific jobs a safer environment will be created not only for themselves but also their families. They will take better preventive measures to prevent exposure to HIV transmission via exposure to biohazard wastes.

Also the first objective of this research is to ascertain the knowledge of general workers in the health facilities about HIV transmission. The hospital workers thus need to be equipped with the knowledge of post exposure prophylaxis for HIV exposure to enable them prevent HIV progression whenever they hospital cleaners are exposed to HIV infected materials in the hospital.

Table 4.18: Practice put in place by health workers to prevent HIV transmission

ITEMS	SA	A	N	D	SD	N	Mean	Stdev	T	df	P-value
We have guidelines and posters pasted on our health facilities where we work	42	15	3	7	1	68	4.32	1.06	10.27	67	0.000*
I wear protective gloves and boots to avoid needle stick injuries and sharps in the health facility.	43	13	11	1	0	68	4.44	0.82	14.48	67	0.000*
We have proper disposal devices to ensure safety in our work place.	43	14	2	5	4	68	4.28	1.20	8.80	67	0.000*
I consider my working devices safe and well enough to protect me against injuries.	39	9	9	10	1	68	4.10	1.20	7.56	67	0.000*
Injuries occur mainly when we collect and dispose needles and sharps used in the health facility.	38	14	2	11	3	68	4.07	1.29	6.84	67	0.000*
I have received the HBV vaccine	17	5	4	16	26	68	2.57	1.64	-2.16	67	0.034*
I have been	18	11	5	8	26	68	2.81	1.70	-0.92	67	0.360

ITEMS	SA	A	N	D	SD	N	Mean	Stdev	T	df	P-value
exposed to occupational health hazard during the past one year.											
I reported to my supervisor or medical personnel when an accident occurred to me in my workplace.	29	6	8	7	18	68	3.31	1.70	1.50	67	0.137
I sometimes forget to protect myself from occupational hazards such as wearing gloves while working.	19	19	1	4	25	68	3.04	1.72	0.19	67	0.849
There is no shortage at protective materials such as gloves, biohazard boxes; boots in our facility.	35	9	6	8	10	68	3.75	1.54	4.02	67	0.000*
Do you feel workers will protect themselves better during cleaning job in the hospitals if there are penalties for	45	9	2	4	8	68	4.16	1.41	6.78	67	0.000*

ITEMS	SA	A	N	D	SD	N	Mean	Stdev	T	df	P-value
not wearing protective materials or using biohazard boxes for waste disposal.											
Our hospital administrator cares about protecting ourselves during work and cautions us when we fall short of protecting ourselves.	51	16	0	1	0	68	4.72	0.54	26.27	67	0.000*

* P-value is significant at 0.05 ($P < 0.05$)

Table 4.18 showed the practice put in place by health workers to prevent HIV transmission. Out of the 12-item statements that were designed for the participants, 8 of them were accepted with mean values significantly greater than the cut-off point of 3.00 ($P < 0.05$) except one of the items, which is “I have received the HBV vaccine.” with mean value of 2.57 which is significantly lower than the cut-off point of 3.00 ($P < 0.05$) and other 3 items which are “I have been exposed to occupational health hazard during the past one year”, “I reported to my supervisor or a medical personnel when an accident occurred to me in my workplace”, and “I sometimes forget to protect myself from occupational hazards such as wearing gloves while working” with mean value of 2.81, 3.31 and 3.04 respectively which is not significantly greater than the cut-off point of 3.00 ($P > 0.05$). This implies that the workers in the health facilities were relatively had practice put in place to prevent HIV transmission but majority of them have not received the HBV vaccine.

One of the objectives is to determine the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work

environment. The research findings have shown hospital cleaners are often exposed to occupational hazard in the hospitals but they need to report to their supervisors whenever they encounter hospital occupational risk exposure in order to proffer quick solution or prevention for various blood borne pathogenic infection prevention such as HIV and Hepatitis B. There is also the need to ensure hospital cleaners wear their protective materials such as hand gloves to reduce the successful transmission of HIV, Hepatitis B, Hepatitis C and other blood borne pathogens through hospital injuries or hazard exposure.

Table 4.19: Correlation of the knowledge of the health workers about HIV transmission and the practice put in place by health workers to prevent HIV transmission

		Practice put in place by health workers to prevent HIV transmission
knowledge of the health workers about HIV transmission	Pearson Correlation	0.684
	P-value	0.000*
	N	200

* P<0.05 (significant)

The third objective of this research is to determine the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work environment and table 4.19 there is a significant positive correlation between the knowledge of the health workers about HIV transmission and the practice put in place by health workers to prevent HIV transmission (P<0.05). This implies that as the knowledge of the health workers about HIV transmission increases, the practice put in place by health workers to prevent HIV transmission also increases.

CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This research was conducted in 10 hospitals in Abakaliki and its metropolis in Ebonyi state. In these 10 hospitals there were 960 staff and about 646 patients visiting these hospitals daily while an average of 125 patients are admitted daily. This gives a clear picture of these hospitals and the traffic of people in these hospitals, with this statistics it can be ascertained hundreds of needles, sharp objects and other used and disposed medical materials, amounting to hundreds of tone of biohazard wastes which are highly infectious including being infected with Human Immunodeficiency Virus, Hepatitis C Virus, Hepatitis B Virus and other blood borne pathogens are being generated.

There are a total of 108 hospital cleaners working in these 10 hospitals and these cleaners ensure that these health facilities are kept clean; they dispose all these tonnage of wastes (bio hazardous wastes) from these hospitals and they are constantly exposed to these highly infectious wastes. This prompted to interview these various hospital managers to ascertain strategies put in place to ensure the safety of these hospital cleaners and measures that are put in place and also to ensure safe working environment to reduce the risk of occupational hazards or injuries from blood borne pathogens such as HIV, HCV, and HBV focusing on the research problem which states that; there is a low level of knowledge of occupational safety towards HIV transmission among general workers in health facilities. However, if they are equipped with the necessary safety knowledge while employed in their specific jobs, a safer environment will be created not only for themselves but also for their families. They will take better preventive measures to prevent exposure to HIV transmission via exposure to biohazard wastes.

5.2 Discussion according to findings of the research

The review will be divided between a discussion first of the interviews and then those of responses gathered from the questionnaire.

5.2.1 Assertions from the semi structured interview granted to the hospital managers

In the course of the interview granted to the 10 hospital managers, the hospital managers were asked if they were aware of blood borne pathogens and their mode of transmission especially in the hospital environment and the 10 hospital managers agreed that they knew about these pathogens; HIV, HBV and HCV and the risk of transmissions. The 10 hospital managers were asked if they organise safety trainings on occupational hazards for their staff, 4 out of 10 managers agreed they organise such trainings while 6 of the hospital managers among the 10 responded that they do not organise such safety trainings for their staff.

The 10 hospital managers were further asked if they organise occupational safety orientation for their staff (cleaners) before they commence duties in these hospitals. 6 hospital managers agreed that they orientate their cleaning staff before they begin to work in the hospitals while 20% of the respondents said they do not have such orientation programmes for their cleaning staff, another 20% of the hospital managers reported that they teach their staff how to protect themselves at work and they train them verbally but not in an organised manner.

The 10 hospital managers agreed to have been providing protective tools for working in the hospitals, they all agreed to have been providing biohazard boxes for waste disposal, provision of latex hand gloves for staff to protect their hands while working in the hospital facilities, 6 hospital managers agreed to have been providing nose masks for their cleaners, 2 managers said they only provided nose masks to their staff only if deemed necessary and at the request of their staff.

All the 10 hospital managers confirmed they do not compensate their staff in eventuality of occupational accident though one of the managers said such incident is left for their national management board to decide if they are to compensate the staff or not to compensate the staff.

Out of the 10 hospitals, only 1 has staff enrolled under the national health insurance scheme, the other remaining 90% of the hospital managers have no insurance policy cover for their staff.

The hospital managers were required to indicate whether they ran a mandatory HIV screening on their staff in their hospitals; 1 hospital manager admitted conducting a mandatory HIV test and HBV test for his staff while the rest of the 9 hospital managers said they do not mandate their staff to undergo HIV screening, they were further inquired why a mandatory ran HIV and HBV test for their staff and said “the hospital management do not work with HIV positive staff unless the person has nothing to do with handling sharp instruments on patients in the hospital.

The hospital managers were asked what they do with their employees if they tested HIV positive; 3 hospital managers said they refer their employees to other facilities for HIV treatment, 5 hospital managers responded that they treat HIV patients in their facilities, 2 hospital managers said they do not interfere with the lives of their staff and it is their decision to make concerning how to go about their treatment.

An attempt was made to determine how many hospitals administered HBV vaccine in facilities for their staff; 3 managers responded that they give HBV vaccine but it is optional, 2 hospital managers admitted they mandate their staff to receive HBV vaccine and 5 hospital managers said they do not vaccinate their staff against HBV. Eight hospital managers agreed they provide post exposure prophylaxis against HIV for staff getting into contact with possible infected hospital materials or biohazard wastes. Two hospital managers said they do not administer post exposure prophylaxis in their health facilities.

Hospital managers had to indicate what they do for their hospital employees when they get injured in their health facilities (in contact with biohazard wastes); the 10 hospital managers accepted the victim will undergo proper counselling, HIV screening and post exposure prophylaxis is given to the person if considered necessary.

When asked if there is any occupational health safety policy or code of good conduct to protect the interest of the hospital cleaners from hospital hazard exposure; only 1 hospital manager admitted they have a code of good conduct for their cleaners, the remaining 9 hospital managers said they do not have such policies or code of good conduct.

Were there any government regulatory body protecting the interest of hospital cleaners and all the hospital managers confirmed that there was none of such regulatory body in existence?

When asked if they will like to improve on matters concerning the safety of their hospital cleaners, they all agreed that they would want to improve. All the hospital managers agreed to improve the measures taken to ensure occupational safety for their hospital cleaners and they said they will take various steps:

- Organise more occupational safely training
- Supervise cleaners and hospital staff more carefully to ensure more occupational safety.
- Paste posters on occupational safely to aid safety measures in the hospital environment
- To continue providing safe working tools and protective materials to hospital staff in order to ensure work safety.

The hospital managers were requested if they were comfortable with the research study interview granted to them and they all accepted they were comfortable with the researcher's interview. They also said such research would help hospital mangers to focus on hospital occupational safety especially hospital cleaners who are often not highly regarded in the health care facility setting.

5.2.2 Assertions from the questionnaires results filled by various hospital cleaners

A total of 90 copies of questionnaires were administered; only 68 were returned and they were found usable for statistical analysis; representing 75.6% of the total questionnaires; which is the response rate. The mean age and standard deviation of the respondents in this study are 38.6 ± 5.4 years.

The demographic characteristics of the respondents in terms of sex distribution of the respondents, majority of them 82.4% were female, while 17.6% of them were male. The level of education of participants showed that majority of them 48.5% had secondary education, while only 4.4% of them had no formal education. Majority of

the participants 38.2% were in the age range of 20-29 years and as the number of the participant's decreases and the age increases. The employment status of the participants showed that the majority of them (88.2%) were employed by the facility, while only 11.8% of them had contract employment.

The demographic statistics showed females make up the main population of hospital cleaners and majority of them attained secondary school educational level which implied that they could understand trainings given to them on occupational hazards because they are literate enough. Another important factor is many of these hospital cleaners are within the age range of 20 to 29 years which is a major productive age and sexual active age. This implies if they get infected with HIV or Hepatitis B and C, they stand the chance of infecting a lot of people and the workforce of our population will equally be threaten to a large extent.

The demographic statistics also indicated the majority of the hospital cleaners 88.2% were directly employed by various hospital management they worked for, this implied that it is the primary duty of the hospitals to protect, safe guard and train these hospital cleaners against occupational hazards that can expose them to HIV and other blood borne pathogens.

The viral status of the participants (at least for the past 3 months) in which 72.1% of them knew their HIV status, 47.1% of them knew their Hepatitis B status and 48.5% of them knew their Hepatitis C status; shows that many hospital cleaners know their HIV status but there was need for them to be aware of Hepatitis B and C, they also needed to know about other blood borne pathogens capable of getting them infected through hospital occupational injuries. If proper awareness is put in place among the hospital staff, many hospital workers would want to know their Hepatitis B and Hepatitis C viral status.

5.3 The findings discussed within the context of the objectives

5.3.1 Objective one: To ascertain the knowledge of general workers in health facilities about HIV transmission.

The semi-structured interviews granted to the 10 various hospital managers showed that there was need for an organised training on hospital work and occupational hazards, risk exposures and precautions both when the hospital cleaners are recruited and during the course of discharging their duties to equip the hospital cleaners with the appropriate knowledge of protecting themselves while working in the hospitals.

The questionnaires completed by the hospital cleaners reflected the knowledge of workers in health facilities about HIV transmission; this is in accordance with the first research objective which is to ascertain the knowledge of general workers in health facilities about HIV transmission. Out of the 8-item statements all of them were accepted with mean values significantly greater than the cut-off point of 3.00 ($P < 0.05$) except one of the items, which is "I am aware of post exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs." with mean value of 3.25 which is not significantly greater than the cut-off point of 3.00 ($P > 0.05$). This implies the workers in the health facilities were highly knowledgeable about HIV transmission but they were not aware of the post exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs. This implies hospital cleaners and other hospital workers need to be educated about post exposure prophylaxis and how important it is to take this PEP after being exposed to hospital used needles and sharps or patient body fluids or materials capable of infecting people when gotten exposed to. PEP has been in practice for over a decade but the awareness is poor among health workers in this region.

5.3.2 Objective two:

The research showed the practice put in place by health workers to prevent HIV transmission; this is in accordance with the second research objective of the research; to know the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work environment. Out of the 12-item statements 8 of them were accepted with mean values significantly greater

than the cut-off point of 3.00 ($P < 0.05$) except one of the items, which is “I have received the HBV vaccine.” with mean value of 2.57 which is significantly lower than the cut-off point of 3.00 ($P < 0.05$) and other 3 items which are “I have been exposed to occupational health hazard during the past one year”, “I reported to my supervisor or a medical personnel when an accident occurred to me in my workplace”, and “I sometimes forget to protect myself from occupational hazards such as wearing gloves while working” with mean value of 2.81, 3.31 and 3.04 respectively which is not significantly greater than the cut-off point of 3.00 ($P > 0.05$). This implies the workers in the health facilities relatively had good practice put in place to prevent HIV transmission but majority of them have not received the HBV vaccine. This implies many hospital cleaners are not aware of HBV vaccine and most of the hospitals do not administer the vaccine, therefore making hospitals work very risky.

The semi-structured interview granted to the 10 hospital administrators implied there were no form of compensation given to hospital cleaners if they became injured or infected with diseases while discharging their duties, there should be strong policies put in place to protect these hospital cleaners from various hazards and risk exposures in the hospitals. It is also encouraging they form unions in order to coordinate themselves and focus on their labour rights and protection. The government and other concerned organisations should pick interest on protecting these hospital cleaners and carry out checks in various hospitals to ensure hospital cleaners are adequately provided for and well protected in a safe working environment.

Hospital managements should agitate for provision of HBV vaccines and post exposure prophylaxis for HIV transmission prevention and they should create the awareness among health facility workers including the hospital cleaners who are at risk of getting exposed to hospital used materials.

5.3.3 Objective three: To identify gap existing between the knowledge of general workers in health facilities and the practices involved in the workplace

There is a significant positive correlation between the knowledge of the health workers about HIV transmission and the practice put in place by health workers to prevent HIV transmission ($P < 0.05$). This implies as the knowledge of the health

workers about HIV transmission increases, the practice put in place by health workers to prevent HIV transmission also increases. The significant correlation relates to the third research objective.

Since the correlation suggests the increase in knowledge of hospital occupational hazards and exposure relates with the practice by hospital cleaners to prevent HIV transmission, there is need for continuous training on blood borne pathogens transmission such as HIV transmission in the hospitals and its routes of transmission. The government and other concern health and environmental bodies should educate all hospital staff, hospital management and even patients on the importance of protecting themselves from injuries and accidents that can occur in the hospital environment. If people working in the hospitals acquire more knowledge of occupational hazards and risk of exposure to blood borne pathogens, these health workers will practice in the hospital with more safety cautions to protect themselves from HIV, HBV and HCV and all other blood borne pathogens that could be transmitted through hospital occupational hazards and risk exposures.

5.4 Recommendation

Effort should be made by the government and other concerned organisations to make people aware of HBV vaccine and make the vaccines accessible to the populace to reduce HBV infection and also to protect health workers in general from HBV.

Not many hospitals cleaners agreed to have been exposed to hospital occupational hazards and reported to their supervisors or medical personnel in their workplace to help sort solutions for their accidental exposure to used hospital materials that are probably infected with blood borne pathogens. More efforts should be made by the hospital administrators and supervisors to educate hospital cleaners and other staff on reporting any incidence of occupational injuries and other forms of occupational hazard exposure to help reduce the risk of blood borne pathogens transmission after risk of exposure.

Many hospital cleaners accepted they tend to forget protecting themselves with hand gloves to reduce the risk of occupational exposure. More effort should be made by the hospital management and hospital work supervisors to emphasize more on adherence to wearing of all forms of protective wears while hospital cleaners discharged their duties in the hospitals. It is not enough to provide hand gloves and other protective materials in the hospitals without ensuring the protective materials and tools are being utilized and used properly.

5.5 Research study limitations and recommendations on how to overcome them

The researcher envisaged certain limitations to this study; first in the research there were the challenge of some cleaners not understanding the proper meaning of the terms used in this research because in Nigeria most unskilled labourers such as hospital cleaners are mostly not educated. Taking cognisance of such limitation, the researcher should help explain verbally and assist them on the importance of the research, the questions in the questionnaires and what is expected of them and the questionnaires are written in a native language (Igbo) which is the predominant language of the study research region.

Another limitation that was envisaged was where some workers might not truly have answered questions in the questionnaires correctly to avoid implicating or hurting their hospital administrators even though being anonymous and confidentiality was ensured in the research. This factor had a negative tendency on the research report. More research need to be conducted on this subject and the language of instruction for the hospital cleaners should be brought down to their level of understanding (native language). Training hospital staff is necessary to equip them with the knowledge on how to protect them from hospital occupational hazard and these trainings should be done with the native language of the people to ensure adequate communication and understanding especially hospital maids and hospital cleaners who are often not very literate.

Each time research is carried out involving staff of an organisation it is important the subjects of the study understand any information received from them will remain

confidential and safe. This is the only way to ensure pure and useful response for a research study.

APPENDICES

RESEARCH QUESTIONNAIRE AJUJU GBASARA NNYOCHA

1. TITLE: Knowledge of occupational safety by hospital cleaners towards HIV and other blood borne pathogens transmission in Abakaliki region in eastern Nigeria.

Ama m ihe ndi olu nficha ulo ogwu na ndi isi ulo ogwu gbasara oya mminwu na nje si na obala mmadu a banye n ahu site n ihe mgberede ga emenwu na ana alu olu na ulo ogwu.

2. QUESTIONNAIRE

Dear Participant,

Thank you for accepting to participate in this occupational health safety research on health facility cleaners. The aims of this research are:

- To ascertain the knowledge of general workers in health facilities about HIV transmission.
- To know the existing practices put in place in health facilities to prevent HIV transmission through occupational hazard risks in the work environment.
- To identify gap existing between the knowledge of general workers in health facilities and the practices involved in the workplace.
- To establish good conducts that will protect general workers (cleaners) in health facilities from occupational HIV transmission.

Your participation is anonymous and responses will be protected and kept confidential. The information gathered will be used to write a research report in fulfilment of the requirements for a Masters in philosophy (MPhil) degree with Stellenbosch University South Africa.

Thank you.

Uchenna Johnpaul Anozie

AKWUKWO AJUJU

Onye nzaa ajuju,

Dalu maka ikweye na iso were za ajuju nke nnyocha na ihe gbasara ulu nficha ulu ogwu na ndi isi ulu ogwu gbasara oya mminwu na nje si na obala madu a banye n ahu si te n ihe mgberede ga emenwu na ana alu ulu na ulu ogwu. Ihe ndia bu ihe anyi jiri na eme nnyocha:

- Anyi choro imata usoro eji aru ulu nficha na ulu ogwu I ji we gbochibido ibute oya si na obala mmadu abanye mmadu na ahu na ulu ulu ogwu.
- Anyi choro ima usosro na iwu edebere na ulu ogwu maka ndi ulu nficha maka igbachibido ihe mgberede ga ebunyewu madu oya ma o bu nje nke ga esinwu na obala madu ba ye onye ozo na ahu.
- Anyi choro imata ihe ndi ulu uno ogwu ama gi bayere igbochibido onwe ha na oya di iche iche si na obala mmadu efe onye ozo na ulu ogwu.
- Anyi choro imebe iwu na usoro aga eji na aru oru nficha ulu ogwu nke ga eme ka ndi ulu uno ogwu ama na ebute oya ndi na adi na obala mmadu si te na iru oru na ulu ogwu di ka ulu nficha.

Nsonye gi na nnyocha diri na ali gi, odigi onye ozo ga amata maka ya, aha madu aga gi adi na akwukwo obula nke gee me ka amata gi. Anyi ga eji ajauju na aziza gi were deputa ihe anyi mere na nchoputa na nnyocha nke ndi mahadum Stellenbosch na mba South Africa, a ga eji nnyocha we nye madu satifikat na egosiputa na madu emezugo aguma agu akwukwo nke mastas mahadum.

Dalu rine.

Afam bu,

Anozie Uchenna Johnpaul.

2.1 BIOGRAPHICAL DETAILS

Kindly provide the following information about yourself;

Indicate your answer by placing an X in the appropriate places

1. SEX: M () F ()

2. AGE: 20 – 29 ()
 30 – 39 ()
 40 – 49 ()
 50+ ()

3. HIGHEST LEVEL OF EDUCATION ATTAINED? :
 A. PRIMARY SCHOOL ()
 B. SECONDARY SCHOOL ()
 C. TERTIARY INSTITUTION ()

4. DO YOU KNOW YOUR HIV STATUS? (past 3 months) YES { } NO { }
5. DO YOU KNOW YOU HCV STATUS? (past 3 months) YES { } NO { }
6. DO YOU KNOW YOU HBV STATUS? (past 3 months) YES { } NO { }
7. ARE YOU EMPLOYED BY THE HEALTH FACILITY? YES { } NO { }
8. ARE YOU A CONTRACT STAFF? YES { } NO { }

IHE GBASARAGI

Biko zaa ajuju ndia

Jiri akara (X) were mejuputa ebe lga aza ajuju obula

1. I bu nwoke ka I bu Nwanyi? EEH () MBA ()
2. Aro ule ka idi? 20-29 () 30 -39 () 40-49 () 50 Ma obu karia ()
3. Ebe ka ijedebelu na akwukwo gi?:
 A. Ulo akwukwo primari ()
 B. Ulo akwukwo secondari ()
 C. Ulo akwukwo mahadum ()
4. Imara onodugi banyere oya mmiwu? (onwa ato gara aga) EHH() MBA ()
5. Imara onodugi banyere oya iba ocha na anya C?(onwa ato gara aga) EHH() MBA ()
6. Imara onodugi banyere oya iba ocha na anya B? (onwa ato gara aga) EHH() MBA ()
7. O bu ulo ogwu a were gi na olu a? E EHH() MBA ()
8. O bu ulo oru ozo were gi na olu a? EHH() MBA ()

2.2 INSTRUCTION

The following statements represent some of the opinions that cleaners have regarding hazard Human Immunodeficiency Virus, Hepatitis B Virus and Hepatitis C Virus transmission through occupational health in their health facilities.

Kindly place an “X” UNDER THE HEADING OF YOUR CHOICE:

NTUZIAKA

Ihe na-esonu okwu na-anochi anya ufodu echiche ndi olu nficha nwere bayere oya mmiwu, iba ocha na anya C na iba ocha na anya B, etu oya ndia si abanye madu na ahu si te na iru olu ulo ogwu.

Biko ka ye akara (X) NA OKPURU ISI OKWU EDEPUTARA SI TE NA IHE BU EBUM NA OBI GI MA O BU ECHICHE GI.

Score	1	2	3	4	5
<p>Opinion</p> <p>The hospital facility is highly infectious</p> <p>Sharp objects and needles in the hospital can transmit blood borne diseases</p> <p>One can avoid and prevent hospital work injuries in cleaning jobs 100% by being careful while working</p> <p>We have guidelines and posters pasted on our health facility where we work</p> <p>I have been trained on Hepatitis C Virus,</p>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree

<p>Hepatitis B Virus and Human Immunodeficiency Virus mode of transmission</p> <p>I wear protective glove and boots to avoid needle stick injuries and sharps in the health facility</p> <p>I know about Hepatitis B Virus, Hepatitis C Virus and Human Immunodeficiency Virus and how they can be transmitted through occupational health hazards</p> <p>The chance of occupational health hazards are relatively small or even insignificant</p> <p>We have proper disposal devices to ensure safety in our workplace</p> <p>I consider my working devices safe and well enough to protect me against injuries</p> <p>Injuries occur mainly when we collect and</p>					
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<p>dispose needles and sharps used in the health facility.</p> <p>I have received the HBV vaccine</p> <p>I have been exposed to occupational health hazard during the past one year</p> <p>I am aware of post exposure prophylaxis (PEP) for the prevention of HIV transmission when occupational hazard occurs</p> <p>I reported to my supervisor or a medical personnel when an accident occurred to me in my workplace</p> <p>I sometimes forget to protect myself from occupational hazards such as wearing gloves while working</p> <p>There is no shortage of protective materials such as gloves, bio hazard boxes, booths in our</p>					
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<p>facility.</p> <p>We are often trained on occupational hazard in our facility</p> <p>Do you feel workers will protect themselves better during cleaning job in the hospitals if there are penalties for not wearing protective materials or using bio hazard boxes for waste disposal</p> <p>Our hospital administrator cares about protecting ourselves during work and cautions us when we fall short of protecting ourselves</p>					
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AJUJU N ASUSU IGBO

AKARA	1	2	3	4	5
<p>Ebum n uche gi:</p> <p>I kwetara na aga ebutenwu oya n ulo ogwu?</p> <p>I Kwetara na ihe obala meturu ya na ntutu ejiri gba madu ogwu ga ebu nye nwu madu oya di iche iche di ka oya mmiwu.</p> <p>I kwetara na a ga agbachabidonwu ihe mberede oru ulo ogwu na ana eficha ulo ogwu n oburu n akpachapu anya.</p> <p>Enwere akwukwo ana ama n ahu aja na egosiputa etu ndi uro ulo ogwu ga esi na akpachapuru onwe ha anya.</p> <p>E kuziri anyi maka oya di iche iche e si na ulo ogwu ebute di ka oya mminwu, oya iba ocha n anya B, Oya iba ocha n anya C.</p> <p>Anam eyichi aru m ofuma si te na igba ihe na aka ya na ukwu na mu na aru oru</p>	Ekwetam	Ekwetam ofuma	Anopum Iche	Ekweta ghim	Ekwetagi m ofuma

<p>m na ulo ogwu.</p> <p>Amaram maka oya mmiwu, oya iba ocha n anya B na oya iba ocha n anya C si te na iru oru na ulo ogwu</p> <p>Uzo esi ebute oya di iche iche n ulo ogwu pere mpe nke ukwu.</p> <p>Emegbere usoro n ebe a na ekwusi ihe ejiri ruo oru n ulo ogwu anyi n uzo kwesiri ekwesi.</p> <p>Ekwetaram na ihe e nyere anyi iji weere gbochibido ihe mberede oru ulo ogwu di mma iji wee chekwo ba anyi n ulo oru anyi</p> <p>Obu ntutu ejiri gba ndi madu ogwu n ulo ogwu bu ihe n ebutekari ihe mberede n ulo oru ulo ogwu.</p> <p>Agbagom ogwu mgbochi nke oya lba ocha n anya B</p> <p>Agabigagom ihe mberede ulo ogwu na afo a.</p>					
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<p>Amaram na enwere ogwu ana agba maka igbochi oya mmiwu na enwe ihe mberede ga ebute ka ebunyewu madu oya mmiwu</p> <p>Agwaram onye isim na ulo oru mgbe mu nwere ihe mberede na ebe mu na aru olu mu.</p> <p>Oge ufodu ana m erofu iyichi ahum na mu na aru oru na ulo ogwu.</p> <p>Ihe anyi ji eyichi ahu anyi ma kwa na egbochibido ihe mberede n oru ulo ogwu adighi ako uko n ulo oru anyi.</p> <p>Ufodu oge ana ekuziri anyi maka oru ulo ogwu na etu anyi ga esi gbachibido ihe mberede oru ulo ogwu</p> <p>O buru na enwe nra ma o bu opipia ana enye onye oru nficha ulo ogwu ma oburu na oyichigi onwe ya ofuma iji wee gbachibido ihe mberede ulo ogwu, o di gi ka ndi oru nficha ulo ogwu aga na</p>					
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<p>akpachapuru onwe ha anya na uzo puru iche na ana aru olu nficha ulo ogwu?</p> <p>Onye isi ulo ogwu anyi na etinye uchu ya iji wee hu na anyi na akpachapuru onwe anyi anya n ulo oru anyi.</p>					
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**SEMI-STRUCTURED INTERVIEW QUESTIONS FOR THE RESEARCH STUDY
GRANTED TO VARIOUS HOSPITAL MANAGERS**

1. WHAT IS THE CAPACITY OF THIS HOSPITAL IN TERMS OF:
 - (a) STAFF STRENGTH
 - (b) NUMBER OF PATIENTS AVERAGELY SEEN ON WORK DAYS?
 - (c) HOW MANY IN-PATIENTS DO YOU HAVE ON DAILY BASES (AVERAGE)?
2. HOW MANY HOSPITAL CLEANERS WORK IN YOUR HOSPITAL?
3. DO YOU KNOW ABOUT VARIOUS BLOOD BORNE PATHOGENS SUCH AS HIV, HBV (HEPATITIS B), HCV (HEPATITIS C) EBOLA AND LASSER VIRUS?
4. DO YOU ORGANISE SAFETY TRAINING OR HEALTH HAZARD TRAINING FOR YOUR HOSPITAL STAFF INCLUDING HOSPITAL CLEANERS?
5. DO YOU HAVE ANY OCCUPATIONAL SAFETY ORIENTATION FOR YOUR STAFF BEFORE THEY START WORKING HERE?
6. WHAT MEASURES HAVE YOU PUT IN PLACE TO CREATE A SAFE WORKING ENVIRONMENT FOR YOUR HOSPITAL CLEANERS SUCH AS;
 - (a) SAFE BIO HAZARD DISPOSAL BOXES;
 - (b) HAND LATEX GLOVES;
 - (c) NOSE MASKS ETC;
7. DO YOU HAVE ANY INSURANCE COVER FOR YOUR HOSPITAL STAFF INCLUDING HOSPITAL CLEANERS?
8. IS ANY TYPE OF COMPENSATION GRANTED TO ANY ONE THAT SUSTAINS INJURY OR GETS INFECTED IN THE PROCESS OF WORKING IN YOUR HOSPITAL ENVIRONMENT?
9.
 - (a) DO YOU ENFORCE HIV, HEPATITIS B VIRUS AND HEPATITIS C VIRUS SCREENING ON OR BEFORE YOUR HOSPITAL CLEANERS WORK FOR YOU?
 - (b) WHY IS THE MANDATORY TESTING CONDUCTED? IS IT LEGAL IN NIGERIA TO ENFORCE HIV TESTING FOR YOUR STAFF?
 - (c) WHAT DO YOU DO IF ANY EMPLOYEE IS TESTED HIV POSITIVE?
10.
 - (a) DO YOU VACCINATE YOUR STAFF AGAINST HEPATITIS B VIRUS IN YOUR HOSPITAL ESPECIALLY HOSPITAL EMPLOYEES THAT ARE ALWAYS EXPOSED TO BODY FLUIDS AND BLOOD?
 - (b) DO YOU GIVE POST EXPOSURE PROPHYLAXIS TO WORKERS THAT GET EXPOSED TO HIV?
11. WHAT DO YOU DO FOR HOSPITAL EMPLOYEES ESPECIALLY HOSPITAL CLEANERS WHO ACCIDENTALLY GET INJURED WITH HOSPITAL USED NEEDLES OR SHARPS?

12. IS THERE ANY OCCUPATIONAL HEALTH SAFETY POLICY OR CODE OF GOOD CONDUCTS FOR HOSPITAL CLEANERS IN YOUR HOSPITAL?
13. (a) ARE THERE ANY GOVERNMENT AGENCIES THAT REGULATE THE OPERATIONS OF HOSPITAL CLEANERS AND OTHER STAFF TO ENSURE SAFETY IN WORKING PRACTICE IN THE HOSPITALS IN NIGERIA?
(b) WHAT DO THEY DO AND HOW OFTEN DO THEY VISIT YOUR FACILITY?
14. (a) AFTER THIS INTERVIEW WOULD YOU WANT TO TAKE STEPS IN IMPROVING THE OCCUPATIONAL SAFETY FOR YOUR STAFF?
(b) MENTION SOME OF THESE STEPS YOU WILL TAKE.
15. ARE YOU COMFORTABLE WITH THIS RESEARCH STUDY ACTIVITY AND DO YOU THINK IT WILL HAVE ANY IMPACT IN THE ADMINISTRATION OF YOUR HOSPITAL?

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