

**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
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**RISK PERCEPTION OF HIV AND PERCEIVED BARRIERS TO
COMPLIANCE WITH STANDARD PRECAUTIONS AMONG
HEALTHCARE WORKERS IN LOWER MANYA DISTRICT**

BY

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**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA,
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DECLARATION

I Sandra Enyonam Akagbo hereby declare that except for other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

I hereby certify that this dissertation was supervised in accordance with procedures laid down by the University

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Date.....

Dr. Mercy Ackumey
(Academic Supervisor)

DEDICATION

This work is dedicated to the Almighty God who has continually sustained me and brought me this far, my family especially my mum, Madam Georgina Hayman, who first instilled unconditional love in me, the joy of hard work and the satisfaction of a job well done; I wish you long life filled with happiness. Also to my good friend and Brother Mr. Emmanuel Sarku (Clinical Psychologist).



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To God be the glory, great things He hath done

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ABSTRACT

Human Immunodeficiency Virus (HIV) is a devastating health condition that affects every sphere of society including workplaces. A number of occupational exposures to patients' blood and body fluids occur each year in health-care settings putting healthcare workers (HCWs) at a high risk of several blood-borne infections including human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HBC).

This study investigated the health care provider's risk perception of HIV, knowledge on standard precautions (SPs), barriers and rate of compliance with standard precautions and also work related injuries faced by the HCWs. A Self-administered semi-structured questionnaire was used to elicit responses from one hundred healthcare workers comprising of laboratory technicians, midwives, nurses and ward aides. Majority of the participants regarded HIV as a public health issue and most of them perceived that they were at risk of contracting HIV on the job. Data revealed good compliance with standard precautions (SPs) among quite a number of HCWs. However, most of the HCWs were of the view that complying with standard precautions (SP) during emergency situations sometimes put the patients at risk and therefore they were likely not to adhere. Knowledge of the basic concept of the standard precautions was inadequate among the health care workers and most of the HCWs sometimes experience chemical splashes in the course of their duty. Despite the risk of non-compliance and benefits of compliance with universal precautions, HCWs still often fail to strictly adhere to universal precautions. Therefore, interventions need to address individual provider's attitudes and emphasize that universal precautions are standard practice and not just for a special group of patients but for all patients. Key words: Health care workers, Risk perception, HIV, Barriers to Compliance, standard precautions.

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LIST OF ACRONYMS/ ABBREVIATION

H.B.C	Home-Based Care
HBM	Health Belief Model
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCWs	Health care workers
HIV	Human immunodeficiency virus
ILO	International Labour Organisation
PPE	Personal protective equipment
PLWHA	People Living with HIV/AIDS
PMTCT	prevention of mother to child transfer
SPs	Standard Precaution
USAIDS	United States Agency for International Development
UPs	Universal Precautions
VCT	voluntary counselling and testing
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Background

Human Immunodeficiency Virus (HIV) is a devastating health condition that affects every sphere of society including workplaces. A number of occupational exposures to patients' blood and body fluids occur each year in health-care settings putting healthcare workers (HCWs) at a high risk of several blood-borne infections including human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HBC) [Dement *et al.*, 2004; Timilshina *et al.*, 2011].

Health workers are "all people engaged in actions whose primary intent is to enhance health" (World Health Report 2006). They include physicians, nurses, emergency medical personnel, dental professionals and students, medical and nursing students, laboratory technicians, pharmacists, hospital volunteers, and administrative staff (CDC, 2013).

Guidelines to enhance the safety of HCWs have been in existence since the late 1980's and early 1990's to help reduce the rate at which HCWs were exposed to blood, fluids, needles and other sharp objects. This initiative was as a result of the HCWs increased risk of exposure to blood-borne pathogens in the 1970s which led to the infection of many HCWs to hepatitis B virus (HBV) and HIV (Kermode *et al.*, 2005). The content and labelling of the guidelines have changed over time. It was referred to as universal precautions or body substance isolation but now it is termed standard precautions (Kermode *et al.*, 2005).

Researches have indicated that needle-stick injuries (NSIs) and prick from other sharp devices are the most common occupational accidents in addition to exposures to direct

contact with body fluids/ blood and tissues that may be contaminated. Contact with blood and bodily fluids is a serious occupational concern for health-care workers and it represents a common mode of the transmission of HIV (Pruss-Ustun et al., 2005; WHO/ILO, 2005; Kabbash et al., 2007; Reda et al., 2008; Sreedharan et al., 2010).

Studies have also revealed that the use of personal protective equipment (PPE) such as sterile surgical gloves and gowns, and sterile equipment, hygiene practices such as antiseptic hand washing, and safe instrument and waste disposal procedures outlined in universal precaution guidelines, can keep the HCWs safe from blood-borne infections (Akinboro *et al.*, 2012; Timilshina *et al.*, 2010). The first reported case of a healthcare worker developing HIV infection after a needle stick injury was in 1984 (Varghese *et al.*, 2003). HCWs are often seen as “immune” to injury or illness, this is because in their job to care for the sick and incapacitated; their patients come first. They are often likely to sacrifice their own safety for the sake of their patients (WHO, 2013).

In sum, HCWs form an enormous and mounting workforce facing an exceptional occupational hazard, such as exposure to human blood and body fluids, which puts them at risk of contracting numerous blood borne infections (BBIs) including the Hepatitis B Virus (HBV), the Hepatitis C Virus (HCV), and HIV.

1.1. Statement of the Problem

Studies reveal a high risk perception of HIV and other blood-borne infections among HCWs (Kermode *et al.*, 2005; Hanafi *et al.*, 2007; Kocić *et al.*, 2008; Akinboro *et al.*, 2012; Basavaprabhu *et al.*, 2012). The perception of risk can lead to exaggerated fears of HIV and AIDS related risks and these over-blown perceptions influence the quality of care given to patients, it can also lead to stigmatisation and discrimination against

people living with HIV or AIDS (Akinboro *et al.*, 2012). In other words, the manner HCWs perceive their own risks in relation to caring for HIV positive patients potentially influences their willingness to provide care.

Also, infection control practices are poor and prevalent with a higher incidence of HIV in Africa. All over the developing world, healthcare providers, patients, and the community as a whole are placed at risk of contracting HIV because of a shortage or lack of supplies, poor training, poor awareness about the danger of unsafe infection control practices and limited organizational support for safe practice. Implementing universal precautions has been a major challenge for health care providers and, the occupational safety of HCWs is often neglected (Akinboro *et al.*, 2012; Sagoe-Moses *et al.*, 2001).

Furthermore, there are limited studies in Ghana about compliance among HCWs to standard precautions. However, there has been previous research that focused on attitudes to and management of HIV/AIDS among health workers in Ghana (Awusabo-Asare & Marfo, 1997).

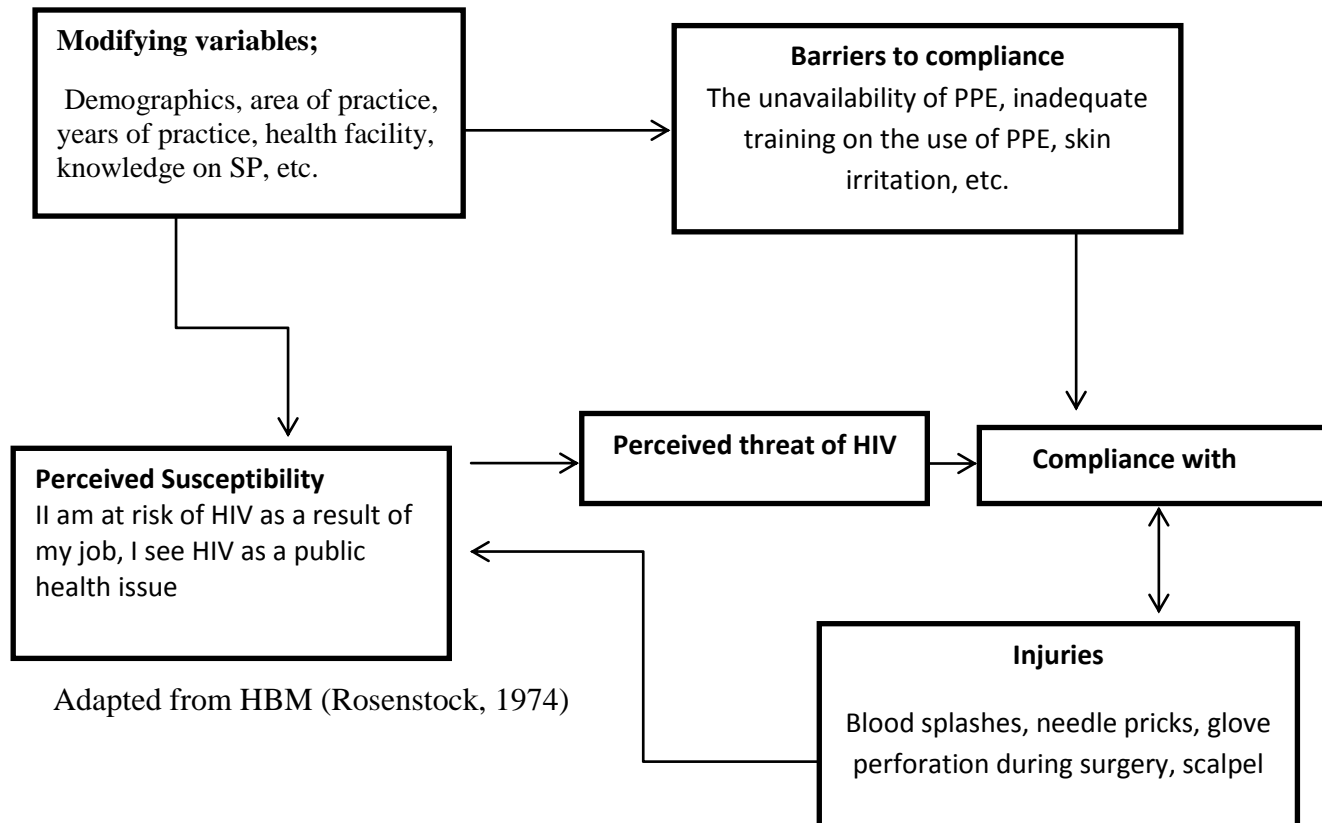
Finally some studies conducted outside Ghana, have also reported that HCWs fail to comply with standard precautions but the studies failed to investigate barriers to compliance of standard precaution among HCWs aimed at reducing risk associated with HIV exposure (Kabbash *et al.*, 2007; Akinboro *et al.*, 2012; Reda *et al.*, 2010).

With this in mind, the need for studies targeting health facilities cannot be over-emphasised.

1.03. Conceptual Framework

The conceptual framework for the study was adapted from the health belief model to explain the association between variables of the study (Figure 1.0).

Figure 1.0 Conceptual Framework



From figure 1: It is expected that

- Modifying factors such as HCWs level of knowledge on standard precautions; profession/area of practice, years of practice and location of hospital will inform their perception of HIV as a threat
- Modifying factors such as HCWs profession/area of practice, and location of hospital will inform their perception of barriers to compliance
- The perception of HIV will compel HCWs to see HIV as a threat.
- HCWs perception of HIV as a threat will compel them to comply with standard precautions
- Barriers will influence level of compliance with standard precautions
- Work related injuries will be associated with poor compliance and vice versa.

1.2. Objectives for Study

1.2.1 General objectives

This study seeks to examine health care provider's risk perception of HIV, knowledge of SPs, barriers and rate of compliance with standard precautions and also the work related injuries faced by the HCWs.

1.3. Specific objectives

- To examine risk perception of HIV and compliance with standard precautions
- To assess health care worker's compliance with standard precautions
- To identify barriers to compliance with standard precautions
- To identify the Work-related accident/injury
- To determine the knowledge of HCWs on standard precautions

1.4. Justification

Universal Precautions (UPs) and more recently standard precautions have been widely promoted in high-income countries to protect health care workers (HCWs) from occupational exposure to blood and the consequent risk of infection with blood-borne pathogens.

In low-income countries, the situation is very different: UPs are often practiced partially, if at all, thereby exposing the HCWs to unnecessary risk of infection (Kermode *et al.*, 2005). It will therefore be of great importance to study the factors that influence low compliance with standard precautions in Ghana.

Findings of this study would highlight factors related to compliance with standard precaution among HCWs. It will also help in planning and targeting appropriate measures/interventions to improve compliance to standard precautions among health care workers.

Findings and recommendations of the study will be useful for ensuring that barriers to compliance are minimised at hospital settings. Recommendations emerging from this study will be useful for improving occupational health and safety in hospitals. The health care workers will be the ultimate beneficiary of interventions that will be based on findings from the study.

1.5. Research Questions:

The following research questions were asked in order to meet the goals.

- a. Do healthcare workers perceive themselves to be at risk of HIV?
- b. How often do the HCWs comply with standard precautions?

- c. What are the barriers to compliance with standard precautions?
- d. What injuries are the HCWs frequently exposed to?
- e. How knowledgeable are HCWs on standard precautions?

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

The literature review was guided by the problem statement, justification and the objectives for the study. The literature looked at theoretical framework, and various reports and studies conducted in different countries. The focus of the review was on risk perception of HIV, health care worker's practice of standard precautions, barriers to compliance with standard precautions, work-related accident/injury and knowledge of standard precautions.

2.1 Theoretical Framework

2.1.1 Health Belief Model

The health belief model (HBM) has been widely used and is considered as one of the most useful models in health care prevention and promotion (Roden, 2004). It assists in the understanding of the different behaviours or attitudes people may develop under the same condition by following or not following certain guidelines or requirements (Kartal & Ozsoy, 2004).

Hochbaum, Kegels, Rosenstock and Leventhal in the 1950s developed this theory as a way to examine the barriers that prevented people from using free programs, which would detect or prevent diseases

The theory is based on two components: a) the perceived threat for acquiring a disease, which comprises of the perceived susceptibility and perceived severity, constructs. Based on this, an individual faces pressure to take action, nevertheless this action may not necessarily take place (Nejad, 2005). b) The enabling factors that generate or trigger the behaviour, which include the perceived benefits and perceived barriers

(Efstathiou *et al.*, 2011). Additional constructs were added later in order to overcome some limitations the model showed. Hence, the self-efficacy and cues to action were added (Rosenstock, 1974).

HBM has been used in many studies related to health care behaviours and attitudes such as weight management (Daddario, 2007), sexual behaviours (Lin, Simoni & Zemon, 2005), vaccination behaviours (Rhodes, 2003; Raftopoulos 2007). It has also been previously applied as a theoretical model to measure attitudes of nurses and health care workers towards implementing certain aspects of universal precautions from occupational exposure to pathogens (Grady *et al.*, 1993; Williams, Campbel, Henry & Collier, 1994; Osborn, 2003; Efstathiou *et al.*, 2011).

The six constructs of the health believe model is summarized below:

- Perceived susceptibility: personal perception on the risk of acquiring a certain disease or condition
- Perceived severity: personal perception of the seriousness of a certain disease, behaviour or condition
- Perceived Benefits: personal perceptions on the effectiveness and positive consequences when adopting a Behaviour
- Barriers: personal perception of the obstacles that may prevent him/her to adopt a new behaviour

Added constructs:

- Cues to action: factors that trigger a behaviour
- Self-efficacy: personal perception on his/her ability to adopt a behaviour

2.2 History of Standard Precautions

The center for disease control (CDC) initially issued a document in 1983 entitled ‘Guidelines for Isolation Precautions in Hospital’, which contained information on precautions for blood and body fluids (Okechukwu, 2009). It recommended preventive measures that need to be taken when a patient is known or suspected to be infected with blood-borne pathogens (Garner, Simmons, & Williams, 1983). In 1987, CDC again published ‘Recommendations for Prevention of HIV Transmission in Healthcare Settings’. The guidelines suggested that precautions should be consistently practiced for all patients regardless of their blood-borne infection status. This contradicted the earlier (1983) recommendation which states that preventive measures should be taken when a patient is known or suspected to be infected with blood-borne pathogens (Garner *et al.*, 1983).

Due to this extension, Standard precautions became known as Universal Precautions and it was defined by CDC (1996) as a set of precautions designed to prevent the transmission of HIV, HBV and other blood-borne pathogens when providing first aid or health care (Okechukwu, 2009). “Thus, universal precautions replaced and eliminated the need for the isolation category blood and body fluid precautions in the 1983 CDC Guidelines for Isolation Precautions in Hospitals” (Okechukwu, 2009).

2.3. Prevalence of HIV

According to the UNAIDS report (2012), on the Global AIDS Epidemic, approximately 34 million people are currently living with HIV and nearly 30 million people have died of AIDS-related causes since the beginning of the epidemic.

The UNAIDS report on the global AIDS epidemic (2012) and Population Reference Bureau. (2011) suggests that Sub-Saharan Africa is the hardest hit region in terms of HIV and currently it has more than two-thirds (69%) of people living with HIV.

The UNAIDS report on the global AIDS epidemic (2012) reveals South Africa as the country in sub-Saharan region with the highest number of people living with HIV in the world (5.6 million) and Swaziland with the highest prevalence rate in the world (26.0%)

According to the 2011 HIV sentinel report in Ghana, five regions namely Central, Eastern, Greater Accra, Ashanti and Volta recorded an increase in HIV prevalence. The Regional prevalence ranged from 0.3% in the Northern Region to 4.7% in the Central Region. The 2011 prevalence for Eastern Region where this study was carried out is 3.6%, second after Cape coast.

Out of the 35 million health care workers worldwide, nearly 3 million experience percutaneous exposures to blood borne viruses each year (Wilburn & Eijkemans, 2004). According to a World Health Organization (WHO) estimate, in year 2002, these sharp injuries resulted in 16 000 hepatitis C virus, 66 000 hepatitis B virus and 1000 HIV infections in health care workers worldwide (Pruss-Ustun, 2005). WHO (2003) has estimated that in developing countries, 40%–65% of HBV and HCV infections in HCWs are attributable to percutaneous occupational exposure. As of the year 2000,

there were no reported studies investigating the prevalence of HIV among health workers (Shisana *et al.*, 2004).

However, based on a sample of 721 health workers a study conducted by Shisana *et al.* (2004) in South Africa found that 15.7% of health workers employed in the public and private health facilities located in four South African provinces were living with HIV/AIDS in 2002.

Furthermore, to determine the prevalence of HIV infection and the extent of disease progression based on CD4 count in a public health system workforce in southern Africa, a study was conducted in two public hospitals in Gauteng, South Africa by Connelly *et al.*, (2007). The study reported that the overall prevalence of HIV was 11.5%. “By occupation, prevalence was highest among student nurses (13.8%) and nurses (13.7%). The highest prevalence by age was in the 25 - 34-year groups (15.9%)[Connelly *et al.*, 2007].

2.4. HIV and work place policy

An HIV work place policy is a written document that acknowledges the effects of HIV and other related illnesses on the smooth operation of a company. Since HIV/AIDS has been recognized as a workplace health concern, more and more organizations including healthcare facilities are formulating HIV/AIDS Workplace Policies that address the many issues surrounding HIV/AIDS. Although each and every workplace around the country has its own way of responding to the AIDS pandemic, a well-written HIV/AIDS Workplace Policy contains key factors that are internationally accepted (WHO/ILO, 2005).

The policy must define how the health facility will use a combination of engineering and work practice controls, enforce the use of personal protective clothing and

equipment , provide training , medical surveillance, pre and post exposure prophylaxis, and signs and labels, among other provisions. HIV/AIDS is a concern or problem for the workplace because it affects the workforce, and also the workplace can play a vibrant role in limiting the transmission and effects of the epidemic (WHO/ILO, 2005). According to the April 2005 International Labour Organisation (ILO) / World Health Organisation (WHO/ILO, 2005) joint guidelines on prevention and control of occupational risks related to infectious diseases, to successfully manage risk or exposure, one must first of all go through the process of hazard identification, then risk assessment and risk control.

The management of risk starts with the “identification of situations, activities and tasks in the workplace which may put health-care workers at risk of exposure to HIV and other blood-borne infections or associated opportunistic infections” (WHO/ILO, 2005). To effectively identify hazards, there should be established and implemented procedures that ensure that health-care workers can report perceived hazards without sanction (WHO/ILO, 2005). “This requires an active programme to educate health-care workers about the importance of reporting and how and when to report” hazards (WHO/ILO, 2005). Identification of hazards also involves “analyses of reports of incidents of exposure to blood or body fluids” and “Surveillance of the workplace layout, work practices and other sources of worker exposure” (ILO/WHO, 2005).

As soon as a hazard is identified, the next step is to do a risk assessment. Risk assessment is carried out in order to assess the level and nature of the risk to health-care workers of exposure to hazards such as blood or body fluids and to determine the measures needed to eliminate the hazard or minimize the risk factors (ILO/WHO, 2005).

Risk assessment includes taking into account modes of transmission of HIV and other blood-borne pathogens in the workplace; type and frequency of exposure to blood or

body fluids, availability, adequacy and use of protective clothing and equipment; the knowledge and training of employers, supervisors and health-care workers regarding HIV and other blood-borne pathogens and safe work practices and many more (ILO/WHO, 2005).

The final step in risk management is risk control. The objective of risk control is “to follow the hierarchy of controls, selecting the most effective control measures in order of priority for their effectiveness in minimizing health-care workers’ exposure to blood or body fluids, or preventing injury or illness resulting from exposure” (ILO/WHO, 2005).

Risk control involves Substitution, Engineering controls, Administrative controls (workplace policies aimed at limiting exposure to the hazard,). Work practice controls (“Controls reduce exposure to occupational hazards through the method by which the work is conducted, protecting the health and improving the confidence of health service workers and their patients. Examples include no needle recapping, placing sharps containers at eye-level and within arm’s reach, emptying sharps containers before they are full, and establishing the means for safe handling and disposing of sharps devices before beginning a procedure”). Personal protective equipment (PPE) (making available equipment to protect workers from exposure to blood or body fluids, there are adequate supplies of items for personal protection, proper maintenance of equipment, adequate training on use of PPE, etc.) and Elimination of hazard (ILO/WHO, 2005).

Elimination is the most effective and preferred measure is the complete removal of a hazard from the work area (ILO/WHO, 2005). Where elimination is not possible, the organization has to replace the work practices with others that present a lesser risk, for example ‘substituting a less toxic chemical for a disinfectant, such as paracetic acid for glutaraldehyde’ (ILO/WHO, 2005).

Engineering controls encompasses the isolation or removal of hazard from a workplace. They may include the use of suitable mechanisms, methods and equipment to avert worker exposure. Some of these measures developed to curtail exposure to blood or body fluids should take into account: sharps containers, also known as safety boxes; newer device technology such as safer devices with engineered injury prevention features and many more (ILO/WHO, 2005).

Furthermore, the management of risk exposure according to the 2005 ILO/WHO guidelines should consider safe work practices/ standard precautions such as, personal hygiene; good hand-washing practices and an infection control programmes which aim to minimize the risk of transmission of HIV and other blood borne infections in the workplace.

It also takes into account safe handling of disposable sharp and injection equipment. It requires placement of clearly marked puncture-resistant containers for the disposal of sharps (sharp boxes), regular replacement of sharps containers before they reach the manufacturer's fill line or when they are half full, containers should be sealed before they are removed, the disposal of non-reusable sharps in safely positioned containers that comply with relevant national regulations and technical guidelines, avoiding recapping and other hand manipulations of needles, and, if recapping is necessary, using a single-handed scoop technique, responsibility for proper disposal by the person using the sharp, responsibility for the proper disposal and for reporting the incident by any person finding a sharp (ILO/WHO, 2005).

2.5. Post-exposure Management

Adhering to standard precautions remains the principal approach for the prevention of infections due to work-related exposure (Okechukwu, 2009). Nonetheless, occupational

exposure every now and then occurs; hence, appropriate post-exposure management is vital for workplace safety (Okechukwu, 2009). Health care facilities should make accessible a system that comprises written protocols for prompt reporting, evaluation, counseling, and treatment as well as follow-up of occupational exposures that might place HCWs at risk for acquiring infections (Okechukwu, 2009). Furthermore, HCWs ought to be trained on the risk for and prevention of infections, including the need to be vaccinated against hepatitis B and C (CDC, 1989; CDC, 1991; Garner, 1996).

If an occupational exposure occurs, the conditions and post exposure management should be recorded in the HCWs confidential medical record (usually on a form the facility designates for this purpose) [CDC, 1998].

Significant information to be documented includes date and time of exposure, details of the procedure being performed, including where and how the exposure occurred, and if the exposure was related to a sharp device, the type of device and how and when in the course of handling the device the exposure occurred, details about the exposure source (i.e., whether the source material contained HIV or other blood-borne pathogens), and if the source is an HIV-infected person, the stage of disease, history of antiretroviral therapy, and viral load, if known; and details about counseling, post exposure management, and follow-up (CDC, 1998).

2.6. Post-exposure Prophylaxis (PEP) for HIV

Post-exposure prophylaxis (PEP) plays a vital role in post-exposure management (CDC, 1998). PEP for HIV involves the commencement of antiretroviral treatment as soon as possible preferably within hours rather than days of exposure. The recommended PEP includes a basic 4-week regimen of two drugs (zidovudine and lamivudine) depending on the level of risk for HIV transmission represented by the

exposure (CDC, 1998; Okechukwu, 2009).

The decision to recommend HIV post exposure prophylaxis must consider the nature of the exposure (e.g exposure from NSI or potentially infectious fluid) and the quantity of blood or body fluid involved in the exposure (CDC, 1998). An evaluation of the risk for infection resulting from the exposure and of the infectivity of the exposure source is key determinants of offering PEP.

2.7. Risk-perception regarding HIV

Risk perception can be said to be the “belief (whether rational or irrational) held by an individual, group, or society about the chance of occurrence of a risk or about the extent, magnitude, and timing of its effect(s)”; it is posited that risk susceptibility dominates both the actual and perceived characteristics of the situation as a determinant of risk behavior (Sitkin & Pablo, 1992).

Individual and social features form an individual’s risk perception and influence the way they react towards risks; understanding perceived risk can draw upon factors associated with the person (e.g. demographics, personality, social/professional status, political orientation), or to the risk source (e.g. health impacts, economic effects). Individuals respond to risk or hazard in ways consistent to their perception of that risk. In other words it is their perception that influences behaviour or action (Mileti, 1993; Brenot *et al.*, 1996; Schmidt, 2004).

Several studies conducted on risk perception regarding HIV among HCWs have indicated that majority of them have a very high risk perception regarding occupational exposure to HIV and other blood-borne pathogens. Most HCWs regarded HIV as a public health concern and often see themselves at risk of contracting the infection

whilst working (Kermode *et al.*, 2005; Hanafi *et al.*, 2007; Kocić *et al.*, 2008; Akinboro *et al.*, 2012; Basavaprabhu *et al.*, 2012).

The level of risk depends on the number of patients with that infection in the healthcare facility and the precautions the HCWs observe whilst dealing with these patients (Akinboro *et al.*, 2012). The perception of high risk can be attributed to the high rate of infection of HIV in the larger population (Kermode *et al.*, 2005).

Akinboro *et al.* (2012) in a study on Community health care workers' risk perception of occupational exposure to HIV in Ibadan, south-west Nigeria and reported a very high risk-perception amongst HCWs regarding occupational exposure to HIV and AIDS but a poor compliance with universal precautions in their professional duties. HCWs perception of risk and workplace safety climate did not influence their compliance with universal precautions.

HCWs regard HIV and AIDS as a public health issue and believe that they are at risk of contracting HIV whilst working (Akinboro *et al.*, 2012). HCWs agree they stand a higher risk of contracting HIV than non-health professionals and also non-availability of personal protective equipment (PPE) sometimes when caring for patients put them at risk (Akinboro *et al.*, 2012).

Further studies investigating the perception of professionals risk, knowledge, attitudes and practice of HCWs to HIV and AIDS, have found a high perception of professional risk among HCWs frequently exposed to patients' blood and body fluid (Jovic-Vranes *et al.*, 2006; Kocić *et al.*, 2008).

There have been similar situation of non-compliance reported in other studies that have

been carried out Egypt, Italy, Serbia, Ethiopia, Nigeria and other countries across the world (Kotwal & Taneja 2010; Parmeggiani *et al.*, 2010; Hanafi, *et al.*, 2011; Akinboro *et al.*, 2012).

2.8. Compliance to Standard Precautions

The term compliance according to, Haynes *et al.*, (1979) is the extent to which certain behaviour (for example, following physician's orders or implementing healthier lifestyles) is in accordance with the physicians' instructions or health care advice.

Compliance is the degree to which a person adheres to advice and it may also be defined as "the act of complying, yielding, or acting in accord (Haynes, *et al.*, 1979)."

Rules and procedures that govern all behaviour exists in a variety of settings (including health care settings), but people do not always comply with them (Efstathiou *et al.*, 2011).

According to Kelman (1958) compliance or obedience occurs when another person or group influences an individual. The ability of a person to comply may be influenced or controlled by a variety of factors like culture, socio-economic factors, self-efficacy, and lack of knowledge or means (Efstathiou *et al.*, 2011).

The importance of compliance to standard precautions cannot be underestimated (Garner, 1996). Standard precautions are regarded as the most effective means of protecting HCWs, patients, and the public, thereby reducing hospital acquired infections (Wang *et al.*, 2003).

Siegel, *et al.*, (2007) report that, the use of precautionary measures during patient care is determined by the nature of the health care worker-patient interaction and the extent of

anticipated blood, body fluid, or pathogen exposure. In some cases for example the health personnel performing venipuncture, might need only gloves, but for other situations such as intubations, use of gloves, gown, and face shield or mask and goggles is necessary.

Standard precautions comprise of the use of gown/plastic apron, proper hand washing, use of gloves, putting used needles and other sharp objects into the designated 'sharps' containers, not recapping needles that have been contaminated with blood or body fluids, covering of broken skin before coming to work, reporting and recording needle stick injury when it occurs, promptly wiping up all blood spills and other body fluids with disinfectants and many more.

Compliance with these standard precautions has been shown to reduce the risk of exposure to blood and body fluids (Ferguson, *et al.*, 2004).

Studies have also identified that even though the HCWs believe that they are at risk to infection, their risk perceptions do not act in accordance with compliance to standard precautions (Akinboro *et al.*, 2012; Basavaprabhu *et al.*, 2012; Hanafi *et al.*, 2011; Kermode *et al.*, 2005; Kocić *et al.* 2008). Despite the existence of universal precautions guidelines since 1987, suboptimal observance to these has been documented extensively.

Despite the evidence that failure to use universal precautions increases the risk of mucocutaneous blood and body fluid exposure and adherence decreases risk, several HCWs act in violation to the standard precautions. For instance in a study carried out by Timilshina, *et al.*, (2011) in Nepal, it was reported that a total of 62% regularly used protective gloves while handling patients and 72% reported that they never used high-

level disinfection to eliminate all microorganisms (bacteria, viruses, fungi, and parasites, including bacterial endospores) from instruments and other items that would come into contact with broken skin or intact mucous membranes.

Also a study conducted by Kermode *et al.* (2005) in 7 rural north Indian health care setting to identify level of knowledge and Compliance of universal Precautions (Ups) among 266 HCW, revealed that standard compliance was low only 32% wore eye protection when indicated, and 40% recapped needles at least sometimes.

2.9. Barriers/Factors leading to non-compliance

Several studies have identified some factors that contribute to non-compliance with Standard Precautions. Some factors that accounted for these were lack of knowledge, lack of time, forgetfulness, lack of means, negative influence of the equipment on nursing skills, uncomfortable equipment, skin irritation, lack of training, conflict between the need to provide care and self-protection, and distance to necessary equipment or facility (Tait *et al.*, 2000; Osborne, 2003; Stein *et al.*, 2003; Sax *et al.*, 2005; Oliveira *et al.*, 2010).

Neves *et al.*, (2011) in a qualitative study conducted in a teaching hospital with 15 nursing professionals attempted to analyse the reasons, attitudes and beliefs of nursing staff regarding adherence to personal protective equipment., result revealed several barriers interfere in matters of safety and personal protective equipment, such as communication, work overload, physical structure, accessibility of protective equipment.

Kotwal and Taneja (2010) in his study to assess the knowledge, attitude, practices and

barriers to compliance of universal Precautions (Ups) among HCWs in LokNayak Hospital in India also disclosed that the perceived barriers to compliance with UPs, were that HCWs felt too busy to use personal protective equipment (PPE), they also did not use PPE because colleagues did not use it, the HCWs felt that using PPE may offend patients, and lead to discomfort.

Non-compliance with standard precautions among health care workers has been associated with their belief that their workload is increased by adhering to universal precautions and therefore, these procedures are difficult to accommodate due to day to day current clinical pressures (Cutter & Jordan, 2004). Additionally, non-compliance among health care workers may be due to a lack of understanding among health care workers of how to properly use protective barriers (Vaz *et al.*, 2010).

2.10. Work–Related Injuries/ Accidents

Occupational risks exist wherever health care is practiced. However, there is dearth of information on the status of occupational safety among hospital workers in Ghana. Occupational / work-related injuries are hazards to which health workers are exposed to (Ofili *et al.*, 2004)

Injuries among HCWs may negatively affect job satisfaction, contribute to job shortages, and affect overall quality of care provided by nursing facility residents (Khatutsky *et al.*, 2012). Injuries are also expensive, as they lead to missed days of work and require shifting CNA staff to lighter duties.

The risks HCWs are exposed to may be physical, chemical, mechanical or psychosocial. Some of the hazards that hospital workers experience are “physical

hazards such as radiation, leading to sickness, burns and cancers; hazards from chemicals, leading to contact dermatitis and allergic asthma” (Ofili *et al.*, 2004). The most common injuries in the health industry according to studies are needle-stick, splashes from bodily fluids, Cuts from other sharp objects, etc. and nurses have the highest risk of suffering NSI compared with the other occupational categories such as doctors and ward aides (Hanafi, *et al.*, 2011; Vaz *et al.*, 2010; Kermode *et al.*, 2005; Manyele *et al.*, 2008).

According to Reda *et al.*, (2010), needle stick injuries are significantly associated with females. This suggests that females are more prone to needle pricks. Furthermore their study on occupational exposures and behaviour of health care workers (HCWs) in eastern Ethiopia; revealed a Life time risks of needle stick injury.

To examine differences in exposure rates across categories, Ferguson *et al.* (2004) studied exposure rates for all respondents who reported an incident of a break in standard precautions. In terms of sharps injuries, only 23% of those who said they had forgotten to use precautions had experienced a sharps injury in the past 3 months, which was lower than the overall rate. In terms of mucocutaneous exposures, those who had not anticipated exposure had a higher exposure rate (59%).

Kabbash *et al.*, (2007) carried out a cross sectional studies in 32 Haemodialysis units in the Nile Delta, Egypt. The purpose of the study was to evaluate and Knowledge and practices towards Risk of HIV infection by 317 HCWs. At the end the research they accounted that exposure to needle stick injury reported in the previous year was 48.6%.

At the end of a study conducted by Ofili *et al.*, (2004), they instituted that the major accidents/injuries recorded at work among the laboratory workers, nurses and doctors were contact with patient's blood with ungloved hands, blood splashes on face and parts of the body, needle pricks and chemical splashes.

2.11. Knowledge of Standard Precautions

Knowledge is often attributed to a recall of information and it is essential to suitable behavioral change (Okechukwu, 2009). It is the most significant tool for achieving behavioural change (Gbefwi, 2004).

HCWs are expected to have training and some knowledge of the basic concept of standard precautions, potential sources of occupational exposure and clinical conditions and body fluids that require observance of the standard Precautions.

Li et al 2011 in a study have associated UP training with better knowledge of and adherence to UP. In other words, adequate training in standard precautions can lead to increase in the knowledge of SPs and in turn lead to adherence. Training and education have been found to be of utmost importance to developing awareness among health care workers (Vaz *et al.*, 2010)

The knowledge of UP among HCWs also has a 'weak association with perceived adherence and suffering of occupational sharp injuries' (Sri *et al.*, 2011). This suggests that knowledge is not the sole determinant of compliance to UP and prevention of work related injury

According to a study by Vaz *et al.* (2010), the knowledge of universal precautions was

highest among women compared with men, and among the nurses more than medical doctors. Furthermore Vaz *et al.* (2010) identified that the level of awareness of universal precautions increased with longer year of service in health care sector.

Timilshina *et al.*, (2011), in a research to identify the infection control knowledge and practice compliance of basic health workers of 28 primary health care centers in two districts of the Western Development Region, Nepal, between 2003 and 2004 revealed that of the 100 basic health workers studied, only 22% had correct knowledge of universal precautions. Furthermore, some of the HCWs (46%) had ever received training and on standard. This study therefore shows that most of the HCWs in an urban tertiary health care facility (HCF) in India possessed incomplete knowledge. This lack of appropriate knowledge may be a factor leading to a high level of anxiety among them regarding exposure to blood and body fluids and needle stick injuries.

However Parmeggiani *et al.*, (2010) in an attempt to assess knowledge, attitudes, and compliance regarding standard precautions about health care-associated infections (HAIs) and the associated determinants among healthcare workers (HCWs) in emergency departments in Italy, employed an anonymous questionnaire, self-administered by all HCWs in eight randomly selected non-academic acute general public hospitals, revealed that HCWs who know the risk of acquiring Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) from a patient were in practice from less years, worked fewer hours per week, knew that a HCW can transmit HCV and HIV to a patient, knew that HCV and HIV infections can be serious, and have received information from educational courses and scientific journals.

HCWs who know that the use of gloves, mask, protective eyewear, and hands hygiene after removing gloves are control measures were nurses, provided care to fewer patients Parmeggiani, et al., (2010). This indicates that HCWs have high knowledge, positive attitudes, but low compliance concerning standard precautions. The reasons for low compliance have not been adequately answered by the study. It is therefore important to find out the situation in Ghana.

Vaz et al. (2010) investigated the knowledge, awareness and practices of health care workers towards universal precautions at the University Hospital of the West Indies.

The findings showed that majority of the health care workers were aware of policies and procedures for reporting accidents. Splashes from body fluids, needle stick injuries and cuts from other objects were quite prevalent among health care workers. In spite of workers knowledge of precautionary measures, majority still experience accidents due to low compliance with standard procedures.

HCWs in a study conducted by Abdulraheem *et al.* (2012) in the local government areas of Borno State knew that the aim of standard precautions was to protect both health care workers and patients from transmission of infection. Majority thought that standard precautions were meant to protect health workers alone from getting infections from patient. Some also agreed that standard precautions are aimed at protecting health workers while handling infectious waste.

The HCWs who had been in long service have greater knowledge of standard precautions and this may be due to their participation in a greater number of seminars, conferences and training some of which may include universal precautions which not only encouraged safer work practices but also improved concordance with policy and procedures (Abdulraheem *et al.*, 2012).

CHAPTER THREE

METHODS

3.0 Introduction

This chapter presents the design and methods used for the research project. A research design refers to the overall approach or strategy taken in conducting a research. Baumgartner, Strong and Hensley (2002), refer to research methods as an account of research participants, research instruments and procedures for administration, data collection and data analysis.

3.1 Study Design

A quantitative cross-sectional survey design was employed for the study. This design allow the study to be carried out at one point in time from different developmental groups at a single point in time for the purpose of inferring trends over time.

This study design is appropriate because the purpose of the study is to understand the knowledge and practice of standard precautions among health care workers in order to generate information on how to improve compliance. This cross-sectional study describes and examines factors associated with the practice of standard precautions.

3.2. Study Location

The study was carried out in Lower Manya Krobo district in Akuse Government Hospital and St. Martin de Porres Catholic Hospital.

Lower Manya Krobo is one of the 21 districts in the Eastern Region and it lies in the South-eastern part of the Eastern Region.

According to the HIV sentinel surveillance report (2011), the Eastern region of Ghana, ranks second in terms of HIV prevalence. This implies that the populations of HCWs who continually handle these patients are at risk of exposure to HIV.

Akuse Government Hospital and St. Martin Hospital were selected for the study because they are the two major referral points for HIV related cases in the Lower Manya Krobo District.

3.3.1 St. Martin de Porres Catholic Hospital, Agormanya

The St. Martin de Porres Catholic Hospital is located at Agormanya in the Lower Manya Krobo District of the Eastern Region of Ghana. The health facility was established by Rt. Reverend Joseph Oliver Bowers (later Bishop) [1910 – 2012] in 1946 as a Maternity Home.

The facility offers a full range of HIV/AIDS services, including voluntary counselling and testing services (VCT) and prevention of mother to child transfer (PMTCT). It also undertakes specialized services in home-based care (H.B.C.) for people living with HIV/AIDS (PLWHA's).

3. 3.2 Akuse Government Hospital, Akuse

Akuse Government hospital is one of the oldest hospitals in Ghana built by the Germans in 1911. It is located in Akuse in the Eastern region of Ghana. It is located between Somanya and Asutsuare in the Lower Manya Krobo district. The hospital provides health services for a number of communities in the Lower Manya Krobo District and the surrounding districts such as Yilo Krobo, Asuogyaman, North Tongu, and Dangbe West districts.

The health facility is made up of the male and female ward, a maternity ward, a laboratory unit and a voluntary, counseling and testing unit (VCT).

3.4 Study population

A HCW is a person (e.g. nurse, physician, pharmacist, technician, mortician, dentist, student, contractor, attending clinician, public safety worker, emergency response personnel, health-care waste worker, first-aid provider or volunteer) whose activities involve contact with patients or with blood or other body fluids from patients (World Health Report, 2006 & CDC, 2013).

However for the purpose of this study, the population for this research comprised of nurses, ward aides/ward orderlies, laboratory technicians and midwives since they often come into contact with blood and bodily fluids during treatment especially in emergencies. The target population was identified at Akuse and St. Martins Hospital. These hospitals are two of the largest facilities that serve the lower Manya Krobo district. The estimated population for our study of the two facilities is 172.

3.5. Sampling

A sample of 100 HWCs namely 18 midwives, 55 nurses, 5 lab technicians and 22 ward aides participated in the study. The participants were sampled from the population of HCWs in both Akuse and St. Martin Hospital respectively. A total of 7 midwives, 30 nurses, 5 lab technician, and 10 ward aides were sampled from Akuse. A sample of 11 midwives, 25 nurses, and 22 ward aides were sampled from St. Martin. Lab technicians from St. Martin could not avail themselves for the 4 week period of data collection as a result of other commitments. In all 52 participants were selected from Akuse Government Hospital while 48 were Sample from St. Martin Hospital.

The above HCWs were sampled for the study because of their frequent interaction with patients and hospital treatment equipment which often expose them to potentially infectious blood and other bodily fluids

3.6. Sample size determination

The sample size was based on the 10% estimate of the population with a confidence interval of 95% using the formula;

$$n = \frac{Z^2 * P * (1 - P)}{d^2}$$

- n = Sample Size
- Z = Z-value (e.g., 1.96 for a 95 percent confidence level)
- P = Percentage of population picking a choice, expressed as decimal (Godden, 2004)

d = Confidence interval, expressed as decimal

$$\text{Therefore: } n = \frac{(1.96)^2 * 0.1(1-0.1)}{(0.5)^2} = 138$$

For a population < 10,000

$$f = \frac{n}{1 + \frac{n}{N}} \quad \text{Araoye (2004)}$$

Where:

nf = the desired sample size when the population is less than 10,000

n = 138, i.e. the desired sample size when the population is more than 10,000

N = 172, i.e. the estimate of the population size

$$nf = \frac{138}{1 + \frac{138}{172}} \quad \text{Araoye (2004)}$$

$$nf = 49$$

Hence the sample size for the study was estimated at 49. However, one hundred (100) were selected for the study in order to make room for inadequate response rate. This is because the sampling population is always busy. Per HCWs distribution ratio of the two hospitals, quota sampling technique of 50:48 was used to select 52 HCWs and 48 HCWs from Akuse and St. Martin respectively. Similar quota technique of 5:18:55:22 was used to sample a total of 5 laboratory technicians, 18 midwives, 55 nurses and 22 ward aides for the study. Similar technique was used to select participants per hospital distribution in the ratio 7:30:5:10 for midwives, nurses, lab technicians and ward aides respectively for Akuse government hospital.

A ratio of 11:25:12:0 was used in St. Martin for midwives, nurses, ward aides and lab technicians respectively. In terms of hospital distribution of staffs, a ratio of 7:11 for midwives; Akuse: St. Martin, 30:25 for nurses; Akuse: St. Martin, 5:0 for lab technician; Akuse: St. Martin and ward aides, 10:12; Akuse: St. Martin. The distribution is summarized in Table 3.1 below

Table 3.1: Summary of distribution of participants from Akuse and St. Martin

HWCs	Akuse	St. Martin	Total
Midwives	7	11	18
Nurses	30	25	55
Lab technicians	5	0	5
Ward aides	10	12	22
Total	52	48	100

3.7. Sampling technique

Participants for the study were conveniently and purposively selected for the research from St. Martin and Akuse Government hospital. The sampling techniques were used because the research settings were at the convenience of the researcher and the researcher was interested in only the population of midwives, nurses, lab technicians and ward aides.

3.8 Variables

- Knowledge on standard precaution
- Risk perception of HIV
- Perceived barriers to compliance with standard precautions
- Work-related injuries/accidents
- Compliance with standard precautions

3.9. Data Collection Technique and Tools

Self-administered semi-structured questionnaire was used to obtain data from respondents. Questionnaires were adopted from other studies such as Akinboro et al., (2012), Ofili *et al.*, (2004), Ferguson et al., (2004) and Okechuku, (2009). These questionnaires were used to measure risk perception, knowledge of standard precautions, compliance with standard precautions, barriers to compliance and work-related accidents at the hospital settings. These studies have been adapted because it has been reliably tested and have been used in studies in Nigeria and some other countries. They are therefore reliable and valid.

Data collection was done within a period of four weeks. The research team spent the first two weeks collecting data in Akuse and the last two weeks was spent in Agormanya.

3.10. Tools

The semi-structured questionnaire was divided in to six sections. First section captured the demographic characteristics of the participants. The second section measured risk perception, third section measured compliance to standard precautions (SPs), the fourth section measured barriers to compliance, fifth section was on knowledge on standard precautions and final section measured work- related injuries.

3.10.1 HIV Risk Perception Questionnaire (Akinboro et al., 2010)

This questionnaire measures perception of the risks posed by HIV to Health workers.

A 5-point Likert scale (1= strongly disagree, 2= disagree, 3= undecided, 4=

agree, 5= strongly agree) was used to rate the perception ranging from 1 to 5 (According to the Likert responses). Scores for each of seven items was added and those scoring more points were seen to have higher risk perception.

3.10.2 Compliance with Standard Precautions Questionnaire (Akinboro et al., 2010)

This questionnaire measures the rate at which healthcare workers adhere to standard precautions when providing treatment and care. A 5-point Likert scale (1= never, 2= rarely, 3= sometimes 4= often, 5= always) was used to rate the level of compliance ranging from 1 to 5 (according to the likert responses). Scores for each of twelve items was added and those scoring more points were considered more compliant to universal precaution and vice versa.

3.10.3 Barriers to Compliance (Ferguson et al., 2004)

This questionnaire measures the factors that hinder health care workers effort to adhere to standard precautions when providing treatment and care. A 5-point Likert scale (1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always) was used to rate the level of compliance ranging from 1 to 5 (according to the Likert responses). Scores for each of eleven items was added and those scoring points were seen as experiencing more barriers and vice versa.

3.10.4 Knowledge of standard precautions Questionnaire (Okechukwu, 2009)

This questionnaire deals with healthcare workers level of knowledge of standard precautions associated with healthcare delivery. Knowledge about standard precautions was measured through 7 questions having with multiple responses set. On this questionnaire, respondents circle the number that corresponds with a chosen answer/option to the items. They were permitted to choose more than one response for some items. Items were scored per number of correct responses.

Scores for all items are summed to create knowledge score. Those having more points will be having more knowledge regarding standard precautions. The scores are then divided to into three categories of level of knowledge. These include, less knowledgeable (0-5), somewhat knowledgeable (6-15) and very knowledgeable (15+).

3.10.5 Work Related Accidents or Injuries questionnaire (Ofili et al., 2004)

This questionnaire measures the Accidents/Injuries that are bound to occur at the workplace when providing treatment and care. A 5-point Likert scale (1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always) was used to rate the level of work related injuries from 1 to 5 (according to the Likert responses). Scores for each of eleven items was added and those scoring points were seen as experiencing more work related accidents and vice versa.

3.11. Pilot study

The questionnaire was pretested at the university of Ghana hospital Legon before the main data collection. Similar to the St. Martin and Akuse government hospitals, Legon hospital has trained physicians and dedicated nursing and pharmacy staff who have been fully engaged in developing ART programmes and models of care.

The facility has an out-patient and in-patient department, theatre, antenatal care, dental, eye, laboratory, family planning, prevention of mother to child transmission (PMTCT), voluntary counselling and testing (VCT), pharmacy, laundry, mortuary and X-ray units. The purpose of the pilot study was to establish the procedures and parameters to use for the research and to determine the reliability of the questionnaire. Based on the responses and comments from participants, minimal changes were made to some of the question to fit the research situation.

The Cronbach's Alpha results for reliability are as follows (Table 3.2):

Table 3.2 Summary of Cronbach's Alpha Reliability of Tests

<i>Variables</i>	<i>Alpha Result</i>
Risk perception	.64
Compliance to SP	.72
Barriers to SP	.80
Knowledge of SP	.75
Work-related injury	.86

3.12. Data Collection Procedure

Letter of introduction was obtained from the school of public health of the University of Ghana to obtain permission from the hospitals of interest. An office space was secured at the various hospitals for the purpose of data collection. Participants who agreed to participate were invited for the study. During the appointment, the investigator explained the purpose of the research and the procedures involved. If the participant wished to proceed, the consent form was reviewed and then signed by both

the participant and the investigator. A second copy of the consent form was also signed and given to the participant.

An initial assessment was conducted by the researcher to obtain basic demographic information from participant. Afterwards, the participants completed a booklet of self-report questionnaires with the help of the researcher. For participants who had difficulty reading or focusing on text, the researcher assisted them by reading the questions aloud and marking the answers. Participants who were too fatigued to complete the entire procedure in one sitting were given the option to schedule an additional appointment to finish the questionnaires or to complete them independently. Data collection lasted for a month.

3.13. Data analysis

Data was analysed using SPSS v.19. The frequency distribution table was used to determine the response rate on variables. The Chi Square (χ^2) test and Fishers exact test as appropriate was used to determine the association between variables

3.14. Ethical considerations

Ethical Clearance for the study was obtained from Ghana Health Service ethical review committee. The Ghana Health Service Ethical Code of conduct of research was considered for this study. It requires that when obtaining data informed consent, confidentiality and right to withdraw from the study must be taken into consideration. Although a research study may be feasible on practical grounds it remains unacceptable due to its ethical implications. It is important that a researcher explores these implications prior to embarking on a research work

CHAPTER FOUR

RESULTS

4.1. Introduction

This chapter presents the findings, based on responses in the completed copies of the questionnaire on risk perception, work-related injury as well as the barriers, knowledge and practice of standard precautions among health care workers. The Fisher Exact Chi-square test was used to determine association between variables. Due to the large response rate however, only significant values are reported for Chi-square test tables.

The majority of respondents were female (73%). With respect to categories of health care providers, 55% were nurses, 22% were ward aides, 5 % were laboratory technicians and 18% % were midwives. Fifty-two per cent (52%) of the participants were from Akuse government hospital with the other respondents from St. Martin catholic hospital in Agormanya (table 4.1).

Table 4.1: Background Characteristics of Respondents *: N=100

Variables	Frequency	Percentage
	N=100	(%)
Sex		
<i>Men</i>	27	27.0
<i>Females</i>	73	73.0
Area of practice		
<i>Midwife</i>	18	18.0
<i>Nurse</i>	55	55.0
<i>Lab technician</i>	5	5.0
<i>Ward aides</i>	22	22.0
Level of Education		
<i>SHS/ Vocational</i>	23	23.0
<i>Tertiary</i>	77	77.0

4.2. Findings on Risk Perception of HIV

Majority of the participants (94%) regarded HIV as a public health issue and most of them (57% strongly agree and 37% agree) perceived that they were at risk of contracting HIV on the job (Table 4.2). The study also revealed that 89% of the respondents agreed that their risk of contracting HIV is larger than other professional outside the health care industry because of the job they do (Table 4.2). Furthermore, 94% of the respondents agreed that unavailability of personal protective equipment (PPE) puts them at risk of contracting HIV

More than half of the respondents did not like working with colleagues who would not adhere to standard precautions (72%) while 81% of the participants were of the view that not knowing the HIV status of patients placed them at risk of infection; However 61% of respondents mentioned that an HIV- infected worker may poses a health risk. The Chi-square test and Fisher exact test was used to test the association of variables. Only significant values are reported (Table 4. 3)

TABLE 4. 2: Respondents' risk-perception regarding HIV

Variables	Degree of risk perception									
	Strongly disagree		Disagree		Undecided		Agree		Strongly Agree	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
I think about HIV and/or AIDS as a public health problem all the time (R1).	1	1.0	2	2.0	2	2.0	39	39.4	55	55.6
I think I am at risk of contracting HIV as a result of my job	2	2.0	4	4.0	0	0.0	37	37.0	57	57.0
My risk of contracting HIV is larger than that of other professionals outside healthcare industry.	1	1.0	8	8.0	2	2.0	36	36.0	53	53.0
Unavailability of personal protective equipment such as gloves, gowns, masks, nylon aprons, et cetera, at some times when caring for patients put me at a very high risk.	3	3.0	3	3.0	0	0.0	28	28.0	66	66.0
Not knowing the HIV status of patients before giving them care puts me at very high risk of contracting HIV.	5	5.0	8	8.0	6	6.0	36	36.0	45	45.0
Working with a colleague who does not adhere to universal precautions in the course of duty puts me at a very high risk of HIV infection.	6	6.0	13	13.0	9	9.0	42	42.0	30	30.0
An HIV-infected healthcare worker constitutes a very high risk to their colleagues and patients.	13	13.1	19	19.2	6	6.1	25	25.3	36	36.3

Fisher Exact test analysis indicated that nurses (58.3%) ($p = 0.05$) and ward aides

(21%; $p = 0.04$) were more likely to perceive HIV as a public health problem compared to other health professionals such as Midwife (17.4%) and lab technicians(5.2%). Additionally, more nurses significantly ($p = 0.05$) considered themselves to be at high risk of HIV (55.1%) as a result of the nature of their job compared with ward aides (21.4%) midwives (16.5%), and lab technicians (5%) respectively (Table 4.3).

Table 4.3: Summary of X^2 result of significant values of variables on risk perception

Variable	Frequency (%)	df	X^2	P
<i>1 I view HIV as a public health issue</i>				
Nurse	54(58.3)	4	7.13	0.05
Ward aides	22(21.0)	4	8.89	0.04
<i>2 I am at a high risk of HIV as a result of my job</i>				
Nurse	55(55.1)	3	6.52	0.05
<i>3 My risk of contracting HIV is larger than that of other professionals outside healthcare industry.</i>				
Akuse hospital	52(49.8)	4	7.77	0.05
St. Martin	48(50.2)	4	7.77	0.05
<i>4 Unavailability of personal protective equipment such as gloves, gowns, masks, waterproof aprons, et cetera, at some times when caring for patients put me at a very high risk.</i>				
Midwife	18(18.2)	3	6.70	0.05
Ward aides	22(21.1)	3	7.24	0.05
<i>5. Not knowing the HIV status of patients before giving them care puts me at very high risk of contracting HIV.</i>				
Nurse	55(57.6)	4	8.94	0.05

Working with a colleague who does not adhere to universal precautions in the course of duty puts me at a very high risk of HIV infection

Midwife	18(16.7)	4	10.94	0.02
Nurse	55(59.4)	4	15.08	0.03

6. *An HIV-infected healthcare worker poses a very high risk to colleagues and patients.*

Lab technician	5(2.9)	4	7.09	0.05
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* $p < 0.05$

Furthermore, almost majority of the HCWs purported that their risk of contracting HIV is larger than that of other professionals outside healthcare industry. Compared to Akuse Hospital (49.8%; $p = 0.05$), most HCWs from St. Martin hospital (50.2%) significantly believed that their risk of contracting HIV was larger than that of other professionals outside the healthcare industry (Table 4.3).

Additionally, quite a minority of the HCWs (Midwife, 18.25% and Ward Aide, 21.1%) believed that unavailability of personal protective equipment such as gloves, gowns, masks, waterproof aprons, et cetera, at some times when caring for patients puts them at a very high risk ($p = 0.05$). [Table 4.3]

Most HCWs [(nurses) 57.6%] attributed the lack of knowledge on the HIV status of patients before giving them care as a potential source of high risk of exposure to HIV.

Thus, majority of the HCWs were more likely not to work with colleagues who do not adhere to standard precautions since they can be at risk of contracting HIV.

This was significant for nurses ($p = 0.02$) and midwives ($p = 0.03$). This implied that majority of the midwives and nurses would not like to work with colleagues who do

not comply with standards. Notwithstanding, some of the Lab technicians who were in the minority were of the view that an HIV-infected healthcare worker hardly posed a very high risk to colleagues and patients ($p = 0.05$).

4.3. Findings on Compliance with standard precautions

Data gathered through the self-reporting questionnaire revealed good compliance with standard precautions (SP) amongst the HCWs surveyed; 99.0% of the participants claimed that they protected themselves against contact with blood and body fluids of all patients. This was significant for HCWs in Akuse government hospital (54.6%) who tend to protect themselves compared to St. Martin (45.4%; $p = 0.05$) [Table 4.5]. For example 50% reported that they always protect themselves against blood and body fluid whilst 24% often protect themselves and 25% sometimes protected themselves (Table 4.4).

Almost all the respondents reported washing their hands after removing their gloves (99%). However, HCWs who have been practicing for 12-17 years hardly wash their hands immediately after removing gloves ($p = 0.02$) [table 4.5]. Nonetheless, 97% of the respondents agreed that HCWs promptly wipe all blood spills but about 6% of HCWs do not cover their broken skin to avoid contamination. Additionally, HCWs who have been practicing for 0-5 years (67.9%) are more likely to cover broken skins compared to other HCWs who have been practicing for various years ($p = 0.02$). 15% of the participants agreed that HCWs do not report needlestick injuries (NSI).

Furthermore, majority of the HCWs (57%) claimed they recap needles while more than half of the respondents (55%) always put used needles in to 'sharps containers' especially nurses (57.2%; $p = 0.006$) and midwives (16.2%; $p = 0.02$). 30% often

would put used needles into ‘sharps’ containers. 17% of the HCWs always put on eye protection and this is significant for Midwives (22.1%) compared to other HCWs ($p = 0.05$). this means that Midwives claim they always put on eye protection. 12% often wear eye protection whilst 25% and 9% rarely or never wore eye protection respectively. Additionally, 3% of the respondents claim they have never had adequate training while majority (88%) agree that their supervisors always, often or sometimes encourage training and this is significant for those who have been practicing for 6-11 years ($p = 0.04$; refer to Table 4.5). this means that HCWs who have been practicing for 6-11 years see regular training on compliance as very important

Table 4.4: respondents level of compliance

Variables	Degree of compliance									
	Never		Rarely		Sometimes		Often		Always	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Protection against blood and body fluids of all patients	0	0.0	1	1.0	25	25.0	24	24.0	50	50.0
Puts used needles into sharps container	1	1.0	1	1.0	13	0.0	30	30.0	55	55.0
Wears gloves	0	0.0	1	1.0	10	10.0	28	28.0	61	61.0
Wash hands after removing Gloves	0	0.0	1	1.0	21	21.0	29	29.0	49	49.0
Wears waterproof apron	2	2.0	11	11.0	35	35.0	26	26.0	26	26.0
Wears eye protection	9	9.0	25	25.0	37	37.0	12	12.0	17	17.0
Do not recap needles	25	25.0	18	18.0	17	17.0	6	6.0	34	34.0
Promptly wipes all blood	1	1.0	2	2.0	8	8.0	28	28.0	61	61.0
Covers broken skin	2	2.0	4	4.0	14	14.0	34	34.0	46	46.0
Reports needlestick injury	8	8.0	7	7.0	27	27.0	25	25.0	33	33.0
Supervisors encourage Training	6	6.0	6	6	40	40.0	19	19.0	29	29.0
Staffs have had adequate Training	3	3.0	0	0	23	23.0	42	42.0	46	46.0

Table 4.5: Summary of X^2 result of significant values of variables on compliance

Variables	Frequency (%)	Df	X^2	P
<i>Protection against blood and body fluids of all patients</i>				
Akuse hospital	52(54.6)	3	6.79	0.05
St. Martin	48(45.4)	3	6.79	0.05
<i>Puts used needles into sharps container</i>				
Midwife	18(16.2)	4	10.81	0.02
Nurse	55(57.2)	4	11.82	0.006
<i>Wears gloves</i>				
Midwife	18(16.9)	3	7.72	0.04
<i>Wash hands after removing gloves</i>				
12-17 years	5(4.0)	2	6.23	0.02
<i>Wears waterproof apron</i>				
Midwife	18(20.4)	4	15.82	0.01
Nurse	55(56.6)	4	9.55	0.04
Akuse hospital	52(52.3)	4	9.93	0.03
St. Martin	48(47.7)	4	9.93	0.03
<i>Wears eye protection</i>				
Midwife	18(22.1)	4	8.73	0.05
<i>Covers broken skin</i>				
0-5 years	65(67.9)	4	10.80	0.02
<i>Supervisors encourage training</i>				
6-11years	23(21.2)	4	9.03	0.04
* $p < .05$				

Table 4.5 further indicates that wearing of gloves is highly significant for midwives compared to other HCWs ($p = 0.04$). This means that midwives perceive hand gloves to be very important in health care delivery. Moreover, wearing of water proof apron is highly significant for nurses (56.6%) and midwives (20.45%) compared to other HCWs ($p < .05$). This indicates that midwives and nurses are more likely to make use of water proof aprons compared to other HCWs. Moreover HCWs of Akuse (52.3%) were more likely to wear water proof apron compared to HCWs at St. Martin (47.7%; $p = 0.05$)

4.4. Findings Barriers to Compliance

Half of the participants ($n=50$) were of the view that complying with standard precautions (SP) during emergency situations sometimes put the patients at risk and therefore they are likely not to adhere (Table 4.6). Significantly, 58.6% of HCW who have been practicing for 0-5 years and 6-11 (23.1%) claim that complying with precautions interferes with the ability to provide care ($p < 0.05$) compare to other HCWs. Furthermore, majority (74%) of respondents believed that sometimes the unavailability of personal protective equipment (PPE) could be a barrier to compliance with SP. However lab technicians (4.7%) compared to other HCWs ($p = 0.005$) belief that PPE should not be a barrier to compliance (Table 4.7)

Other reasons given for not using precautions were: HCWs did not anticipate the exposure (63%); this perception was significantly high for HCWs who have been practicing for 0-5 years (68.3%) and 6-11 years (28.6%) compared to other HCWs ($p < .05$). other HCWs claim that high demands in care led to being in a hurry and therefore they forgot precautions (79%). Quite a number of the HCWs were of the opinion that the patients did not pose a risk (75%), the available equipment was not effective (78%). Additionally, many of respondents (73%) would not comply with

precautions because of the perception that it might cause fear to the patients. The study also revealed that because PPE is not conveniently located 72% of the respondents did not adhere to precautions. A few participants thought practicing SP always (5%) or often (9%) was time consuming, majority however agreed that sometimes it did (45%). Most respondents (79%) also experienced discomfort with protective gear and therefore they were not always using it to prevent infection. This was significant issue for those who have been practicing for 0-11 years (91.4%; Table 4.7)

Table 4.6: responses on Barriers to compliance

Variables	Degree of barriers									
	Never		Rarely		Sometimes		Often		Always	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Compliance During emergency puts patient at risk	17	17.0	8	8.0	50	50	50	50	0	0
Interferes With ability to provide care	26	26.3	10	10.1	38	38.3	19	19.2	6	6.1
Unanticipated exposure	17	17.2	19	19.2	39	39.4	15	15.2	9	9.1
care demands led to being in Hurry	9	9.0	12	12.0	44	44.0	29	29.0	6	6.0
Unavailability of equipment	10	10.0	3	3.0	74	74.0	7	7.0	6	6.0
Belief that patients do not pose risk	23	23.5	12	12.0	38	38.8	17	17.3	8	8.2
Discomfort With protective Gear	25	25.0	12	12.0	42	42.0	16	16.0	5	5.0
Ineffective equipment	10	10.0	12	12.0	60	60.0	12	12.0	6	6.0
Protective equipment might cause fear	19	19.0	11	11.0	63	63.0	4	4.0	3	3.0
PPE is not conveniently Located	17	17.2	10	10.1	53	53.5	14	14.1	5	5.1
Practice is time consuming	30	30.0	11	11.0	45	45.0	9	9.0	5	5.0

Table 4.7: Summary of X^2 result of significant values of barriers to compliance

Variables	Frequency (%)	Df	X2	P
<i>Interferes with ability to provide care</i>				
0-5 years	64(58.6)	4	9.16	0.05
6-11 years	23(28.6)	4	9.35	0.04
<i>Unanticipated exposure</i>				
0-5 years	64(68.3)	4	13.98	0.006
6-11 years	23(23.1)	4	10.64	0.03
<i>Unavailability of equipment</i>				
Lab technicians	5(4.7)	4	12.77	0.005
<i>Discomfort with protective gear</i>				
0-5 years	69(62.5)	4	10.40	0.03
6-11 years	23(25.4)	4	11.11	0.02
*p < .05				

4.5. Findings Knowledge on SP among HCWs

Knowledge of the basic concept of the standard precautions was inadequate among the health care workers; only 37% of them knew that SP includes; hand washing before and after any direct contact with patient and , consideration of the potential for transmission of infectious agents in patient placement decisions., Cough etiquette such as directing patients/relatives with symptoms of a respiratory infection to cover their mouths/noses when coughing or sneezing and Safe injection practices and aseptic technique.

More than half of the respondents (64%) had adequate knowledge on the potential ways of occupational exposure whilst 54% of the participants knew hand washing is performed; before any direct contact with patients, between patients' contact, immediately after removing gloves and after touching body fluids such as blood, excretions and sweat.

Almost all the respondents (90%) were aware that SP should be performed uniformly to all hospitalized patients and also 91% of the respondents were aware that body fluids such as blood, vaginal fluid, blood tinged body fluids and saliva in dental procedures required SP. Findings from the study show that the 51.5% of the respondents know that PPE should be worn regardless of the patients' factor (HIV, HBV or any sign and symptom of infection).

Furthermore, only 49% of the HCWs had knowledge that HIV counseling and testing was required after occupational exposure, and that PEP should be given if the HIV test result is negative. Almost all the participants (90%) were aware that ART is taken within 72 hours and 63.6% had correct knowledge on the duration of ART. Almost two third of the respondents (82%) were more knowledgeable of standard precautions.

The chi square (X^2) and Fisher exact test was used to determine the association of hospital, area of practice and years of practice with level of knowledge (Table 4.8).

Table 4.8: Level of knowledge of respondents of standard precautions

Variables	Level of knowledge		Df	X ²	P
	Somewhat Knowledgeable	Very knowledgeable			
Area of practice	Frequency (%)	Frequency (%)	3	2.12	.53
<i>Midwife</i>	2(11.1)	16(88.9)	1	.77	.31
<i>Nurse</i>	9(16.4)	46(88.9)	1	.22	.42
<i>Lab technician</i>	1(20)	4(80)	1	.01	.64
<i>Ward aide</i>	6(27.3)	16(72.7)	1	.20	.17
Hospital			1	.04	.53
<i>Akuse</i>	9(17.3)	43 (82.7)	1		
<i>St. Martin</i>	9(18.8)	39(81.3)	1		
Years of practice			4	5.04	.25
<i>0-5</i>	12(18.5)	53(81.5)	1	.06	.50
<i>6-11</i>	5(21.7)	18(78.3)	1	.13	.47
<i>12-17</i>	0(0.00)	5(100)	1	1.25	.34
<i>24-29</i>	1(100)	0(0.00)	-	-	-
<i>30 or more</i>	0(0.00)	6(100)	1	4.27	.20

* $p < .05$

Table 4.8 shows that midwife (88.9%), nurses (88.9%), and lab technicians (80%) were more knowledgeable of standard precautions compared to ward aides (72.7%) although the difference was not statistically significant ($p > .05$).

Moreover, HCWs of St. Martin (81.3%) displayed virtually equal knowledge of standard precaution as HCWs of Akuse (82.7%, $p = .53$). HCWs of various years of experience also display equivalent level of knowledge on standard precaution although Knowledge was high for lesser years of experience compared to higher years of experience. The difference is however, is statistically insignificant ($p > 0.05$). Knowledge level is worse for those who have been practicing for 24-29 years.

4.6. Findings on Work-related Injuries

The findings from the study show that although 9% of the respondents claim they always experience blood splashes on their face and other parts of their body, 23% and 55% often and sometimes respectively experience it. The study also reported that more than half (53%) sometimes experience chemical splashes. This was significant for HCWs who have been practicing for 6-11 years ($p = 0.04$) as they believe that chemical splash is a serious issue that requires attention compared to other HCWs. 27.2% of the respondents experience knife relates injuries whilst glove perforation during surgery was experienced by 39% of the respondents and then 37 of the participants reported that they sometimes experience scalpel injury (Table 4.9).

11% of the respondents always experience open wound contamination when working as against 38% of them who sometimes experience it. However, HCWs who have practicing for 6-11 years (21.6%) hardly encounter wound contamination compared to other health workers ($p = 0.04$)

Majority (32%) rarely experienced accidental falls when rushing to attend to patients although quite a number of them (29%) sometimes experience falls. This is significant for lab technicians ($p = 0.05$) and Ward Aides ($p = 0.001$) compared to other health workers (table 4.10).

Moreover HCWs at Akuse (51.5%) were more likely to experience accidental falls compared to HCWs at St. Martin ($p = .05$). Over half (59%) said they had never experienced fire injury. 42% of the HCWs who participated said they sometimes experience NSI, 16% always got pricked by needle and then a quarter of them (25%) often got injured by needle.

The level of needle prick injury is significant for Lab technicians ($p = 0.02$) and HCWs who have been practicing for 12-17 years ($p = 0.02$) as compared to other HCWs. This means that Lab technicians and HCWs who have been practicing for 12-17 years hardly experience needle stick injury. When asked to report any other injury apart from the ones stated on the questionnaire, 4 respondents had experienced aggression or attack from patients or their relatives while 7 of them had experienced electrocution or electric shock while working with an electrical gadget

Table 4.9: work related injuries

Variables	Degree of injuries									
	Never		Rarely		Sometimes		Often		Always	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Blood splashes on face and other parts of the Body	5	5.0	8	8.0	55	55.0	23	23.0	9	9.0
Needle pricks	5	5.0	11	11.0	42	42.0	25	25.0	16	16.0
Chemical splashes	14	14.0	13	13.0	53	53.0	17	17.0	3	3.0
Knife cuts	45	45.5	24	24.5	23	23.2	4	4.0	3	3.0
Glove perforation	27	27.0	24	24.0	32	32.0	9	9.0	7	7.0
Scalpel injury	31	31.0	21	21.0	37	37.0	5	5.0	6	6.0
Open-wound	19	19.0	22	22.0	38	38.0	9	9.0	11	11.0
Accidental falls	27	27.0	32	32.0	29	29.0	7	7.0	5	5.0
fire accidents	59	59.0	29	29.0	8	8.0	1	1.0	3	3.0

Table 4.10: Summary of X^2 result of significant values of variables on work related injuries

Variables	Frequency (%)	Df	X^2	P
<i>Needle pricks</i>				
Lab technician	5(4.5)	5	10.99	0.02
12-17 years	5(5.1)	5	12.02	0.02
<i>Chemical splashes</i>				
6-11 years	23(21.6)	4	9.11	0.04
<i>Open wound contamination</i>				
12-17 years	5(14.6)	5	9.87	0.04
<i>Accidental falls</i>				
Lab technician	5(4.3)	4	7.61	0.05
Ward aide	22(27.7)	4	17.74	0.001
Akuse hospital	52(51.5)	4	9.31	0.05
St. Martin	48(48.5)	4	9.31	0.05

1.7 Summary of Key Findings

1. There was a statistical association between area of practice and Risk perception.
2. Years of practice were significantly associated with compliance.
3. Area of practice had no significant association with the level of knowledge on standard precautions.
4. The years of practice had no statistical significant association with the level of knowledge on standard precaution.
5. No statistical association was found between Hospital and perceived barriers
6. Area of practice was also not significantly associated with perceived barriers.
7. Years of practice had no statistical significant association with perceived barriers.
8. Area of practice did not significantly associate with work related injuries

CHAPTER FIVE

DISCUSSIONS

5.0. Introduction

This chapter is in two sections, it presents limitations of the study and discussions of the findings in relation to objectives of the study. The study sought to examine health care provider's risk perception of HIV, knowledge of standard precaution (SPs), barriers and rate of compliance with standard precautions and also the work related injuries faced by the HCWs.

Study findings showed a high risk perception yet suboptimal practice of standard precautions (SPs) among healthcare workers. The majority of the health care providers also had medium knowledge on standard precautions. The study discovered some such as of the challenges faced by HCWs regarding occupational risks or accidents during the performance of their professional duties, and the injuries that are likely to occur as a result of non-adherence.

5.01. Risk Perception among health care workers

This study revealed a generally high risk-perception regarding occupational exposure to HIV. Most of the HCWs at St. Martin compared to their colleagues in Akuse believe that the risk of contracting HIV is larger than other professional outside the health sector. This could be due to the fact that they are overwhelmed by the number of HIV cases they attend to.

Midwives and ward aides believe that the unavailability of protective gears such as gloves, gowns, masks, waterproof aprons and so on; when providing care puts them at risk. Most of the nurses attribute the lack of knowledge of HIV status of patients before

giving care to HIV exposure. In view of that most nurses and midwives would not like to work with colleagues who do not comply with standard precautions.

However lab technicians think otherwise; to them an HIV infected HCW hardly poses a very high risk to colleagues and patients. To the HCWs, availability of protective gears and knowing the HIV status of the patients guarantees their safety.). Earlier studies have shown that the perception of high risk could be attributed to the high rate of infection of HIV in the larger population and the nature and number of exposures to blood borne pathogens. (Mkuye, Nyembela, Lwihula , Mtui , Nocoll ,& Laukamm-Josten, 1991; Kermode, et al 2005).

This finding is in line with literature, which indicates that many HCWs have a very high risk perception regarding occupational exposure to HIV and other blood-borne pathogens and often see themselves at risk of contracting the infection whilst working (Kermode *et al.* 2005; Hanafi *et al.* 2007; Kocić *et al.* 2008; Akinboro *et al.* 2012; Basavaprabhu *et al.* 2012).

The high risk perception of HIV can be explained by two elements in the health belief model; which is perceived susceptibility and severity (Rosenstock, 1974; Hochbaum, 1986). HCWs will develop a personal risk perception if they feel they are predisposed to HIV. This risk becomes evident if they assume that HIV is a threat to their health. Their risk perception is influenced by the nature of job, level of knowledge on the concepts of SP, frequent work related and contact with blood and other body fluid (Akinboro *et al.* 2012; Efstathiou *et al.*,2011)

5.02. Compliance with standard precautions

Compliance with standard precaution is the hall mark of health care practice. As a result, the importance of compliance to standard precautions cannot be underestimated.

The findings of this study revealed good compliance with standard precautions among HCWs.

It was found that HCWs in Akuse tend to protect themselves against blood and bodily fluid of all patients and wear waterproof aprons most of the time compared to their colleagues in St. Martin hospital. This is expected because St. Martin as a private hospital tends to establish a more stringent monitoring mechanism compared to Akuse which is a government hospital where regulations ensuring strict adherence to standards are relaxed.

Wearing of waterproof aprons is important to midwives and nurses in the course of providing care. Moreover, nurses and midwives tend to put used needles into ‘sharps’ containers most of the time than other healthcare workers (Lab technician and ward aides) also, midwives are the ones who frequently use gloves compared to other health professional. Wearing of eye protection is also important to midwives though they do not utilize it often. This difference in utilization of protective equipment is not surprising; as reported by Siegel *et al.*, (2007) the use of precautionary measures during patient care is determined by the nature of the health care worker-patient interaction and the extent of anticipated blood, body fluid, or pathogen exposure.

Additionally, HCWs who have been practicing for 12-17 years hardly wash hands immediately after removing gloves. Furthermore, HCWs practicing for 0-5 years cover their broken skin when providing care compared to other HCWs. The health professionals who have been practicing for 6- 11 years perceive the encouragement from supervisors for further is training as important. This is because the HCWs in long service need to be abreast with current trends in relation to standard precautions. More so, the HCWs in long service often feel they are under no obligation to please anybody thus they often will not see the urgency in adhering to SPs.

The findings of this study are similar to other findings from Europe and Africa who have also indicated partial or suboptimal practices with respect to standard precautions (Hanafi et al 2011, Akinboro et al 2012, Parmeggiani, et al 2010, Kotwal & Taneja 2010).

The high reported rate of compliance among the HCWs can be explained by the construct “perceived benefits” in the HBM (Rosenstock, 1974; Hochbaum, 1986). HCWs are likely to comply based on the personal perceptions of the effectiveness and positive consequences of adhering with standard precautions. In an attempt to avoid exposure to HIV infection, HCWs will make use of protective gears.

5.03. Barriers to compliance among health care workers

Some HWCs fail to consider the risk they face and pose to others, especially patients when they do not adhere to standard precautions. The study discovered some of the challenges faced by HCWs regarding occupational risks or accidents during the performance of their professional duties. These include unanticipated exposure; high demands in care led to being in a hurry and therefore they forgot precautions. Others were of the opinion that the patients did not pose a risk; the available equipment was not effective.

Those who have been practicing for 0-11 years claim that complying with SPs during emergency situations interferes with the ability to provide care compared to other years of practice. They also claim that they do not anticipate exposure when providing care. This may explain why they hardly comply with SPs. They also experience discomfort with protective wears and therefore they seldom use them. Unlike other HCWs most of the lab technicians were of the opinion that unavailability PPE should not be

considered as excuse for non-compliance.

When HCWs encounter barriers at the work place, they find it difficult to adhere to SP. This could be explained further by other contextual factors as well. The identification of barriers as a major hindrance to compliance has been documented in literature (Tait, Voepel-Lewis, Tuttle, & Malviya, 2000; Madan et al., 2002; Oliveira, Cardoso, Mascarenhas, 2010; Sax, Perneger, Hugonnet, Herrault, Chrait, & Pittet, 2005; Osborne, 2003; Stein et al., 2003; Cutter & Jordan, 2004; Wang *et al.* 2003; Efstathiou *et al.*, 2011).

For example Neves, Souza, Medeiros, Munari, Ribeiro, and Tipple (2011) in a qualitative study conducted in a teaching hospital with 15 nursing professionals revealed that several barriers such as poor communication, work overload, physical structure, accessibility of protective equipment and many others interfere in matters of safety and personal protective equipment.

The high of barrier among HCWs in the current study indicates that most of them perceived quite a number of hindrances in the course of their duty. Per the HBM it is expected that barriers would hinder compliance to standard precautions. However the current findings show otherwise. This means that although the HCWs encounter barriers they still comply with precautionary measures. The possible explanation is that HCWs are likely to ignore the relationship between perceived barriers and compliance.

5.04 Knowledge on Standard Precautions

The study showed low understanding of universal precautions among the health care workers.

Limited number of respondents were very knowledgeable on the basic concept of standard precautions, potential sources of occupational exposure, situations requiring hand washing, patient factors that determine the use of PPE and post exposure

prophylaxis. The rest had partial knowledge or very little knowledge. This finding is similar to earlier studies (Timilshina *et al.*, 2011; Okechukwu, 2009; Parmeggiani *et al.*, 2010; Vaz *et al.*, 2010; Thu, Anh, Chau & Hung 2012; Abdulraheem *et al.* 2012)

Further analysis revealed that HCWs who were in long service had lower knowledge of standard precautions contrary to an earlier study which reported high knowledge (Abdulraheem *et al.*, 2012). This may be due to their low participation in a greater number of seminars, conferences and training some of which may include universal precautions which not only encouraged safer work practices but also improved concordance with policy and procedures.

Knowledge on SPs as a modifying factor in the HBM has the likelihood of increasing the HCW's perceived susceptibility of the exposure to HIV which will then influence the likelihood of compliance to SPs. The current show that knowledge and risk perception are not significantly related. What accounts for this lack of relationship has not been documented. There could be other possible factors which were not identified by the study.

5.05. Level of Exposure to injuries among health care workers

Occupational risks exist wherever health care is practiced. The most common injuries in the health industry according to studies are needlestick, splashes from bodily fluids, cuts from other sharp objects, and so on (Ofili *et al.*, 2010).

Study findings revealed that HCWs at Akuse compared to St. Martin were more likely to experience accidental falls. This could be explained by the nature of the floors. Akuse has terrazzo floor compared to Martins which has a normal cement floor. Other possible explanation is that HCWs at Akuse do not adhere to strict standards when

providing care. HCWs who sometimes encounter most falls are lab technicians and ward aides.

Lab technicians and other HCWs who have been practicing for 12- 17 years hardly experience needlestick injury as compared to other HCWs especially nurses. This is not surprising at all because the findings in this study revealed a high care demand among nurses (work overload), ward aides and midwives as compared to lab technicians. This study finding is in line with earlier studies which reported high incidence of needle injury among nurses as compared to other health professionals while disposing of a used needle, injecting medicine, recapping a needle, or drawing blood. The practice of recapping used needles should be forbidden in healthcare facilities in line with the Occupational Safety and Health Administration (OSHA).

HCWs sometimes experience chemical splashes. However, those who have been practicing for 6-11 years perceive it as a serious issue that requires attention compared to other HCWs. Further observations indicated that lab technicians were the ones who experienced chemical injuries most often since they are always in contact with chemicals.

Per the assumptions of the HBM, injuries are likely to result from poor compliance with SPs and also influence the perceived susceptibility to risk exposure to HIV.

The study finding however revealed that injuries occurrences are independent of compliance. The possible explanation is that certain injuries such as fire outbreaks, accidental falls and many more may occur outside the control of the individual.

5.06. Implications of findings with Health Belief Model:

Studies all over the world have shown poor compliance to universal precautions among health care workers (Kermode et al. 2005; Ji et al. 2005; Wang et al. 2003). In spite of training and seminars on universal precautions, availability of personal protective equipment and many more compliance with universal precaution is not 100% (Parmeggiani et al., 2010; Kotwal & Taneja, 2010; Hanafi *et al.*, 2011; Akinboro *et al.*, 2012;).

The Health Belief Model (HBM) postulates, six main constructs influence people's decisions about whether to take action to prevent, screen for, and control illness (Hochbaum, 1956). According to this model people are ready to take action if they believe that ;they are predisposed to a disease (perceived susceptibility); believe that condition has serious implications (perceived severity), believe that taking actions will reduce their risk to the condition (perceived benefits), understand that costs of taking action (perceived barriers) outweighed by the benefits, are exposed to factors that prompt action (cue to action) and are confident in their ability to successfully perform that action (self-efficacy) [Hochbaum, 1956,].

Using the HBM it is expected that the high rate of perceived barriers that were encounter would hinder compliance. The study however revealed a positive relationship between barriers and compliance. This implies that there may be other factors responsible for this outcome. The HBM should take in to account other possible constructs to explain contradictory findings.

5.07. Limitations of the Study

This is one of the few studies that have attempted to apply quantitative research method in studying the relationship between risks perception and standard precautions. However, the findings of this study are somewhat limited. This study did not collect direct observational data on universal precaution practice among HCWs, but relied on self-report. This may result in underreporting of compliance with universal precautions. Social desirability bias may also be a potential limitation in self-reported studies like this one in the sense that HCWs might report socially acceptable responses than their actual day to day practice.

The study was also limited by the sample size of the study population. This was as a result of time constraint and cost involved in visiting research sites regularly. It was also difficult accessing most of the HCWs as they were always busy providing care.

As a quantitative study, the sample size may not be representative of all HCWs. Nevertheless, the findings of this study could be generalized to the population of interest it was a usual procedure that most patients with HIV are referred to the 2 hospitals from which we selected our samples and because it includes HCWs from both public and private facility.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATION

6.0 Introduction

This chapter is divided into two sections; conclusions and recommendations. These recommendations are in relation to the findings of this study. The recommendations involve research and practice. These recommendations are meant for all HCWs, especially those who work in highly infectious settings such as those who handle patients who have infectious diseases.

6.01 Conclusions

This study aimed at examining HCWs risk perception of HIV and barriers to compliance with standard precautions (SPs). This was achieved by exploring health care provider's risk perception of HIV, knowledge of standard precautions (SPs), barriers and rate of compliance with standard precautions and also the work related accidents that they face.

The study showed a high risk perception of HIV but partial or suboptimal compliance with standard precautions. Barriers have been found to be the key element hindering compliance.

Furthermore, knowledge on SP was found to be below average. Most of the HCWs seem to have quite a fair knowledge on standard precautions. The lack of compliance is at the backdrop of the level of knowledge of standard precautions.

Result further indicated that though HCWs do encounter accidents at the workplace, it was not necessarily related to lack of compliance but the demand of urgent health care.

In summary, this study showed that although the HCWs' Knowledge on SPs was good and all respondents showed favourable attitudes to SPs, most HCWs reported low adherence to standard presentations. There is a need for continuous and appropriate training on SP for both senior and junior HCWs.

6.02 Recommendation for future research

As with any emerging public health problem, there are several important research areas in which our knowledge about barriers to standard precautions and their prevention can be improved. Studies are recommended to determine the adverse effect of barriers on the performance of HCWs when providing treatment.

Future studies may also need to use qualitative study tools, such as focus group discussions, observation and in-depth interviews. This would add to the body of knowledge by exploring factors which are difficult to quantify..

In addition, the importance of improving workplace safety in at health care settings is very important. More research is therefore needed to determine the effect of barriers on work place accidents

Finally, the relationship between knowledge and compliance is not clear and this merits further study. Since factors other than knowledge accounted for low compliance, exploration of currently unidentified factors is warranted.

6.03 Recommendations for practice

From the study, it is recommended that all health facilities put measures in place to

reduce the risk that health care workers perceive. For instance, the health facilities should ensure that there is constant supply of PPE and a strict adherence to infection control practices by all and sundry.

To improve adherence to universal precautions, interventions also need address issues beyond knowledge. For instance, although HCWs have the knowledge about SPs, barriers such as discomfort in using PPE, the distance between HCWs and PPE in emergency situations, etc. should be attended to; this is an important step in changing behaviours and increasing compliance with universal precautions.

Additionally the study reveals that, HCWs who have been practicing for several years often take standard precautions for granted. These HCWs should be constantly and continuously prompted on the benefits of compliance with standard precautions and the consequences of not adhering to them. Posting images and notices can help in ensuring that HCWs are adequately educated and well-sensitised in terms of occupationally-acquired diseases and their prevention.

Comprehensive understanding and favourable attitudes towards occupational risks will enhance adherence to standard precautions.

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APPENDIX A: QUESTIONNAIRE**Introduction**

I am a student of the School of Public Health at the University of Ghana conducting a research on risk perception of HIV, and perceived barriers to compliance with standard precautions among healthcare workers in Lower Manya Krobo district. You are assured that any information given would be used for academic purposes only and your personal identity will not be revealed.

SECTION 1: DEMOGRAPHICS:

Please tick the appropriate response

1. Sex: Male..... Female.....

2. Level of education: a. Primary....., b. JHS..... c. SHS/Vocational..... d. Tertiary.....
e. No education.....

3. Age.....

4. Number of years post qualification experience.....

5. Area of practice: a. Midwife b. Nurse c. Lab technician d. Ward aide . e.

Other, (please specify)

6. Rank or Position.....

7. Name of facility.....

SECTION 2: HIV/AIDS RISK PERCEPTION QUESTIONNAIRE

This section measures perception of the risks pose by HIV to Health workers.

Please rate the extent to which you agree with each of the following statements in relation to HIV infection among healthcare workers.

Respondents' risk-perception regarding HIV. 1= Strongly disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Strongly agree						
RATINGS		1	2	3	4	5
1	I think about HIV as a public health problem all the time.					
2	I think I am at risk of contracting HIV as a result of my job.					
3	My risk of contracting HIV is larger than that of other professionals outside healthcare industry.					
4	Unavailability of personal protective equipment such as gloves, gowns, masks, nylon aprons, etc., at some times when caring for patients puts me at a very high risk.					
5	Not knowing the HIV status of patients before giving them care puts me at very high risk of contracting HIV.					
6	I don't like working with a colleague who does not adhere to universal precautions in the course of duty since he/she may be at risk and put me at a very high risk of HIV infection.					
7	An HIV-infected healthcare worker constitutes a very high risk to their colleagues and patients.					

Source: adapted and modified from Akinboro et al., 2010

SECTION3: COMPLIANCE WITH STANDARD PRECAUTIONS QUESTIONNAIRE

This section relates to the rate at which healthcare workers adhere to standard precautions when providing treatment and care. Please tick the appropriate boxes with regards to how often you observe standard precautions.

Practices of universal precautions						
1= Never, 2= Rarely 3= Sometimes 4= Often 5= Always						
RATINGS		1	2	3	4	5
1	Healthcare workers protect themselves against blood and body fluids of all patients regardless of their diagnosis.					
2	Healthcare workers put used needles and other sharp objects into the designated 'sharps' containers.					
3	Healthcare workers wear gloves whenever there is a possibility of exposure to blood or other body fluids.					
4	Healthcare workers wash their hands after removing disposable gloves and after every procedure.					
5	Healthcare workers wear waterproof apron whenever there is a possibility of blood or other body fluids splashing on my clothes.					
6	Healthcare workers wear eye protection (i.e. goggles or glasses) whenever there is a possibility of blood or other body fluids splashing on my face.					
7	Healthcare workers do not recap needles that have been contaminated with blood or body fluids.					
8	Healthcare workers promptly wipe up all blood spills and other body fluids with disinfectants.					
9	Healthcare workers cover their broken skin before coming to work.					

	10. Healthcare workers report needle stick injury when it occurs by recording it in a book.					
	11 .In my current work area, supervisors encourage employees to obtain training in occupational health and safety issues, such as safe patient-handling techniques.					
	12. As staffs in this health centre, we have had adequate training on how to protect ourselves from infection with HIV.					

Source: adapted and modified from Akinboro, *et al.*, 2010

SECTION 4: BARRIERS TO COMPLIANCE

In patient care, you are expected to follow some laid down procedure to avoid self-exposure to risk. However, sometimes you are not able to follow these procedures. What are some of the factors that prevent you from doing so?

Tick the appropriate box indicating which of the following applies to you

	1= Never, 2= Rarely 3= Sometimes 4= Often 5= Always					
	RATINGS	1	2	3	4	5
1	Compliance during emergency would put the patient at risk					
2	Complying with precautions interferes with ability to provide care					
3	Exposure to infection is not anticipated during treatment					
4	Patient care demands led to being in a hurry and did not take time to comply					
5	Equipment needed to comply are not available					
6	The belief that patient do not pose a risk					
7	The Discomfort with the use of protective gears does not allow me to comply					
8	Equipment needed to comply are not effective					
9	The use of protective equipment might cause fear in patients					
10	Personal protective equipment is not conveniently located for use.					
11	The practice of standard precaution is time consuming.					

Any other barrier apart from the ones stated above?

.....

.....

.....

Source: adapted and modified from Ferguson *et al.*, 2004

SECTION 5: KNOWLEDGE OF STANDARD PRECAUTIONS

This section deals with healthcare workers level of knowledge of standard precautions associated with healthcare delivery.

Please circle the number that corresponds with your chosen answer/ option to the items. You can choose more than one response for items

1	The concept of standard precautions includes	Hand washing before and after any direct contact with patient	A
		Consideration of the potential for transmission of infectious agents in patient placement decisions.	B
		Cough etiquette such as directing patients/relatives with symptoms of a respiratory infection to cover their mouths/noses when coughing or sneezing	C
		Safe injection practices such and aseptic Technique	D
2	What are the potential ways of occupational exposure?	Needle stick /sharp injury	A
		Splash on the eye	B
		Inhalation	C
		Talking to patients	D
		Touching patients	E
3	According to the standards precautions, hand washing is Performed	Before any direct contact with patients	A
		Between patients' contact	B
		Immediately after removing gloves	C
		After touching body fluids such as blood, excretions and sweat	D
4	For which of these conditions should standard precautions be	Uniformly to all hospitalized patients.	A

	followed?	When the healthcare worker has a known or suspected infection.	B
		When the patient has a known or suspected infection.	C
		At the discretion of the healthcare worker.	D
5	Which of the following body fluids require standard precautions?	Blood	A
		Vaginal fluid	B
		Blood tinged body fluids	C
		Saliva in dental procedures	D
		All of the above	E
6	Which of these patient factors are important in deciding when to use personal protective equipment such as goggles, mask, gloves, gowns and apron?	HIV/AIDS	A
		Hepatitis B virus (HBV) infection	B
		Signs and symptoms of infection	C
		None of the above	D
7	For post exposure prophylaxis (PEP) for HIV, HIV counseling & testing is done immediately after the exposure and PEP is given only to HIV negative test result	YES	A
		NO	B
	Two or three antiretroviral drugs are given immediately after the exposure but within 72 hours.	YES	A
		NO	B
	The antiretroviral drug is taken for 4 weeks	YES	A
		NO	B

Source: adapted and modified from Okechukwu, 2009

SECTION6: WORK RELATED ACCIDENTS OR INJURIES

Accidents/Injuries are bound to occur at the workplace as a result of the need to provide urgent care. Please tick the appropriate box indicating your encounter with the following:

1= Never, 2= Rarely 3= Sometimes 4= Often 5= Always					
Types of Injury	1	2	3	4	5
Blood splashes on the face and other parts of the body					
Needle pricks					
Chemical splashes					
Knife cuts					
Glove perforation during surgery					
Scalpel injury					
Open wound contamination with patients' blood					
Accidental falls (at work)					
Fire accidents					

Source: adapted and modified from Ofili et al., 2004

Are there any other work related accidents or injuries aside from the ones stated above?

.....

.....

Thank you for participating in this study. The information you have provided will contribute to understanding the factors which influence compliance with universal precautions.

APPENDIX B: INFORMED CONSENT

Project title: RISK PERCEPTION OF HIV AND PERCEIVED BARRIERS TO COMPLIANCE WITH STANDARD PRECAUTIONS AMONG HEALTHCARE WORKERS IN LOWER MANYA KROBO DISTRICT

Institutional Affiliation:

School of Public Health

College of health Sciences

University of Ghana

Legon

Background

Personal Information:

The lead investigator is Sandra Enyonam Akagbo, currently a master's student of the School of Public Health, Legon is undertaking a study on risk perception of HIV and perceived barriers to compliance with standard precautions among healthcare workers in lower Manya Krobo district This study is for academic purpose and the requirement for the award of Master science Degree in Applied Health Social Sciences degree under the supervision of DR. Mercy Ackumey of the School of Public Health, University of Ghana Legon.

Procedure:

Data will be gathered using semi-structured questionnaires

Risks and Benefits:

Although there are no known risks associated with the research protocol, if you feel uncomfortable, you have the right to opt out. You are also at will to withdraw from participation if you desire to do so. There is no reasonable foreseeable harm that may arise from participating in this research. Benefits that arise will contribute to the little literature available on ways to promote standard precautions in Ghana.

Anonymity and confidentiality:

Please be rest assured that information collected will be handled with the strictest confidentiality, will not be shared with third parties not directly involved in the research and thus will be used for purely academic purpose.

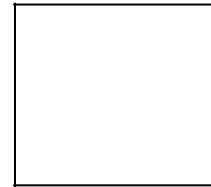
Before taking consent: If you have any question, feel free to ask. If you have questions you wish to ask later, or anything you wish to seek clarification on regarding the research, please do not hesitate to contact the principal investigator (Sandra Enyonam Akagbo) on; telephone number (0243237894) or email

(seakagbo@ymail.com), or **the Academic Supervisor on (0205376816) or the Ethics administrator on (0244712919).**

I have been adequately informed about the purpose, procedures, potential risks and benefits of this study, I have had the opportunity to ask questions which has been answered to my satisfaction. I know that I can refuse to participate in this study without any loss or benefit to which I would have been otherwise been entitled. Having gone through the consent form thoroughly, I agree to enroll in this study.

Name of participant.....

Signature or thumb print:



Date.....

Interviewer's Statement:

I have explained the procedure to be followed in this study to the participant in the language that he or she understands best and he/she has agreed to participate in the study.

Signature of interviewer.....

Date.....