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INTRODUCTION

Infection is one of the most important problems in health care services worldwide. It constitutes one of the most important causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures.^{1,2}

Health care workers (HCWs) are at a high risk of needle stick injuries and blood-borne pathogens as they perform their clinical activities in a hospital.³ They are exposed to blood borne pathogens, such as human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV) viruses, from sharp injuries and contacts with blood and other body fluids.^{4,5} According to a WHO estimate, in the year 2002, sharp injuries resulted in 16,000 hepatitis C Virus, 66,000 hepatitis B virus and 10,000 HIV infections in health care workers worldwide.⁶ There is no immunization for HIV and hepatitis C.⁷ It becomes important to prevent infection by preventing exposure. Recapping, disassembly, and inappropriate disposal increase the risk of needle stick injury.^{8,9} The incidence rate of these causative factors is higher in developing countries for the higher rate of injection with previously used syringes.¹⁰ Developing countries where the prevalence of HIV-infected patients is very high, record the highest needle stick injuries too.¹⁰ Needle stick injuries were also reported as the most common occupational health hazard in a Nigerian teaching hospital.¹¹ The World Health Organization (WHO) estimates that about 2.5% of HIV cases among HCWs and 40% of hepatitis B and C cases among HCWs are the result of these exposures.¹² Irrational and unsafe injection practices are rife in developing countries.¹³ The practice of recapping needles has been identified as a contributor to incidence of needle stick injuries among HCWs.^{5, 14} It is believed that only one out of three needle stick injuries are reported in the US, while these injuries virtually go undocumented in many developing countries.¹⁵ Unsafe injections and the consequent transmission of blood borne pathogens are suspected to occur routinely in the developing world.¹⁶ It was estimated that each person in developing countries receives an average of 1.5 injections per annum. ^{16, 19} About 90-95% of injections are therapeutic, while 5-10% is given for immunization.¹⁷ It has been shown that between 70% and 99% of these injections are unnecessary, while at least 50% are unsafe in 14 of 19 countries in five developing world regions with data. ^{17, 18, 19, 20.}

Hauri et al of the Department of Essential Health Technologies, WHO estimates 3.4 injections per person per year in developing countries.^{16, 18} In Nigeria, the annual mean was found to be 4.9 injections per year.²¹ Injection over use and unsafe practices account for a substantial burden of death and disability worldwide.¹⁶ Eighteen studies reported a convincing link between unsafe injections and the transmission of hepatitis B and C., HIV, Ebola and Lassa virus infections and malaria.¹⁹ Injuries from sharp devices have been associated with the transmission of more than 40 pathogens, including HBV, HCV, HIV, haemorrhagic fevers, malaria and tetanus, thereby increasing the risk and burden of infectious diseases.^{22, 23, 24, 25} Contaminated sharps such as needles, lancets, scalpels, broken glass, specimen tubes and other instruments, can transmit blood borne pathogens such as HIV, Hepatitis B (HBV) and Hepatitis C viruses (HCV).²⁶ The circumstances leading to needle stick injuries depend partly on the type and design of the device and certain work practices.²⁷ Also, the level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers observe while dealing with these patients.²⁷ It is documented that 10 – 25% injuries occurred while recapping a used needle.⁵ The recapping of needles has been prohibited under the Occupation Safety and Health Administration (OSHA)

blood-borne pathogen standard.²⁸

A data combined from more than 20 prospective studies worldwide of health care workers exposed to HIV infected blood through percutaneous injury revealed an average transmission rate of 0.3% per injury,^{4, 15, 27, 29} and after a mucous membrane exposure approximately 0.09%.³⁰ The commonest mode of transmission of HIV –contaminated blood to health care workers is via needle stick injury.²⁷ The greater the size and depth of the blood inoculation, the greater the risk.⁴ Transmission through the conjunctiva and open lesions in the skin can also occur when in contact with HIV containing fluids.⁴

An increasing number and variety of needle devices with safety features are now available. Needleless or protracted needle I.V. systems have decreased the incidence of needle – stick injuries by 62% - 88%.³¹ Some of these injection devices are; Auto-disable syringe, manually retractable, automatically retractable, standard disposable and needle remover.³¹

The World Health Organization defines a safe injection as one that is given using appropriate equipment, does not harm the recipient, does not expose the provider to any waste that is dangerous to the community.³² A safe injection is only given when there is no other suitable alternative. Developing countries, especially those in sub-Saharan Africa, that account for the highest prevalence of HIV-infected patients in the world also report the highest incidences of occupational exposure.^{12, 25, 33} HCV and HBV infections are generally considered endemic in sub-Saharan Africa.³³

Occupational safety of HCWs is often neglected in low-income countries in spite of the greater risks associated with occupational exposure to blood, inadequate supply of personal protective equipment (PPE), and limited organizational support for safe practices.³³

National data are unavailable for these blood borne infections in Ethiopia. However, surveys in different parts of the country indicate the prevalence of HCV to be 0.9 to 5.8%^{34,35} and estimates for HBV range from 4.7% to 14.4%.³⁵⁻³⁹ According to projections for 2010, the prevalence of HIV/AIDS for Ethiopia is estimated at 2.8%.⁴⁰ In a study on standard precautions carried out from February to May, 2010 in 10 hospitals and 20 health centres in two administrative regions of Ethiopia (Harare and Dire Dawa), projected estimates of HIV/AIDS prevalence for 2010 as 4.4% for Harare and 5.7% for Dire Dawa.⁴⁰ The prevalence of HBS Ag in healthy blood donors in Kathmandu Valley has been reported to be about 1.67%.⁴¹ Sero-prevalence study suggests that the overall anti-HCV positivity in blood donors is about 0.3% in Nepal.⁴² The prevalence of HCV sero positivity in health blood donors has been reported to be about 0.2% in Nepal.⁴³ The prevalence of HBS Ag in healthy blood donors in Saudi Arabia ranges from 2.7% to 9.8%.³⁹⁻⁴⁰ Sero-prevalence studies suggest that the overall anti HCV positivity is about 3.5 – 5%.⁴³⁻⁴⁵

Thalassemia and Sickle cell disease are common in Saudi Arabia and prevalence of hepatitis C virus antibodies among this high-risk group is about 40%.⁴⁵ The prevalence of HIV sero-positivity has been reported to be about 0.09% in the Kingdom.⁴⁶ These figures suggest that a sizable number of individuals are a potential risk for transmission of blood-borne diseases to doctors, laboratory technicians, blood bank workers, nurses, personnel working in renal dialysis and transplant units, and other health care workers.^{27, 47}

Recognizing this threat, the U.S. Centers for Disease Control and prevention (CDC) proposed a series of procedures for preventing occupational exposures and for handling potentially infectious materials such as blood and body fluids.⁴⁸ These procedures, known as standard precautions (SPS), advise health care workers (HCWS) to practice regular personal hygiene; use protective barriers such as gloves and gown

whenever there is contact with mucous membranes, blood and body fluids of patients; and dispose of sharps, body fluids, and other clinical wastes properly.^{48, 49, 50}

The potentially infectious nature of all blood and body substances necessitates the implementation of infection control practices and policies. There are more than 20 blood-borne diseases, but those of primary significance to health care workers are hepatitis due to either the hepatitis B virus (HBV) or hepatitis C virus (HCV) and acquired immunodeficiency syndrome (AIDS) due to human immuno-deficiency virus (HIV).⁵¹ In order to minimize the risk of HIV/AIDS, HBV and HCV through unsafe injection, practices, the Federal Ministry of Health has phased out the use of sterilizable injection equipment in Nigeria.⁵¹ Standard precautions apply to blood; all body fluids, secretions and excretions (except sweat) regardless of whether or not they contain visible blood; non-intact skin, and mucous membranes,^{22, 23, 52, 53, 54} any unfixed tissue or organ (other than intact skin) from human (living or dead), human immunodeficiency virus (HIV) or hepatitis B virus (HBV) containing culture medium or other solutions.⁵⁴

Universal precautions are a set of guidelines that aim to protect health care workers (HCWs) from blood-borne infections.⁵⁵ In 1981, the CDC proposed the concept of “universal precautions, originally designed to protect HCWs from exposure to blood-borne pathogens.^{56, 57} The definition and recommendations of universal precautions was revised by the Centres for Disease Control and prevention (CDC) and given the new name of standard precaution,⁵⁸ which combines the major features of universal precautions and Body Substance Isolation (BSI)^{59, 60}. Under the Standard precautions, blood and body fluid of all patients are considered potentially infectious for HIV, HBV and other blood borne pathogens.^{54,58} In addition, standard precautions stipulate that HCWs take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures and disposal.⁵ The term “Standard precautions” is replacing “Universal precautions”, as it expands the coverage of universal precautions by recognizing that any body fluid may contain contagious and harmful micro-organisms.⁶⁰ Standard precautions is regarded as an effective means of protecting HCWs, patients, and the public, thus reducing hospital acquired (nosocomial) infections.⁵¹

The components of standard precautions include; hand hygiene, personal protective equipment (PPE) such as use of gloves, cap, gowns, mask, safe waste disposal system, correct sterilization and disinfection processes, appropriate use of instruments and equipment, vaccination, education, screening of blood for transfusion and post exposure protocol (PEP).⁶² To reinforce the above existing components, three other areas of practice have been added and include; respiratory hygiene/cough etiquette, safe injection practices, and use of masks for the insertion of catheters or injection of materials into spinal or epidural spaces via lumbar puncture (e.g. myelogram, spinal or epidural anaesthesia).⁶²

Reports indicate that standard precautions are effective in preventing both occupational exposure incidents and associated infections.^{25, 63} Compliance with universal precautions has been shown to reduce the risk of exposure to blood and body fluids.⁶⁴ However, studies have extensively reported suboptimal and non-uniform adherence to standard precautions by HCWs in both developed and developing countries.^{12, 55, 65, 66} Standard precautions are designed to reduce the risk of transmission of infectious agents from both recognized and unrecognized sources of infection in health care settings.

The incidence of infection with Hepatitis B virus has declined in health care workers in recent years largely due to the widespread immunization with hepatitis B vaccine.⁶⁷ In many health facilities, even though the personnel are vaccinated, the sero-conversion status after vaccination is not assessed.²⁷ Standard

precautions is also intended to protect the patient by ensuring that health care personnel do not transmit infectious agents to patients through their hands or equipment during patient care.⁶²

Employee exposure to blood borne pathogens from blood and other potentially infectious materials (OPIM) occur because employees are not using universal precautions.⁶⁸ OPIM is defined as:

The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.⁶⁸

Any unfixed tissue or organ (other than intact skin) from a human (living or dead);⁶⁸ and

HIV – containing cell tissue cultures, organ cultures, and HIV or HBV – containing culture medium or other solutions, and blood, organs, or other tissues from experimental animals infected with HIV or HBV.⁶⁸

The Blood-borne pathogens standard allows for hospitals to use acceptable alternatives to universal precautions.⁶⁹ Alternative/concepts in infection control are called Body Substance Isolation (BSI) and standard precautions.⁶⁹ These methods define all body fluids and substances as infectious.⁶⁹ These methods incorporate not only the fluids and materials covered by the blood borne pathogens standard but expands coverage to include all body fluids and substances.⁶⁹

These concepts are acceptable alternatives to universal precautions, provided that facilities utilizing them adhere to all other provisions of the standard.⁶⁹ For compliance with OSHA standards, the use of either universal precautions or standard precautions are acceptable.⁶⁹

Since it is not feasible or cost-effective to test all patients for all pathogens prior to giving care, and identification of patients infected with blood borne pathogens cannot be reliably made through medical history and physical examination, standard precautions are therefore recommended for use on all patients by the United States Centers for Disease Control (CDC), regardless of diagnosis and treatment setting.^{70, 71}

Statement of the Problem

Healthcare workers (HCWs) are at risk of occupational hazards as they perform their clinical activities in the hospital.⁷² The occupational health of the health care workforce of about 35 million people representing about 12% of the working population has been neglected.⁷² They are exposed to blood borne infections by pathogens such as HIV, hepatitis B and hepatitis C viruses, from sharps injuries and contacts with deep body fluids.^{4, 5, 58} In an era of HIV epidemic in sub-Saharan Africa,⁷³ this occupational risk is real and significant. It has been found that the risk of transmission of HIV/AIDS via needle stick incidents is 0.3 %;^{4,15,27,29} i.e, 1 case per 300 needle stick incidents.

The Occupational Safety and Health Administration estimates that 5.6 million HCWs worldwide who handle sharp devices, are at risk of occupational exposure to blood borne pathogens.⁷⁴ These injuries are usually under-reported for so many reasons such as stigmatization, should HIV result from such incidents.¹⁵ The sero-prevalence of HIV varies widely from country to country and from one region to another within the same country.⁷⁵ Sub-Saharan Africa (SSA) has the highest HIV sero-prevalence in the world.⁷⁵ The 2005 sero-sentinel survey conducted in Nigeria reported an overall HIV sero-prevalence of 4.4%.⁷⁵ This high prevalence in the country poses an occupational risk to HCWs. HIV/AIDS constitutes a major health problem in Nigeria.⁷⁶ Nigeria is one of the countries worst hit by the HIV/AIDS epidemic, with about 2.99

million people currently infected.⁷⁶ Over a million people (» 1.70 million) have already died from AIDS⁷⁶ since it was first reported and confirmed in Nigeria in 1986.⁷⁷

The health consequences of these infections are enormous; symptoms of HCV infection may not manifest until 20-30 years after viral transmission.⁷⁸ Also, about 60-85% of HCV infections result in liver cirrhosis and liver cancer.⁶¹ There is no immunization for HCV and HIV, it becomes important to prevent infection by preventing exposure.⁷

The rising prevalence of morbidity and mortality following exposure to blood borne infections is due to the lack of knowledge, wrong attitude towards and non-compliance to standard precautions as well as bad practices such as bending of needles, recapping of needles, detachment of needles, reuse of needles and lack of adequate sharps containers and disposal facilities, shortage of supply of injection equipment and unwarranted and unsafe use of injections, that put both patients and HCWs at risk of occupational exposure. The improper disposal of used sharps and needles is known to cause needle stick injuries.⁸¹

WHO estimates that annually, 16 billion injections are given each year in developing and transitional countries with an annual mean 1.5 injections per person per year.¹⁷ 70 to 99% of these injections are unnecessary, while 50% are unsafe in 14 of 19 countries in five developing world regions with data.^{18,19,20} In Nigeria, the annual mean was found to be 4.9 injections per person per year.²¹ The socio-economic and psychological burden of unsafe injections occur at individual, family, community and national levels. It is estimated that each year, the annual global burden of indirect medical cost due to hepatitis B and C and HIV/AIDS is estimated to be US \$535 million.⁸³

Globally, in 2000, unsafe injection was responsible for an estimated 21 million cases of Hepatitis B virus (HBV) infection, 2 million cases of Hepatitis C virus (HCV) infection and 260,000 cases of HIV infection, making up 32%, 40% and 5% of infections due to unsafe injection practices respectively.⁸⁴

It is estimated that 9.18 million DALYs would be lost between 2010 and 2030 although interventions implemented in the year 2000 for the safe and appropriate use of injections could reduce it. ²², ⁸⁴

WHO estimates that 501,000 deaths have occurred because of unsafe injection practices.⁸⁴ These deaths could have been prevented by injection safety practices, which is an element of standard precautions, an integral component of infection prevention and control as well as a key element of health care worker safety.

Such deaths involving members of the family especially the bread winners could lead to sorrow and poverty for many families. Also, the rising prevalence of morbidity and mortality from these blood-borne infections can cause absenteeism from work, use of huge sums of money for treatment, reduced worker effect and decreased productivity, which will affect the economy adversely.

In spite of the risk HCWs are exposed to, studies have extensively reported sub-optimal and non-uniform adherence to standard precautions by HCWs in both developed and developing countries. ¹², ⁵⁵, ⁶⁵, ⁶⁶ For instance, in a study done in Benin City, only 34.2% of nurses had heard of universal precautions,⁸⁵ and in another study done in South East Nigeria, only 15.2% of Doctors had good practice of standard precautions.⁷

Compliance with these universal precautions has been shown to reduce the risk of exposure to blood and body fluids.⁶⁴ However, it is known that these preventive strategies are mostly not implemented fully and/or compromised in the health care systems of most developing countries.^{25,33,61,86,87,88} Standard precautions is practiced in high income countries to protect HCWs from occupational exposure to blood and the consequent risk of infection with blood-borne pathogens, but the situation is different in low income

countries, where standard precautions are partially practiced.⁶⁵

Occupational safety of HCWs is often neglected in low income countries in spite of the greater risk of infection due to higher disease prevalence, low level awareness of the risks associated with occupational exposure to blood, inadequate supply of personal protective equipment (PPE), and limited organizational support for safe practices.³³ Efforts to reduce population levels of infections such as hepatitis and HIV are important goals.

Identified and similar problems exist in Central Hospital, Warri, other health establishments in Delta State as well as other states. However, the knowledge, attitude and practice of standard precautions among HCWs in Central Hospital, Warri, have not been assessed before.

Justification for the Study

On the whole, available data show that needle stick injuries and blood borne pathogens are serious threats to patients, HCWs and to the host community. The rising prevalence of morbidity and mortality as a result of nosocomial and blood borne infections such as HIV/AIDS, HBV and HCV among others is as a result of lack of awareness, wrong attitude towards and non-compliance with the definitions and recommendations of standard precautions. Compliance with standard precautions has been shown to reduce risk of exposure to blood and body fluids.⁶⁴ Due to this, surveillance of HCWs' compliance to standard precautions is an important element of occupational and nosocomial infection control as it enables assessment of risks from occupation exposure to infection.⁸⁹

This study will expose the level of awareness, attitude and practice of standard precautions among the HCWs and hence could be used as a baseline for intervention. It will also identify gaps which would be recommended for correction through interventions. This study could be used to monitor trends of events concerning knowledge, attitude and practice of standard precautions among health care workers in Central Hospital, Warri, by reviewing from time to time, the incidence of needle stick injuries and the morbidity and mortality pattern. It will also identify gaps in the standard precaution practices among these HCWs and the results from the study will be used for the planning of health education intervention programme. It will also provide reference material for the academic society as well as further research.

1.2 AIMS AND OBJECTIVES

General Aim

The general objective is to assess the knowledge, perception and practice of standard precautions among health care workers in Central Hospital, Warri, Delta State.

Specific Objectives

To assess the level of knowledge of standard precautions among health care workers in Central Hospital, Warri.

To ascertain the attitude of health care workers in Central Hospital, Warri towards standard precautions.

To determine the level of practice of standard precautions among health care workers in Central Hospital, Warri.

To determine the level of immunization of the health care workers against infectious diseases such as HBV.

To describe the action taken by the health care workers when they are exposed to occupational hazards and injuries.

To ascertain the attitude of the health care workers towards patients with

HIV-AIDS.

To determine the practice of environmental cleanliness and waste disposal of the health care workers in Central Hospital Warri.

To determine some of the factors that affect knowledge, attitude and practice of standard precautions among the health care workers.

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