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Factors Impacting HIV Post Exposure Prophylaxis among Health Care Workers

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Walden University
2017

Abstract

Factors Impacting HIV Post Exposure Prophylaxis among Health Care Workers

by

Ulunma Njemanze

MSc, Canterbury Christ Church University, 2010

BSc, Igbinedion University, 2006.

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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August 2017

Abstract

Health care workers are at risk of contracting HIV as a result of occupational exposure while treating infected patients. HIV postexposure prophylaxis (PEP) is an effective antiretroviral treatment course used in preventing potential HIV infection following an accidental occupational exposure to HIV. The objective of this cross sectional study was to identify the factors that impact the practice of HIV PEP among health care workers at the National Hospital, Abuja, Nigeria. A cross-sectional survey using self-administered, structured questionnaires was conducted on 182 health care workers at the National Hospital comprising of medical doctors, nurses, and laboratory scientists. A chi-square test of independence was used to assess the association between knowledge of PEP and PEP use. Logistic regression was used to determine the relationship between PEP use and types of occupational exposure, existing precautionary policies, and fear of stigma. The results of this study were statistically insignificant with variables PEP knowledge ($p=$ 0.274), types of occupational exposures ($p=$ 0.575), awareness of precautionary policies ($p=$ 0.219), and fear of stigma ($p=$0.282), which could be a result of the small sample surveyed. Nonetheless, this study can lead to positive social change whereby health care workers are well-trained on the practice of PEP after sustaining an occupational injury in order to prevent HIV infection. Factors such as inadequate knowledge on HIV PEP practice, underreporting of occupational injuries, lack of awareness of precautionary guidelines on HIV PEP, and the fear of stigma after an occupational exposure to HIV affect the practice of HIV post exposure prophylaxis. Therefore, more education on PEP for HIV among health care workers is warranted.

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Dedication

I dedicate my study to my Mother Dr. Joy Njemanze who introduced me to the world of Public Health and has been my greatest support. I also dedicate this study to all the health care workers in Nigeria who are faced with occupational hazards that preexpose them to HIV infection.

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Chapter 1: Introduction to the Study

Introduction

HIV is an infectious disease, and occupational injury or exposure of health care workers to this deadly virus threatens the functionalities of health care delivery systems, especially in developing countries such as Nigeria (Agaba et al. 2012; Ekundayo & Ogbaini-Emovon, 2014). Nigeria is ranked as one of the top 10 countries with a high prevalence of HIV in Sub-Saharan Africa with a prevalence of 3.4 million (Avert, 2015). In 2013, 210,000 people were recorded to have died from AIDS-related illnesses in Nigeria. There has been a slight reduction in the annual death rate of people living with HIV since 2005. About 20% of people living with HIV have access to the antiretroviral treatment (ART; Avert, 2015). Most occupational injuries are as a result of unsafe injection practices that exposes health care workers to various infectious diseases (Omorogbe, Omuemu, & Isara, 2012). The World Health Organization (2004) estimated that about 501,000 deaths occurred as a result of unsafe injection practices. Safe injection practice can reduce the risk of HIV infection exposure among health care workers (Omorogbe et al. 2012).

In this study, I focused on the factors that affect the practice of HIV postexposure prophylaxis (PEP) among health care workers at the National Hospital, Abuja, Nigeria. Health care workers are at an increased risk of contracting HIV after an occupational injury or being exposed to infectious materials, such as blood, body tissue, body fluids, and contaminated environmental surfaces (Agaba et al. 2012; Mathewos et al. 2013). It is vital to ensure the health and safety of health care workers in a hospital setting. In this

study, I addressed the factors that impact the compliance or noncompliance of health care workers on PEP after an occupational exposure.

PEP is an antiretroviral drug regime used to prevent HIV infection when a person has been exposed to the virus through various means like sexual intercourse with an infected person or occupational injury and contact with infected blood and body fluids (Esin, Alabi, Ojo, & Ajape, 2013). Health care workers are at high risk of exposure to infectious diseases, such as HIV, due to occupational injury or exposure from needle sticks and other sharp surgical instruments in a health care setting (Omorogbe et al. 2012). Other factors that may put health care workers at higher risk of HIV infection include a high prevalence of the infection in the population, such as Nigeria, with about 3.4 million people living with HIV (AVERT, 2015). The increased risk of occupational exposure due to unsafe practices in the hospital setting, the nature of transmission of infection via occupational exposure, the presence of the virus in contaminated fluid and the amount of viral load, and the availability and lack of access of PEP for HIV may increase the prevalence of HIV infection among health care workers in developing countries such as Nigeria (Agaba et al. 2012, Varghese, Abraham, & Mathai, 2003). Therefore, it is pertinent to train health care workers to practice PEP after sustaining an occupational injury that may expose them to HIV infection as a way to minimize the risk of HIV infection among health care workers in Nigeria (Mathewos et al. 2013).

The positive social change implications of this research study were based on ensuring that health care workers are well-trained on the practice of PEP after sustaining an occupational injury in order to prevent HIV infection spread among health care

workers and hospital patients. I used questionnaires which study participants answered to provoke self-awareness of PEP practice and behavior. Through this study, participants became more aware of precautionary policies and guidelines on occupational exposures in the hospital setting. The hospital may review existing policies on occupational exposures and the practice of PEP, which could lead to an increased training of health care workers on the practice of PEP.

Background

Research has been conducted in various countries worldwide on the knowledge, awareness, and practice of PEP among health care workers. Agaba et al. (2012) ascertained the level of knowledge and practice of HIV PEP and the determinants of their knowledge in Nigeria. However, scholars have not explored the factors that impact the practice of HIV prophylaxis among health care workers after an occupational exposure in Nigeria.

The purpose of this study was to address this gap in literature. I examined the factors that impact the practice of PEP for HIV infection among health care workers at National Hospital, Abuja, Nigeria. I aimed to ascertain the level of knowledge, the attitudes, and the practices of health care workers at National Hospital Abuja on the use of HIV PEP. Data from this study can be used to improve and encourage more training on the practice of HIV PEP, address factors that impact compliance or noncompliance of HIV PEP practice, and reform existing hospital policy and guidelines on the use of HIV PEP.

Problem Statement

Nigeria has a population of about 177.5 million people (World Bank, 2016), with Abuja as the federal capital. One of the health issues that the country faces is the high prevalence of HIV infection, with an estimated number of 3.4 million people living with the virus (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2014). Health care workers are at an increased risk of HIV infection due to the nature of their jobs that puts them in direct contact with blood and body fluids of HIV positive patients (Agaba et al. 2012). Increased frequency of needle stick injuries (NSI) and the prevalence of HIV in a patient population in health care facilities contribute to the high risk of occupational exposure among health care workers; this high risk of exposure places them at risk of HIV infection (Agaba et al. 2012; Ashat, Bhatia, Puri, Thakare, & Kousal, 2011; Cowan & Macklin, 2012).

PEP for HIV infection is an emergency antiretroviral treatment course that is used to reduce the likelihood of HIV infection after a health care worker, or any individual, has been exposed to the virus (World Health Organization [WHO], 2016). It is a method of preventing the spread of HIV. The high prevalence of HIV infection among health care workers resulting from occupational exposure can be attributed to the level of knowledge and poor practice of PEP, as well as the underreporting of injuries sustained when caring for HIV positive patients among health care workers in Nigerian hospitals (Ekundayo & Ogbaini-Emovon, 2014). There is a gap in literature and documentation in Nigeria and other sub-Saharan countries about the factors that impact the use of HIV prophylaxis by health care workers after an occupational exposure in the hospital setting to prevent HIV

infection. This is an underresearched area of public health concern that needs to be addressed. Therefore, the results of this study can create awareness among health care workers and encourage good practice of PEP.

Purpose of the Study

The purpose of the research study was to identify the factors that impact the effective use of PEP among health care workers at the National Hospital Abuja, Nigeria. I used the quantitative method approach by carrying out a cross-sectional survey among health care workers at the National Hospital, Abuja. Primary data were collected by self-administered, structured questionnaires that were tested and retested for validity on target population. Data were used to ascertain factors, such as the knowledge, practice and attitude, and stigma towards the use of HIV PEP among health care workers. Availability, use, and precautionary policies on HIV PEP at the National Hospital, Abuja were explored.

Research Question(s) and Hypotheses

The following research questions and hypotheses were used as a guide for this research study.

1. What is the association between the level of knowledge of HIV PEP and practice of HIV PEP at the National Hospital, Abuja?

$H_0 1$: There is no correlation between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1 1$: There is a correlation between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

2. What is the relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja?

$H_0 2$: There is no relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1 2$: There is a relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

3. What is the relationship between the existing precautionary policy on PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers?

$H_0 3$: There is no relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

$H_1 3$: There is a relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

4. What is the relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital Abuja?

$H_0 4$: There is no relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital, Abuja.

$H_1 4$: There is a relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital, Abuja.

Theoretical Framework for the Study

The health belief model (HBM) is a conceptual framework that can be used to understand a health behavior and reasons for compliance or noncompliance among health care workers at the National Hospital Abuja, with the recommended health action of using PEP after an occupational exposure with the blood or body fluid of an HIV positive patient (Turner, Hunt, DiBrezzo, & Jones, 2004). The major components of this model include the following: perceived barriers, perceived benefits, perceived susceptibility, and perceived severity. These components were used to identify compliance or noncompliance with the practice of PEP among health care workers in Abuja (University of Twente, 2012).

This health model was chosen because it is based on the understanding that a health care worker would take a health-related action to avoid a negative health condition, such as HIV infection. Taking HIV PEP regime will prevent HIV infection after an occupational exposure, and health care workers can successfully complete the required HIV PEP regime without supervision (Boston University School of Public Health, 2016). This model was used to explore the perceived barriers faced by health care workers that militate against or impact the use of HIV prophylaxis after an occupational exposure when attending to a HIV positive patient in the hospital. I used this model to explore the perceived benefits that health action, such as the use of HIV PEP regime, will have on the health care worker. The model was used to determine the perceived susceptibility of a health care worker to occupational injuries, such as needle stick injury (NSI). The perceived severity of an occupational exposure that could lead to HIV

infection determines the course of action the health care worker will take to prevent infection. Other components of this model, such as cues to action and self-efficacy, focus on the strategies available to health care workers to ensure readiness when exposed to injury and confidence in their ability to take the appropriate health action (Boston University School of Public Health, 2016; University of Twente, 2012).

Nature of the Study

A descriptive, cross-sectional survey method was used to obtain data by distributing questionnaires to research study participants. According to Frankfort-Nachmias and Nachmias (2008), a cross-sectional design is often identified with survey research where participants are asked to respond to a set of questions about their backgrounds, past experiences, and attitudes. A cross-sectional design is used to describe the pattern of relationship between independent and dependent variables. The purpose of applying a survey method approach for this study was to generalize from a sample – health care workers in National Hospital, Abuja – to a population -Nigerian health care workers- so that inferences can be made about some characteristics, attitude, or behavior of this population towards HIV prophylaxis after an occupational exposure (Creswell, 2014). The dependent variable for this research was the use/practice of HIV PEP among health care workers at the National Hospital, Abuja, and the independent variables were the factors that impact the use of HIV PEP, such as level of knowledge on HIV PEP, underreporting types of occupational injuries, and existing precautionary policies of the hospital on HIV PEP and fear of stigmatization.

Statistical adjustment was used to overcome the methodological limitations of a cross-sectional design using SPSS (Frankfort-Nachmias &Nachmias, 2008). I analyzed data by calculating the percentages and means and applying a chi square statistical test to study the association between the dependent and independent variables. Logistic regression tests were used as a predictive analysis to explain the relationship between one continuous dependent variable–use of PEP and the various independent variables– PEP knowledge, occupational injury report, PEP precautionary policies, and stigma (Statistics Solutions, 2016).

Operational Definitions

Health care worker: This refers to all people delivering health care services who have direct contact with patients or with a patient's blood or body substances.

HIV infection: HIV is a viral infectious disease that, if left untreated, can lead to AIDS and result in death.

HIV PEP knowledge: The level of knowledge health care workers has on the practice of HIV PEP (independent variables).

HIV PEP use: The use of HIV PEP after an occupational injury by a health care worker (dependent variable).

HIV PEP precautionary policies: These are existing policies on HIV PEP in the hospital created to prevent or minimize HIV infection of health care workers.

Hospital setting: This is a health care facility where people come to receive diagnosis and treatments for their ailments.

Occupational injury: Types of occupational exposures sustained by health care worker.

Occupational injury/exposure: An injury or illness considered to be work related if an event at the work place contributed to the resulting condition (Bureau of Labor Statistics, 2012).

Post exposure prophylaxis (PEP): This is an antiretroviral therapy regime that is used to prevent infection when a person has been exposed as a result of injury or sexual contact with an infected person.

Stigma: A set of negative and often unfair beliefs that a society or group of people have about something (Merriam Webster, n.d.).

Assumptions

Researchers are bound to make assumptions when carrying out a study. An assumption is the belief that something is certain to occur without proof. According to Dusick (2011), all scholars assume that variables are well defined and measurable and that the survey instrument used is reliable and valid. Assumptions for this study included the following:

1. All health care workers at National Hospital, Abuja, Nigeria are aware of HIV PEP practice.

2. The study participants provided honest information on their knowledge, attitude, and practice of HIV PEP.

3. The study participants adhered to the written instructions of the survey

4.   The study participants had some general knowledge on HIV infection and
occupational exposures.

The assumptions of this research were necessary because study participants need
to have basic reading and written knowledge of English to follow the instructions of the
survey, understand the purpose of the study, answer the survey questions honestly, and
have a basic knowledge of HIV infection and HIV PEP.

Delimitations and Scope

The delimitations for study participants entailed being a certified health care
worker practicing in National Hospital Abuja at the time of research. The scope of this
study was limited to health care workers who worked at the National Hospital, Abuja and
who cared for the HIV positive patients admitted to the hospital. The findings of this
study can only be generalized to the study population of health care workers in a hospital
setting who participated in the research study.

Limitations

In this study, I investigated the factors (ie., knowledge, awareness, and attitudes
of health care workers) that impact the practice of HIV PEP at National Hospital, Abuja,
Nigeria. The health care workers surveyed for this research study were comprise of
medical doctors, nurses, and laboratory technicians who were in direct contact with HIV-
positive patients admitted at National Hospital, Abuja. Limitations of this research study
include the following:

1.   Data for this research study were self-reported by study participants. This
limited the study because participants may not truthfully report responses

to the survey questions and may be biased in the responses. Participants

may have provided answers that they believe to be desired by the

researcher to the questions and are expected from a health care worker.

2. The participation for this research study was voluntary. A difference may

have occurred in those who willingly participated in the study and those

who opted not to participate in this research study. The reason may be due

to the sensitive nature of the study. Late and nonresponders to the study

were compared statistically to the initial responders using the independent

t test on each variable.

3. Another limitation was that the study may not be generalized to other

health care workers in other tertiary hospitals in Nigeria or in other

countries. As such, it is advisable to replicate the study using health care

workers from other tertiary hospitals for comparison.

Significance

This research study was used to identify the factors that impact the effective use

of HIV prophylaxis among health care workers in National Hospital, Abuja, Nigeria after

an occupational exposure. This research study was unique because I aimed to address this

underresearched area in public health (Agaba et al. 2012; Ekundayo & Ogbaini-Emovon,

2014; Esin et al. 2011; Kumakech, Achora, Berggren, & Bajunirwe, 2011). The findings

from this study provide insights to the underlying factors that contribute to the high

prevalence of HIV infection among health care workers in Nigerian tertiary hospitals,

such as the National Hospital, Abuja. The results of this research study could be used to

encourage change in hospital policies on HIV PEP and in the training of health care workers on proper practice of HIV prophylaxis after an occupational exposure. This research study can bring about positive social change by ensuring that health care workers who attend to HIV-positive patients are well trained on the use of HIV prophylaxis to avoid further spread of the disease and to reduce the stigma associated with HIV infection, which could discourage people from seeking medical attention when needed.

Summary

Chapter 1 of this dissertation provided an overview of HIV infection in Nigeria through occupational injuries placing health care workers at risk and the factors that affect the practice of HIV PEP among health care workers in Nigerian hospitals. I outlined the importance of putting precautions in place to prevent occupational/accidental injuries among health care workers, which may expose them to HIV infection from caring for a HIV-positive patient. I study used Bandura's HBM to hypothesize the association between the knowledge, beliefs, and attitude among health care workers at the National Hospital, Abuja on occupational injuries and how this impacts on the practice of HIV PEP.

Chapter 2 provides detailed information on various types of occupational injuries sustained by health care workers that expose them to blood-borne infections, such as HIV infection, the practice of PEP in Nigeria and other countries, factors impacting and barriers to the practice of PEP, and the importance of encouraging medical facilities to have in place precautionary guidelines on HIV PEP.

Chapter 2: Literature Review

Introduction

The HIV virus infection is a global public health problem with about 68% of people living with the virus residing in Sub-Saharan Africa (Ncube, Meintjes, & Chola, 2014). The global rate of HIV transmission after a percutaneous occupational injury/exposure in a hospital setting among health care workers is 3 per 1,000 injuries (Chen, Fox, & Rogers, 2001; Okulicz & Murray, 2012; Puro et al. 2004; Stacey, Sellers & Barrett, 2012; Sharma, Rasania, Verma, & Singh, 2010). According to Ford and Mayer (2015), the HIV status of a source should be determined as a guide to appropriate clinical action and to inform the exposed individual. HIV infection can be prevented and treated in several ways. For treatment purposes, the WHO recommended the use of ART, which is a combination of antiretroviral medicines used to suppress the individuals' susceptibility to the HIV infection by halting replication of the virus inside the body of the infected person (as cited in Ncube et al. 2014).

The purpose of this research study was to ascertain the factors that affect the practice of HIV PEP among health care workers at National Hospital, Abuja, Nigeria. Health care workers in high endemicity areas of HIV infection are at a high risk of contracting HIV infection (Aminde et al. 2015). In order to prevent HIV infection, PEP for HIV has been recommended as the best preventive method after an occupational exposure. Aminde et al. (2015) also documented that when a health care worker has been exposed to a HIV infection, it may take up to 3 days after exposure to detect the virus in the lymph nodes and about 5 days in the blood. Consequently, a short window of

opportunity is provided in which PEP, an ART, can be administered to prevent HIV infection by inhibiting viral replication and halting the irreversible establishment of the virus in the injured person (Aminde et al. 2015). Researchers have stressed the importance of training health care workers on the effective practice of HIV PEP as a form of HIV prevention (Gupta et al. 2008). There is a common misconception that HIV infection is mostly acquired through sexual intercourse; however, the virus can be acquired by occupational injuries when caring for HIV-positive people admitted in the health facility.

Literature Search Strategy

HIV infection, PEP, health care workers, and Nigerian peer-reviewed research literature published since the year 2008 were systematically searched. Peer-reviewed articles that were published prior to the year 2008 that included factors that impact HIV PEP practice were reviewed. Research studies that were conducted in the last 5 years were given priority as the most current research studies were considered first.

The following electronic databases were used to search for literature on the selected research area: CINAHL Plus with Full Text, MEDLINE with Full Text, PubMed Central, ProQuest Nursing and Allied Health Source, ScienceDirect, PsycINFO, African Journal Online (AJOL), and Google Scholar. The following keywords were used in combination to search for research and peer-reviewed articles in the databases: *HIV, HIV infection, post exposure prophylaxis, occupational injuries/exposures, health care workers,* and *Nigeria.*

Theoretical Foundation

The HBM is a theoretical model of social sciences that was first developed in the 1950s (Glanz, Rimer, & Viswanath, 2008, University of Twente, 2012). This model was developed as a result of the failure of a free tuberculosis (TB) screening health program in a bid to explain the unwillingness of people to participate in this health program aimed to prevent and detect disease (University of Twente, 2012). The model was modified to study people's responses to symptoms, their behavioral response to diagnosed illnesses, and their response to recommended medical regime (Glanz et al. 2008). The HBM is comprised of various concepts that predict the rationale behind why people will take a particular health action in order to prevent, screen, or control adverse health conditions (Glanz et al. 2008). The primary concepts of the HBM that address peoples' behavioral response to a health action include the following: susceptibility, seriousness, benefits and barriers to behavior, cues to action, and self-efficacy (Glanz et al. 2008).

Based on the HBM, health care workers are likely to take a health action, such as HIV PEP, which is believed to reduce the risk to occupational exposure if they believe they are susceptible to the health condition–HIV infection. The health care workers are likely to take health action if they believe that the health problem will result in serious consequences, that the course of action to take will be of benefit in reducing susceptibility to the health condition, and that anticipated benefits of health action will outweigh the barrier to action (Glanz et al. 2008).

Perceived susceptibility of the HBM an individual's belief of his or her likelihood of contracting a health condition (Glanz et al. 2008). For example, a health care worker

must believe that there is a possibility of being infected with HIV after an occupational injury before being motivated to screen for the virus or commence HIV prophylaxis treatment course. Perceived severity entails feelings about the severity or seriousness of contracting an illness and the social consequences associated with the health condition (Glanz et al. 2008). Perceived severity is the level of seriousness that a health care worker associates with regard to HIV infection and social consequences, such as stigma, associated with HIV infection. Perceived threat is referred to as the combination of perceived susceptibility and perceived severity. A health care worker at this stage weighs the susceptibility and seriousness of contracting HIV infection after an occupational exposure. Perceived benefits of the HBM refer to a person's belief that the various health actions available will be beneficial to reducing the threat of a serious health problem, which will lead to a change in behavior (Glanz et al. 2008). Health actions such as screening for HIV and commencing the HIV PEP treatment course indicate the willingness of the health care worker to reduce the risk of contracting the virus after an occupational exposure. Perceived barrier is the potential negative outcome that a particular health action has as perceived by an individual that may be seen as impediments to undertaking recommended health behaviors (Glanz et al. 2008). This construct is a form of cost-benefit analysis that an individual uses to weigh the benefits of the health action with the potential barriers to provide a preferred form of action to the health condition (Glanz et al. 2008). A health care worker may regard commencing HIV PEP as unnecessary and may want to avoid the stigma associated with the practice of PEP.

Cues to action in the HBM are triggering mechanisms that encourage a person to take a health action in order to prevent or treat a health problem (Glanz et al. 2008). When a health care worker is aware of the importance of HIV PEP practice, he or she is likely to act appropriately once involved in an occupational exposure. Self-efficacy, as defined by Bandura (1997), is "the conviction that one can successfully execute a health behavior required to produce outcomes" (as cited in Glanz et al. 2008). This construct was added to the HBM in 1988 by Rosenstock, Strecher, and Becker to emphasize the need for people to feel competent to overcome a health condition with the health action taken (Glanz et al. 2008). According to this construct, a health care worker is capable of commencing HIV prophylaxis after an occupational exposure in order to prevent HIV infection.

The HBM is applicable to this research study because I assessed the knowledge, attitude, and practice of HIV PEP among health care workers at National Hospital, Abuja, Nigeria and their behavioral intentions to allow for training and to promote the use of HIV PEP after an occupational exposure in the hospital. Figure 1 shows the HBM of behavioral responses a health care worker would have to the practice of HIV PEP.

Figure 1. HBM of health care workers and PEP practice

Occupational Injuries and HIV Infection

Occupational injuries occur that expose a health care worker to HIV infection and other blood-borne infections in a hospital setting while attending or caring for an infected patient via various transmission routes, such as percutaneous exposure, mucous membrane, and cutaneous exposures (Goldschmidt, 2010; Odongkara et al. 2012; Priya, Krishnan, Jayalakshmi, & Vasanthi, 2015; Serdar et al. 2013). According to Vaz, McGrowder, Crawford, Alexander-Lindo, and Irving (2010) and Pathak, Kahlon, Ahluwalia, Sharma, and Raveesha (2012), the constant handling of needles among health care workers increases their risk of needle stick injuries, which may result exposure to fatal infection from blood-borne pathogens such as HIV. Health care workers are exposed

to HIV infection in the blood and saliva (Goldschmidt, 2010; Shriyan & Annamma, 2012; Varghese et al. 2003).

In a country like India, an estimated 2.5 million people are living with HIV, and health care workers are at a higher risk of being infected with the virus (Ashat et al. 2011). This high risk of exposure to HIV infection can be attributed to the frequency of needle stick injuries and mucus membrane exposure, which pose a threat to the psycho-physical health of health care workers (Ashat et al. 2011; Singru & Banerjee, 2008; Vaid, Langan, & Maude, 2013). The nature of exposure, and the HIV status of the patient, are proportional to the risk of infection transmission and, as such, determine the amount of infection transmitted to the exposed health care worker (Ashat et al. 2011).

Injection practice in low- and middle-income countries are poor. An estimated 40% injections given by health care workers are carried out with equipment that is unsafe (Ashat et al.2011). This unsafe practice increases the spread of HIV infection and other blood-borne viruses among patients and health care workers. This work-related risk of acquiring HIV infection is prevalent in high endemic areas; as such, health care workers should be trained on injection safety practices and sharp instruments disposal (Aminde et al. 2015). Esin et al. (2011) stated that a widespread adoption of universal precautions guidelines has resulted in significant reduction in needle-stick and other injuries experienced among health care workers.

Occupational Injuries and HIV Infection among Health Care Workers in Nigeria

In Nigeria and other African countries, researchers (Agaba et al. 2012; Ekundayo & Ogbaini-Emovon, 2014; Esin et al. 2011; Kumakech et al. 2011; Nwankwo &

Aniebue, 2011; Omorogbe et al. 2012) showed that health care workers are equally at high risk of HIV infection from occupational injuries when caring for HIV positive patients admitted in the hospital. Nigeria has been an epidemic region for the AIDS virus since its first discovery in the country in 1986 in a 13-year old girl (Nwankwo & Aniebue, 2011). The first occupational injury that led to HIV infection was acquired from a patient originating from Sub-Saharan Africa (Nwankwo & Aniebue, 2011). The risk of HIV infection is relatively high in cases of deep injury, visible blood on a sharp object or device, invasive procedures, and an occupational exposure involving a patient with advanced AIDS (Kumakech et al. 2011). The WHO estimated that about 3 million percutaneous exposures occur annually among 35 million health care workers globally, which corresponds to about 1,000 new cases of HIV infections resulting from occupational exposures of which over 90% of such exposures occur in resource-constrained countries like Nigeria, South Africa, and India (Kumakech et al. 2011).

In Nigeria, few centers have institutionalized reporting and follow-up on occupational injuries. As such, there is a paucity of information on HIV transmission in the hospital settings (Nwankwo & Aniebue, 2011). This raises concern among health care workers, and those in training, as to the safety in caring for and operating on patients with HIV infection (Nwankwo & Aniebue, 2011). According to Nwankwo and Aniebue (2011), the occurrence of occupational exposures to patients' blood and body fluids may be higher in trainee health care workers, such as surgeons, whose skills are still limited. As such, appropriate postexposure management is an important part of a program

intervention to prevent HIV infection and an integral element of workplace safety (Esin et al. 2011).

According to Omorogbe et al. (2012), the burden of injection practice in a Nigerian hospital setting is borne by the health care workers, patients, and the community. Issues such as the inadequate supply of appropriate sharp containers, recapping of needles unsafely, bending and braking hypodermic needles, careless abandonment of sharps in wrong places like dirty linen, and handing sharps from one health care worker to another can preexpose health care workers to occupational injuries that may result in HIV infection (Omorogbe et al. 2012). Unsafe injection practices carry socioeconomic and psychological consequences on the health care worker and the health system at large (Omorogbe et al. 2012). As a result of occupational exposures to Hepatitis B virus (HBV), Hepatitis C virus (HCV), and HIV/AIDS, the global burden of indirect clinical cost was estimated to be $535 million yearly (Omorogbe et al. 2012).

Measures Used to Prevent Occupational Injuries

In 1985, Garner introduced the term universal basic precaution, which is defined as the prevention of transmission of blood-borne pathogens such as HIV through health care workers' use of the precautionary rules related to care and nursing (Vaz et al. 2010). The Center for Disease Control (CDC) advocated universal precautions as a means to reduce occupational exposures to HIV infection (as cited in Nwankwo & Aniebue, 2011). Precautionary practices (implementation of health education, universal hospital precautions and guidelines, eliminating needle recapping, and the use of sharps containers for safe disposal) has resulted in an 80% reduction of needle stick injuries with

additional reductions made possible through the use of safer needle devices (Vaz et al. 2010). Health care workers, patients, and visitors can be protected from exposure to HIV infection and other blood-borne pathogens by the safe handling and disposal of sharp objects after use (Joyce, Kuhar, & Brooks, 2015; Vaz et al. 2010).

Due to the fatal nature of HIV infection, it is important to protect health care workers at risk of this infection by adhering to standard precautions; educational programs; appropriate workload for health care workers; better sharp disposal systems; and postexposure care, such as the administration of antiretroviral drugs for PEP (Rybacki, Piekarska, Wiszniewska, & Walusiak-Skorupa, 2013). According to Omorogbe et al. (2012), the unsafe practice of recapping and detaching injection needles among health care workers in Benin-City, Nigeria increased the risk of HIV infection; only a few health care workers had PEP when exposed while most washed the site of injury with soap and water and applied methylated spirit or liquid bleach to injury. Therefore, consistent health education on safe injection practices while attending to a patient, especially one with known HIV status, is important to decrease and prevent further occupational injuries in the hospital setting resulting in HIV infection of both patients and health care workers. Also, counseling on risk assessment, PEP, and baseline and follow-up testing after exposure can prevent HIV infection of the health care worker (Goldschmidt, 2010).

Post Exposure Prophylaxis for HIV Infection

In the last 30 years, HIV infection has been of global public health concern in the Sub-Saharan Africa region (Aminde et al. 2015). PEP for HIV is an ART regime

recommended when a person has been exposed to HIV infection via sexual assault or nonoccupational or occupational exposures (Ekundayo & Ogbaini-Emovon, 2014; Ford & Mayer, 2015; Ncube et al. 2014; Rey, 2011). After exposure to HIV, it may take up to 3 days for the virus to reflect in the lymph nodes and 5 days in the blood; there is a short window frame whereby HIV infection can be prevented through the use of PEP as it inhibits viral replication and halts the irreversible establishment of the virus (Aminde et al. 2015). The practice of PEP for HIV infection includes counseling, laboratory tests after exposure, and medication (Ekundayo & Ogbaini-Emovon, 2014). I stopped reviewing here due to time constraints. Please go through the rest of your chapter and look for the patterns I pointed out to you. I will now look at Chapter 3.

Recommendations for the use of post exposure prophylaxis (PEP) entails commencing treatment one hour after exposure without exceeding 72 hours after exposure; immediate administration of First Aid such as washing site of injury with soap and water (Kuruvilla, 2011; Shaghaghian, Pardis & Mansoori, 2014); screening the source person and healthcare worker to determine HIV status after obtaining informed consent and after counseling both individuals (Ekundayo & Ogbaini-Emovon, 2014). Ekundayo and Ogbaini-Emovon (2014) further explained that in cases where the source person is found to be HIV positive, post exposure prophylaxis for HIV should be maintained for 28 days and only discontinued if source person is HIV negative. HIV prophylaxis treatment regime can reduce the likelihood of acquiring HIV infection by about 81% once taken after possible exposure to the virus either through sexual assault, non-occupational or occupational exposures (Ekundayo & Ogbaini-Emovon, 2014).

Post exposure prophylaxis practice in Nigerian hospitals

According to Aminde et al. (2015) post exposure prophylaxis is the use of short term antiretroviral drugs to reduce the risk of HIV infection after possible exposure to the virus. Evidence show that post exposure prophylaxis is an effective method of preventing HIV infection and has become globally accepted as a form of preventing HIV infection. Nonetheless, the practice of post exposure prophylaxis (PEP) still remains poor especially in low and middle income countries such as Nigeria who have a high prevalence of patient HIV infection cases to date (Ekundayo & Ogbaini-Emovon, 2014). In a study carried out to assess the level of knowledge of post exposure prophylaxis (PEP) for HIV infection among doctors working in Federal Medical Center, Gombe, in Northern Nigeria by Esin et al. (2011) results showed that about 90% of the study participants were not aware of the high risk of sero-conversion as a result of significant needle-sticks injury and mucous membrane exposure. This study also showed poor knowledge among the doctors concerning actions to be taken, such as how soon to commence the PEP treatment and the duration of medication following needle stick injury (Esin et al. 2011). Most alarming is the fact that about 50% or more of the surveyed doctors participating in this study had experienced significant exposure to potentially infective materials and none had reported or sought PEP advice (Esin et al. 2011).

A review of the study by Nwankwo and Aniebue (2011) shows that few health care centers in Nigeria have institutionalized strict reporting and follow-up for occupational percutaneous injuries and there is insufficient information on HIV transmission in the work place in Nigeria. This has resulted in questions being raised and

an increase in concern among surgeons and other healthcare workers in training as to the safety of caring and operating on patients with HIV infection. In a study by Agaba et al. (2012) on the awareness and knowledge of Human Immunodeficiency Virus (HIV) post exposure prophylaxis (PEP) among Nigerian family physicians indicated that the greater majority of Nigerian family physicians were knowledgeable on the concept of HIV post exposure prophylaxis and its effectiveness in inhibiting HIV transmission. Nonetheless, access to use and practice of HIV post exposure prophylaxis among family physicians in Nigeria is still sub-optimal and will require further training or education on HIV post exposure prophylaxis to improve practice and prevention.

Possible factors impacting the practice of PEP

Due to the advent of the Antiretroviral therapy (ART) HIV infection is now considered a chronic disease/illness whereby, healthcare workers are expected to provide constant care to persons living with HIV (Aminde et al. 2015). It is important to note that HIV infection presents a great threat to the health of healthcare workers and as such can lead to the failure or ineffectiveness of healthcare delivery worldwide (Odongkara et al. 2012). As such, the risk of work related HIV acquisition remains a threat to healthcare workers working in high endemicity areas for HIV infection (Aminde et al. 2015).

According to Esin et al. (2011) most doctors involved in their research study to assess the level of knowledge on post exposure prophylaxis (PEP) for HIV infection had inadequate knowledge about post-exposure prophylaxis (PEP) despite being at risk of infection. Lack of adequate knowledge is an important factor which impacts the practice of HIV post exposure prophylaxis among healthcare workers who are at high risk of

exposure and should know the procedures to be taken and who the first point of contact should be in the event of an occupational exposure to risk factors (Esin et al. 2011). In a study by Odongkara et al. (2012) on the prevalence of occupational exposure to HIV among health workers in Northern Uganda, the prevalence of HIV infection is 10.3% creating a high risk for infection for healthcare workers who attend to HIV patients. The researchers noted that irrespective of this high prevalence of HIV infection in the area, knowledge on the risk of occupational exposure to HIV among healthcare workers were limited. The risk of exposure to HIV infection was also noted to have resulted in anxiety among healthcare workers and the subsequent refusal or reluctance to attend to HIV positive patients requiring care. The possibility of limited knowledge on occupational exposure to HIV infection can affect the practice of post exposure prophylaxis for HIV among healthcare workers.

Barriers to the practice of PEP

The fear of stigmatization is one major barrier to the practice and utilization of HIV post exposure prophylaxis after an occupational exposure (Pieterse, 2011). For example in Malawi, the fear of judgment and stigmatization result in the delay of healthcare workers to get screened for HIV after an occupational exposure (Glauser, 2014) The rationale behind this fear is that when colleagues, patients or the community are made aware of the HIV status of a healthcare worker they become reluctant to receive care from that healthcare worker because they believe that the healthcare worker should be able to prevent exposure to HIV infection (Ncube et al. 2014). Issues such as challenges to adherence to medication, and cost of HIV prophylaxis drugs affect the

effective use and practice of PEP among healthcare workers and patients (Beymer et al.

2014). Another barrier to the utilization of HIV prophylaxis is the lack of knowledge on

post exposure prophylaxis among healthcare workers (Esin et al. 2011; Omorogbe et al.

2012). A review of literature show that healthcare workers are aware of post exposure

prophylaxis but few practice it and few have in-depth knowledge on how and when to

utilize post exposure prophylaxis for HIV (Nwankwo & Aniebue, 2011; Omorogbe et al.

2012; Ryback et al. 2013). As such, the importance of adequate knowledge on the

practice of post exposure prophylaxis for HIV cannot be over emphasized because it is

pertinent that healthcare workers be knowledgeable about HIV/AIDS prevention and

treatment, while adhering to universal precautions and maintaining quality care

(Delobelle et al. 2009). The importance of the practice of post exposure prophylaxis

among healthcare workers in Nigeria and the factors which impact its practice among

healthcare workers is the basis for this research study.

Summary

Chapter two provides an in-depth review on HIV infection in Sub-Saharan Africa

and the practice of post exposure prophylaxis. The theoretical foundation of this study

which is the Health Belief Model (HBM) was explored in depth to understand the

rationale behind the practice of HIV post exposure prophylaxis among healthcare

workers in Nigeria. This chapter explores the various medium by which healthcare

workers can be exposed to HIV infection via occupational exposures. Also, explored are

the various prevention strategies which healthcare workers can adhere to in order to

prevent occupational exposures which can result in HIV infection of the healthcare

worker and patient. This research study can be used as a source of information to address the factors that affect the practice and the barriers to the practice of HIV post exposure prophylaxis among healthcare workers at the National Hospital, Abuja. A review of literature on post exposure prophylaxis (PEP) for HIV shows that there is a need to address the gap in literature on the practice of HIV post exposure prophylaxis among healthcare workers especially in developing countries such as Nigeria who have a high prevalence of HIV infection.

Chapter three is the methodology section which covers the following topics: the research design and methodology, population and sample, survey instrument, the procedures used for collecting and analyzing the data.

Chapter 3: Research Method

Introduction

The purpose of this study was to identify the factors that affect the effective use of PEP for HIV among health care workers at the National Hospital Abuja, Nigeria. The participating health care workers in this study had their knowledge and attitude on the practice of PEP for HIV after an occupational exposure assessed quantitatively with the use of a survey instrument. The intent of this study was to correlate the dependent variables (HIV PEP use) with the independent variables (knowledge of HIV PEP, types of occupational injury, HIV PEP existing precautionary policies, and stigma). The findings from this research study can be used for educational purposes and future research to develop and implement policies in Nigerian hospitals that will ensure the effective practice of PEP for HIV among health care workers in Nigeria.

This chapter covers the following topics: the quantitative design and methodology for this research study, rationale for the choice of study, the relationship between research design and the research questions for the study, sample population, the sampling method, recruitment of study participants, and data collection procedures. I also present an explanation of how data were collected for the study, the tool that was used to collect the data, how data collected were analyzed, and the threats to data quality. Also, I described the possible threats to external, internal, and statistical validity and the ethical procedures.

Research Design and Rationale

I applied a cross-sectional design approach that focused on quantitative data collected through survey method among health care workers at the National Hospital,

Abuja, Nigeria. I chose to use a cross-sectional method of approach for this research

because I focused on the factors that impact the practice of PEP for HIV, which does not

require data to be collected over a period of time (Creswell, 2014). This method was used

to determine the relationship or correlation between the dependent variable and

independent variables, but not causality. I decided to use a survey tool for this research

study because it was economical and the data could be collected rapidly.

The uniqueness about a cross-sectional survey design is in the specificity of

questions asked by the researcher. Researchers use surveys to ask study participants

about their experiences that led to their current behavior under study. In order to

generalize the results of this study, the survey research method was used to answer

questions on knowledge and attitude that impact the practice of HIV PEP among health

care workers at the National Hospital, Abuja, Nigeria. The hospital represents a cross-

section of the society, and a survey design was used to ascertain the level of knowledge

among health care workers on the practice of PEP for HIV as a method of preventing

further HIV infection in the country.

The dependent variable for this research study, HIV PEP use, was defined as the

use of HIV prophylaxis after an occupational injury by a health care worker. The

independent variables for this research study were defined as

- HIV PEP knowledge: The level of knowledge health care workers have on
  the practice of HIV PEP

- Occupational injury: Types of occupational exposure sustained by a health
  care worker

- HIV PEP precautionary policies*:* These are existing protocols on HIV PEP in the hospital created to prevent or minimize HIV infection acquisition by health care workers

- Stigma: A set of negative and often unfair beliefs that a society or group of people have about something.

The sociodemographic information collected for this research study comprised of gender, age, marital status, number of years in clinical practice, average patient size, and religion; these were adjusted as covariates. The research questions and hypotheses driving this research were as follows:

1. What is the association between the level of knowledge of HIV PEP and practice of HIV PEP at the National Hospital, Abuja?

$H_0$1: There is no correlation between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1$1: There is a correlation between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

2. What is the relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja?

$H_0$2: There is no relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1$2: There is a relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

3.   What is the relationship between the existing precautionary policy on PEP

for HIV at National Hospital, Abuja and the practice of HIV PEP among

health care workers?

$H_0 3$: There is no relationship between the existing precautionary policy on HIV

PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

$H_1 3$: There is a relationship between the existing precautionary policy on HIV

PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

4.   What is the relationship between the fear of stigma and the use of PEP

among healthcare workers at the National Hospital, Abuja?

$H_0 4$: There is no relationship between the fear of stigma and the use of PEP

among health care workers at the National Hospital, Abuja.

$H_1 4$: There is a relationship between the fear of stigma and the use of PEP among

health care workers at the National Hospital, Abuja.

Population

The target population for this research was comprised of health care workers at

the National Hospital, Abuja, Nigeria who were at a high risk of contracting HIV as a

result of possible occupational exposures involving HIV-positive patients' blood and

bodily fluids. The health care workers were comprised of doctors (house officers,

residents, and consultants) and nurses (registered nurses, midwives, and laboratory

scientists). The population size of clinical services staff at the National Hospital Abuja

was 1,629, out of which 390 medical doctors, 648 are nurses, and 43 are laboratory

scientists. As such, total target population size for this research study comprising of doctors, nurses, and laboratory technicians was 1,081.

Sampling and Sampling Procedures

In this quantitative study, I used a stratified random sampling method to select study participants. The sample size of 191 study participants (health care workers) was stratified into three groups of doctors (74), nurses (74), and laboratory scientists (43). I chose a stratified sampling method to recruit study participants to ensure that the different groups of health care workers who care for HIV-positive patients in the hospital were represented adequately in the sample in order to increase the level of accuracy when estimating parameters (Frankfort-Nachmias & Nachmias, 2008). This also reduces the cost of carrying out the study. The stratification procedure does not violate the random selection principle because a probability sample can be drawn within each group (Frankfort-Nachmias & Nachmias, 2008).

The sample for this study was randomly drawn from the groups/strata. The simple random sampling technique involves the assignment of sampling units from the target population (health care workers) to an equal and known nonzero probability in being selected (Frankfort-Nachmias & Nachmias, 2008). I used this sampling technique to ensure that health care workers at the National Hospital, Abuja were independent of previous sampling units that will eliminate systematic bias from the selection procedure. I was confident that the findings obtained from the sample were representative of the real values found in the target population (Frankfort-Nachmias & Nachmias, 2008).

I included health care workers because they are in direct contact with HIV-positive patients admitted in the hospital. Exclusion criterions included workers in the hospital setting such as cleaners, security officers, administrative workers, and hospital maintenance workers who were not in direct contact with HIV-positive patients.

A target population sample size of 191 was obtained using the G* Power 3.1.7 analysis tool. Based on the chi-square test of independence (χ^2 test), the degree of freedom $df=$ (r-1) (c-1); therefore, $df=$ (3-1) (2-1), $df=$ 3.

The G* Power analysis tool was used to calculate power, effect size (medium), and alpha level ($\alpha=$ 0.05).

χ^2 tests - Goodness-of-fit tests: Contingency tables

Analysis: A priori: Compute required sample size

Input: Effect size w   =   0.3

            α err prob   =   0.0498843

            Power (1-β err prob)   =   0.95

            Df   =   3

Output: Noncentrality parameter λ =   17.190000

            Critical χ^2 =   7.819897

            Total sample size   =   191

            Actual power =   0.950140

Figure 2 below is a graphical representation of the goodness -of- fit tests showing Effect size w= 0.30, α err prob =0.05, Power (1-β err prob) =0.95, Df =3.
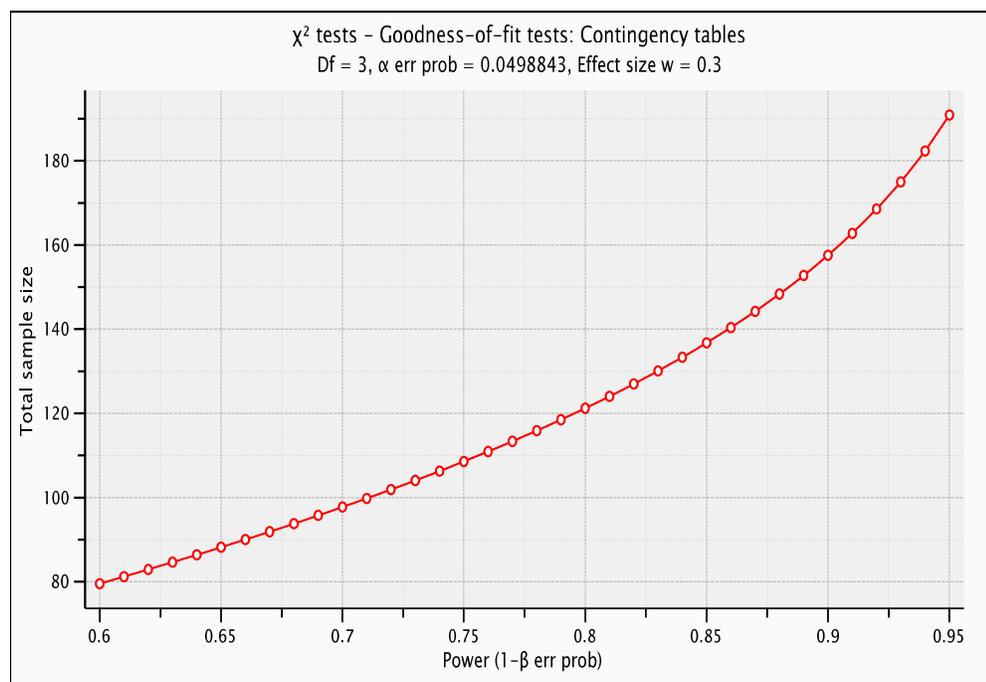
Figure 2. χ² tests - Goodness-of-fit tests

Procedures for Recruitment, Participation, and Data Collection

Recruitment of study participants entailed the development of a list of health care

workers (doctors, nurses, and laboratory technicians) who cared directly for HIV-positive

patients from the various departments and units at the National Hospital, Abuja, Nigeria.

The departments included department of medicine, pediatrics, out patients department

(OPD), laboratory, (Obstetrics and Gynecology) O&G, surgery, and special HIV clinic.

Each questionnaire was assigned a numerical identifier to ensure confidentiality and

anonymity. Permission was obtained from the chief medical director (CMD) and research

and ethics committee board of the National Hospital, Abuja, Nigeria to survey the health

care workers and obtain information on sociodemographic characteristics such as age,

sex, qualification, and years of experience I also assessed their knowledge, attitude, and

practice towards HIV PEP, history of needle stick injury, and reports of occupational injury.

The research study was announced to the health care workers at their departmental meeting prior to questionnaires being sent out. An informed consent form was attached to the questionnaire and given to the study participants. The informed consent is used to ensure that the study participant acknowledges understanding of the research study aims and objectives and understands that they can withdraw at any time.

I used the quantitative methods approach by conducting a survey based on the HBM factors (knowledge, awareness, attitudes, and the fear of stigma) that impact the practice of PEP for HIV among health care workers at the National Hospital, Abuja. Data collection entailed the use of structured, self-administered questionnaires distributed among health care workers who met the study participation. I also collected information on sociodemographic characteristics; perceived risk of HIV infection from occupational exposures; access and use of PEP; and knowledge, attitude, and practice towards PEP for HIV (Ekundayo & Ogbaini-Emovon, 2014).

At the end of data collection, study participants were debriefed and provided with information relating to the purpose of the research study. During this debriefing process, any misconceptions that the study participants had were addressed, and the study participant given the option to withdraw his or her data after as an ethical right (Gilston, 2016). My contact details were provided in the case that participants had further questions or comments relating to the research study (Gilston, 2016).

Instrumentation and Operationalization of Constructs

The instrument used for this research study was a 33-question, structured, self-administered questionnaire (Appendix A) designed from a combination of two survey instruments from Aminde et al. (2015) and Ekundayo and Ogbaini-Emovon (2014). The purpose of the questionnaire was to ascertain the factors that impact the practice of HIV PEP among health care workers at the National Hospital, Abuja. The survey instruments designed by these authors were relevant to addressing the research questions. The instruments were used in target populations that were similar to this stud with both studies based on samples from West African countries. The basis for developing this questionnaire was from a review of the literature. Permission to use these survey instruments was obtained from the authors (Appendix B and C). The survey instrument by Aminde et al. was used to assess the knowledge on PEP among medical students in Cameroun; the validity of the contents in the survey instrument was established through consultation with experts. The survey instrument created by Ekundayo and Ogbaini-Emovon was used to collect information on sociodemographic characteristics and to assess the knowledge, attitude, and practice towards PEP for HIV among resident doctors at the University of Benin Teaching Hospital Benin City, Nigeria. The validity of this survey instrument was established through a pretest conducted among 20 resident doctors who were not included in the study (Ekundayo & Ogbaini-Emovon, 2014). A pilot study is a pretesting of a particular research instrument that is used to provide advanced warning on areas where the main study might fail or instruments are inappropriate (van

Teijlingen & Hundley, 2001). There was no mention of the use of a Cronbach alpha value by Ekundayo and Ogbaini-Emovon to determine the reliability of the pilot study.

The first section of the instrument consisted of seven single-response questions about the sociodemographic information of respondents. The study participants were asked to choose a response to questions on sex, age, occupation, marital status, religion, and average patients seen daily to develop a profile on the respondents to establish independent variables for the study. The second section of the instrument consisted of two single-response questions of Yes/No about the knowledge and awareness of HIV PEP. Respondents were asked to respond to questions on the source of information on HIV PEP and history of training of health care workers on HIV PEP practice. The third section of the instrument was on the use of HIV PEP among health care workers; it was comprised of one multiple answer question and three single-response questions. The study participants were required to respond to questions on indicators for initiating HIV PEP to assess the need for PEP after an occupational exposure; the effectiveness of PEP as a preventive measure against HIV transmission to determine attitude towards PEP practice; the respondents' overall knowledge score on PEP practice to identify self-assessment score on PEP knowledge as an impact to PEP practice; and the willingness to recommend PEP to prevent HIV acquisition to ascertain the attitude and practice of healthcare workers to HIV PEP. The fourth section of the instrument consisted of five single-response questions and one multiple-response question about the knowledge and attitudes of health care workers towards the types of occupational exposures to HIV infection. The questions in this section consisted of the proportion of NSI from HIV-

infected persons, the self-assessment of health care workers on the risk of HIV

acquisition, the history of occupational exposures to HIV to identify common

occupational exposures experienced by health care workers, the frequency of

occupational exposures to identify the level of risk, circumstances of exposures to

determine circumstances of exposure that commonly lead to occupational injuries among

health care workers, and history of HIV screening after an occupational exposure to

identify factors that impact HIV prophylaxis practice. The fifth section of the instrument

consisted of eight single-response questions (Yes/No) and one multiple-response question

about the knowledge and attitude of health care workers on existing hospital

precautionary policies for HIV PEP after an occupational exposure. The study

participants were asked to respond to questions, such as awareness of existing hospital

policies on PEP, action to take in case of an occupational injury, injury reporting

behavior, knowledge of hospital policies to commence HIV PEP after an occupational

injury, duration of HIV PEP regimen after an exposure, reasons for noncompliance to

hospital protocol on HIV PEP after an occupational exposure, knowledge on other safety

measures to prevent HIV infection in the workplace, self-satisfaction with hospital HIV

prevent protocols, and the need for more training on HIV PEP. The sixth section of the

instrument consisted of four single-response questions about the health care workers and

the fear of stigmatization as a factor that impacts the practice of HIV PEP among health

care workers. Study participants were asked to provide responses to questions on

awareness of stigma attached to HIV infection, concerns about being stigmatized by

others after an occupational exposure, the impact of stigma on HIV screening, and the

impact of stigma on HIV PEP practice. I stopped reviewing here. Please go through the rest of your chapter and look for the patterns I pointed out to you. I will now look at Chapter 4.

Evidence of reliability of the instrument to be used was determined through internal consistency. Internal consistency for reliability is defined as the consistency of the results delivered in a test, which ensures that the various items measuring the different constructs result in consistent scores (Trochim, 2006a).

Evidence for validity was obtained by the use of construct validity whose focused is on whether the scores from a study serve as a useful purpose and has positive consequences when used in practice (Creswell, 2014). Construct validity is related to generalizing and as such, involves generalizing from research study to the concept of the study measures (Trochim, 2006b).

Operationalization

The dependent variable for this research study is: HIV post exposure prophylaxis (PEP) utilization. The independent variables for this study are: HIV post exposure prophylaxis knowledge, types of occupational injury, HIV post exposure prophylaxis precautionary policies, and stigma. In order to determine if there is a relationship between the variables, correlation statistics was used. The aim of the study was to determine if there is a correlation/association between the knowledge, beliefs, attitudes of healthcare workers at National Hospital Abuja and their utilization of post exposure prophylaxis for HIV.

Socio-demographic information collected for this research study and variables include:

Age: study participant age at the time survey will be carried out, 18-29, 30-39, 40-49, 50-59, 60+;

Marital status: the marital status of study participants at time of study, single, married, divorced or widowed;

Gender: male or female;

Number of years in the hospital: this is the total number of years the healthcare workers has worked at the National Hospital, Abuja, at time of survey, 1-5, 5-10,10 or more;

Patient size: this is the approximate number of patients the healthcare worker has attended to at time of survey, <50, 51-99, 100-199, 200-299, 300+;

HIV PEP Utilization: this is the dependent variable which will measure the practice of HIV PEP among healthcare workers. Responses from items 10 through 13 of the instrument were measured by counting the positive and correct responses so as to develop a raw score ranging from 0 to 3 on the practice of HIV PEP among healthcare workers. Logistic regression analysis was used to analyze the independent variables association to dependent variable of HIV PEP utilization.

HIVPEP knowledge: measures the study participant's knowledge of how HIV is transmitted and the prevention practices such as post exposure prophylaxis for HIV. Items 8 through to 9 (see Appendix A) in the questionnaire were measured by counting the positive responses on knowledge of HIV PEP practice to develop a raw score which

range from 0 to 2. Logistic regression analysis was used to analyze the independent

variables relationship to dependent variable of HIV PEP utilization.

Knowledge and attitude towards types of HIV occupational exposure: measures

the knowledge and attitude of study participants on occupational exposures which could

lead to HIV infection. Items 14 through 19 of the instrument were measured by counting

the positive responses on knowledge and attitude of healthcare workers on types of

occupational injuries to develop a raw score ranging from 0 to 6. Logistic regression

analysis was used to analyze the independent variables relationship to dependent variable

of HIV PEP utilization.

HIVPEP knowledge on existing precautionary policies: measures the participant's

knowledge and activities surrounding hospital policies on post exposure prophylaxis

(PEP) for HIV practice. Responses to items 20 through 29 of the questionnaire were

measured by counting positive and correct responses on hospital precautionary policies

and protocols on HIV PEP practice to develop a raw score ranging from 0 to 10. Logistic

regression analysis was used to analyze the independent variables correlation to

dependent variable of HIV PEP utilization.

Healthcare workers and Stigma: measures the attitude of healthcare workers

(study participants) towards the practice of PEP after an occupational exposure and the

fear of stigmatization. Responses (Yes/No) to items 30 through 33 were counted to obtain

a raw score ranging from 0 to 4 on the fear of stigma among healthcare workers. Logistic

regression analysis was used to analyze the independent variables relationship to

dependent variable of HIV PEP utilization.

Data Analysis Plan

The statistical software used to analyze data was the SPSS statistical software 21.0. The data cleaning process for this research study ensures that error which may occur in spite of careful study design will be identified and corrected to minimize the impact on study results (Van den Broeck, Cunningham & Herbst, 2005). While cleaning data, there were several errors to look out for such as;

- missing data which was coded as "999"

- not applicable or blank which was coded as "0"

- any typing errors on data entry

- any column shift, whereby data for one variable column is entered under the adjacent column

- any fabricated or 'made up' data

- any coding errors

- any measurement errors

The three procedures which can be used to detect such errors in a study are; Descriptive statistics, Scatter plots and Histograms. Detection using descriptive statistics will require looking at the minimum and maximum values, the means, median and standard deviations. The histogram provides an easy method of detecting errors in distribution such as age, sex, or occupation. Scatter plots are used to identify outliers or values of a variable which are different from the expected values.

The following research questions and hypotheses were addressed in this research.

1. What is the association between the level of knowledge of HIV PEP and practice of HIV PEP at the National Hospital, Abuja?

$H_0 1$: There is no association between the level of knowledge on HIV PEP and practice of HIV PEP among healthcare workers at National Hospital, Abuja.

$H_1 1$: There is an association between the level of knowledge on HIV PEP and practice of HIV PEP among healthcare workers at National Hospital, Abuja.

2. What is the relationship between types of occupational injury and the practice of HIV post exposure prophylaxis among healthcare workers at National Hospital, Abuja?

$H_0 2$: There is no relationship between types of occupational injury and the practice of HIV post exposure prophylaxis among healthcare workers at National Hospital, Abuja.

$H_1 2$: There is a relationship between types of occupational injury and the practice of HIV post exposure prophylaxis among healthcare workers at National Hospital, Abuja.

3. What is the relationship between the existing precautionary policy on post exposure prophylaxis at National Hospital, Abuja and the practice of HIV PEP among healthcare workers?

$H_0 3$: There is no relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among healthcare workers.

$H_1 3$: There is a relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among healthcare workers.

4. What is the relationship between the fear of stigma and the use of PEP among healthcare workers at the National Hospital, Abuja?

$H_0$4: There is no relationship between the fear of stigma and the use of PEP among healthcare workers at the National Hospital, Abuja.

$H_1$4: There is a relationship between the fear of stigma and the use of PEP among healthcare workers at the National Hospital, Abuja.

The following steps were followed in the analysis of study data;

Step 1: the number of healthcare workers who responded to the study was specified. The demographic data of the respondents will be presented in a table format.

Step 2: respondent and non-respondent analysis was used to determine response bias. It is important to establish response bias because it informs the researcher on if the survey results would have been impacted if the non-respondents had responded (Creswell, 2014).

Step 3: this step entailed the description of descriptive analysis of data for research variables.

Step 4: this step comprised of the statistical analysis inputted into software program (SPSS) used to test the research questions and hypotheses. Statistical tests such as, logistic regression and Chi-Square tests were used to test research questions and hypotheses.

Step 5: comprised of presentation of study results in tables and its interpretation.

Addressing the research questions through data collected involved the comparison of groups and relationship between variables. The statistical tests used to address the research questions and hypotheses were Chi-square test of Independence and logistic regression tests.

The data obtained from RQ1 was analyzed using the Chi-square test of independence to look at the two-way associations. The logistic regression analysis was used to adjust for relevant variable such as demographic and clinical variables of interest looking at the independent variable association to the dependent variable of HIV PEP utilization.

The data obtained from RQ2 was analyzed using logistic regression test. The logistic regression analysis analyzed the independent variable- types of occupational injury-association to the dependent variable of HIV PEP utilization.

The data obtained from RQ3 was analyzed using logistic regression test. The logistic regression analysis analyzed the independent variable – existing precautionary policies- association to the dependent variable of HIV PEP utilization.

Data obtained from RQ4 was analyzed using logistic regression analysis. The logistic regression analysis analyzed the independent variable – fear of stigma- association to the dependent variable of HIV PEP utilization.

Data analysis was carried out to assess any significant relationships between demographic data obtained and data related to HIV PEP utilization to determine if there are covariates.

Threats to Validity

During a research study, it is pertinent to recognize potential threats to external validity of the study. As such, there should be in place a plan to minimize such threats. According to Creswell (2014) external validity threats occur when researchers draw incorrect inferences from a sample data to other persons, settings, and past or future

situations. This is as a result of the characteristics of individuals participating in the study, the uniqueness of the setting selected, and the time chosen to conduct the research (Creswell, 2014). In this research study, one threat to external validity is the interaction effects of selection. Due to the narrow characteristics of selecting only healthcare workers in a hospital setting who are at risk of being exposed to HIV infection through occupational injuries the researcher will not be able to generalize results from this study to individuals who do not have the same characteristics as the study participants (Creswell, 2014). As such, the researcher cannot generalize results to other groups with different characteristics. The interaction of study participants within the hospital setting means that a researcher cannot generalize to individuals in another setting (Creswell, 2014). To address this threat, the researcher will need to conduct additional research in new settings to determine if the same results will be achieved (Creswell, 2014). This research study was cross-sectional meaning that it was conducted at a particular time. Therefore, the interaction of history could be a threat to validity because the research is time-bound and the researcher cannot generalize study results to past or future events (Creswell, 2014). The researcher will have to replicate the research study in order to determine if the results will be the same in later time in comparison with an earlier time (Creswell, 2014).

Internal validity threats in a research study occur due to the experiences of study participants that threaten the ability of the researcher to draw accurate inferences from data collected about a target population (Creswell, 2014). For this research study, one potential internal validity threat was the threat of selection bias. The study participants

who were selected for this study had to meet the selection criteria of healthcare workers at the National Hospital, Abuja who are at risk of exposure to HIV infection through various types of occupational injuries. To address this form of internal threat, the researcher had to select study participants randomly so that there is a probability that characteristics will be equally distributed among participants (Creswell, 2014). Another threat to internal validity for this study was mortality. There is likelihood that during the study some participants will withdraw from the study due to many unknown reasons. Therefore, the researcher can address this by recruiting a large sample to accommodate possible participant withdrawal from the study (Creswell, 2014).

Expectancies of the evaluator and apprehension of evaluation are two potential threats to construct validity. In a research study, in order for the findings to be meaningful and not solely descriptive the instrument used must display construct validity (Frankfort-Nachmias & Nachmias, 2008). It is important that the researcher is aware of the potential to influence participants and therefore be aware when communicating with participants with what they say, write and body language (Trochim, 2006). Due to the participant's fear of being evaluated, they may perform poorly but in some cases participants may perform extremely well in their desire to be perceived as smart. As such, the survey instrument used in this study was completed in an environment in which the participants were comfortable and not under any form of pressure.

Ethical Procedures

The adherence to ethical procedures and standards when conducting a research study with human participants is important (Rudestam & Newton, 2007). Human

participants are not to be exposed to any form or at least minimal risk and as such informed consent was obtained before this research study could commence. Study participants were only approached to enroll for this research study after consent has been obtained from the Chief Medical Director (CMD) at the National Hospital, Abuja, and Research and Ethics Committee of National Hospital Abuja. The purpose of this research study and any potential or perceived impact of participation were explained to the study participants before they could participate in the study. Also, study participants were given the opportunity to ask questions in a focus group discussion with regards the study for clarification and voice any concerns they may have towards the study. Once all concerns had been addressed by the researcher, the study participants who met the inclusion criteria were asked to sign an informed consent form.

The informed consent form included information that all data to be collected will be confidential and only the researcher may have access to data. The study participants were made aware that they could withdrawal from the study at any stage and participation in this research study is voluntary. An explanation was provided stating that there will be no physical threats or benefits associated with this study but there might be emotional duress due to the nature of some questions asked about their history of occupational injuries and stigmatization of HIV patients and caregivers. As such, study participants were not mandated to answer questions that make them feel uncomfortable.

Permission to conduct research study was obtained from Walden University Institutional Review Board after filling the IRB application form.

Ethical concerns of informed consent form were addressed by ensuring that participants only sign the informed consent forms after being debriefed on the research study. Also, hard copies of recruitment materials such as survey and data were stored in a locked cabinet which only the researcher will have access to. Data collected were stored in the researcher's laptop which is password protected and will not be shared to any third party. The confidentiality section of the informed consent form included an explanation of data storage so that study participants are assured of anonymity and confidentiality during the research process. The results from this research will be used for educational purposes.

Summary

Chapter three described the research study design and sampling methods used within the framework of quantitative data collection using a survey method. The dependent variable was identified and the independent variables such as HIV PEP Utilization, HIV PEP knowledge, Types of occupational injury, HIV PEP precautionary policies and Stigma were described. The research questions, null and alternative hypotheses were stated. The population, healthcare workers comprising of medical doctors, laboratory scientists and nurses at the National Hospital, Abuja were described, and the statistical tests, Chi-square test of Independence and logistic regression and the effect size of 0.3, the power level of 0.95, and the alpha level of 0.05. The methodology describes the demographic data to be collected and the survey tool that will be used. SPSS 21.0 was used for data entry, data management and data analysis and a five step data analysis plan was described. Potential threats to external and internal validity,

construct validity and how the researcher would address these were described. The

ethical procedures to be addressed were described with the use of informed consent forms

and need for IRB approval. Finally the manners in which data storage and security were

achieved were also addressed in this chapter. In Chapter 4, presentations and descriptions

of the results of data analyses are given.

Chapter 4: Results

Introduction

The purpose of this study was to assess the factors that affect the practice of PEP for HIV among health care workers at the National Hospital Abuja, Nigeria. The following research questions and hypotheses were used as a guide for this research study.

1. What is the association between the level of knowledge of HIV PEP and practice of HIV PEP at the National Hospital, Abuja?

$H_0 1$: There is no association between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1 1$: There is an association between the level of knowledge on HIV PEP and practice of HIV PEP among health care workers at National Hospital, Abuja.

2. What is the relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja?

$H_0 2$: There is no relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

$H_1 2$: There is a relationship between types of occupational injury and the practice of HIV PEP among health care workers at National Hospital, Abuja.

3. What is the relationship between the existing precautionary policy on PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers?

$H_0$3: There is no relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

$H_1$3: There is a relationship between the existing precautionary policy on HIV PEP at National Hospital, Abuja and the practice of HIV PEP among health care workers.

4.   What is the relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital Abuja?

$H_0$4: There is no relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital, Abuja.

$H_1$4: There is a relationship between the fear of stigma and the use of PEP among health care workers at the National Hospital, Abuja.

The results pertaining to these research questions will be presented in this chapter. The results from the descriptive statistical analysis performed on the sociodemographic descriptive are defined followed by the statistical analysis for each research question. A summary concludes the chapter.

Data Collection

Data collection began in September 2016 and ended in October 2016. Data collection occurred as described in Chapter 3. Recruitment of health care workers at the National Hospital Abuja, Nigeria took place via distributing structured questionnaires (Appendix C) to study participants in various departments at the hospital. The various heads of departments encouraged health care workers present to complete the survey stating their belief in the importance of the research study.

Out of the 220 surveys distributed, 182 completed surveys were returned. Out of the 38 surveys not returned, 14 were medical doctors, seven were lab scientists, and 17 were nurses. Some of the respondents did not answer all the questions on the survey' those questions not answered were reported as missing in the tables.

Social Demographic Descriptive

Table 1 includes the sociodemographic description of participants: sex, age, occupation, marital status, average patients seen daily, religion, and years in clinical practice. A majority of the respondents were female 122 (67%); there were 60 male respondents (33%). A majority of the respondents were within the 18-39 age range with 153 (84.1%) while 15.9% of respondents were within 40-59 years of age. Among the respondents, 60 (33%) were medical doctors, 84 (46.2%) were nurses and 38 (20.9%) were lab scientists. There were 95 (52.8%) single respondents, 83 (46.1%) married respondents, two (1.1%) divorced respondents, and 2 (1.1%) missing data, which was a result of nonresponse of the question. For average patients seen daily by respondents, 45 (24.7%) saw about <50 patients daily, 55 (30.2%) saw between 51-99 patients daily, 49 (26.9%) saw between 100-199 patients daily, 23 (12.6%) saw between 200-299 patients daily, while five (2.7%) saw about 300+ patients; there were five (2.7%) missing data. There were 145 (79.7%) Christians, 35 (19.2%) Muslims, and 2 (1.1%) missing. For years of clinical practice, 35 (19.2%) had between 1-5 years of clinical practice, 40 (22%) had between 5-10 years of clinical practice experience, and 106 (58.6%) had above 10 years' experience in clinical practice; only one (0.5%) did not respond.

Table 1

Socio Demographic Characteristics of the study participants

Variable	n	%
Sex		
Male	60	33.0
Female	122	67.0
Age		
18-39	153	84.1
40-59	29	15.9
Occupation		
Medical Doctor	60	33.0
Nurse	84	46.2
Lab Scientist	38	20.9
Marital Status		
Single	95	52.8
Married	83	46.1
Divorced	2	1.1
Missing	2	1.1
Average patients seen daily		
<50	45	24.7
51-99	55	30.2
100-199	49	26.9
200-299	23	12.6
300+	5	2.7
Missing	5	2.7
Religion		
Christianity	145	79.7
Muslim	35	19.2
Traditional Practices	0	0
Missing	2	1.1
Years of Clinical Practice		
1-5 years	35	19.2
5-10years	40	22.0
10 years and above	106	58.2
Missing	1	.5

Table 2

HIV PEP-Related Variables

Variables		n	%
HIV occupational exposure	Yes	96	52.7
	No	86	47.3
PEP use (among those exposed)			
	Yes	80	76.9
	No	24	23.1
PEP knowledge			
	Yes	177	97.3
	No	5	2.7
PEP training	Yes	154	88.0
	No	21	12.0
Types of exposure	No exposure	86	47.3
	Needle stick injury	34	37.0
	Splashing of Blood/body fluids	12	13.0
	Both splashing of blood/body fluids	46	50.0
Awareness of existing policy			
	Yes	176	96.7
	No	6	3.3
Fear of stigma			
	HIV stigma	178	98.3
	HIV stigma by others	102	57.3
	Stigma & HIV Screening	154	84.6
	Stigma & PEP practice	167	92.3

According to the study results, 53% of health care workers had been exposed to HIV infection through occupational injury while 47% had never been exposed to HIV infection via occupational exposure at the National Hospital Abuja. Among those exposed to HIV infection after sustaining an occupational injury, 37% of health care workers were exposed to HIV infection through NSI, 13% were exposed via splashing of blood and body fluids, and 50% of health care workers were exposed to HIV infection through both NSI and splashing of blood and body fluid occupational exposures. I found that 77% of health care workers practiced PEP after being exposed to HIV through an occupational injury while 23% of health care workers did not practice PEP.

I found that 97% health care workers had a good knowledge of PEP practice and 3% had no knowledge on PEP practice. In addition, 97% of health care workers at the National Hospital Abuja were aware of the hospital existing precautionary policies on PEP practice while 3% were not aware. I found that 98% of respondents at National Hospital Abuja agreed that there is stigma attached to HIV infection, and 57% of health care workers at National Hospital Abuja feared being stigmatized by others when exposed to HIV infection after an occupational injury while 85% of health care workers agreed that the fear of stigma affected the likelihood of screening for HIV infection after an occupational exposure to HIV infection. I found 92% of health care workers at National Hospital Abuja agreed that the fear of stigma affected the practice of PEP for HIV infection after an occupational exposure to HIV infection.

Test of Hypothesis 1

A chi-square test for independence was used to look at the two-way associations addressing Research Question 1 (RQ1).

The level of knowledge among health care workers at National Hospital, Abuja was statistically tested using a chi-square test of independence to determine the correlation between completions of PEP after being exposed to HIV at the workplace (hospital). Table 3 shows that 73% of the participants with low levels of knowledge of PEP practices were more likely to complete PEP after an occupational exposure while 85% with a high level of knowledge of PEP practice were likely to complete PEP after an occupational exposure to HIV.

Table 3

Cross Tabulation of PEP Knowledge and PEP Utilization

| | | | PEP Utilization | | Total |
			No	Yes	
Knowledge of PEP	No	n	10	27	37
		Expected count	7.6	29.4	37.0
		% knowledge of PEP	27.0%	73.0%	100.0%
		n	7	39	46
		Expected count	9.4	36.6	46.0
	Yes	% Knowledge of PEP	15.2%	84.8%	100.0%
Total		n	17	66	83
		Expected count	17.0	66.0	83.0
		% knowledge of PEP	20.5%	79.5%	100.0%

Note. N = 83

However, in the chi-square test, I found that there was no statistically significant

association between the level of knowledge of PEP and PEP practice among HIV

occupationally exposed health care workers at $\chi^2 = 1.76$, $p > 0.05$ (Table 4). This finding

may be attributed to the small sample size resulting from a low response rate. As such,

the null hypothesis was not rejected.

Table 4

Chi-Square Test

	Value	f	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson chi-square	1.756[a]		.185		
Continuity correction[b]	1.106		.293		
Likelihood ratio	1.748		.186		
Fisher's exact test				.274	.147
Linear-by-linear association	1.735		.188		
N of valid cases		3			

Note. a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.58.
b. Computed only for a 2x2 table

Test of Hypothesis 2

Logistic regression was used to test for the relationship between types of occupational injury and the practice of PEP among health care workers at National Hospital Abuja after such exposures.

Table 2 indicated that 39% of health care workers had been exposed to HIV infection through NSI, 13% had been exposed to HIV infection via splashing of blood/bodily fluids on mucosal surfaces, and 50% of health care workers had had both NSI and splashing of blood/bodily fluids exposures to HIV infection.

Table 5

Cross Tabulation of Occupational Exposure to HIV and PEP Utilization

			PEP utilization		Total
			No	Yes	
	Needle stick injury	*n*	5	29	34
		% Type of exposure	14.7%	85.3%	100.0%
	Splashing of blood/bodily fluid on mucosal surfaces	*n*	3	9	12
Type of exposure		% Type of exposure	25.0%	75.0%	100.0%
	Both needle stick injury and splashing of blood/bodily fluid on mucosal surfaces	*n*	10	33	43
		% Type of exposure	23.3%	76.7%	100.0%
		n	18	71	89
Total		% Type of exposure	20.2%	79.8%	100.0%
		% of Total	20.2%	79.8%	100.0%

Note. N= 89

Table 5 shows that 85% of health care workers who were exposed to HIV infection via NSI completed PEP, 75% of health care workers exposed to HIV infection via splashing of blood/bodily fluid on mucosal surfaces completed PEP, and 76% who were exposed to HIV infection via NSI and splashing of blood/bodily fluid on mucosal surfaces completed PEP.

In the logistic regression (see Table 6), I found that there was no significant difference ($p= 0.595$) in health care workers' PEP use and the various types of occupational exposures: NSI and splashing of blood/bodily fluid on mucosal surfaces among health care workers. Therefore, the null hypothesis was not rejected.

Table 6

Variables in the Equation for types of occupational injuries

	B	S.E.	Wald	df	Sig.	OR	95% C.I. for OR Lower	Upper
			1.039	2	.595			
Needle stick Injury								
Splashing of blood	-.659	.824	.640	1	.424	.517	.103	2.601
Both Needle Stick and Splashing of Blood	-.564	.604	.872	1	.350	.569	.174	1.859
Constant	1.758	.484	13.178	1	.000	5.800		

Note. N= 89; $\chi 2 = 1.09$, p > 0.05

Test of Hypothesis 3

Logistic regression was used to test for the relationship between PEP utilization

and the awareness of existing precautionary policy for HIV prevention at National

Hospital Abuja, Nigeria addressing research question 3(RQ3).

Table 7

Cross tabulation of awareness of the existing Precautionary Policy and PEP Utilization

			PEP Utilization		Total
			No	Yes	
Existing Precautionary Policy	Yes	n	22	78	100
		% within Existing Precautionary Policy	22.0%	78.0%	100.0%
		% of Total	21.2%	75.0%	96.2%
	No	n	2	2	4
		% within Existing Precautionary Policy	50.0%	50.0%	100.0%
		% of Total	1.9%	1.9%	3.8%
	Total	n	24	80	104
		% within Existing Precautionary Policy	23.1%	76.9%	100.0%
		% of Total	23.1%	76.9%	100.0%

Note. N= 104

Table 7 shows the results of cross tabulation carried out among respondents

(healthcare workers) on the existing precautionary policies at the National Hospital,

Abuja and the utilization of PEP. I found that 78% of healthcare workers who are aware

of existing PEP Precautionary policy at the hospital were more likely to utilize PEP while

22% of healthcare workers aware of existing PEP precautionary policy were not going to

utilize PEP as a means of HIV prevention when exposed. Nevertheless, 50% of

healthcare workers not aware of existing PEP precautionary policy at National Hospital, Abuja were likely to utilize PEP and 50% of healthcare workers not aware of existing PEP precautionary policy were likely not going to utilize PEP for HIV prevention after an occupational exposure.

Table 8

Variables in the Equation for Awareness of existing precautionary policy

	B	S.E.	Wald	df	Sig.	OR
Awareness of existing Precautionary Policy	-1.266	1.029	1.514	1	.219	.282
Constant	1.266	.241	27.489	1	.000	3.545

Note. N= 104; χ²= 1.09, p > 0.05;

Logistic regression (table 8) carried out indicates that there is no significant difference between the awareness of existing precautionary policy at National Hospital Abuja and PEP utilization among healthcare workers after an occupational exposure to HIV (*p*=0.219). As such, the null hypothesis is not rejected.

Test of Hypothesis 4

Logistic regression was used to test for the relationship between the fear of stigma for HIV and the practice of PEP among healthcare workers at National Hospital Abuja after occupational exposure to HIV.

Table 9

Cross tabulation for Fear of Stigma and PEP Utilization

| | | | PEP Utilization | | Total |
			No	Yes	
	Fear of Stigma and HIV infection	n	84	94	178
		% within Fear of Stigma and HIV infection	47.2%	52.8%	100.0%
		% of Total	46.4%	51.9%	98.3%
	Fear of Stigma by others	n	15	42	57
		% within Fear of Stigma by others	26.3%	73.7%	100.0%
		% of Total	14.6%	40.8%	55.3%
Fear of Stigma					
	Fear of stigma and HIV screening	n	71	83	154
		% within Fear of stigma and HIV screening	46.1%	53.9%	100.0%
		% of Total	39.0%	45.6%	84.6%
	Fear of stigma and practice of PEP	n	77	90	167
		% within Fear of stigma and practice of PEP	46.1%	53.9%	100.0%
		% of Total	42.5%	49.7%	92.3%

Note. N= 103

    Table 9 shows that 53% of healthcare workers at the National Hospital Abuja who believe that stigma is attached to HIV infection will utilize PEP after an occupational exposure. I found that 74% of healthcare workers who fear being stigmatized by others after an occupational exposure to HIV are more likely to utilize PEP while 54% who fear being stigmatized while screening for HIV after sustaining an occupational exposure to HIV are more likely to utilize PEP and 54% who fear being stigmatized while practicing PEP after an occupational exposure to HIV would still complete PEP.

Table 10

Variables in the Equation of fear of Stigma

		B	S.E.	Wald	df	Sig.	OR
Step 1ᵃ	Fear of Stigma s_31(1)	.529	.492	1.155	1	.282	1.696
	Constant	1.030	.301	11.717	1	.001	2.800

Note. N= 103; χ^2 = 1.09, p > 0.05;

Table 10 shows the results of logistic regression carried out to test the relationship between fear of stigma among healthcare workers at National Hospital, Abuja and PEP utilization which indicates that there is no significant difference (*p*= 0.282) between the fear of stigma and the practice of PEP. Therefore, the null hypothesis is not rejected.

Table 11

Summary of Data Analyses and Hypothesis Testing

Hypothesis	Dependent Variable	Independent Variable	Statistical Test	Sig.	Hypothesis Outcome
1	PEP Practice	Level of Knowledge	Chi-Square Test of Independence	0.274	Null is not Rejected & Alternative Rejected
2	PEP Practice	Occupational Exposures	Logistic Regression	0.595	Null is not Rejected & Alternative Rejected
3	PEP Practice	Awareness of existing precautionary practices	Logistic Regression	0.219	Null is not Rejected & Alternative Rejected
4	PEP Practice	Fear of Stigma	Logistic Regression	0.282	Null is not Rejected & Alternative Rejected

Summary

In Chapter 4, the results of data analyzed were presented and described. This chapter includes the research purpose, a description of the demographics, statistical testing of research questions and hypotheses, and statistical findings. This research study examined data collected through the survey method using self-administered questionnaires (Appendix C) distributed among healthcare workers at the National Hospital Abuja, Nigeria to determine the statistical associations between the independent variables (HIV PEP knowledge, Occupational injury report, awareness of HIV PEP precautionary policies, Stigma) and the dichotomous outcome variable (HIV PEP Utilization). A total of 182 healthcare workers were sampled for this research study.

Using Chi-Square test of Independence and logistics regression the results of participants surveyed were examined to either prove or disprove the null hypotheses. For research question 1Chi-Square test shows that there is no statistical significant association between the level of knowledge of HIV PEP and HIV PEP utilization among occupationally exposed healthcare workers ($p = 0.274$); therefore, the null hypothesis is not rejected. For research question 2 logistic regression carried out suggests that there is no significant difference in healthcare workers' PEP Utilization and the various types of occupational exposures ($p = 0.595$). Therefore, the null hypothesis is not rejected. For research question 3 the result from logistic regression carried out indicates that there is no significant difference between the awareness of existing precautionary policy at National Hospital Abuja and PEP utilization among healthcare workers after an occupational exposure to HIV ($p = 0.219$); therefore, the null hypothesis is also not rejected. Lastly, for Hypothesis 4 the result from logistic regression carried out to test the relationship between fear of stigma and PEP utilization also shows that there is no significant association ($p = 0.282$) between the fear of stigma and the practice of PEP and as such, the null hypothesis again is not rejected. As such, it is pertinent to note that none of the four research questions yielded any positive associations with the

In Chapter 5, detailed discussions and interpretations of findings of the study along with implications of the research on social change, recommendations, and conclusions are made.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this research study was to identify the factors that impact the practice of PEP for HIV among health care workers at the National Hospital, Abuja, Nigeria. I used a cross-sectional design to collect quantitative data through a survey method among health care workers at the National Hospital, Abuja, Nigeria. This research method was used to determine the relationship or correlation between the dependent variable and independent variables, but not causality. I used a survey tool for this research study because it is economical and data can be collected rapidly. The uniqueness about a cross-sectional survey research design is in the specificity of questions asked by the researcher. This survey research method was used to answer questions on factors (knowledge and attitude) that impact the practice of HIV PEP among health care workers at the National Hospital, Abuja, Nigeria.

Interpretation of the Findings

The findings from this study are mostly in line from the findings from other studies. However, the results in this study portray a change in trends of significant predictors of the outcome variables. For RQ1, I found that there was no significant association between the level of knowledge of PEP and PEP practice among HIV occupationally exposed health care workers at the National Hospital, Abuja ($p = 0.274$). According to Aminde et al. (2015), adequate knowledge and practices on PEP for HIV among health care workers are crucial for HIV prevention. Therefore, it is pertinent that

the health care workers are educated frequently on the practice of PEP to reduce the spread of HIV.

For RQ2, I found that there was no significant relationship in health care workers' PEP use and the various types of occupational exposures ($p=0.595$). Health care workers are exposed to a lot of sharps as they are primarily responsible for the administration of medications including intravenous drugs and carrying out surgical procedures (Omorogbe et al. 2012). As such, health care workers at the National Hospital Abuja should be trained on reporting such exposures as they occur and the practice of PEP for HIV and other infections.

For RQ3, I found that there was no significant relationship between the awareness of existing precautionary policy at National Hospital Abuja and PEP use among health care workers ($p=0.282$). It is important that health care workers are aware of the existing precautionary policies at the hospital.

For RQ4, I found that there was also no significant relationship between the fear of stigma and the practice of PEP among health care workers at National Hospital Abuja ($p=0.282$). The culture of silence in Nigeria plays a role in HIV prevention programs. The fear of stigma among health care workers and their community may result in noncompliance of PEP practice, which increases the spread of HIV.

The knowledge on PEP among health care workers at the National Hospital Abuja had no impact on the practice of PEP after an occupational exposure to HIV infection. This is in contrast with studies by Agaba et al. (2012) and Ekundayo and Ogbaini-Emovon (2015) whereby good level of knowledge on PEP resulted in the practice of PEP

among health care workers. Esin et al. (2012) found that the overall level of knowledge of PEP for HIV infection was low among health care workers, which affected the practice of PEP after an occupational injury, such as NSI. Mashoto, Mubyazi, Mohamed, and Malebo (2013) found that though a high proportion of health care workers (96.3%) understood that they were at risk of occupational exposure to HIV; a quarter of the health care workers were not aware of whom to contact in the event of occupational exposure, which is one of the basic requirements before commencing PEP. One third of health care workers did not have comprehensive knowledge on the causes of occupational HIV transmission and did not know when PEP is needed (Mashoto et al. 2013). Mashoto et al.'s findings are in alignment with my findings in that the knowledge on PEP is insignificant to the practice of PEP among health care workers after an occupational exposure to HIV.

I found that the types of occupational exposure had no statistical significant impact on the practice of PEP among health care workers. This is in line with Agaba et al. (2012) who found that, irrespective of the high exposure rate via various forms of occupational injuries, only a few participants practiced PEP for HIV. In contrast, Omorogbe et al. (2012) revealed that though the knowledge of injection safety among health care workers (nurses) at six mission hospitals was poor, their practice of PEP following NSI was encouraging.

I found no statistical significance between knowledge of existing precautionary policies at the National Hospital Abuja and the fear of stigma among health care workers and its impact on the practice of PEP after an occupational exposure. In contrast with the

findings of this study, Ekundayo and Ogbaini-Emovon (2014) found that the lack of

information about existing HIV-PEP policy and fear of stigmatization were the reasons

for poor practice of PEP among health care workers after an occupational exposure at

University of Benin Teaching Hospital, Nigeria. Also, Esin et al. (2011) found that

although 62.1% of health care workers were aware of the existing precautionary policy at

the hospital, more than half of the participants did not know the first aid procedure to

carry out following an occupational injury to HIV infection. As such, there was a gap in

applying theory to practice among health care workers at Federal Medical Centre Gombe,

Nigeria. This supports findings from my study that knowledge on existing precautionary

policies on PEP at National Hospital Abuja among health care workers has no impact on

the practice of PEP after an occupational exposure to HIV.

The HBM was used as the theoretical foundation for this research study. I used

the HBM to describe the possible actions that health care workers are bound to take after

an occupational exposure to HIV. The HBM is a psychological model that is used to

explain and predict health behaviors by focusing on the attitudes and beliefs of

individuals (University of Twente, 2012). The HBM was first developed in the 1950s in

response to the failure of a free TB health screening program (University of Twente,

2012). The HBM has since been adapted to explore a variety of long- and short-term

health behaviors towards health-related issues, such as the transmission of HIV/AIDS.

The HBM is based on the understanding that a health care worker would take a

positive health action of using PEP after an occupational exposure to prevent HIV

infection. When a health care worker believes that he/she is susceptible to HIV infection

after an occupational exposure, she or she perceives the severity of such an occupational exposure resulting in HIV infection as significant enough for a health care worker to avoid. Therefore, the recommended health action of using HIV PEP to prevent HIV infection is taken. The perceived fear of stigma from others among health care workers can result in barriers to using PEP for HIV after an occupational exposure. Reminders in the form of PEP policy on posters placed in strategic and accessible areas of the hospital ensures that health care workers have cues to action. Health care workers acquire self-efficacy through information and trainings on the use of PEP after an occupational exposure to HIV.

In this study, I looked at the relationship between factors (health care workers' beliefs and knowledge about HIV infection) acquired through occupational injury and the impact those beliefs and knowledge had on their attitudes towards practicing PEP in the hospital. Their behavioral intention regarding HIV prevention activities in the hospital was based on their perception of whether the activity was worthwhile and would result in a positive health outcome. I hypothesized that the attitudes of health care workers who were not knowledgeable and who or had negative beliefs about HIV infection would not use HIV PEP. Possibly due to the small sample size, I found no significant association between beliefs (the fear of stigma) and behavioral intent of HIV PEP use; there was also no association found between knowledge of PEP and PEP use.

In the last 30 years, HIV infection has become one of the main communicable diseases in the Sub-Saharan African region (Aminde et al. 2015). In Nigeria, the progressive spread of HIV/AIDS continues to be of a public health concern. Nigeria is

among the countries with the highest number of people living with HIV/AIDS apart from

South Africa and India (Monjok, Smesny, & Essien, 2009). Health care workers with

direct contact to HIV positive patients are at a high risk of acquiring HIV infection from

infected blood and bodily fluids through occupational injury (Ekundayo & Ogbaini-

Emovon 2014). The risk of transmission that health care workers face from exposure to

an HIV-infected person is estimated at 0.3% for percutaneous exposures and 0.09% for

mucous membrane or nonintact skin exposures, with risk modulated by exposure and

source-patient characteristics (Goldschmidt, 2011). According to Shivalli (2014),

prevention of blood/body fluid exposure through safer practices, barrier precautions, safer

needle devices, and other innovations are the best ways to prevent HIV and other blood-

borne/body fluid pathogens. Occupationally acquired HIV poses greater psychosocial

challenges to health care workers due to the associated stigma and discrimination

(Shivalli, 2014). As such, an understanding of the professional behavior is essential to

assess and minimize the occupational exposure to HIV among health care workers

(Shivalli, 2014). In this study, I looked at how factors impact the practice of PEP among

health care workers at the National Hospital Abuja, Nigeria.

Limitations of the Study

There were several limitations to this research study that impacted the results. The

sample size that was used to carry out the study was a limiting factor to the research

study. The G* Power analysis tool was used to calculate the level of power at .95,

medium effect size of 0.30 and alpha level ($\alpha = 0.05$) to produce the required sample size

of 191. However, in most of my analyses, due to missing data and low response rate,

there were only about 100 respondents included. This might have resulted in the insignificance seen in all of the analyses. Greater statistical significance of mean differences would have occurred if more respondents had participated and there were less missing data. As such, nonsignificance of results should be interpreted with caution because of the low response rate from study participants. There could have been statistical significance if sample size was larger or the response rate was higher.

Another potential limitation to the study was the use of self-reported data. It is possible that the respondents may have introduced bias to provide answers deemed acceptable and in line with the hospital policies on PEP. This type of bias is referred to as social desirability bias. Social desirability bias is a type of response bias whereby the respondent feels a need to deny undesirable traits and refer to traits that are deemed socially desirable (Kaminska & Foulsham, 2013). Social desirability bias can be a result of self-deception or other deception, which affects the validity of survey research findings (Fisher, 1993).

Participation in the study was voluntary, so there may have been selection bias. As such, some health care workers did not respond to the study while some responded late. There may be a difference in the practice of PEP among health care workers who did and those who did not respond or responded after several attempts to reach them.

This research study was a cross-sectional survey; I collected data at a single point in time. As such, a limitation to this study may be that responses from study participants could change over time. According to Sedgwick (2014), cross-sectional studies may take a longer period of time for recruitment of participants, but measurements for sample are

collected at a single point in time. Cross-sectional studies are different from longitudinal studies because longitudinal studies require each participant to be observed at multiple times, allowing trends in an outcome to be monitored over time (Sedgwick, 2014). Also, longitudinal studies may be prospective or retrospective and observational or experimental in design while cross sectional studies are particularly suitable for estimating the prevalence of a behavior in a population (Sedgwick, 2014).

<div align="center">**Recommendations**</div>

Recommendations for Future Research

I found that there was no relationship between the fear of stigma among health care workers and the use of PEP, no association between the knowledge of PEP among health care workers and the use of PEP, no relationship between the types of occupational injuries sustained and the use of PEP among health care workers, and no relationship between the awareness of existing precautionary policies for PEP and the use of PEP among health care workers at National Hospital Abuja, Nigeria. However, the sample size was small and with a lot of missing data.

Future research is recommended to determine if my findings are consistent with a larger sample size of health care workers across the country and if there is any correlation with the factors that impact the practice of PEP. These recommendations can be met by extending the survey to a larger group of health care workers in Nigeria (ie., a collection of health care workers at various tertiary hospitals) and by including statistical analysis to determine if there is a correlation between respondents' knowledge, the types of occupational injuries sustained, awareness of existing hospital precautionary policies, and

the use of PEP. In further studies, the results may be generalizable, have greater statistical significance, and determine if there is correlation between respondents' knowledge, the types of occupational injuries sustained, hospital precautionary policies, and the use of PEP. Although the required sample size was191 and a medium effect size of 0.30 was used, it is recommended that a much larger sample and a larger effect size be used to avoid the effects of missing data. The larger sample size also may provide greater statistical significance.

Addressing potential social desirability bias is recommended for future research. This can be addressed by introduction of the survey with reference to the research topic, and careful wording of accompanying letters and consent forms. Bias is usually more pronounced in an interview format; therefore, it is important that any future research be conducted via the anonymous survey tool and not be changed to an interview format (Kaminska & Foulsham, 2013). Participation in research study should remain voluntary, and the use of incentives may decrease the number of nonresponders and late responders.

Recommendations for Action

Due to the small sample size used in this research study, it is advised that future research be carried out with a larger sample size that may produce more significant results. In order to reduce factors of noncompliance to the practice of HIV PEP among health care workers, it is recommended that health care workers at National Hospital and in Nigerian Hospitals be adequately educated about PEP guideline policy for HIV infection. Hospitals should have written policy easily accessible to health care workers (Esin et al. 2011). The introduction of training modules on workplace safety, organizing

continuous medical education programs to improve awareness, and the provision and
uptake of PEP for HIV is needed to decrease the spread of HIV and encourage the
practice of PEP among health care workers at the National Hospital Abuja.

Implications of Findings

HIV/AIDS continues to impact the Sub-Saharan region of Africa. To address the
rising rate of HIV/AIDS among health care workers in this region, it is necessary to
provide HIV/AIDS education and prevention materials, as well as training on PEP
practice. The goal of this study was to ascertain the knowledge of PEP and practice of
PEP among health care workers at National Hospital Abuja and its impact on the use HIV
PEP.

The implication for positive social change of this study include obtaining
knowledge on the factors that affect compliance and noncompliance of the practice of
HIV PEP among health care workers at National Hospital Abuja, Nigeria. In addressing
the factors that impact the practice of HIV PEP among health care workers, it is expected
that behavior will change and more health care workers across the country will adhere to
the practice of PEP after an occupational exposure to HIV infection. According to the
HBM, a health care worker will take a health action based on his/her belief that such
action will prevent a negative health condition, such as HIV infection. In addressing the
belief of health care workers, their plan or readiness to take a positive health action, such
as use of PEP, after an occupational exposure to HIV infection can be addressed.

Conclusion

The study resulted in nonsignificant results. Nevertheless, the nonsignificant results should be treated with caution as this can be attributed to the small sample size used and the low response rate received from study participants at the National Hospital Abuja.

The risk of HIV transmission among health care workers after an occupational exposure is well documented and recognized. According to Aynalem and Dejenie (2014), risk of health care workers to HIV after an occupational exposure depends on multiple factors like high prevalence of the infection in the population, frequency of exposure, nature and efficiency of transmission of exposure, high viral load, or patients with advanced illness. Due to the impact of HIV/AIDS among health care workers, it is imperative that HIV PEP education occur regularly at hospitals where those who are at risk to be affected due to an occupational exposure can be reached. Ensuring adequate knowledge of HIV transmission and hands-on training could avert exposure to HIV (Shivalli, 2014). According to Esin et al. (2011), the mainstay of preventing HIV infection acquired through occupational exposures is compliance with universal precautions guidelines focused on appropriate management of exposures as an integral element of prevention, control, and workplace safety. The practice of recapping and detaching needles by health care workers still exists among health care workers and increases the risk of HIV infection from NSI. Strict compliance for universal precautions and apt management of exposures are crucial in this regard. There is a need for regular training workshops on injection safety aimed to improve the knowledge and practice of

needle stick safety among health care workers (Omorogbe et al. 2012). According to Shivalli (2014), a lack of curative treatment and prevailing social stigma and discrimination will keep HIV in the lime light.

Factors such as inadequate knowledge on HIV PEP practice, underreporting of occupational injuries, lack of awareness of precautionary guidelines on HIV PEP, and the fear of stigma after an occupational exposure are nonsignificant to the practice of HIV PEP. Nevertheless, it is pertinent that a hospital develops institutional guidelines on PEP practice and provides adequate materials and supervision to ensure adherence with guidelines for HIV PEP practice among health care workers. HIV stigma is cited as a barrier to accessing prevention, care, and treatment services, even among health care workers (Shivalli, 2014). Therefore, efforts should be made to break the culture of silence seen when there is risk of HIV infection among health care workers after an occupational exposure.

Future recommended research includes surveying a larger group of health care workers (including other geographical locations in Nigeria) using incentives or gifts for participants, and introducing the research to study participants without bias. Also, recommended for future research is a comparative study to determine if occupation, and years of practice is a factor impacting the compliance or noncompliance of HIV PEP practice among health care workers at National Hospital Abuja, Nigeria.

References

Agaba, P. A., Agaba, E. I., Ocheke, A. N., Daniyam, C .A., Akanbi, M. O., & Okeke, E.

    N. (2012). Awareness and knowledge human immunodeficiency virus post

    exposure prophylaxis among Nigerian family physicians. *Nigerian Medical*

    Journal, 53(2), 155-160

    http://www.nigeriamedj.com/text.asp?2012/53/3/155/104386

Aminde, L. N., Takah, N. F., Noubiap, J. N., Tindong, M., Ngwasiri, C., Jingi, A. M.,...

    Dzudie, A. (2015). Awareness and low uptake of post exposure prophylaxis for

    HIV among clinical medical students in a high endemicity setting. *BMC Public*

    Health, 15(1), 1104. doi:10.1186/s12889-015-2468-9

Ashat, M., Bhatia, V., Puri, S., Thakare, M., & Koushal, V. (2011). Needle stick injury

    and HIV risk among health care workers in North India. *Indian Journal of*

    Medical Sciences, *65*(9), 371-378. doi:10.4103/0019-5359.108947

Avert. (2015). HIV and AIDS in Nigeria. Retrieved from

    http://www.Avert.org/professionals/hiv-around-world/sub-saharan-africa/nigeria

Aynalem Tesfay, F., & Dejenie Habtewold, T. (2014). Assessment of prevalence and

    determinants of occupational exposure to HIV infection among healthcare

    workers in selected health institutions in Debre Berhan town, North Shoa Zone,

    Amhara Region, Ethiopia, 2014. *AIDS Research and Treatment*, *2014*.

Beymer, M. R., Bolan, R. K., Flynn, R. P., Kerrone, D. R., Pieribone, D. L., Kulkarni, S.

    P., … Landovitz, R. J. (2014). Uptake and repeat use of postexposure prophylaxis

in a community-based clinic in Los Angeles, California. *AIDS Research and Human Retroviruses*, *30*(9), 848–855. http://doi.org/10.1089/aid.2014.0017

Bureau of Labor Statistics. (2012). Occupational safety and health definitions. Retrieved from http://www.bls.gov/iif/oshdef.htm

Chen, M. Y., Fox, E. F., & Rogers, C. A. (2001). Post-exposure prophylaxis for human immunodeficiency virus: Knowledge and experience of junior doctors. *Sexually Transmitted Infections, 77*(6), 444-5. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1744409/

Cowan, E., & Macklin, R. (2012). Unconsented HIV testing in cases of occupational exposure: Ethics, law, and policy. *Academic Emergency Medicine: Official Journal of the Society for Academic Emergency Medicine*, *19*(10), 1181-1187. doi:10.1111/j.1553-2712.2012.01453.x

de la Tribonnière, X., Dufresne, M. D., Alfandari, S., Fontier, C., Sobazek, A., Valette, M.,... Mouton, Y. (1998). Tolerance, compliance and psychological consequences of post-exposure prophylaxis in health-care workers. *International Journal of STD & AIDS*, *9*(10), 591-594. https://www.ncbi.nlm.nih.gov/pubmed/9819109

Delobelle, P., Rawlinson, J. J. L., Ntuli, S., Malatsi, I., Decock, R., & Depoorter A. M. (2009). HIV/AIDS knowledge, attitudes, practices and perceptions of rural nurses in South Africa. *Journal of Advanced Nursing, 65*(5), 1061–1073. doi: 10.1111/j.1365-2648.2009.04973.x

Ekundayo, O. T., & Ogbaini-Emovon, E. A. (2014). Knowledge, attitude and practice of Human Immunodeficiency Virus infection post-exposure prophylaxis among

resident doctors in a tertiary hospital, Benin City, Nigeria. *International Journal of Community Research, 3*(3), 68-73. Retrieved from

https://www.ajol.info/index.php/ijcr/article/view/107664

Esin, I., Alabi, S., Ojo, E., & Ajape, A. (2011). Knowledge of human immunodeficiency virus post-exposure prophylaxis among doctors in a Nigerian tertiary hospital. *Nigerian Journal of Clinical Practice*, *14*(4), 464-466. doi:10.4103/1119-3077.91757

Explorable.com (2010). Cronbach's Alpha. Retrieved from

https://explorable.com/cronbachs-alpha

Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research*, *20*, 303-315. Retrieved from

https://www.jstor.org/stable/2489277

Ford, N., & Mayer, K. H. (2015). World Health Organization Guidelines on post exposure prophylaxis for HIV: Recommendations for a public health approach. *Clinical Infectious Diseases, 60*(3), 161-164.

Gilston, A. (2016). Debriefing in psychology research. Retrieved from

http://study.com/academy/lesson/debriefing-in-psychology-research-definition-process-quiz.html

Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research and practice* (4th ed.). San Francisco, CA: Jossey-Bass

Glauser, W. (2014). Health worker-only HIV clinic improves care for all. *Canadian Medical Association Journal, 186* (1), 1. Retrieved from www.cmaj.ca/content/186/1/E19.full

Goldschmidt (2010). Occupational post exposure prophylaxis for HIV: The PEPline perspective. *Topics in HIV Medicine, 18*(5) 174-177. Retrieved from www.ncbi.nlm.nih.gov/pubmed/21245519

Gupta, A., Anand, S., Sastry, J., Krisagar, A., Basavaraj, A., Bhat, S. M.,.... Kakrani, A. L. (2008). High risk for occupational exposure to HIV and utilization of post-exposure prophylaxis in a teaching hospital in Pune, India. *BMC Infectious Diseases*, *8*142. doi:10.1186/1471-2334-8-142

Joyce, M. P., Kuhar, D., & Brooks, J. T. (2015). Notes from the field: occupationally acquired HIV infection among health care workers - United States, 1985-2013.*MMWR. Morbidity and Mortality Weekly Report*, *63*(53), 1245-1246. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6353a4.htm

Kaminska, O., & Foulsham, T. (2013). Understanding sources of social desirability bias in different modes: Evidence from eye-tracking. *Institute for Social & Economic Research*. Retrieved from https://www.iser.essex.ac.uk/research/publications/working-papers/iser/2013-04.pdf

Kumakech E., Achora S., Berggren V. & Bajunirwe F., (2011) Occupational exposure to HIV: A conflict situation for health workers. *International Nursing Review* 58, 454–462. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/22092324

Kuruvilla, S. (2011). Occupational exposure to blood borne pathogens: Prevention and

    management. AAACN Viewpoint, *33*(5), 3-6. Retrieved from

    https://www.aaacn.org/sites/default/files/members/viewpoint/septoct11.pdf

Mashoto, K. O., Mubyazi, G. M., Mohamed, H., & Malebo, H. M. (2013). Self-reported

    occupational exposure to HIV and factors influencing its management practice: a

    study of healthcare workers in Tumbi and Dodoma Hospitals, Tanzania. *BMC*

    health services research, *13*(1), 276. Retrieved from

    https://www.ncbi.nlm.nih.gov/pubmed/23866940

Mathewos, B., Birhan, W., Kinfe, S., Boru, M., Tiruneh, G., Addis, Z., & Alemu, A.

    (2013). Assessment of knowledge, attitude and practice towards post exposure

    prophylaxis for HIV among health care workers in Gondar, North West

    Ethiopia. *BMC Public Health*, *13*(1), 508. doi: 10.1186/1471-2458-13-508

Monjok, E., Smesny, A., & Essien, E. J. (2009). HIV/AIDS-related stigma and

    discrimination in Nigeria: review of research studies and future directions for

    prevention strategies. *African Journal of Reproductive Health*, *13*(3). Retrieved

    from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2919838/

Ncube, N. Q., Meintjes, W. J., & Chola, L. (2014). Knowledge and attitudes of non-

    occupational HIV post-exposure prophylaxis amongst first- and second-year

    medical students at Stellenbosch University in South Africa. *African Journal of*

    Primary Health Care & Family Medicine, *6*(1), E1-E9.

    doi:10.4102/phcfm.v6i1.665

Nwankwo, T., & Aniebue, U. (2011). Percutaneous injuries and accidental blood exposure in surgical residents: awareness and use of prophylaxis in relation to HIV. *Nigerian Journal of Clinical Practice, 14*(1), 34-37. doi:10.4103/1119-3077.79237

Odongkara, B.M., Mulongo, G., Mwetwale, C., Akasiima, A., Muchunguzi, H.V., Mukasa, S., Turinawe, K.V., Adong J.O…… Katende, J. (2012). Prevalence of occupational exposure to HIV among health workers in Northern Uganda. *International Journal of Risk & Safety in Medicine 24*, 103–113 doi 10.3233/JRS-2012-0563

Okulicz, J., & Murray, C. (2012). Evaluation of HIV postexposure prophylaxis for occupational and nonoccupational exposures at a deployed U.S. military trauma hospital. *Military Medicine, 177*(12), 1524-1532. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/23397700

Omorogbe, V. E., Omueme, V. O., & Isara, A. R. (2012).Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. *Annals of African Medicine, 11*(1), 36-41. doi: 10.4103/1596-3519.91020

Pathak, R., Kahlon, A. S., Ahluwalia, S. K., Sharma, S., & Bhardwaj, R. (2012). Needle stick injury and inadequate post exposure practices among health care workers of a tertiary care centre in rural India. *International Journal of Collaborative Research on Internal Medicine & Public Health, 4*(5), 638-648. Retrieved from www.iomcworld.com/ijcrimph/files/v04-n05-22.pdf

Pieterse, M. (2011). Impeding access? Stigma, individual responsibility and access to

post-HIV-exposure prophylaxis (PEP) in South Africa. *Medicine and Law*, *30*(2),

279-294. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/21877471

Priya, N. L., Krishnan, K. U., Jayalakshmi, G., & Vasanthi, S. (2015). An analysis of

multimodal occupational exposure leading to blood borne infections among health

care workers. *Indian Journal of Pathology & Microbiology*, *58*(1), 66-68.

doi:10.4103/0377-4929.151191

Puro, V., Cicalini, S., De Carli, G., Soldani, F., Antunes, F., Balslev, U., . . . Larsen, C.

(2004). Post-exposure prophylaxis of HIV infection in healthcare workers:

Recommendations for the European setting. *European Journal of*

Epidemiology, 19(6), 577-84. Retrieved from

https://doi.org/10.1023/B:EJEP.0000032349.57057.8a

Rey, D. (2011). Post-exposure prophylaxis for HIV infection. *Expert Review of Anti-*

Infective Therapy, 9(4), 431-42. doi:http://dx.doi.org/10.1586/eri.11.20

Rybacki, M., Piekarska, A., Wiszniewska, M., & Walusiak-Skorupa, J. (2013). Work

safety among Polish health care workers in respect of exposure to bloodborne

pathogens. *Medycyna Pracy*, *64*(1), 1-10. Retrieved from

https://www.ncbi.nlm.nih.gov/pubmed/23650763

Sedgwick, P. (2014). Cross sectional studies: advantages and disadvantages. *BMJ: British*

Medical Journal, *348*. Retrieved from www.bmj.com/content/348/bmj.g2276

Serdar, T., Đerek, L., Unic, A., Marijancevic, D., Markovic, D., Primorac, A., &

Petrovecki, M. (2013). Occupational exposures in healthcare workers in

university hospital dubrava - 10 year follow-up study. *Central European Journal of Public Health, 21*(3), 150-4. Retrieved from

https://www.ncbi.nlm.nih.gov/pubmed/24344541

Shaghaghian S., Pardis S., & Mansoori Z. (2014). Knowledge, attitude and practice of dentists towards prophylaxis after exposure to blood and body fluids. *International Journal of Occupational and Environment Medicine,* 5,146-154. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/25027043

Sharma, R., Rasania, S., Verma, A., & Singh, S. (2010). Study of Prevalence and Response to Needle Stick Injuries among Health Care Workers in a Tertiary Care Hospital in Delhi, India. *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine*, *35*(1), 74-77. doi:10.4103/0970-0218.62565

Shivalli, S. (2014). Occupational exposure to HIV: Perceptions and preventive practices of Indian nursing students. Advances in preventive medicine, 2014. Retrieved from pubmedcentralcanada.ca/pmcc/articles/PMC4016910

Shriyan, A., Roche, R., & Annamma. (2012). Incidence of occupational exposures in a tertiary health care center. *Indian Journal of Sexually Transmitted Diseases*, *33*(2), 91-97. doi:10.4103/0253-7184.102111

Singru, S., & Banerjee, A. (2008). Occupational exposure to blood and body fluids among health care workers in a teaching hospital in Mumbai, India. *Indian Journal of Community Medicine, 33*(1), 26-30. doi:http://dx.doi.org/10.4103/0970-0218.39239

Stacey, K., Sellers, L., & Barrett, S. (2012). Education provided to outgoing UK medical elective students regarding HIV risk and post exposure prophylaxis. *International Journal of STD & AIDS*, *23*(11), 772-774. doi:10.1258/ijsa.2009.009401

Sullivan, L. M (2012). *Essentials of biostatistics in public health* (2nd ed.). Boston, MA: Jones & Bartlett.

Trochim, W. M. K. (2006a). *Types of reliability.* Retrieved from http://www.socialresearchmethods.net/kb/reltypes.php

Trochim, W. M. K. (2006b). *Construct validity.* Retrieved from http://www.socialresearchmethods.net/kb/constval.php

Joint United Nations Programme on HIV/AIDS [UNAIDS] (2014). *HIV and AIDS estimates* 2014. Retrieved from http://www.unaids.org/en/regionscountries/countries/nigeria

University of Twente (2012). Health Belief Model. Retrieved from http://www.utwente.nl/cw/theorieenoverzicht/Theory%20Clusters/Health%20Communication/Health_Belief_Model/

Vaid, N., Langan, K. M., & Maude, R. J. (2013). Post-exposure prophylaxis in resource-poor settings: review and recommendations for pre-departure risk assessment and planning for expatriate healthcare workers. *Tropical Medicine & International Health: TM & IH, 18*(5), 588-595. doi:10.1111/tmi.12080

Van den Broeck, J., Cunningham, S. A., Eeckels, R., & Herbst, K. (2005). Data cleaning: detecting, diagnosing, and editing data abnormalities. *PLoS Med*, *2*(10), e267. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1198040/

vanTeijlingen, E. R. & Hundley, V. (2001). Importance of pilot studies. Retrieved from

http://sru.soc.surrey.ac.uk/SRU35.html

Varghese, G. M., Abraham, O. C., & Mathai, D. (2003). Post-exposure prophylaxis for

blood borne viral infections in Healthcare workers. *Postgraduate Medical*

Journal, 79, 324-328. Retrieved from http://dx.doi.org/10.1136/pmj.79.932.324

Vaz, K., McGrowder, D., Crawford, T., Alexander-Lindo, R. L., & Irving, R. (2010).

Prevalence of injuries and reporting of accidents among health care workers at the

University Hospital of the West Indies. *International Journal of Occupational*

Medicine and Environmental Health, *23*(2), 133-143. doi:10.2478/v10001-010-

0016-5

World Bank (2016). Nigeria. Retrieved from http://data.worldbank.org/country/nigeria

World Health Organization (2016). HIV/AIDS: *Post exposure prophylaxis.* Retrieved

from http://www.who.int/hiv/topics/prophylaxis/en/

Appendix A: Permissions to use Survey Instruments

Ephraim Ogbaini-emovon <epogbaini@yahoo.com>
reply-to: Ephraim ogbaini-emovon <epogbaini@yahoo.com>
to: Ulunma Njemanze <ulunma.njemanze@waldenu.edu>
date: Sat, Feb 13, 2016 at 12:22 PM
subject: Re: Permission to use study questionnaire

Dear Ulunma,

Your message is well received and permission is hereby granted for you to use the

questionnaire for your dissertation. Should you need any further help, do let me know.

Best wishes!

Dr Ephraim Ogbaini-Emovon MD, MPH, PGD (Proj. Mgt), FMCPath, CPF (England)
Consultant Clinical Microbiologist/Public Health Expert.
WHO Consultant
Ebola Response, Liberia.

Leopold AMINDE < amindeln@gmail.com>
to: Ulunma Njemanze <ulunma.njemanze@waldenu.edu>
cc: Leopold AMINDE <amindeln@gmail.com>
date: Fri, Feb 12, 2016 at 10:25 AM
subject: Re: Permission to use study questionnaire

Dear Ulunma,

It is my pleasure to read from you and above all Congratulate you for your PhD position

at Walden.

Before I proceed, you may want to look at the title of your dissertation again.... "Factors

impacting Post exposure prophylaxis **for HIV** among healthcare....". As you know, PEP

exists for a number of other blood borne infections as well. There is currently dearth in

PEP HIV research in Africa, and I'm glad you are exploring the area as well. That said, I

am happy to grant you permission to use the study questionnaire of my above mentioned

paper. You may also want to look at my previous study on the same

subject: https://www.researchgate.net/publication/275098131_Occupational_Post-

Exposure_Prophylaxis_PEP_against_Human_Immunodeficiency_Virus_HIV_Infection_i
n_a_Health_District_in_Cameroon_Assessment_of_the_Knowledge_and_Practices_of_
Nurses.

I trust I will have a copy of your findings from this beautiful project.

I am therefore happy to provide assistance as you progress in your dissertation which is
definitely an area of interest to me.

Kind regards,

Leopold N. AMINDE, MD, PhD(c)
School of Public Health, Faculty of Medicine & Biomedical Sciences,
University of Queensland, Brisbane, Australia.
Physician & Clinical Researcher,
Clinical Research Education, Networking & Consultancy (CRENC)
P.O. Box 3480, Douala - Cameroon.
Mobile: 00 237 674 625 384
Email: amindeln@gmail.com, leopami64@yahoo.com

Appendix B: Letter of Cooperation

NATIONAL HOSPITAL

(Established by Act No 36 of 1999).

BOARD CHAIRMAN:

Ag. DIRECTOR OF ADMINISTRATION
Alh. Y. O. Sadiq, Bsc (Soc), Msc (Soc), AHSAN, MNIPR

CHIEF MEDICAL DIRECTOR / CEO
Dr. J. A. F. Momoh, MBBS, MSC, FWACP(LM)

DIRECTOR OF CLINICAL SERVICES/CMAC
Dr. Oluseyi Oniyangi, MBBS,FWACP, (Pead) FIPNA

NHA/ADMIN/236/V.VII

1st August, 2016

RE: FACTORS IMPACTING POST EXPOSURE PROPHYLAXIS AMONG HEALTHCARE WORKERS AT NATIONAL HOSPITAL, ABUJA NIGERIA. NHA/EC/043/2016

Health Research Ethics Committee (HREC) Assigned number: NHA/EC/043/2016

Name of Principal Investigator: **Ulunma Njemanze**

Address of Principal Investigator   29 Ahmed Musa Crescent
Jabi Abuja.

Date of Receipt of Valid Application: 16th June, 2016

Notice of Approval

This is to inform you that the research described in the submitted protocol, the consent forms, and other changes stated in the submitted research protocol addendum have been reviewed and *given full approval by the Institutional Review Board (IRB) Committee, National Hospital Abuja.*

This approval dates from **1st August, 2016 to 31st July, 2018.** If there is delay in starting the research, please inform the HREC National Hospital Abuja so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study.*

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit to your research site without previous notification.

Dr. Oluseyi Oniyangi
(DCS/CMAC)
For: Chairman, HREC, National Hospital

Appendix C: Factors impacting use of PEP For HIV among Health Care Workers

Socio-Demographic Information

1. Sex   Male ( )   Female ( )

2. Age   18-39 ( ) 40-59 ( ) 60 + ( )

3. Occupation   Medical Doctor ( ) Nurse ( ) Lab Scientist ( )

4. Marital status   Single ( ) Married ( ) Divorced ( )

5. Average patients seen daily   <50( ) 51-99 ( ) 100-199 ( ) 200-299 ( ) 300+ ( )

6. Religion   Christianity ( )Muslim ( ) Traditional Practice ( )

7. Years in Clinical Practice?

   1-5 years ( )

   5-10 years ( )

   10 years and above ( )

Knowledge, attitude and practice of HIV post exposure prophylaxis

8. Do you know about PEP for HIV?   Yes ( )   No ( )

 a. If yes, from what source of information?

   Radio ( )

   Television ( )

   Seminars or workshops ( )

   Ward rounds ( )

   Training on PEP ( )

   Not sure ( )

9. Have you ever had any training on HIV PEP?   Yes ( )   No ( )

HIV Post exposure Prophylaxis (PEP) utilization

10. What are the indications for initiating HIV PEP? (Multiple response accepted)

    Needle stick injury ( )

    Exposure to blood and bodily fluids ( )

    Rape ( )

11. Is HIV PEP effective in preventing HIV transmission?   Yes ( ) No ( ) Don't

    Know ( )

12. How would you rate your overall knowledge on PEP?   Good ( ) Moderate ( )

    Poor ( )

13. Will you be willing to recommend PEP for HIV exposure to others? Yes ( ) No ( )

    Undecided ( )

Knowledge and attitude towards type of occupational exposure to HIV infection

among healthcare workers

14. What proportion of needle stick injuries from HIV infected persons result in HIV

    transmission?

    1/100   ( )

    1/500   ( )

    3/1000 ( )

    Do not know ( )

15. Do you consider yourself to be at risk of HIV acquisition at your workplace? Yes( )

No( )

16. Have you ever had an occupational exposure to HIV in the past?   Yes ( ) No ( )

a. If yes, what type of exposure was it?

Needle stick injury ( )

Splashing of blood/bodily fluid on mucosal surfaces ( )

Both needle stick injury and splashing of bodily fluid on mucosal surfaces ()

17. How many exposures have you had during the last 12 months?

0 ( )

1 ( )

2-3 ( )

>4 ( )

18. What were the circumstances of exposure? (Multiple answers accepted)

Setting up IV line ( )

During surgery ( )

Giving injections ( )

Collecting blood samples ( )

Recapping needles ( )

During delivery ( )

Other ( )

19. If you have had an occupational exposure to HIV, did you complete PEP process?

Yes ( ) No ( )

a. If No, why did you not test for HIV?

Not aware ( )

Assumed patient was negative ( )

Other reasons ( )

Knowledge and attitude on Hospital precautionary policies for HIV PEP after

occupational exposure

20. Are you aware of the existing hospital policy on first aid measures after an

occupational exposure?   Yes ( ) No ( )

21. Promote active bleeding of the injury?   Yes ( ) No ( ) Do not know ( )

22. Wash exposed area with soap and water and apply dressing? Yes ( ) No( ) Do not

know( )

23. Report occupational exposure to a clinic staff?   Yes ( ) No ( ) Do not know ( )

24. What is the hospital recommendation to commence HIV PEP after an exposure?

Within 1hr ( )

Within 72 hrs ( )

Do not know ( )

25. How long HIV PEP regimen should be taken after an exposure?

1 month ( )

3 months ( )

Do not know ( )

26. What could be the reason for not adhering to hospital protocol on HIV PEP after

an occupational exposure? (Multiple answers accepted)

Deemed not necessary ( )

Not aware of Hospital PEP protocol at the time of exposure ( )

Assumed exposure source was negative ( )

ARVs not available ( )

27. Apart from HIV PEP are you aware of other safety measures at work to prevent

    HIV infection?   Yes ( ) No ( )

28. Are you satisfied with the current HIV infection prevention protocol at work?

                                                               Yes ( ) No ( )

29. Do you feel that more training is required for staff on HIV infection prevention?

                                                               Yes ( ) No ( )

Healthcare workers and the Fear of Stigmatization

30. Is there stigma attached to HIV infection?   Yes ( ) No ( )

31. If occupational injury is sustained, are you worried of being stigmatized by

    others?   Yes ( ) No ( )

32. Does the fear of stigma affect HIV screening after an occupational exposure?

                                                               Yes ( ) No ( )

33. Does the fear of stigma affect the practice of PEP?   Yes ( ) No ( )

Thank you for completing this survey. If you have any questions or concerns regarding the questions on this survey or you would like information regarding HIV post exposure prophylaxis practice please email me at **ulunma.njemanze@waldenu.edu**for answers and or resources.