

University of Alberta

The Experience of Ugandan Nurses in the Practice of Universal Precautions

by

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Dedication

I dedicate this thesis to nurses in developing countries who are living these stories and continue to serve. Nursing in these circumstances takes courage and God's strength. I learned much from the experiences shared by Ugandan nurses whose commitment and dedication is inspiring.

Abstract

The use of universal or standard precautions by health care workers (HCWs) is essential to avoid exposure to blood and other body secretions that may transmit infectious diseases. Health care workers in Uganda often find it difficult to translate the principles of universal precautions into practice. Without appropriate use of universal precautions, disease transmission to HCWs may rise. In a resource-constrained environment such as Uganda however, nurses typically do not practice universal precautions unless they know the patients' HIV or AIDS status. There is a need to understand the experiences and the context in which nurses' practice universal precautions. Therefore, the purpose of this study was to explore the experience of Ugandan nurses and midwives in the practice of universal precautions and to identify factors that influence the use of universal precautions by nurses while caring for persons living with HIV and AIDS. A qualitative research approach, using a focused ethnography was used for the study.

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Chapter 1: Introduction

Approximately 2.5% of Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) cases and 40% of Hepatitis B virus (HBV) and Hepatitis C Virus (HCV) cases among healthcare workers (HCWs) worldwide are the result of occupational blood-borne exposure (WHO, 2006). Although blood-borne exposure results in substantially fewer new HIV infections each year than other routes of transmission, the direct exposure to blood is still the most efficient means of transmission. Effective measures exist to prevent HIV transmission resulting from needle stick injuries and other exposures in healthcare settings, but many countries are making inadequate use of these highly effective tools.

More than two decades ago, the Center for Disease Control and Prevention (CDC) published guidelines (CDC, 1987) for universal precautions to prevent transmission of HIV and AIDS, hepatitis and other infectious diseases in health care settings and to protect both HCWs and patients. Implementing these guidelines protects HCWs from exposure to blood and other body secretions known to transmit diseases (CDC, 1987; Ramsey et al., 1996). The AIDS epidemic continues to be a challenge to healthcare systems (UNAIDS, 2008) requiring strict adherence to universal precautions as recommended by the CDC in the United States and adopted internationally. Nurses are the largest group of HCWs providing frontline care for AIDS patients and incur a high risk of occupational exposure to infectious diseases (Oulton, 2006; Fournier, 2004). Despite the adoption of universal precautions in many healthcare settings, these measures may not always be used consistently or correctly. Several authors have identified factors that contribute

to the increased risk of exposure to the HIV virus for nurses. For example nurses may not practice universal precautions consistently due to a lack of resources (Lymer, Richt, & Isaksson, 2004; Kuruuzum et al., 2008; Jeong, Cho, & Park, 2008; Oulton, 2005).

Healthcare workers and particularly nurses, are at an increased risk of preventable, life-threatening occupational infections (Kuruuzum et al., 2008; Lymer, Richt, & Isaksson, 2004; Sadoh, 2006; Trim, 2004) because they carry out procedures that may put them at risk. Reporting of HIV occupational transmission in developing countries is poor and may not include information on the number of HCWs affected by HIV transmission in the workplace.

HCWs have been victims of blood-borne infections like Ebola, Marburg, HIV and AIDS (Bausch, Sprecher, Jeffs, & Boumandouki, 2008). These infections were reported by the Ugandan media with claims of inadequate capacity to deal with workplace health and safety. In 2000, the Ugandan media reported that 7 out of 31 health workers who were infected with Ebola while treating patients in Gulu died, (including six nurses and one doctor); similarly, in 2007 five out of the 14 health workers who were infected with Ebola in Bundibugyo died (Nalufa, 2008). This report may be an indication of gaps in universal precautions practice in Uganda where resources are limited. AIDS has also been a leading cause of adult disease and death in Uganda and rates are estimated to be on the increase in adults (UNAIDS, 2008). Therefore, without appropriate universal precaution practice the disease transmission to HCWs may rise.

Universal precautions practices involve: hand washing; wearing gloves, and at times double gloves; sterilization of equipment; and use of

protective eyewear whenever contact with blood or other body fluids is anticipated (CDC, 1987). Universal precautions also require the non-recapping of hypodermic needles after use and the immediate disposal to a biohazard container of contaminated objects (CDC, 1987; Mondywa, 2006). The practice of universal precautions requires that the highest level of barrier protection methods, sterilization of equipment, and the appropriate use of disposable equipment is used for all patients without regard to their sero-status (CDC, 1987; Reidpath & Chan, 2005). Gammon and colleagues (2008) argue that the practice of universal precautions also involves decontamination of equipment and the environment, patient placement, linen and waste management.

Significance of the Problem

Health care workers often find it difficult to translate the principles of universal precautions into practice. Several authors (Lymer et al., 2004; Tait & Tuttle 1994; Cutter & Jordan, 2004) have reported non-compliance among HCWs in the use of universal precautions. In a recent literature review Gammon (2008) reported that compliance to infection control precautions was suboptimal with practitioners being selective in their application of recommended universal precautions practice. In a resource-constrained environment such as Uganda, nurses typically do not practice universal precautions unless they know the patient's HIV status (Fournier, 2004). Protecting nurses from infection has been emphasized in health care settings (CDC, 1987; Mondywa & Hauck, 2007); however, adhering to established guidelines seems hampered by nurses' need to first know the sero-status of their patients (Mathole, Lindmark & Ahlberg, 2006; Lymer et al., 2004).

Furthermore, practicing universal precautions may be seen as a source of stigma towards patients and therefore HCWs may not use them in order to minimize discrimination towards persons living with HIV and AIDS (PHAs) (Chelenyane & Endacott, 2006; Mill et al., 2010; Mondywa 2007;).

Universal precautions have been recommended for more than two decades (Mondywa, 2007), however compliance with standards of practice and nurses' adherence to the precautions has not been adequately studied. The nature of nursing work increases the likelihood of nurses' exposure to blood and body fluids (Mondywa 2007). Examples of exposure among nurses includes; a blood-soiled hand, extensive splashes of blood or amniotic fluid on their face, and needle-stick injuries. Several authors (Sadoh, Fawole, Sadoh., Oladimeji, Sotiloye,2006; Sinclair et al. 1996) have reported a high occupational risk for infectious diseases among doctors and dentists. There has been limited investigation of the occupational risk of HIV infection for nurses in developing countries however where the burden of disease is higher and resources are fewer. Furthermore, there has been no research to explore the occupational risk for HIV infection and the practice of universal precautions among Ugandan nurses.

Research Question

The research question that guided this study was: What is the experience of Ugandan nurses in the practice of universal precautions? A qualitative research approach, using a focused ethnography was used for the study. In-depth interviews were used to collect the data.

Chapter II: Literature Review

A literature search of studies indexed in the Cumulative Index of Nursing and Allied Health Literature (CINAHL), MEDLINE and Global Health database was conducted. The search was limited to English language, peer-reviewed journals but with no limits on publication dates. The following terms were used as keywords in the search: *occupational risk, universal precautions, infectious diseases, health care workers, nurses and practices*.

The literature was classified into four areas: definition of universal precautions; risk of exposure to infectious diseases; nurses and universal precautions; and decision to practice universal precautions. The research studies included in the review were from healthcare disciplines mainly nursing, medicine and dentistry. One hundred and eighty articles were initially identified and reviewed for relevance; however many were eliminated based on the title, journal or the focus of the study population. Ninety-six articles were screened by reading the abstract, and of these 56 articles were considered relevant and were reviewed in detail. The articles reviewed were mostly quantitative with four qualitative studies identified. None of the articles used ethnography as the research design. Only 10 of the studies reviewed had been carried out in Sub-Saharan Africa. The literature reviewed focused primarily on HIV risk of exposure, and knowledge, attitudes and practices of nurses. Most studies examined universal precaution practices with doctors and dentists, while others did not specify the category of HCWs. Few of the studies explored the experience of nurses in the practice of universal

precautions, and no research had been carried out in low and middle-income countries with a high AIDS disease burden.

Definition of Universal Precautions

Universal precautions are a set of practices designed to protect HCWs and patients from infection with a range of pathogens including blood-borne viruses (CDC, 1987; Sadoh et al., 2006; WHO, 2003). The term *universal precautions* have been used interchangeably with the term *standard precautions*. In the current study however, the term universal precautions was used with a specific focus on the prevention of exposure to blood and body fluids. It is not feasible, cost-effective, necessary, or even helpful to test all patients for all pathogens prior to giving care in order to identify and take precautions only with those infected (Sadoh et al., 2006; Wu, 2008). Therefore, universal precautions have been recommended when caring for all patients regardless of diagnosis (CDC, 1987).

Universal precautions may be limited in the protection of HCWs as the focus has been primarily on the prevention of infections through blood and body fluid while ignoring respiratory protection (Osborne, 2003). These concerns have led to a review of the practice of universal precautions by the CDC (1996) and in countries like Australia. Australia incorporated a two-tier practice that includes the use of standard precautions for blood-borne infections with additional precautions to prevent respiratory infections (Osborne, 2003). Universal precautions guidelines involve the use of personal protective equipment to reduce contact with infectious materials, immediate hand washing after exposure to reduce the risk of disease transmission, and

proper sharps disposal to reduce needle-stick injuries (CDC, 1996). Decisions regarding the level of precautions to use are based on the nature of the procedure, and not on the actual or assumed serological status of the patient.

Before practicing universal precautions, HCWs often inquire about clients' sero-status. Knowledge of patient sero-status however does not prevent occupational exposure whereas universal precaution observance does. The implementation of universal precautions is different among different HCWs and the type of training influences adequate knowledge of universal precautions (Sadoh et al., 2006; Mathole et al., 2006; Adebamowo et al., 2002; Wu, 2008). Nevertheless many people belonging to 'risk groups' for HIV and other blood-borne infections are not infected with the virus, while many infected people do not belong to 'risk groups' (WHO, 2003). Therefore, applying universal precautions only with those from so-called 'risk groups' for infection may leave HCWs vulnerable.

In 1987, the CDC created and recommended the universal precautions standard for all healthcare workers (CDC, 1987). A recent study in Afghanistan of universal precautions awareness found that HCWs had poor knowledge of the basic principles (Salehi and Garner 2010). Although other studies (Sadoh et al., 2006; Ramsey et al., 1996; Wu, 2008) have indicated a high level of compliance with universal precautions, several of these authors have recommended research using observational strategies to ensure HCWs do not over-report their use of universal precautions. They suggest that in order to examine the practice of universal precautions the researcher must observe nurses in their clinical practice, and explore their interpretation of universal

precautions, including the equipment used, and their interactions with the practice environment. The use of observation is required to identify any weak link in the chain.

Risk of Exposure to Infectious Diseases

Concern for the safety of HCWs has been high in the era of HIV and AIDS because there is no known cure for the disease after one is infected (Puro et al., 2001; Umeh, 1999). The concern is higher in developing countries where one has to deal with a combination of two issues namely; larger transmission risk and inadequate safety measures and risk reduction strategies to deal with this increased risk (Lee, 2009).

The CDC guidelines on universal precautions have been one of the main strategies used to address the high risk to HCWs' health and safety. Since there is no cure for AIDS, avoiding risk and ensuring minimal viral transmission, is critical. Devices that require handling such as needles and scalpels are associated with higher rates of exposure and with increased risk of disease transmission especially when needles have to be re-capped (Puro et al., 2001). Nurses handle devices regularly and are at a high risk of infection with blood-borne diseases. Furthermore, Lee (2009) reported that in developing countries risk increases when nurses did not adhere to universal precautions for reasons including lack of equipment, lack of training, and limited support from management.

The determinants of risk for acquiring occupational blood-borne infections may be influenced by the prevalence of HIV infection in the patient population, the exposure to blood, and the nature of the exposure (Abouafia, 1998). The risk of occupational exposure of HCWs to HIV infection is less

than one per cent in the United States (Ramsey et al., 1996; Huerta & Oddi, 1992) and may be higher in developing countries where the disease prevalence is high and there are limited healthcare resources. Exposure to blood and body fluids is common among all nurses during their practice (Puro et al., 2001). For instance, when nurses are unable to perform procedures while wearing gloves, they expose themselves to risk by working without gloves (McNabb & Keller, 1991).

Most of the HCWs who have contracted HIV are thought to have violated the appropriate use of universal precautions (CDC, 1987; Adebamowo, et, al., 2002; McNabb & Keller 1991). Adebamowo and colleagues (2002) reported that 92.5% of surgeons in a Nigerian hospital had parenteral exposure to blood and body fluids within a one-year period. Most respondents assessed their risk of becoming infected with HIV and AIDS as between one and five percent compared to the CDC estimated risk of 0.3% following blood/body fluid exposure to an HIV -infected individual. This finding indicates exposure to blood and body fluids was very common and the risk of transmission of infectious diseases was high.

The 0.3% risk of infection following exposure to an HIV-infected individual is based on data from North America and Western Europe (Lee, 2009; Ramsey, 1996) In these regions, the reporting system is good and the prevalence of infection is lower than in developing countries. The prevalence in developing countries, where many cases may not be documented, may be higher than in developed countries (Lee, 2009; Ramsey et al., 1996). The problem of documentation was evident in a recent study with Ugandan nurses (Fournier, 2004). Nurses believed that there were undocumented cases of HIV

and HIV- infected nurses in the early 1980s due to lack of knowledge of the disease. In a study of Ethiopian HCWs' attitudes towards universal precautions, Reda (2009) speculated that nurses with less experience were at a higher risk of exposure to infectious diseases. The higher exposure risk may be attributed to ignorance of occupational exposure but could also be related to weak universal precautions practice. The author concluded that senior HCWs had less risk because they worked in non-risk exposing positions that were not truly comparable to those of front-line nurses. In addition, those who were exposed to blood and body fluids also had no system for reporting and subsequent management of occupational exposures, thus increasing the risk even further. The author suggested that nurses may have overlooked occupational risks during their practice.

Most of the studies done among physicians and dentists have reported inconsistencies in the use of universal precautions (Melo, 2006; McKinney & Young, 1990; Thomas, Jarboe & Frazer, 2008; Daniel, Silberman, Bryant & Meydrech, 1996). Sundaram and Parkinson (2007) reported that orthopedic trainees in England utilized gloves and aprons consistently; however compliance with the use of eye protectors and face masks was poor. In Nigeria, the self-reported risk of infections among surgical trainees was inversely associated with the utilization of universal precautions; those HCWs who never used the guidelines were found to be at higher risk of exposure to blood-borne infections (Adebamowo, et al., 2002). Nigerian surgical trainees (Adebamowo et al., 2002) and Zimbabwean HCWs (Mathole et al., 2006) were found to have limited knowledge of universal precaution practices.

Delobelle and colleagues (2009) reported that while South African nurses had good knowledge of HIV and AIDS, they lacked knowledge about identification of high risk groups, symptoms, diagnostic tests and universal precautions. The utilization of universal precautions may be compromised when the materials required to practice universal precautions are missing and/or HCWs forget to use them (Adebamowo et al., 2002; Reda, 2009; Fournier et al., 2007; Lee, 2009). Ugandan nurses reported that some nursing care procedures were delegated to relatives who had no option other than to give care to their loved ones without observing universal precautions (Fournier, 2004). In order to avoid risks, nurses also denied patients proper care based on their HIV and AIDS status. Risk taking behavior has a negative connotation and most of the studies done have had low response rates. Those who respond may over-inflate their use of universal precautions (Adebamowo et al., 2002; Aboulafia, 1998).

Nurses and Universal Precautions

The use of universal precautions among HCWs was reinforced with the advent of the HIV and AIDS epidemic. There is confusion, however, about the application and interpretation of universal precautions among nurses (Hinkin, Gammon & Cutter, 2008). Nurses are aware that there is a personal risk associated with taking care of infectious patients and this may make them fearful of caring for these patients (Huerta & Oddi, 1992). Despite the risk, nurses still care for patients with HIV and AIDS; however, by ignoring universal precautions practice they put themselves at high risk of HIV and AIDS transmission.

Operating room nurses in South Korea reported differing infection control practices among themselves despite the regular education programs for new nurses and new employees regarding occupational exposure to infectious diseases (Jeong et al., 2008). In Nigerian primary healthcare facilities, safety protocol and resources for ensuring safe working environments were inadequate and poorly developed (Isah, Sabitu & Ibrahim, 2009). Furthermore, the authors argued that policy for safety practice was poor, and post exposure intervention programmes for staff in the event of accidental exposure grossly underdeveloped. In Korea and Australia double-gloving and the wearing of adequate eye protection is recommended in addition to the practice of universal precautions (Jeong , et al., 2008; Osborne, 2003). Compliance with universal precautions is compromised when nurses are excluded from the development of institutional policies and therefore may not adhere to them (Reda, 2009).

Detailed information on the practice of universal precautions by nurses in Uganda is not available. The country has been active in rolling back HIV and AIDS and other infectious diseases. It is therefore assumed that nurses have had training on universal precautions. Mondywa (2007) reported that universal precautions had been put in place in Uganda to prevent infection transmission. However, Fournier's (2007) reported that Ugandan nurses found universal precautions challenging to practice when resources were scarce and guidelines not readily available.

The CDC (1987) stated that all HCWs should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or other body fluids of any patient is

anticipated. In Uganda, nurses typically are not involved in policy development (Fournier, 2004) and their challenges in the use of universal precautions have been highlighted. Considering the potential risk for exposure, nurses with a professional commitment to care should consistently observe universal precautions. In their study, McNabb and Keller (1991) reported that nurses only practiced universal precautions in instances when they thought a patient was HIV positive. In Australia, strong enforcement of policies increased compliance with universal precautions (Osborne, 2003). Nurses' perception of universal precautions may hinder their practice and in Uganda, universal precautions may be seen as a foreign concept. Practicing universal precautions may be challenging when resources are scarce and the flow of patients is high. Nurses who adapt to the wrong practice and accept it as a norm may make the risk taking behavior worse. Whereas in other instances with time and experience in taking risk, nurses make risk meaningful by accepting the patient as a person, finding work enjoyable and worthwhile and professional commitment to care (Reuter & Northcott, 1993) without practicing universal precautions.

Decision to practice universal precautions

Nurses in resource challenged settings have to make individualized decisions to practice universal precaution, despite the challenges. Studies have shown, for example, that nurse compliance with universal precautions is affected by the availability of protective equipment, the perceived commitment of management to safety and perceptions regarding the interference of universal precautions with job performance (Lee, 2009). According to Simmons (2009), the decision to practice is different from

problem solving and clinical reasoning. Clinical reasoning refers to cognitive processes used by healthcare workers to think about patient issues. Decision to practice, on the other hand, may also encompass ethical reasoning leading to a behavior (Goethals, 2010). Toren and Wagner (2010) described the process of ethical decision-making: defining the dilemma; clarifying the personal and professional values, ethical principles and laws involved; identifying the alternatives for action; choosing the action; initiating discussion about unresolved issues; and generalizing the solution to other similar cases.

Decision-making under conditions of uncertainty, risk and complexity has become the norm in professional practice. Goethal (2010) noted that nursing practice today is characterized by a strong emphasis on high technological interventions and a concern with financial considerations. The practice of universal precautions in resource limited settings requires nurses to make decisions about the use of protective gear while balancing the safety of their patients and themselves.

In optimizing patient outcomes and ensuring nurses safety, evidence-based practice is fundamental (Profetto-McGrath, 2010; Reuter, 1995) and guides nurses in the decision to practice. This approach to practice is not always carried out in low and middle income countries where nurses are taught to put more emphasis on skills with minimal attention to evidence-based practice. Goethals (2010) stated that nurses are regularly confronted with healthcare decisions that they perceive as morally wrong, but they are expected to execute those decisions or comply with unwritten rules. In Uganda nurses may be forced to decide not to practice universal precautions when they have no resources at their disposal or when there no practice guidelines.

In practicing universal precautions in a developing country, resources may be insufficient and yet the number of patient may be overwhelming (Fournier, 2004). In such instances nurses are still expected to ensure the best patient outcomes and in doing so they may compromise their own and their patients' safety. When nurses confront a particular decision they believe to be ethically correct but they are unable to execute it because of situational factors, they may experience moral distress (Goethals, 2010). Harrowing and Mill (2010) reported that Ugandan nurses suffered physical, spiritual and psychological symptoms due to their inability to provide optimal care for their patients and argued that these symptoms were evidence of moral distress. The authors also reported that over time nurses lost the essence to practice; their professionalism was "crippled" by the constraints they encountered in their daily work.

Nurses in Uganda may be knowledgeable about universal precautions however the lack of resources may be a major challenge to implementing them. Studies have demonstrated that most of the healthcare workers have increased their adherence to universal precautions in response to the AIDS epidemic (Oliveira, Marziale, Paiva, & Lopes, 2009.) however nurses in Uganda may not have had this opportunity. South African nurses involved in VCT experienced great struggles in their daily work under what seemed to be insurmountable obstacles (Mavhandu-Mudzusi, Netshandama, & Davhana-Maselesele, 2007). For example, they described daily difficulties as a result of inadequate resources, emotional drain associated with stress and burnout, and frustration as a result of the behaviors and practices of clients and community members that further increased the spread of HIV and AIDS. When resources

are not available in quantity and quality nurses must make ethical choices that influence their decision to practice universal precautions.

Based on the literature review, it is evident that the decision to practice universal precautions in resource limited settings is made within a challenging context. In deciding to practice universal precautions, nurses must balance the risk to themselves and their patients with the availability of resources.

Previous research has demonstrated that Ugandan nurses experience moral distress due to their inability to provide optimal care for their patients with the resources that are available. Furthermore, there is limited understanding of nurses' experience in the practice of universal precautions in resource limited settings. Therefore the purpose of this study was to explore the experience of Ugandan nurses in the practice of universal precautions.

Chapter III: Research Design

A qualitative research design was used in this study to explore the experience of Ugandan nurses in the practice of universal precautions. This design is appropriate to answer questions about how social experience is created and given meaning (Denzin & Lincoln, 2002). A focused ethnography (Morse & Richards, 2007; Morse & Field, 1995; Speziale & Carpenter, 2003) was the research methodology used to guide the data collection, data analysis and report writing. In the current study the researcher explored the experience of Ugandan nurses in the practice of universal precautions using a focused ethnography methodology.

Focused ethnography

Ethnography is a branch of human inquiry associated with anthropology. This methodology enables the researcher to focus on the culture of a group of people with an effort to understand the world view of those studied (Polit & Beck, 2006). Through ethnography, a researcher attempts to learn what knowledge people use to interpret experience and mould their behavior within the context of their culturally-constituted environment (Higgenbotham, 2004). A focused ethnography is used primarily to evaluate or to elicit information on a specific topic or shared experience of a narrow and specific area of inquiry (Morse & Richards 2007; Morse & Field, 1995; Speziale & Carpenter, 2003). In focused ethnography the goal of inquiry is chosen before collecting data and focuses on developing knowledge and improving practice regarding the phenomenon studied (Morse & Field, 1995). Phenomena cannot be divorced from social and cultural contexts and

consequently there was a need to understand universal precautions from Ugandan nurses' perspectives.

Focused ethnography is a context-specific, time-limited, exploratory methodology used to explore situations, interactions and activities, such as the situational performance of social actions, rather than groups, organizations or milieus (Knoblauch, 2005). Muecke (1994) used the term focused ethnography to mean time-limited exploratory studies in a discrete community or organization, limiting the number of key informants to persons with a store of knowledge and experience relative to the problem or phenomenon of study. Knoblauch (2005), on the other hand, argued that conventional ethnography differs from focused ethnography in the following way; the former is time extensive and the researcher gets deeply involved in the field while in the latter the research is short-term and not continual. In recent years, focused ethnographies have become a common methodology to develop nursing knowledge and practice (Muecke, 1994).

There is no exact sample size in ethnography as this depends on the depth of the data rather than the breadth of the sample (Richard & Moose, 2007) The use of naturalistic, inductive research designs usually implies working with a smaller number of participants for a longer period of time (Morse & Field, 1995). A sample of 10-15 nurses is usually adequate to achieve information adequacy when using a focused ethnography (Morse, 1991). Adequacy, according to Morse (1994), includes volume, relevance, and completeness of information collected from the participants.

Setting and Sample

Setting

The research was conducted at Mulago Hospital, Uganda's national referral and teaching hospital in Kampala. Mulago Hospital treats complicated conditions through intensive monitoring and has an Infectious Disease Institute within the hospital complex. In addition, The AIDS Support Organization (TASO) is part of the Mulago Hospital complex. The hospital has a capacity of 1,500 beds and currently employs 1,280 staff, of whom 757 are full-time registered and enrolled nurses. The hospital is comprised of specialty clinics and has allocated one day per week for an HIV/AIDS outpatient clinic (Mulago Hospital, 2009). Hospital nursing units in Mulago are divided into directorates, which are managed by a Principle Nursing Officer (PNO). General nursing includes accident and emergency, medical and surgical wards, theaters, diagnostic units and specialty areas (e.g. obstetrics).

Target population and sample

The target population for the current study included all cadres of nurses, both male and female, at Mulago Hospital. Mulago Hospital has different cadres of nurses ranging from those trained with a Certificate in Nursing to Bachelor of Nursing graduates. There are very few nurses with a Bachelor of Nursing degree and most of these are in leadership roles with no direct patient care responsibility. The other cadres of nurses with Diplomas or Certificates in nursing perform most of the direct patient care. It was anticipated that a sample of 10-15 participants would ensure a range of experiences in universal precautions and achieve information adequacy.

The inclusion criteria for the study included nurses: with a minimum of a two year education certificate, diploma or bachelor of nursing; working on medical, surgical or casualty units: with at least one year of nursing experience; willing to participate; and able to complete the interview in English.

Recruitment process

Ethical approval was received from the University of Alberta Research Ethics Board (Panel B), the Makerere University ethics committee and Mulago Hospital. The recruitment process started with a visit to the Assistant Nursing Commissioner to request permission to conduct the study and to introduce the study to the PNOs of different units. The researcher had previously supervised students at Mulago Hospital and therefore was known to many of the PNOs.

The recruitment of the participants was voluntary and facilitated by a PNO in each area who had knowledge of the nurses in their units. An information poster (see appendix B) was placed in the units and conference rooms indicating the purpose of the research study and the person to contact if a nurse wished to participate. Several nurses in each unit were willing to participate and those who contacted the researcher were screened for eligibility during the initial phone call or contact. During the initial contact, an interview time was arranged with each potential participant at a time and place in Mulago Hospital that was convenient to them. This allowed the nurses to share their experiences in a relaxed environment with minimal interruptions. At the time of the interview, an information letter (see Appendix D) was given to participants and any questions about the study were answered. In the

information letter participants were assured that they were not obliged to take part in the research study and that their participation would not have an impact on their employment. For those who agreed to participate, an informed consent was obtained (see Appendix C). Participants were invited to ask the researcher, their managers or my local supervisor questions about the research at any time.

The recruitment process continued using purposeful sampling (Creswell, 2003) to connect to with participants. Vidich and Lyman (2000) suggest that the logic and power behind purposeful sampling is to obtain rich information. The data is collected until sufficient data is obtained and saturation reached with variations accounted for and understood (Vidich & Lyman, 2000). Saturation means that themes and categories in the data are repetitive and redundant, such that no more new information is discovered by further data collection (Polit & Hungler, 1999). Informational adequacy, (Morse, 1991), was achieved by recruiting informants who were experts in the problem area and had the time and patience to answer the research question.

Data Collection strategies

An in-depth interview was carried out with each participant to explore the practice of universal precautions. All interviews were audio-recorded and transcribed verbatim. The interviews ranged from 40 minutes – 1 hour in length and were conducted in a private room in Mulago hospital between October and November 2009. The researcher took field notes (see Appendix E), to record impressions of the interviews (e.g. non-verbal behavior) and impressions of the surroundings where the interviews are conducted. Field notes also included the researcher's thoughts and interpretations, which served

as a guide for subsequent interviews (Polit & Hungler, 1999). Guiding questions as described by Morse & Richards (2007) were used to ensure the researcher stayed on track while interviewing. (see appendix F). The researcher was familiar to most of the participants, which helped to increase their comfort level.

Data Analysis

Data analysis was carried out simultaneously with data collection, using a content analysis process. This process involved a detailed description of the setting or individuals and later analysis of the data for themes or issues. Creswell (2003) and Speziale and Carpenter (2003) have described six steps in the analysis process. The first step is organizing and preparing the data for analysis. This involved transcribing interviews, typing up field-notes and arranging the data into different types (e.g. participant interviews). In the second step, the researcher read all of the transcripts to obtain a general sense of the information and reflect on its overall meaning. The third step was a detailed analysis of the data to develop a coding framework. Here the text data was organized into categories and labeled with a term, which was derived from the participants' actual language. In step four, a systematic analysis of textual data to develop codes was performed. In the current study, this was done with the assistance of the researcher's supervisors. The codes were used to generate categories and later themes. The categorization scheme was revised as necessary as themes were discovered that were not included in the initial category system. The data was cleaned and entered into the NVIVO-software program to assist with the organization and retrieval of the data. The

last step in the data analysis involved interpreting the data within the context of the literature. Themes were used as narratives in the written report.

Rigor of the Study

Rigor in qualitative research does not follow the conventional scientific criteria (Lincoln & Guba, 2000) but instead refers to the trustworthiness of the research. Krefting (1991) and Sandelowski (1986) describe trustworthiness in terms of truth-value, applicability, consistency, and neutrality based on Guba's criteria as cited by Krefting (1991). The truth-value refers to the *credibility* of the research; applicability refers to the *transferability*; consistency refers to *dependability*; while neutrality refers to *confirmability*.

To enhance *credibility*, the researcher spent two months in Uganda to develop better rapport and enable the participants to become accustomed to the researcher. A field supervisor in Uganda worked with the researcher to ensure that the interview procedure was adhered to. The many realities as described by the informants were discussed with the field supervisor who was familiar with the phenomenon being studied. If the descriptions or interpretations were easily recognized, this was an indication of the credibility of the findings. Field notes were written to enhance the credibility of the interviews and the coding process was checked by two supervisors on an ongoing basis. This was important to establish an audit trail that could be checked by an independent auditor (Morse & Field, 1995). The credibility of the research is enhanced when the researcher describes and interprets his/her own behavior and experiences in relation to the experience of the participants

(Sandelowski, 1986). The field notes were used by the researcher to reflect on the participants' experiences.

The participants selected were experienced with the phenomena; purposeful sampling ensured that only those who met the recruitment criteria were selected. *Transferability* is determined by the similarities of goodness of fit of the findings with other contexts. A detailed description of the research process enhanced the transferability of the findings to other similar settings.

The *dependability* of the study was enhanced and the consistency of data ensured through an in-depth description of the data collection methods, accurate transcription of interviews by the researcher and regular consultation with the supervisor. The coding process, which was reviewed by the supervisors, was another strategy to enhance the dependability of the data.

Confirmability is the final strategy to enhance the rigor of the study. The researcher endeavored not to influence the study and was aware of how the study may have influenced her. To enhance neutrality the researcher recorded in the field notes her perspectives on how she might have influenced the study and how the study had influenced her.

Ethical considerations

The proposal was reviewed and approved by the University of Alberta Health Research Ethics Board Panel B (see Appendix A), the Faculty of Medicine, Makerere University ethics committee (see Appendix J), and Mulago Hospital ethics committee (see Appendix K). In addition, permission for the study was given by Uganda National Council for Science and Technology (see Appendix H and I). This approach is consistent with recommendations outlined by Mill and Ogilvie (2002) for the conduct of

nursing research in international settings. These authors argue that the researcher must ensure that the study is ethically sound by meeting international standards for the protection of human participants, while also considering cross-cultural ethical issues.

Informed consent was obtained from all participants who agreed to be interviewed; they were also given a copy of the consent form. The researcher explained the purpose of the study to the participants and that the findings from the study would be published. The participants were informed that they could withdraw from the study at any time and either leave the interview unfinished or reschedule it for a later time without any explanation. However, of those who met the inclusion criteria none opted out unless they booked an appointment and found they had no time for the interview. Each participant was informed that she/he could refuse to answer any questions during the interview session. There was no risk or adverse effects related to the study but there was potential benefit to the nurses through participating in the research process and reflecting on their practice to assess how they worked. If a participant become emotionally upset or fatigued during the interview, the interview could be stopped; however, this was not required. Participants were offered a small gift of 20,000 Ugandan shillings (CAD \$10) for lunch to compensate them for their time. The information letters and consent forms were written in a clear, concise manner and printed using simple, easy-to-read formatting. The information letter and consent forms were developed at a grade 8 reading level to ensure that all the participants could understand the content. In order to maintain confidentiality, no personal identifying information was included in the transcripts or reports. Only the principal

investigator, supervisor and thesis committee members had access to the raw data. According to Streubert-Speziale and Rinaldi-Capenter (2003), complete anonymity is impossible to guarantee in qualitative research, however, all efforts are made to maximize anonymity where possible.

The identity of each participant was protected by replacing their name with a code number in the transcript and using pseudonyms in the thesis report and published manuscripts. Confidentiality was further ensured by storing the participants' demographic information and the transcribed interviews separately. The individual taped CD and other research data will be stored in a locked file cabinet for 5 years and all electronic data will be stored in password protected computer files. Storage of data will follow the University of Alberta Health Research Ethics Board policy.

Chapter IV: Findings

Participants

An in-depth interview was completed with 16 participants (15 general nurses and 1 infection control nurse) to explore their experience in the practice of universal precautions. Those interviewed were from medical units (6), surgical units (3), emergency and accidents (5) and one was a nursing manager. Fourteen of the 16 participants were female and two were male. The average age of the participants was 41.4 years, with ages ranging from 36 to 48 years. Nurses' on average had 16 years of experience as nurses, ranging from 2 years to 32 years in different units. Eleven nurses had diplomas in nursing, four had a certificate and one had a bachelor of nursing. Potential participants were eager to participate in the study and due to the shortages of nurses in the wards, only those available were interviewed. Many nurses showed willingness to participate in the study but were not available for interviews

Overview of Findings

Most of the participants in the study understood the concept of universal precautions however some were more conversant with infection control measures. Participants tried very hard to practice universal precautions based on their knowledge, however there were often many challenges related to implementing them in practice. For example, there was often insufficient protective gear for nurses to implement universal precautions. In addition, nurses' were overwhelmed with the number of patients in their care, compounding the challenges related to resources. Nurses shared several strategies they used in their practice when they did not have sufficient

resources to carry out universal precautions. Some nurses appeared to have ‘given up’ in their attempts to implement universal precaution practices. Nurses were very interested in protecting themselves from infectious diseases, however were concerned that immunizations for some infectious diseases were not consistently available. Therefore, several nurses stated that they had put the protection of their well-being ‘in the hands of God’. It was of concern that hospital infection control policies either did not exist or were not followed. In the following sections, findings related to: describing the setting; defining universal precautions; practicing universal precautions; challenges to practicing universal precautions; and coping with challenges will be discussed.

Describing the setting

Some of the findings from the interviews with the nurses help to describe the setting in which they worked. Nurses discussed the common infections that they were exposed to, the infection control policies and practices in their institution, and the post-exposure prophylaxis policy.

Common infections... “It [HIV] has become part and parcel of our daily lives”

Lucy

Common diseases that the participants were exposed to included hepatitis, cholera and tuberculosis. The hospital had a tent at the entrance where the infectious disease patients were cared for during an outbreak. Some of the participants felt HIV had been given too much attention, sometimes at the expense of other, more serious infections:

...I know it is like it [HIV] does not exist now. It has become part and parcel of our daily lives. It has been addressed too much now... We know it is through unprotected sex, which is the common way. Otherwise if I’m not too keen I can get it through needle prick. Lucy

It is a very big challenge, people are only looking at HIV now and all projects coming, and their agenda is different from the hospital. They come with [the] agenda of HIV and leave other organisms like hepatitis which is very lethal. People are not talking much about it other bacterial organisms, other parasitic organisms, other fungal organisms' people are not looking at it seriously and yet they continue to cause havoc in the facilities. Dinah

Let me say HIV, although it is a common problem, we are no longer calling it infectious here. Jack

Other participants still believed that HIV and AIDS were a cause for concern:

The most common infectious diseases which I know are HIV/AIDS which we are really exposed to very prompt, hepatitis B virus. Now we have even swine flu which is current, we even have cholera mostly during the dry season wet season rather. We have things like TB, tuberculosis mostly, then we have...like dysentery. Dinah

Most of the patients who come on the ward are HIV positive most of them. Infact if I'm to give a percentage I can give like 75% - 80% HIV positive. When you get registered however we do confirm serology for every new patient and then as you know that TB is almost [always] together with HIV... Isabella.

... For now TB is covering most of the patients' ohm, and HIV. Because if you check for HIV all those people have cough and most of them they have TB. Mark you, TB is the first opportunistic infection they get because of low immunity. It is almost the first and others come later on when the CD4 goes down yeah. And pneumonia can also come in because the chest has also the TB, those things are related and when one comes with pneumonia, even the cough has TB, don't you see? If someone comes that has HIV, he has pneumonia and TB. Either one of those they go together. Sabrina.

Cholera and Ebola were seasonal but still very challenging when they occurred.

Now like these days we have cholera. When you walk out you look down in those white tents past the gate that is where we have cholera patients. So the biggest problem here now is cholera and TB. We really get (Pause) like these ... Hepatitis B, but Cholera, and especially when it rains a lot in places like, Bwase, Katanga and down this way. Jack

...we have a place where we take the infectious cases of that kind, especially swine flu and ebola, cholera; they don't come in contact with the rest of the patient in the hospital. Penny

Infection control policies and practices

Several participants acknowledged that they understood the infection control policies after they had attended workshops. However there were no copies of infection control policies in the wards and only one unit had a policy posted. One participant was unsure where the policies were on her ward:

Some of them like we had enough copies of these policy guidelines on injection safety and infection...and healthcare waste management... I cannot find them here. Each ward should be having but when the painting was done they were disposed. Helen

One participant said she kept the policies in her head and did not need them to be written:

We just carry our policies in our heads [both laughs] that is the truth, now you can imagine ...why I don't carry my knowledge in my head. If there is anywhere where they can appreciate my knowledge, I take it there. Ann

Most participants acknowledged the presence of an infection control committee in the hospital that assisted them when there was an infection problem. Several nurses knew the composition and roles of the infection control committee:

We have like; infection control unit of the hospital... There is also a nurse who is in charge of that. There are other people in the department she works, they go through different wards observing how people handle things and when they find a problem they liaise with the in-charge of that ward to train the nurses and the personnel in that ward to handle and how to go about with universal precautions. Penny

The committee is composed of [a] chairperson, whom is mainly a senior consultant physician or senior consultant surgeon. However the hospital appointees will head the committee and the secretary is

normally a microbiologist. We have a memorandum of understanding with teaching institution A. So normally our microbiologist comes from teaching institution A. And [the] infection control team comprises of a microbiologist and infection control nurses. So at the moment we have two nurses trained. The link person in the infection control is the charge nurse. The teams are the people who are doing everyday supervision of universal precautions practices. Helen

The infection control committees worked with other senior nurses in the wards and did audits of infection control practices:

...they [infection control committee] usually come, actually after supplying us with whatever they can manage to give us. They come and check, and they rotate with their team, they come and see how we are carrying out this in the ward, I think they come every month. Angelina

At least these people from the infection control measures, sometimes back they have been trying to visit the wards, though I have never seen them as a person in the ward. May be because I do evenings but at least they used to come to the wards they see the problems that we have but the funny things is, as much as we say things are not there in the wards, they are aware things are not there. Amber

A few of the nurses said that they were aware of the existence of the policies which were directives from the Ministry of Health. Several participants mentioned the routine procedures which were followed in the wards. Some nurses mentioned the importance of workshops to inform them about infection control practices especially when there was new equipment:

...there is a policy guideline which was brought from the Ministry of Health to the unit and it was like a chart put on the wall in the ward ...all the guidelines for universal precautions , starting with hand washing and so all those for the staff to read through. They trained the nurses how to dilute it [disinfectant], how to use it and when to change when it is overused...Hand washing ...using liquid soap...there is a specific one specific disinfectant strictly for hand washing. The head of department has put a kind of a dryer, an automatic dryer instead of using a common towel for drying hands, just for that reason. We sterilize them [instruments] soak in that solution, you wash and rinse properly because it can also destroy those instruments. After soaking it

and disinfecting it with that lotion we remove and dry and sterilize after. Penny

We have boxes for the sharps, it is marked separately, the time you use the needle or the surgical blades. We order from the stores but we never run short of them. When they are full we close them and put them in our duty room for them to pick, they carry them on daily basis actually. ... then we have buckets labeled for wastes on the wards for the patients we give them, we show them where to put the wastes like food particles that each time we give them a different container which is black and then for the hospital waste we have red top in the procedure room. Yeah, the nurses have been informed about it so they know where to dispose what where. Dinah

A few nurses discussed training and policies related to the use and disposal of sharps:

They give us workshops for two days, one day workshops to train nurses. I have attended one, I think it was last year where they teach you how to dispose sharps, and what have you. Isabella

Then the areas where they see there are emergencies, busy like casualty, labor suite where blood contacts are most frequent, they try to train some kind of workers in that place. Penny

Another area is we are we adding another area of exposure, that those who get exposed are catered for especially needle stick injuries and sharps injuries. So when they get exposed, there is a procedure for it in the hospital. What we have is still in a draft form. Our policy guidelines we have done one in waste management, healthcare waste management and infection control as a whole but not specifically universal precautions. I think we haven't done much. The policy says that gloves must be put on once and thrown or discarded and putting them on you must follow the aseptic techniques, non touch but the practice leaves a lot to be desired and the challenge is, maybe I cannot finish other challenges are like I told you the other day that much as the developing world are talking of compliance, for us we are still at infantry level where availability and accessibility still remains very big challenge. And mainly our procurement system has a big loophole that much as we demand quality things, they may not be there. The amount, quantity and quality still has a lot, a long way to go. And also challenges of the practice itself, the pre-occupation of the health workers is not about universal precautions. Helen

Post-exposure prophylaxis policy - “Accidents do happen”

Most of the participants expressed fear of getting pricked by an HIV-infected needle and in particular, working in some of the units in the institution. For example, one participant had reflected on the dangers posed in some units and believed that working these units was a punishment. She stated ‘I hate it’. Another participant stated that her motivation for working in the institution far outweighed the challenges. She was very great-full for her time off for professional development. Despite the fear of exposure to HIV, several nurses had not considered receiving post-exposure prophylaxis (PEP) following a needle stick injury. Mercy had recently experienced a needle-stick injury but had not received PEP because exposure “it might have been the drug which was in the syringe when it pricked me”.

Several measures were taken by nurses to avoid needle stick injuries but they still occurred, especially when staffs were careless in the disposal of used equipment. This made it necessary to have a policy on prevention and protection in place. Nurses stated that in the event of a needle stick, it was necessary to know the sero-status of the patient in order to take the necessary measures. Many of the participants shared stories about how needle-stick injuries occurred:

As I told you things can be thrown [away] anyhow not in the proper way. Accidents do happen, because one can come and step on these needles, which has been thrown down, one, can cut herself or himself with the blade which has been thrown down. So, accidents do happen in such situations. Penny

There was an incident where an intern doctor was carrying out a secondary suture procedure on the ward, then he happened to you know prick the patient and the needle came direct to prick him. But since we had known that the patient was reactive, we just had to go and

test him and start the post exposure prophylaxis. So knowing the sero-status of the patient, this has been good and has been helping us. Dinah

One nurse mentioned an incident when a patient intentionally removed the syringe and pricked the nurse with the contaminated syringe after being given an injection.

Variation in understanding of the PEP procedure became evident when participants described the procedure. Some of the participant believed that it was important to go for advice from counselors after an accidental exposure, while others felt that they needed to see the doctor in a specific ward to discuss treatment. One participant mentioned that nurses who were put on PEP were given time off work to help them recover from the psychological trauma and the side effects of the drugs.

When someone has got an injury within the working area, whoever gets that accident has to be handled in [private ward], there is a doctor there, private wing and [private ward]for night duty. Such that when someone has an injury, rushes for that assistance or first aid. But before rushing there, we encourage them to squeeze blood under running water may be get detergent jik and water and wash hands when another colleague withdraws blood from the patient or client and later can withdraw the colleagues blood and take it for screening. Then the doctor can consider other procedures or other treatment which has to be taken which are, drugs are taken if the patient is HIV positive. Betty

Nancy described strategies to minimize the risk before seeking any other help:

You are supposed to wash your hands with running water, you go on the sink and wash under running water with soap then after washing, you report to the in-charge, you are taken, is it where?, To casualty or where? Then you know the status of the person of whether when pricking somebody you happen to prick yourself, you have to get the status of that person, then they know your status also, they also take your blood to know your status, then they start on, is it post exposure prophylaxis for, is it two weeks at least I don't know the duration I have forgotten. Nancy

Isabella, on the other hand described how PEP drugs should be administered and kept in the units but also how they were monitored in a private Hospital:

I heard that this [PEP] is working in Private hospital B; they have at least 5 doses in the cupboard. Whereby you have to be giving report like the way we hand in other equipments, so you hand in those doses of drugs that there are these doses like that. And when we see that it is reaching expiry date you give it to the patients and then we get another one. In that way we may be save. Isabella

Nurses who had experienced a needle stick injury were often better able to describe the PEP procedure:

If you prick yourself, you remove blood from the patient then yours, they go and test it and then you start treatment. Peter

...you know the sero-status of the patient or you don't know, that's the time you get to know as the medical worker, your sero-status. If you are positive then, there is no need of going for it but, if you are negative and the patient is actually tested and also negative, then you know that you have not been exposed to the infection. But if the patient is positive and you are negative then you go through a post exposure treatment, antiretroviral drugs for one month. Dinah

Isabella described the challenges related to following the PEP procedure at night or on the weekend:

... you may find someone gets a needle prick at night, at 8pm, as someone comes for night shift then you wait until tomorrow... It may take you another 4-6 hours and the virus is already eating. Yes, multiplying in your body and even another thing, if you get the prick at a weekend there is another problem. Isabella

Most nurses knew about the post exposure prophylaxis (PEP) policy, but some participants were unaware of the steps to take in case they get a needle stick injury:

So we have post exposure prophylaxes in the unit and we have the drugs accessible, then we have someone who is responsible, a doctor who is responsible for that. So we have a set policy and a procedure where you can, if any staff gets exposed, how he should be counseled, how he should be tested and then how he should get the drug. Paula

Most people when they are pricked they report to.... the in charges then to the... ohm what do they call it? PEP officer. Actually you can't really know much, who is pricked and who is not...But I heard one nurse who was pricked from one ward... Me, I told her there is a PEP

officer at Casualty, you go there because you already know that the patients is HIV positive, you also be tested then you will be started on PEP. She took the drugs, that one at least I knew about her. Isabella

So if you get a needle prick and need the drug you can tell the doctor to write for you the treatment you go and pick it, because the labs are closed. The labs don't always work for 24 hours because now we just have an emergency lab at night here in casualty. They prefer I think to take it to [private unit] as nurses are there all the time. Lucy

Despite knowing the procedure for post-exposure prophylaxis, Ann believed that some nurses were reluctant to take anti-viral medication:

There are many needle stick injuries. I don't know maybe some are already positive...because someone gets a needle prick and just takes it without caring.

This is at times because of our stubborn patients. Other times some nurses are not careful. Ann

A few nurses never went for the PEP after a needle stick injury because they trusted God to keep them safe:

...personally I was pricked may be two months or so, three months ago. So I was like I did not want to work on this patient at first, so I hated myself why I really had to. At first my heart said well, if it has happened there is nothing much I can do. The problem I don't want the drugs now, so I didn't even get prescribed to it. I didn't want to commit myself to swallowing them because of their side effect. Gail There appeared to be stigma associated with needle stick injuries. This

resulted in some nurses being hesitant to ask about the PEP policy in case their sero-status became known.

No it is like... When you get a needle prick, people have decided to look at it like.... a thought people will know me that I have been pricked incase I turn out to be positive. It is like something skeptical, so you try to keep it to yourself...there is stigma over it. And at the end of it, she feels like she should do it secretly. Then, if it turns out to be negative she comes out and says "by the way I was pricked by a needle from such and such a patient" It will become like a story and in that time it cannot be aired out. Ann

Another nurse shared a similar reluctance to initiate the PEP procedure after being splashed in the eyes while caring for an HIV positive patient:

In fact yesterday I was taking care of a patient who was very sick, very, very sick he was HIV positive. I gave him treatment via the cannula so, I left the syringe still inside then I was removing the air from the giving set, He shook the hand then, the syringe came out it just fell like this (pointing the finger up) then, the water splashed into my eyes. Then I don't know if I should go [for PEP] I'm still just there. Mercy

Defining universal precautions

Universal precautions practices varied from one unit to the next but also from one nurse to another. Several participants stated that nurses sometimes took risks (e.g., did not use gloves) to make their patients feel more comfortable with them:

Some of my colleagues at times also are careless and you may see them using the[ir] hands without gloves or other protective things when they are indicated. They argue that patients feel better when you don't put on gloves all the time. Isabella

This practice was also seen when the number of patients was overwhelming or in emergencies when time did not allow nurses to take out their gloves or go looking for another pair. On the other hand, participants verbalized that they tried their best to ensure they adhered to the principles of universal precautions when resources were available and when the circumstances allowed. Most of the time the managers ensured that nurses on the wards had the necessary resources and that universal precautions were observed to the best of their ability. A few participants mentioned that they shared supplies with relatives when available in order to ensure better protection. Most of the participants said that the disposal of waste was well done, because containers were

available for sharps disposal and there were dedicated staff members to ensure these were taken to the incinerator.

Nurses were able to order supplies twice a week from the hospital store-room. However on some occasions, the supply was insufficient to meet the needs on the wards. In addition when the supplies were kept in the wards, the senior nurses locked these in a small storeroom which was not always accessible. For example, Anne recalled that “may be your boss locked them [supplies] and did not leave them out so, you can’t pick them from the store”. At other times patients were forced to buy supplies for their care when the ward stock was depleted. Many participants had observed a difference in the availability of supplies between the general wards and hospitals and the private wards and hospitals. The resources in the latter were more available to nurses and their patients. For example, one nurse commented:

...I worked [in private hospital A] before...that was not a challenge because everything was there, infection control was a standard. Those patients [in private wards] they are well attended to, the environment is good, most of our patients here [public hospital A], they have no attendant, they are very sick, they are very needy. You cannot compare them with those [in private wards]; the first impression which I got when I came here [public hospital A] it was bad. I felt I could not manage and [was] even using a pair of gloves on five patients or ten patients, it was a nightmare. Ann

On other occasions resources were available and nurses were eager to observe universal precautions but patients were not comfortable with their use.

Therefore nurses did a lot of explaining when they used protective gear:

Sometimes we need to explain to them [patients], that I’m going to put up a line and I don’t know your status nor do you know my status in case I prick myself, I may infect you or you may infect me. So I have to take care and wear gloves. This is done by some people and others they don’t mind. What some do, they just tell the patient “let me put a

line in you". They do not explain much or why he is not wearing gloves or whatever. Betty

Most of the participants were able to describe the term universal precautions after a lot of probing by the interviewer; however, they were often more comfortable defining infection control practices. Nurses understood that universal precautions should be observed in health care settings and were meant for all health professionals. Some of the participants said that universal precautions were principles to prevent the spread of infection when practicing sterile procedures and to ensure infection control. For example, participants mentioned that universal precautions should be practiced to prevent the health care workers and patients from getting infections like HIV and AIDS. One participant said:

To me I understand the universal precautions as a standard set, a standard measure set for infection control which should be observed in a healthcare setting. So to me it is like it is already a standard procedure, operation[al] procedure which should be used by medical people to prevent spread of infection like HIV and AIDS. Paula

Another participant explained that universal precautions were:

...precautions which are usually taken especially by professionals like nurses ...the way you protect yourself getting infected and even protecting patients from getting infection or separating and maintaining sterility or cleanliness I mean, safety of that nature. Precautions that you can learn, the way you handle yourself or I think the way you, you... work in the environment which you are working. Let me say after you have done a procedure, how you handle the things, how you prepare them, how you take to do the procedure, the patient you are working on, the way you protect yourself and you protect the patient. Angelina

Participants mentioned that they knew how to practice universal precautions but at times were forced by circumstances to take shortcuts. Several participants admitted that they rarely practiced universal precautions in their wards. Penny described universal precautions as "...standard

procedures, which are applied in order to prevent transmission of infection from a client to the health worker or even from a health worker to a patient.” Lucy on the other hand believed that the concept was one that “...unit[ed] all nurses, it is combining us, precautions which we take, all of us.” One participant said she had never heard of universal precautions practices while Mercy gave a simple, but erroneous definition. She said that “universal precautions [are] something white or something which is OK”. Most of the certificate nurses had little theoretical knowledge of universal precautions, unlike registered nurses who could explain the practice without much probing. On the whole the nurses in this study were able to describe universal precautions in different words showing they had some knowledge of the practice. For example, one registered nurse explained that universal precautions were:

...the steps taken in preventing infection, which as I told you, it is not easy here. But when one knows what is to be done we try and follow the principles which may not be easy... [It is] the way someone or a nurse ensures that sterility is maintained. Sterility of the equipment used by the patients ... the way we dispose [of] equipment and use equipment ... the way we nurse patients There are protective wears and sterilization procedures that are basically needed and may not always be done in this ward. Dinah

Practicing universal precautions... *”You can’t change gloves for each and every patient...”*

The practice of universal precautions varied among participants. Some of the nurses stated they used double gloves when doing procedures like dressings or administering drugs and then changed the outer glove when it was

contaminated. This practice was also common when patients had infectious diseases and were uncooperative. Dinah explained:

Myself, I just feel like this is dirty, I remove [the gloves] then get to the next patient. If I was working with the patient, and then blood touched this glove I remove it and then change to another, but I never do [care] with just a pair, I double [glove]. The top [pair] goes off and then I change to the second one. Dinah

Nancy stated that she wore two pairs of gloves because of the poor quality of gloves:

Me, I wear two [gloves] because these disposables are very weak, they can easily be torn or if the others [non-disposable] are available I wear one pair because they are heavy Nancy

However, Paula verbalized that when patients were treated well, they cooperated and one pair of gloves become enough.

... If you have no broken skin and follow the procedure the right way, one pair of gloves is enough. You find our patients are normally cooperative and the dangers of accidents are minimized through this. Because they have been counseled and we treat them well they are cooperative. Paula

At times nurses provided nursing care without any gloves. One participant reported that she did not use gloves when putting in an intravenous drip as long as the vein was easy to see:

...generally we are supposed to put on gloves all the time for protecting ourselves but there are situations may be when you want to put up a drip and the gloves are not there. I put the drip [into the vein] so long as I can see the vein...we try our best to see that patients get their lines despite the absence of gloves. Sabrina

Another participant reported similar situations when nurses did not use gloves and did not explain to the patient what they were doing:

What some nurses do, they just tell the patient “let me put a line in you” They do not explain much or why they are not wearing gloves or whatever, they come and just tell the patient “may I take the blood”. They never wear gloves or explain why they were taking the blood.
Jack

One nurse commented that some patients were more comfortable when nurses didn't wear gloves:

Some of my colleagues at times also are careless and you may see them using the hands without gloves or other protective things when they are indicated. They argue that patients feel better when you don't put on gloves all the time. Isabella

Some of the participants were not consistent in the use of gloves. In some instances therefore, nurses were exposed to blood and body fluids without their knowledge. Nurses reused gloves when they believed the gloves were not dirty or they were carrying out a procedure they did not feel was risky. One nurse justified this by saying:

We are supposed to use a pair after every patient but because of shortage we can't do. You can attend even up to 10 patients so long as it is OK and the thing [glove] does not contaminate itself. If blood doesn't come on it [the glove] you can use for 5-10 patients but when it is contaminated that time you need to change. (Gail)

A few of the nurses realized that it was not good practice to re-use gloves and did not believe it was necessary to do so because of the low cost of disposable gloves. When asked about the practice of re-using gloves one nurse shared:

It depends on someone's personality. For me, I don't want to use a glove on one patient and go and use it on another...I put on a new one [glove] because these are disposable they are not sterile [and] they are not very expensive. Those who do it [reuse gloves] transfer infections to another...Because we are taught; if you use one glove, and take it to another patient you are going to cause more infection. So I don't see why [nurses reuse gloves] these disposables are three hundred shillings [1 Canadian dollar] for a pair in open market. Angelina

When sterilizing equipment, most of the time nurses used Jik [bleach]; at other times precept [disinfectant] tablets were dissolved in water to make solutions to disinfect equipment. One participant said that the concentration of the disinfectant solution was not standard because of the scarcity of the disinfectant. Other times there was no jericans to dissolve the disinfectant tablets:

...if you get a chance of getting a jericans and you put in ... the precept tablet, you clean the bed after the patient has been discharged and you put another patient if there is no... there is no way of using what, that solution. Sometimes sister can give you some...there are some crystals in powder form, which you can pour on the bed and you clean it... usually it is used as an antiseptic to clean the bed but sometimes it is not there. You end up not ... cleaning that bed except using water.
Peter

The practice was to sterilize equipment like beds but as one participant stated nurses might not achieve the goal of ensuring adequate disinfection:

... I use one bottle to soak my instruments, because I'm aware that I have only one bottle. Instead of pouring that [whole] bottle at once, I will just put [in] a quarter. You would rather do with the little that you have [rather] than leaving everything as it is in a mess. Amber.

At other times disinfectants were not available and therefore the equipment was taken directly for autoclaving. This meant that the disinfection process was not followed properly.

The practice for waste disposal was set using different buckets with color codes, However, some nurses used whatever was available instead of following the recommended standard. When disposal containers were available they did not meet the prescribed color code, however nurses improvised using whatever was available:

...in ideal situations we are supposed to have different buckets for disposing different items which we use...like for paper, for other non infectious items we are supposed to have a different bucket but then we find that it is being mixed up, the blood, the papers the highly infectious. They are just put in one box, one bucket and burned together. But ideally we are supposed to have different containers. What we have here is just [a] safety box but the buckets are just same for the papers, for the contaminated cotton, gauze they are in the same bucket as they are put there. Penny

Ann explained the challenges nurses encountered when the appropriate waste container was not available:

...the clinical wastes goes in red, infectious waste goes in black, and then yellow for the food waste. So, what we do, being that we don't have all the colors, once we put them in strategic places and we say this is for food, because now if we say clinical waste you can't put on the ward, you put it in the dressing room and everybody knows this is for clinical waste. Ann

In addition to limited equipments, patients' symptoms of a disease determined the decision to practice universal precautions for most of the nurses. At other times there was an individual approach to the decision to practice based on level of confidence and availability of resources. One participant indicated that despite most patients being HIV positive, the decision to practice universal precautions was determined by the sero-status of the patient:

Most of the patients here are HIV positive. You find that out of 10 you can find either 5 or 6 positive... on admission we check whether they have the sero status and know if they have ever been tested. Nancy

It was evident that most nurses' decision to practice universal precautions was not based on standard protocols but on their own perceptions and experience. This was seen mostly when patients had an infectious disease indicated on

their admission profile. Jack shared how he made decisions about universal precautions:

Patients who come with TB or Hepatitis B, then we will take very high precautions. These ones I will wear gloves, masks and gown if available. These are very infectious diseases but are not very common like HIV although it is worse if patient come with any of the two diseases. Jack

Mercy made her decision to use protective gear based on the diagnosis of the patient and the procedure to be undertaken:

Masks, we use them with those patients who have TB, we use them to prevent that air especially when you are working on the patient, you have to protect ourselves with masks. The gloves we use them when we are giving treatment, when we are carrying out a procedure on a patient, removing [blood] for investigation from the patient so we have to use gloves to protect ourselves from body-fluid from the patients and also to prevent any body-fluids from us. The patient might be safe when the nurse is not safe. You see now, you can't tell, you can't tell whether this one is what! You might take it for granted and you might land into problems. Mercy

Another nurse described decision-making about re-using protective gear;

It depends on some ones personality, for me, I don't want to use a glove on one patient and I go and use it on another, if I use it on this patient I remove it and the other. I put on a new one because these are disposable they are not sterile, they are not very expensive. Those who do it transfers infections to another so, if others can do it for me I won't do it. Angelina.

According to Amber, the reality of practice was very different from the ideal:

...you find that you can't change gloves for each and every patient. You can't, you only change when you recognize, when you see that this one is highly infectious, this one is very dirty, or this one has a hole in it. That is when you change. Amber

Angelina indicated that she would suffocate with a mask and might not use masks even if they were available.

I can't just manage it [with mask] because whenever I talk to them [patients] I suffocate... for us who suffocate we can't, for me immediately I put on like this; I feel I can't breathe so; I just have to remove it. God protects me but nothing else. Angelina

Challenges to practicing universal precautions

A lack of resources was the main hindrance to practicing universal precaution as echoed by all participants in all units. Whether they were explaining the practice or describing the reality of their work environment, the lack of resources was a frequent and recurring issue. However, most nurses used the experience they had in other units and hospitals to inform and inspire their practice even if they faced severe challenges. Participants from all areas identified many challenges in the practice of universal precautions. These challenges included: lack of resources; maintenance issues; lack of information; and overcrowding.

Lack of resources "...there is no water in those sinks"

Nurses described many challenges related to the lack of resources, both material and human. Despite having very limited supplies, nurses did their best to ensure that universal precautions were followed:

...we don't have all the facilities which we could use. We don't have those antiseptics, they are there but they are not enough. If they bring them, the way they are used, we don't have those buckets like for the precept. We may have the precept tablets but we don't have the bucket or the jericán to put in the tablets so that they can dissolve and you make a proper solution of antiseptic... So, we don't have equipment, we don't have bowls, we don't have kidney dishes, they are there but they are very few, for just investigations. As I told you, because we don't have enough equipment and the resources are few, that is why we end up not practicing properly as it is supposed to be. We know it but we have no way because the resources are few, they are limited.
Angelina

In many instances, basics like gloves and masks were not always available to prevent infections. One nurse commented on the supply and use of gloves:

Sometimes the equipment which you have like, the gloves may not be enough to handle at that very time. So we use the few which we have and you cannot say that let me wait and I see that bleeding patient there. Let me wait for another glove to come... At times you don't even remove this glove, first before touching another patient you prefer washing it and then you touch another patient. This way you are using the same, same pair of gloves until you get more supplies. And sometimes the number when we get a lot of patients, we try to ask for more from others, other healthcare workers. Penny

Gail shared her experience with the supply of masks:

They [masks] are worse off than gloves because I remember... usually we depend on donations actually. Very often since I came in this ward last year, we were mainly depending on what was donated... they come in as donations. There are certain supplies, they are not consistent as they should, they are not available and that jeopardizes what we expect to achieve. Gail

The risk of nurses' exposing themselves to infection was increased by the fact that some doctors and nursing colleagues were careless and did not dispose of sharps appropriately.

When they join us in that situation, you find that disposal of things, gloves, cotton ... is not proper. Some people try to throw it everywhere... littered. So in that process you get contamination from patient to patient, from health care worker... because one is coming to pick with contaminated glove, drops there and this one too pick with bare hands. Penny

A few participants believed that challenges related to the lack of supplies were even greater at night or on the weekend. The nurse in charge

often left the box containing supplies locked during the night shift. As one participant shared:

...there are situations where, especially when you are working in nights or weekends, you have received [a] patient who is so infectious like [with] Ebola. You cannot start chasing this patient and you have completely nothing like a protective gear, you may have the gloves but you don't have gumboots, you don't have a gown, you don't have [a] face mask. Those things are not there at night, because mostly those ones, they are kept with the responsible people, the in-charge and so on. They leave you gloves but those other items are not there. It is always a bit hard in that situation to handle because of the shortage.
Betty

Sometimes nurses felt that there was nothing at all available to practice safely in the clinical area. This was not the case in a few units where resources were available although not consistently. It frustrated some nurses when there was absolutely nothing to prevent them from infection. It was worse of when colleagues exposed each other to risks without thinking about protecting other nurses:

...sometimes, the equipment may not be there, that can be one of the challenges, you may have no precept tablets, you may have no soap, you may have no gloves, and you may have completely nothing. So there you cannot really say, you are doing or observing universal precautions against infections. And then also there are certain colleagues who come, they don't have that mind of protecting their friends. They try to throw their used things anyhow, whereby lest [you] can get contaminated. Penny

It was interesting to note that there was not much difference between private units and general units in the same institution in terms of resources. Although private units within the same hospital had more resources, the supply of equipment was still seen to be a challenge:

It is a private unit but at times, we have scarcity of resources yeah, it is there. You know there is, when you want to do or carry out a procedure to a patient and you don't have the equipment to use. The resources are

ordered from the same hospital store and at times they are not there. Isabella.

Two participants elaborated on the challenges related to the supply of syringes and sutures. This led the nurses to sometimes ask the patient to go and buy the item in order to be attended to. This practice was detrimental when a nurse had to inject a patient two times to administer one dose of the same drug:

Like if, let me say syringes, it may happen that you want a 10 ml syringe and you don't have it or even a 5 ml syringe. You want to give a patient an intravenous injection which has like 5 ml but, you have only [a] 3 ml syringe, so giving the patient [an injection] twice, it is not easy. Then even the cannulas...telling a patient that "go and buy a cannula" or "go and buy a syringe" they feel so bad and challenged. But at times you have to do it. Isabella

A similar concern was echoed by another participant:

...in order to achieve what you actually want to do you have to write it down and send the patient's attendant to go and buy it which is very expensive. Like in Casualty here, you can't send an attendant to go and buy, they will say you are a murderer. "How come you are leaving a patient here to bleed, you tell us to go and buy sutures? Why? Is it that the hospital cannot acquire sutures?" So these are problems starting from the grassroots to the National. So, we don't know how they can really actually fight about it, so as to overcome these problems. Betty

Hand washing is fundamental to the practice of universal precautions.

Participants in several units expressed their frustration when they found that there was no soap at the sink, despite knowing correct hand-washing technique. One participant commented:

You find that you go for hand washing, you know how to wash hands, and five times you wash from here to there [Demonstrates from elbow to fingers]. You go under the water, running water and so on. The technique, you find that at the sink there is even no soap. You get it? Ann.

Two participants shared similar sentiments in relation to the lack of water in the sinks and the

hand gel which was supposed to be available was equally not there:

Some things are not working like here you can see those sinks they are faulty, they are no longer even bringing water. You see them there as decorations but there is no water there in those sinks. So you end up after working on a patient here, you go to the other room to look for water to clean your what, your hands. They used to supply us with hand gel but these days they are not, we are not being supplied with those same gels because, when we don't have water sometimes the water disappears you can use your gel and clean your what your hands and gloves but, for these days we have taken over few months without seeing any gel in the ward. Angelina

Ann relied on hand gel when water and soap were not available although she still recognized there was room for washing hands whenever it was possible:

Sometimes you have a hand gel that they say it is alcoholic and it is 99% you know, Preventing you from transferring infections from either one patient to another or from one colleague to another. We have it but we don't have, we don't have water and soap. Most especially soap, soap is an issue. This sector of ours like, Teaching Tertiary Hospital, soap has not been there for quite sometimes, so how do you expect me to maintain universal precautions? Ann

The problem of hand washing was made worse when the sink was not near the patient or was not functioning. Sinks were not only to be used for washing hands but also for decontaminating instruments. Ann shared her frustration with trying to get non functioning sinks repaired so that she could clean used equipment:

Now this is a dressing room, after dressing of course you need to have a sink where you decontaminate your things but, things are now not functional, and you try to call the mechanical people they are not responding. So things go beyond your capability as much as you report and so on mainly because it is outsourced to a private sector, and they don't come to us at the low level to ask us what should we include in

our planning, what is the problem. So they are always up there discussing their own things. Down here the needs of workers are not even met. So you carry your instruments, you carry them to that, that sink. Which sink is supposed to be for hand washing only! Ann

Sinks were not always easily accessible and at times were not functioning.

Sometimes when the nurse tried to get them repaired they ended up being locked or worse than they were initially. Jack shared his observation about the problem:

Hand washing! It is very necessary, unfortunately our ward is having a problem of taps, and we tried and tried and tried. So you find out that it is not as it should be. It is supposed to be patient to patient, when you going to another one, after a procedure. So we usually use the hand gel ..., which we carry with us. Jack

Ann recommended:

The sinks I think should be distributed according to the strategic areas. For example where we dress from [patients treatment room], you find that we needed a sink there [but it] is not functional at the moment. Ann

With regard to waste and sharps disposal, participants emphasized concerns about specific recommendations to be followed during procedures involving the handling of needles and related materials. Nurses needed to be reminded about the use of preventive measures while handling and disposing such materials. There was a need to prevent accidents with all healthcare workers including cleaning staff. Nevertheless this was not always the practice as at times some workers were seen to be careless and to endanger the lives of their colleagues. Ann shared her frustration with her colleagues:

At times the paper waste, the way I told you, the mixing up of papers and clinical waste. That one, you try to pick them until you get tired you talk, because you imagine people are adults and they should know this. But I think it is just lack of commitment to do things, people are

aware of all this knowledge but they lack commitment and motivation.
Ann

Sabrina believed that the number of masks used during rounds resulted in fewer masks being available for patient care. This was said to be as a result of too many HCW especially doctors doing ward rounds at any one time:

...the resources they are very few, sometimes they give us two boxes of masks, and how many doctors are there who wear masks and go there to do ward rounds? In one session there are about 10 doctors plus three nurses who are going to enter there to give treatment. Those are how many people? See what we have agreed now, we can't leave those patients to lie there, we have put everything in God's hands, we can't keep them there for long because this week there is no masks. We enter there to treat them; we go there for the rounds ohm. If they give us that one box, we can use it for that particular day after that you give up.
Sabrina

Although there was an urgency to care for the patients, sometimes nurses were left with no alternative but to take risks. At times the decision to use protective gear depended on personality. Angelina described situations when she observed nurses taking chances:

It depends on some one's personality, for me, I don't want to use a glove on one patient and I go and use it on another. If I use it on this patient I remove it and the other. I put on a new one because these are disposable they are not sterile, they are not very expensive. Those who do it transfers infections to another so, if others can do it for me I won't do it. It depends on someone's character. Because we are taught, if you use one glove, and take it to another patient you are going to cause more infection. So I don't see why, these disposables are three hundred shillings for a pair in open market. So, each box is bought at US\$ 2000 (CAD 1). With 2000 the hospital should be able to buy us gloves why should we reuse? Why should we reuse on people? For me I don't see the reason, because I don't have to be in someone's heart.
Angelina.

The severity of the patient's condition might determine the nurse's action and risk-taking behaviors:

If the patient is bleeding as I have told you, you can't sit down you have to find a way of getting it because, like putting a line on a HIV patient is different from seeing that one who is bleeding and you think you are going to arrest that bleeding with your hands. You have to try and run somewhere and borrow because that one is an exposure ohm. Sabrina

On the other hand, some of the nurses were careful to ensure they utilized universal precautions despite all odds:

We practice on each and every patient at every time because we don't give room, we don't give chance, and you cannot say that this patient is clean I handle without gloves or what, no. We give it no room; we practice it at every time with all the patients. Penny

Another nurse stated that her decision to use universal precautions was influenced by the procedure that she was doing with the patient:

And I'm not scared when I'm touching the patient who is HIV positive after all, our patients are HIV positive. I just need to know when I'm doing certain procedures; I'm I having an open wound? Or is this patient having any open wounds on his skin? That I may..., but that doesn't mean whenever I touch an HIV patient I wear gloves. But I think what is very important is to know the mode of transmission of the disease and how you are going to prevent yourself. And that does not change, may be for me who has worked with HIV for over ten years, it has become my routine way of work and I don't fear. Dinah

Challenges to the practice of universal precautions were not only related to the shortage of protective gear, but also to the shortage of human resources. Nurses stated that this was a fundamental problem. This challenge caused nurses to take shortcuts to finish caring for the patients. This was shared by several nurses:

Maybe another obstacle is human resource. So you know like infection control really needs you to have the things available and you enforce compliance but now if the human resource is not there like the two nurses per shift for over sixty patients, you are bound to take shortcuts, So if you feel nobody is seeing you and you want to finish

the patient in that moment... you don't practice [universal precautions]
Helen

At times you find that somebody has reported at evening duty at the reporting time of arrival but is not seen and it is one nurse on duty. This nurse is to run the ward, when he has many patients... So you find that, even some other professionals are tempted to apply an unsterile procedure. Betty

Shortages of staff meant that some nurses were overworked. This led to burnout within and cycle of uncooperative staff that in turn impacted on workload. Participants believed that senior staff did not care about this as they were less involved in patient care anyway. Nurses were seen leaving the wards and going to attend to personal activities while on duty thus leaving the patients unattended. This was most discouraging but there was no immediate solution to this behavior:

...staff they are not very cooperative...they don't follow time yeah. Like there [Private hospital B?], they used to follow time, they don't follow time here they come after time and they complain they start dodging work. You work up to 3 or 4 pm after coming in the morning at 8 am but at times you find, at times the evening nurse might come at 4 or 5 pm and you give the report, you find yourself working up to 5.30 pm. Nancy

Another nurse also shared her frustration with colleagues who did not do their share of the work:

There are some problems which are not easy to handle and will continue being like that. You find someone has come and finds a patient is there and has a problem so, the person just goes away to attend to other people. This may not be done every time but in case this becomes a habit there is a disciplinary committee in the unit and has to deal with this problem. You know the person may take long to change because, when we are in public service there is nothing the management here can do unless, the public service transfers you to another hospital Jack.

Several participants verbalized that the time constraints imposed by the shortage of staff impacted their ability to practice universal precautions. This was especially an issue when it came to washing hands. With sinks being far apart, nurses felt that they did not have enough time to walk to the sinks after attending to every patient. In such situations the nurses ended up reusing gloves or changing gloves only when needed. One participant described the influence of time constraints:

The hands...you are supposed to wash your hands after every procedure in fact after handling each, after every one patient you are supposed to, but due to time, we don't do that. Yeah, it is the time taken to walk to and from the sink because the sink is far, you can't attend to this one you go and wash; you attend this other one and again go. You just change gloves and after that you wash your hands after finishing. Amber

Some nurses decided not to care for infectious patients and walked away to do other activities as soon as they approach units with these patients:

When you see someone when you are like giving treatment together, when they reach that side in middle wing where there is too much TB, she just branches off and leaves and go somewhere else. Is it right? Do you wait for another sign, another word? That is the sign already”
Sabrina

Some of the nurses who were left to work in the wards developed creative solutions to cope with the staff shortage. For example, when Lucy was alone she involved relatives in the preparation of equipment for sterilization. Relatives were seen crowded around a table rolling cotton wool and gauze to be put in a sterilization box:

...you know, we used to suffer, like now I'm alone I need to make those gauzes and also give treatment. So, we thought, if we teach these people [relatives] they can help us make gauze, just gauze to make for us. You see that work has been done; now I'm OK. Lucy

Lucy spent time training relatives so that they would be better prepared to assist the nurses:

“Once the relatives are there, at least we tell them what to do, we teach them. Sometimes they know. Where sometimes they don’t know we tell them, we tell them. When we cannot turn the patient, you need to turn the patient this way and they do it. No one pushes the attendants unless there are many, you leave them, one patient with one attendant at least to help because, if you chase them all of them out, then the work will be too much for us.” Lucy

The presence of students on the wards could also put a strain on very limited resources:

May be another challenge in this facility is we deal with so many students, cadres of students and when they come you teach them, although Injection Safety tried to train them in various training institutions, but when it comes to practice, it is still a big problem. We noticed these problems when students are in the units. Helen

One of the nurses stated they had advised the schools of nursing to provide supplies for their students but sometimes this did not happen and in extreme cases the students ended up reusing gloves:

Usually in training school, they tell them to come with their gloves, so, if they didn’t come with their gloves, we give them if they are there, if there are not then we don’t. I think they are the ones who use from one patient to another because they don’t have enough. Angelina

Most of the participants were not involved in the ordering of supplies.

Some participants believed that this influenced the availability and quality of protective equipment and supplies:

The things to be used are ordered by the sister in-charge of the unit and do not involve the other staff in the ordering process. The only time the other staff is involved is, when getting the equipments from the store or when you inform the sister of a shortage of some items. Penny

Another nurse was frustrated when equipment was not functioning and workers were not consulted about resources needed:

...So things go beyond your capability as much as you report and so on mainly because it is outsourced to a private sector, and they don't come to us at the low level to ask us what should we include in our planning, what is the problem. So they are always up there discussing their own things. Down here the needs of workers are not even met.
Ann

The situation became worse when a nurse became assertive and tried to address the issue. One participant felt victimized when she spoke out:

“... Usually the main challenge is, when you try to do things as expected or push them as expected, this hospital I have seen that you are actually stepping on people's toes. ...you find that you are getting victimized. And because of that carelessness and negligence I'm scared that even the nursing teams on the operational area are getting relaxed...you want to retain your job, and you don't want to have a bad name. This is very frustrating to the nurses because, you want this done you give your concerns but no response.” Amber

One nurse, on the other hand reported that “I'm always involved from the beginning where we evaluate the procurement processes”.

Maintenance issues- “...The situation is so embarrassing to talk about...”

Issues of maintenance focused primarily on sinks which were not working. This hindered universal precautions practices which require nurses to wash their hands after every procedure. When sinks were not working, nurses and patients struggled to use what was available. This led to congestion which put everyone at more risk of infection. One participant shared that:

...things are now not functional, and you try to call the mechanical people they are not responding. Ann

Practicing universal precautions was even harder for nurses when they could not wash their hands when providing care. When they wanted to wash their hands, sinks were not functional and the one that was functioning might be defective. One nurse verbalized:

It is only one [sink] on the other side where the attendants washes their dishes from. At times you run to the doctor's room or the treatment room. This one near here was blocked because of people; they splash water everywhere because they want to get to the sink so they blocked it completely. There are supposed to be two sinks but, but they are not working now...ideally it should be more often [washing hands] after every patient but because sinks are far away from what we are doing, we don't do it. We do report, we do report, "this one is not working here", "yes we are coming" and so on we keep on singing it until we sing it no more and keep quiet. Then again it comes and again you start like that. Lucy

Nurses in several units had tried to report non-functioning sinks to maintenance for repair but things were getting worse and nurses were becoming more frustrated:

...it is something [maintenance] so embarrassing to talk about or to say something about it. It was one thing that struck my mind when I walked into this ward; I found all the sinks, all the sinks[broken] except the one in the kitchen, the one in the treatment room is broken but it has a little dripping water that is coming from the same. Now, you find that all the health workers, end up washing in the kitchen and because this other sink is not good enough for us to use it. The water that drips all the time but the tap also is not good enough to wash there. The tap is also tilted so that you can't comfortably use it. It is more on the sink instead of being where it should be draining. Gail

One of the nurses said that sometimes when equipment was taken for repair it ended up getting lost:

It is long since we ordered them [dressing equipment] so the people lose them and some break. You know we never even remember to order or go for those taken for maintenance, it came in my mind but then....now I will tell the sister to order. Lucy.

Lack of Information

Participants were concerned about the lack of information related to protecting themselves from infectious diseases, including methods to dispose of waste. For example, one participant was frustrated with a colleague's lack of information about waste disposal:

...he [doctor] was not informed about the red bin, where to put what, you don't see, he will come and mix up everything. So that is how you can fail to maintain the system. Sabrina

Another participant was aware of immunizations for infectious diseases but did not know where to access them:

...the information is not well disseminated... in 2007 there were vaccines, in casualty, but no one knew about it. So people were asking, "I understand there are vaccines, where are they" So, most people were not vaccinated. So, some who knew went and were vaccinated, some were not vaccinated. So that is not also so good. I think it depends where you are, like casualty they get such information, because those things reach and casualty being it is an emergency area, they get it.
Ann

In the same way students were not always aware of methods to discard waste. This made it hard to maintain proper universal precaution practices. One participant had this to share:

...when they come [students]you might find that we don't have enough time to orient them to these things, how they should be done. You find them with these boxes where we throw the gloves and the rest. Amber.

Overcrowding "...we are overwhelmed with patients..."

Several nurses shared the challenge of caring for large numbers of patients with limited resources. This made it difficult to practice universal precautions. In addition, large numbers of students from several institutions also added to the strain on resources. The overwhelming number of patients

was clearly evident in some units; patients were seen lying on the floor and beds were crowded together. Several participants shared Amber's concern that "Patients are too many; the ward is highly infectious." Penny shared her perspective on the influence of overcrowding on the practice of universal precautions:

...because of overwhelming numbers of patients, you find that things like gloves, we run shortages of it. Such that it is hard handling patients, it becomes a bit difficult and as we are overwhelmed with patients, we always work in emergency doing things faster. In that sometimes, some health workers get blood contact directly flushed in their eyes or either pricked, this always happens." Penny

Overcrowding was worse over the weekend when most of the management staff were absent and the resources were locked:

Sometimes like during the weekend you might find you have many patients and the things which are left are very few. When someone...takes a lot of responsibility here, it is not easy and you need to move up and down to get more things. Peter

Several nurses felt that the overwhelming number of patients meant that beds were very close to each other. This interfered with patients' privacy but equally constrained nurses ability to provide nursing care:

Right now we have overwhelming numbers of patients and therefore the space has become a challenge... That is one of the key things we are having as a challenge, adequate space for the nurse team and patients... So you find that you may not be doing the professional way of having each person [in] her own room. I think that thing has been dictated by increasing number of the patients... The staff ends up sharing the small rooms where each one handles your patient. Paula

One nurse believed that the failure to control the flow patients from the emergency area resulted in overcrowding on the wards:

...again we fail, we fail to control the patients from emergency and you find at times there are patients even on the floor and another is up and they can get infections. Lucy

Sabrina stated that overcrowding was managed in her ward through early discharge of patients regardless of whether they were ready. This practice posed new hazards in the community:

...we are so crowded with patients before they are diagnosed; the doctors are forced to discharge them after a short while... But the crowding in the ward, sometimes make them go a little earlier than that. I know they are potentially very dangerous to the society. At the same time you cannot keep them here without even food, you see the challenges. Sabrina

Overcrowding was not always blamed on internal institutional factors, but also on police who brought patients from different parts of this city to the national referral hospital. There was no room for dialogue with the police and nurses were forced to admit patients even when there were no beds:

“You cannot tell those [Police] not to bring but you can tell them hold on. It depends on how they are handling the patients, if all there is, we have enough man power, and you find that may be someone rushes to tell you they are bringing patients to casualty, or we have received the message, from the head of department or area manager, whoever is in that locality you have to see to it that from time to time you equip yourselves ready. Betty

The set up of the ward was frustrating when nurses had to care for large numbers of patients. One participant attributed the spread of infections to overcrowding:

If you are to move around you would see most of our patients are down on the floor. ...they are on the floor there are no beds, the ward is too full...when you look at the condition even ourselves, and we are at a very great risk of getting infected. Patients are too many, the ward is highly infectious...It is sad... somebody who is cardiac, he is being put on a cylinder and is being surrounded by only TB patients, but because

he is dyspneic, you don't have another cylinder you have to put her there. Amber

Coping with challenges

Nurses shared many ways that they coped with challenges to the practice of universal precautions. Strategies used by the participants included: (1) borrowing from other units; (2) donations; (3) controlling the layout of the ward; 4) buying equipment; 5) lobbying for equipment; 6) education and training; 7) nurses self-protection; 8) faith in God; 9) and thinking positively. Nurses were keen to use protection at all cost.

Borrowing from other units - "At first you borrow from another ward"

Several nurses stated that borrowing was a norm when their ward resources were challenged beyond what they could bear. A few participants indicated that they only resorted to borrowing supplies from other wards when their supplies were exhausted. One of the nurses spoke of the need to borrow supplies at night:

In case we have no gloves or other things at night, at first you borrow from another ward, and return their stock during the day. Otherwise you may call the night in-change to authorize to get more from the main store and especially during an emergency. At other times it becomes very hard because one has no time to get to other units to get items and even the staffs at night are not many. Penny

Another participant stated that borrowing was a common practice on weekends:

When there are not enough [supplies] like if we don't have enough from the ward may be they are finished, we try to borrow from other units because the whole of Teaching Tertiary Hospital is one unit. So when you go there they can borrow some like masks, may be a box of gloves and when you receive your stock you return. You cannot sit

back and say let me wait because they are not there. Sometimes like during the weekend you might find you have many patients and the things which are left are very few... So it makes life very hard as you have to borrow from other wards and return when you get your share back. Sabrina

Donations - “Usually we depend on donations”

Some of the wards were equipped with supplies which were donated from other organizations. Donors from outside the country were concerned with infection control techniques. Many participants had worked on units that had received supplies as donations:

Usually we depend on donations actually. Very often since I came in this ward in April last year, we were mainly depending on what was donated. There are people who come in like, you can see that kafera [polythene paper] there. All these things are donations, these other ones, they come in as donations. Sometimes from these students who come from out or visiting people who come from out and then they distribute them, they distribute them to some wards and then we keep them. So, when we run short of anything if they are there we embark on them. Helen

And even these other things I was talking about, like that one, [pointing at her bottle of hand sensitizer gel] it was a donation. If you have it, yes you can use it but like I said, I won't get satisfied even if I use that, because our hands are very dirty. Gail

One participant suggested that immunizations may also have been donated:

They just had a donation or whatever I don't know, because they started immunizing in 6th floor and they asked us to go for first dose. Then those who got the first dose we continued to get the second dose and when those people came again we got the last dose. So, others missed. Peter

Controlling the layout of the unit – “Patients are kept a bit distant from the staff”

Many participants pointed out that the design of the ward could 'protect' nurses from infectious diseases such tuberculosis:

As a team we do the setting up of the work place in a way that it is, it is safe working environment... The process of protecting yourself, depends with what you are. What activities you are doing may be as a nurse. We have different sections; there are those nurses who are working under the TB [Tuberculosis]. The setup itself is in such a way that the patients are kept a bit distant from the staff, where the staff are, such that it is also in an open place. That also encourages the sterilization and you know not so much concentration of the bacillus for the staff and thereby reducing the risk. Paula

Several nurses suggested that the placement of patients could prevent cross infection:

... They cannot mix them with these [heart condition patients] even if there was one patient on that side they can't take them there. They just squeeze them after two, three days if the sputum culture is out, if it is negative they can either leave or if it is not, they go home. The ones who have positive sputum are moved to the middle wing because they are proved TB. Nancy

They come here, when they take the sputum and the chest x-ray immediately... Here on the veranda there is TB. When they are brought and they are TB patients they are taken there. When patients come with TB which is confirmed that it is TB, they are admitted here and they go to the middle wing directly. Angelina

Participants believed that congestion in the wards could expose both nurses and patients to more infections:

As I told you the design of the wards also is not conducive for infection control. But we try what we can. Helen

The space may not be enough although like now it is enough because, if we have two doctors they are able to handle because there are two rooms. For nurses we need more [space] in order to handle patients because like now I'm alone. I need to give drugs, I need to prepare for dressings and if like now there are some people who have come for vaccine, then it becomes too much. Jack

Gail believed that having adequate ventilation was one strategy to compensate for the overcrowding and decrease the likelihood of the spread of infections:

So the design of the ward, it is quite open giving free air entry on the ward and I wouldn't say the number of patients because it is so crowded, the ward is quite crowded but we make sure the ward is aerated, well aerated. Gail

Buying equipment - "Patients are forced to go and buy"

In desperation, patients, relatives and at times the nurses, felt compelled to buy their own equipment. This was seen as a way to overcome the challenges and to ensure that basic universal precautions were observed. Participants stated that sometimes they had no basic protective gear in very grave situations. In these instances they asked patients and relatives to go and buy some of the supplies. This added more stress to the patients and their relatives who were already upset about their illness. One of the nurses had this to share:

Sometimes even the gloves themselves are not there. Patients are forced to go and buy so that you can help them. Dinah

Another nurse shared her concern about asking patients to buy supplies in a private ward:

...telling the patient to go and buy a drug which is not allowed because they know you are supposed to treat them and give them everything. Charge them on discharge but telling the patients that I need this, it is so difficult. Like if you look for gloves in the ward and you fail to get, you tell the patient to buy and the patient refuses, you just look on. Isabella

Most of the participants indicated that it was important to take responsibility for themselves and to buy some protective gear and other equipment. Some of the nurses who worked in units such as casualty and

emergency, units with more immediate risk, took steps to protect themselves by buying personal protection gear. At times the lack of support from management made them realize they had to take care of themselves:

First I have my gown, I have my apron. Eh, I got it myself. I stitched it. I got a tailor and she did it for me. It is plastic and after I use I clean it and keep it. Mercy

On top of buying the equipment, there was a need to also take care of [our]own items in case they got lost in the wards...when you buy your personal scissors...you would walk with them wherever. You own them even after you leave. I brought things here, and they were stolen, they were misplaced so, I don't have any, I have only the stethoscope. This stethoscope, the doctor would walk with it and take it home not until I told them this is my stethoscope it is not hospital equipment. I also became protective of my property because I was going to lose it. Ann

Lobbying for resources “I advocated... for an autoclave”

A few participants networked with those in higher positions and lobbied for extra supplies. Some of those in higher positions such as the budgeting department, helped out because ordering supplies was a long, bureaucratic, process. At times, the supplies received did not meet the demand and those who were able to have influence could go a step further and convince the stores staff to issue more. At other times nurses had to follow up with a letter to ensure supplies were received. As one participant said:

...today we have received twenty boxes of disposable gloves that are one thousand gloves. We are supposed to use them for a full week until next. Actually for us to observe universal precautions we probably need twice as much, but you can't get it. At times I order for one thousand five hundred of gloves and then they still give me the same. However I have tried to lobby, physically I have gone down there, when I came in here they were giving us only five hundred. So I said my, this is the situation in Uganda if you could add as something. So

they added us first eight hundred and now on top they have reached one thousand. Gail

In addition to lobbying for more supplies, one participant had lobbied for an autoclave to sterilize equipments:

Here we sterilize, we've been using sterilization but now, actually I advocated, I talked with the in-charge for an autoclave. We talked with the in-charge that sterilization only cannot solve the problems, she got us an autoclave. Jack

A few nurses went further and wrote letters to help bring about change in the practice of universal precautions. This however did not change the situation. The sinks were still not functional which brought about more frustration for nurses who tried their best to improve their practice of universal precautions:

...people get infection from these sinks. We tried, I tried to design a letter and I gave to my boss, I told her that she should type it, sign it and take it to our area manager following the protocol so that they could look into repairing the sinks. But nothing has happened, down the road now there are six weeks coming up to this day nothing has been done. This is very frustrating to the nurses because, you want this done you give your concerns but no response. So, that is the situation in the ward. So, all that makes it very, very difficult for one really to observe universal precautions. Gail

Education and Training - “We have been having some kind of training”

Some participants had participated in the continuing education training offered in the units. This was not always consistent and some of the nurses did not have any training despite being directly involved with caring for infectious patients. Most participants had learned about universal precautions in their basic education and had not had updated information since that time. Through the Ministry of Health, universal precautions training had been delivered

through short sessions and by experts in the hospital, but not everyone had been able to attend. The sessions were held primarily when there was a new technology or practice being introduced. A few nurses stated that they were just ‘gambling’ with the policy as they had no knowledge about the correct practice. Other nurses who had experience working in different institutions, felt that their current practice only drove them backwards in their knowledge of universal precautions. Although training school was mentioned as the main source of information on universal precautions most of the participants also mentioned sessions offered by the infection control department in the hospital:

Yeah in my training, that [universal precautions] is one of the things I went through and then we had in-service workshop for the staff organized by the infection prevention nurses in the hospital so, we went through that. That is when we had to say, this bucket label is yellow, is for this and this one is black is for this and the sharps container is like this and where to dispose all of them. Dinah

I came to learn about universal precautions as an enrolled nurse at the enrollment level. I learnt universal precautions through the training of infection control; I learnt universal precautions when I went to work in unique hospitals. Ann

Others participants put more emphasis on the sessions done in the work place by different agencies and staff members:

Well I learnt most of these things in training school when we were being trained but those days we were not told about wearing gloves for everybody ... but the Ministry of Health, when they come up with the boxes; they had to train all of us on how to use these boxes. ...yes, things have changed, me I used to, what I learnt in the school is, you could just get soap you do this and finish [clean hand washing verses surgical] but now Ministry of Health is teaching us how we should scrub. Amber

...we have been having some kind of training, they teach us how to dispose of our used equipments in the wards, they take us for that...so

they trained us how to use it and also how to care for these safety boxes, how to discard after use. Penny

They take us for workshops; we could go a certain group of nurses like a group of 10 nurses. Then you learn these things like, prevention of infection, like everything whatever or whenever they want to introduce a new policy or new precaution in the ward, they take us for what, for workshop. Like the say.... like the What is it called? The save needle procedure and also the.... another one what is it... (Pause) safety injection practices.” Angelina

In addition to their own education, a few participants mentioned that they had to teach patients and relatives how to be actively involved in infection control. Nurses were involved in teaching patients and relatives how to protect themselves not only in hospital, but also at home when they were discharged. Several participants mentioned their work with families:

We also teach these patients, we explain to them what kind of disease actually they are having and we also try to teach them how they can help others to help them, because like eh patients is coming with disease A, we try to advise these patients when he is coughing, he is supposed to cover his mouth with that mask. ... That can also protect the relative, the health worker. So they are supposed to be taught that kind of behavior. And like for HIV patients when you are handling patients and the patient knows that he is having HIV, you can tell him that, even if he is at home he should not use, eh sharps like surgical blade and throw it down because children can easily cut themselves with it even people or others can get cut. So they should try to protect the family from getting the disease in that way. That’s what we always do. Penny

Patients, like when a patient is coughing I tell the patient to hold the mouth and then you cough. Sometimes we give them masks and so they put on masks and then you can work on them they do cooperate in this. Peter

Despite sharing their knowledge with patients and relatives, nurses were faced with the same resource challenges when working with families. They gave the

right information to patients and relatives but were not able to give supplies to practice:

... [The] other thing we need to do is to health educate patients, we need to educate the patients... But again we are challenged here, we may health educate, we don't provide what we need, for example, sputum mugs for patients, those things are not available, they are not there. May be in schools but not here, those things are no longer available. Like patient coughing while covering his face, we need to health educate him on that, how TB is transmitted, and how he can prevent this infection from spreading to others. Gail

Nurses self protection – “Healthcare workers should be vaccinated”

Nurses knew that they were at high risk of getting infections because they handled all kinds of patients including patients who had not been started on treatment. In this case nurses were aware that they needed to be immunized but not all nurses had this opportunity. There were plans to immunize the entire staff but not everyone was immunized for one reason or another. One participant shared the reality she had experienced:

When on the bedside you work as you are on the front line, you don't know whose blood is there, you don't know when you will get infection, and you don't know when you will get pricked... For that reason there was the policy around that people should... healthcare workers should be vaccinated against, Hepatitis B. Some people got and some organized for the surgical units for the nurses and doctors to get that. First dose you get and then after that one month and then after 6 months and then after one year 3 doses of that hepatitis. Dinah

The arrangements for immunizations were not clear to participants. Some nurses thought they were required to pay for this service unlike other services which were free in the institution. There were arrangements made for nurses to be immunized in groups, because the vaccine vials were multidose. However this arrangement was not easy for the nurses who were already overwhelmed

by work in their wards. Heavy workloads and the belief that nurses had to pay for immunizations meant that some nurses were unprotected:

That is another challenge yeah! Is like somewhere we were supposed to be paying for it, I don't know how much money. You go in a bunch of 10 nurses and then, they give you like that. Plus the work load I think like, I should say, I neglected myself and I did not go. Those are the things; nurses are always busy by the time you feel like taking yourself for some care. Dinah

No, I had a chance but I never but when the vaccine was brought they had asked us to pay and as for me I didn't have that money. So when they brought the second time, the vaccine was not enough and I did not get a chance, some of us we what? We missed. Sabrina

I have not been immunized, you see when... there is a time a saw a notice there, it was only for surgical, people who are in surgical wards and it was for paying. They were supposed to pay a fee. Mercy
Other nurses had been immunized against hepatitis B, especially if they

worked in surgical or emergency units:

I was immunized for Hepatitis because; I was working on a surgical ward. I got immunized when I was there when I was on surgery. I think it is only once, they immunized long time ago, and they immunized me twice. Angelina

Some nurses believed that they developed a 'natural immunity' to protect them against infectious diseases:

Naturally, I think they use their natural body defense... Gail

...I coughed and coughed for almost a whole month...but with time, the cough cleared and I was ok...So, may be in the process of working in this place caused me to get what, immunity...it is God who protects us but in actual sense, we don't have all the facilities which we could use. Angelina

Faith in God - "It is just God who protects you"

Some participants believed that their faith in God protected them from infectious diseases and allowed them to continue caring for patients. One

participant indicated that it was not her will to work with such patients but felt she did not have a choice.

Wherever you work on an infectious patient you expect either to get the disease or to work out without getting it. It is just God who protects you but if you can get a chance of not working there, then you are ok. Angelina

Another participant shared her belief that it was God who protected her from infectious diseases and she has no fear:

I have become immune I never fear...I have nothing to fear because I have gotten used to the system now, I have no TB there is nothing to do. ...it is just God who protects me otherwise you put in two pairs of gloves and then you put on the masks and then you can take care of them. This is it, for us who suffocate we can't, for me immediately I put on like this; I feel I can't breathe so; I just have to remove it. God protects me but nothing else. Paula

Gail shared a moving story about a needle stick injury she had received. She did not follow the needle stick protocol believing that God would protect her:

It is God who protects us...well my God is there for me, if it is this time, and He wants me to go with this but if He knows that I need this health, I don't think I will get it through this. That is how I counseled myself. Gail

Thinking positively – “So I continue faithfully”

Nurses believed that by thinking positively they could continue working even without observing the required protection protocols. There was a sense of resignation to continue working in conditions that were not ideal:

Me I came alone, and I applied alone to work in [a] Teaching Tertiary Hospital and I applied humbly so I continue faithfully. I continue with my work and I finish, I don't look at any other person. When you look at people, when I report on duty I know I'm alone. Mercy

What is enough or whether it is not enough, for us we don't know, we are on the ground. We just receive what we get and if it is not enough,

we just stay as we are. What can we do? But we have to continue working and of course the patient won't die because there are no resources. Angelina

One nurse felt that she was too old to start looking for new job opportunities and therefore continued in a job that she disliked:

It is our culture that makes us still care for the patients and the nurses who have no alternative, if me, I was young I would leave and work in other places. Otherwise as I finish let me say I hate this ward. Gail

Recommendations

After the interviews several nurses provided recommendations to ensure that universal precautions were practiced. One nurse shared her thoughts on the structure of the infection control team which she thought would result in a positive change:

There should be specialized nurses for infectious diseases. Even not one only but, they should be many. They should be trained, in the whole country when such things happen and there is like outbreak of infectious disease. So institutions like this one is complex that is why they call it Teaching Tertiary Hospital. But within me I was like, I wish they would make an administration for every floor, like first floor, second floor, third floor like that it would be so good, that would be manageable. Penny

For each and every challenge faced the participants had suggestions to share.

Nurses recommended ensuring that functioning sinks were available in strategic areas of the ward. For example, one participant suggested that:

The sinks I think they should be distributed according to the strategic areas. For example where we dress from [patients' treatment room], you find that we needed a sink there which is not functional at the moment. Ann

Another participant recommended that there should be bigger autoclave drums.

There is a central sterilizing place but then the problem is how to keep them. So if we need a drum which can take 20 packs if it is possible, then this would be better. May be to keep the disinfectants like the precepts in enough supply so that, when needed one can get. Sometimes we go out throughout without jik and getting these disinfectants becomes a problem. Jack

One participant pointed out that a team-work spirit with regular meetings to address issues was the way forward to solve most of the problems they encountered.

When you see that something is going out of hand, you should have meetings, meetings help. You remind yourself and review, evaluate what you have been doing and what else to do, because, when you keep on saying ‘after all I’m not concerned, who is concerned?’ Tomorrow you might be the one in that shoe Betty

Chapter V: Discussion

Findings from this study provide a better understanding of Ugandan nurses experience in the practice of universal precautions. In spite of nurses working in very challenging conditions they worked very hard to provide comprehensive nursing care, with the ultimate goal of ensuring optimal patient health. Nurses relied on their past experience when they were unable to practice universal precautions or did not have policies and standards to guide their practice. Traynor, Boland and Buus (2010) reported that in addition to policies and practice guidelines, nurses use personal experience to guide the process of clinical decision-making.

Research Process

The process of collecting data was easier than anticipated. The researcher's previous experience in the setting facilitated the building of trust with both nurse managers and participants. This enhanced the process of entry into the research setting and recruitment of participants. The researcher's knowledge of the setting and teaching experience in the setting positioned her as an 'insider' (Morse & Richards, 2007). The insider role may have both positive and negative effects in research studies (Morse & Richards, 2007); in the current study the insider role had positive influences.

Discussion of Findings

The experience of the nurses in this study illuminates the complexities of practicing universal precautions in resource-limited settings. Nurses experienced challenges related to the lack of resources, maintenance issues, lack of information and overcrowding. Nurses felt overwhelmed with the number of patients in their care, particularly when they lacked the resources

they required to provide safe care. These feelings may be symptomatic of the moral distress that Harrowing and Mill (2010) described in Ugandan nurses. These authors reported that Ugandan nurses experienced moral distress when nurses lacked the resources they required to provide safe, comprehensive care. In the current study, participants' used many strategies to overcome the challenges, demonstrating their resiliency and commitment to their patients' wellbeing.

In the current study nurses had encountered the aftermath of the HIV and AIDS epidemic in both their clinical settings and their communities. Sabrina provided a very moving description of the impact of HIV on health care workers:

There is no family which is not touched, is not touched and if you do research with these health workers I don't know how many you will find without someone sick in the family or has died or has lost how many. So, HIV is not new to us the health workers at all, it is not. So we handle them like any other sick person.

Many participants described the challenges that they faced in the practice setting in order to meet the needs of their patients. Nurses worked in an environment with too few resources, both material and human, and too many patients. Although nurses typically had a good understanding of universal precaution practices, they often had to choose when, and with which patients, to use protective gear. In their decision-making they frequently balanced the availability of resources with the risk to themselves or their patient.

Many of the patients that the nurses cared for were infected with HIV and AIDS. This situation is different from a recent US study (Mullins, 2009) that reported that HIV was not a concern for nurses because of the low prevalence of HIV illness. The majority of the nurses in the current study

believed that caring for patients with HIV and AIDS was the same as for any other patient. Although some nurses expressed the desire to know the HIV status of their patients, most of the participants realized that there were many infectious diseases, in addition to HIV, that they needed to protect themselves and their patients from exposure. The finding that Ugandan nurses cared for all patients in a similar way have been reported previously (Fournier, Kipp, Mill & Walusimbi, 2007). Similarly, other researchers (Harrowing & Mill, 2010; Walusimbi & Okonsky, 2004) have reported that Ugandan nurses treated all patients in the same manner, however took extra precautions with patients with HIV and AIDS. In the current study a few nurses appeared to ‘take for granted’ the infectious nature of HIV disease, perhaps because they had cared for so many patients with HIV and AIDS.

Several studies have reported that nurses and midwives are fearful of HIV exposure and are worried about getting AIDS (Delobelle, Rawlinson, Ntuli, Malatsi, Decock & Depoorter, 2009; Mondwiwa & Hauck, 2007; Mill et al., 2009). Most of the nurses in the current study however, were not fearful of taking care of patients with HIV and AIDS, especially if they had sufficient protective gear to practice universal precautions. Nurses were highly committed to providing the best care possible to all of their patients. A few participants, on the other hand, demonstrated some hesitation to care for patients that they suspected to be infectious. For example, some nurses reported using two pairs of gloves when providing care to HIV- positive patients and avoiding contact when possible with these patients. Harrowing and Mill (2010) also reported that some Ugandan nurses felt uncomfortable taking care of AIDS patients and practiced double-gloving to protect

themselves. In the current study some nurses reporting using no gloves to make their patients more comfortable. Mill and colleagues (2009) reported that some Canadian nurses chose not to use gloves with patients in order to demonstrate their comfort with the patient and to decrease stigma and discrimination.

In the current study, there was minimal reported stigma and discrimination by nurses toward the care of patients with HIV. Some of the nurses, however, expressed their desire to know the HIV status of their patients prior to implementing universal precautions. In addition there were a few nurses who avoided caring for patients that they considered to be infectious. These may be interpreted as signs of stigma toward HIV-positive patients. The need to know the HIV status of patients as a factor in the practice of universal precautions has been reported previously with nurses in sub-Saharan Africa (Fournier, 2007; Mathole, Lindmark & Ahlberg, 2006; Mbanya, 2008; Salyer, Walusimbi & Fitzpatrick, 2008). Stigma towards patients with HIV and AIDS has been reported previously in a variety of settings (Ansari, & Gaestel, 2010; Gilbert, & Walker, 2010); Greeff, & Phetlhu, 2007; Mill et al., 2009; Mitchell, & Knowlton, 2009; Mwinituo, & Mill, 2006). In the current study, nurses reported some stigma associated with needle-stick injury and post-exposure prophylaxis following exposure to the HIV virus.

Nursing curricula in Uganda includes information about the prevention of HIV and treatment of AIDS (Walusimbi, 2004). Education and training has been identified as an important component to improving adherence to universal precautions (Madeo, 2004). Furthermore, it is important for

governments and institutions to have policy related to the universal precaution practice. In the current study, it was evident that educational level had a role to play in the practice of universal precautions. Most nurses understood that universal precautions were meant for all health professionals and should be observed in the provision of care to all patients. A few of the nurses were lacking in theoretical knowledge about universal precautions, but were more informed about infection control procedures. Although knowledgeable about universal precautions, some nurses were frustrated when they did not have the protective equipment to implement them. The nurses with less education appeared to also have less knowledge of universal precautions. Walusimbi (2004) also reported that Ugandan nurses with less education had less knowledge about HIV and AIDS.

Nurses cited several reasons, including lack of resources, maintenance issues, lack of information and overcrowding for not practicing universal precautions. The primary challenge to the practice of universal precautions was the inadequate supply resources, both material and human. This challenge has been reported by several authors in many developing countries, especially in Sub-Saharan Africa (Adebamowo, 2002; Fournier, 2007; Harrowing & Mill, 2010; Isah, Sabitu, & Ibrahim, 2009; Reda, 2009). Nurses were often caught in a vicious cycle: the lack of resources led to fatigue and despair, which in turn contributed to a growing negative attitude toward their work and their patients. This process has been reported previously when Ugandan nurses were unable to provide optimal nursing care with limited resources (Fournier, 2007 and Harrowing, 2010). Nurses then became less conscientious about meeting professional standards, and often failed to appear at the workplace for

their scheduled shifts, thus aggravating an already critical situation. The overwhelming number of patients, in relation to the number of nurses, was also a significant challenge to universal precaution practice.

Hand hygiene was reported as a problem by almost all of the nurses. Although hand gel is a recommended alternative to hand washing, it should only be used when soap and water are unavailable to clean the hands. Several studies have indicated the save use of hand gel and evaluated the problem with hand washing and use of hand gel as an alternative (Caniza et al., 2009; Guilhermetti et al., 2010; Ogg, & Petersen, 2007; Rupp et al., 2008). In the current study, soap was often not available and sinks were often not functioning. Therefore, nurses frequently were forced to rely on hand gel for cleaning their hands. Similarly, when preparing to do an invasive procedure with patients, nurses commonly weighed the risk of exposure to an infectious agent with the availability of gloves.

When nurses were faced with these challenges they focused on their nursing skills to ensure patients received the best possible care. In addition, nurses used a variety of creative strategies to address the challenges they faced. These included teaching relatives to get involved in care, buying equipment, improvising when equipment was unavailable, and borrowing from other wards. It was common for nurses to ask patients and relatives to participate in nursing care, including the purchase of supplies and equipment that were unavailable. In many instances however, patients could not afford these items. In extreme cases, nurses purchased supplies, medications or food for their patients; this was an indication of the strong commitment of nurses to provide care for their patients. Harrowing and Mill (2010) also reported that

patients in Uganda were asked by nurses to buy supplies. Ann captured the need to improvise in her comment “you improvise until you improvise nothing”. In a recent study with Uganda nurses, Fournier (2007) also reported that nurses engaged relatives in patient care and improvised when equipment was unavailable. At times, these challenges forced nurses to work without observing universal precautions.

Universal precautions emphasizes the need for health service providers to consider all patients as potentially infected with HIV or other blood and body fluids and to adhere rigorously to infection control precautions. The precautions also emphasize the need for safe working environments where workers feel more supported, which could also help to minimize worker stress and discrimination against patients with HIV. Although the overall negative impact of HIV/AIDS has been devastating, there is a lot of government commitment in Uganda, a key determinant to success in ensuring universal precautions practices to protect the nurses and the patients. Nurses in the current study were aware of infection control policies that had been developed by the Ministry of Health. In addition they described institutional infection control policies, particularly in relation to post-exposure prophylaxis. From the perspective of participants, what was missing were the written documents to ensure that nurses had accurate information about universal precautions practices. As recommended by Wu and colleagues (2008) effective universal precaution interventions need to target both administrators and providers, and address both structural barriers and individual attitudinal and behavioral factors.

Lee (2009) reported that PEP and Hepatitis B vaccine are efficacious and cost-effective in developed settings for the prevention of blood-borne disease. Nurses in the current study were aware of policies related to universal precautions practice, vaccination against Hepatitis B and post-exposure prophylaxis (PEP), however frequently the written policies were unavailable to nurses. Furthermore nurses often lacked information about vaccination programs and PEP procedures. In a recent Ugandan study (Harrowing & Mill, 2010) nurses also reported that infection control documents were not accessible. Even when aware of PEP, nurses in the current study sometimes avoided following the PEP procedure, due to concerns with the side effects of the anti-retrovirals and the stigma associated PEP. In addition, most of the nurses were not immunized against Hepatitis B.

Wu and colleagues (2008) have noted that promoting adherence to universal precautions is the best method to reduce risk in resource-poor settings. Knowledge about universal precautions, and the resources to implement them are both critical requirements for Ugandan nurses to implement universal precautions. Provision of basic equipment such as gloves and ensuring workers are trained in safe methods can be very efficacious. Ongoing education programs are recommended to encourage compliance with universal precautions (Mbanya et al., 2001). Cutter and Jordan (2004) remind us however that education is only one component required to ensure compliance with universal precautions. Perception of risk, attitudes and beliefs are also important factors that influence nurses decisions to practice universal precautions. Nurses in Uganda need ongoing support and the consistent supply of resources to ensure that universal precautions are observed at all times,

rather than selectively practiced. In addition, more emphasis must be put on the use of universal precautions for the prevention of **all** blood borne infections, rather than focusing only on HIV and AIDS.

Conclusion

In the current study, despite the challenges associated with implementing universal precautions, nurses displayed an overall enthusiasm for their work and a dedication to provide the best possible care for their patients. Similarly, Salyer and colleagues (2008) reported that Ugandan midwives showed great enthusiasm for providing high quality care to their patients living with HIV and AIDS. Participants in the current study shared a wide range of strategies that they used to minimize the challenges they faced in their practice; many of these strategies demonstrated their commitment to their patients and their willingness to use their own resources to improve their practice. There was evidence of collaborative efforts among nurses, patients, and relatives to ensure that supplies and equipment were available and functional, in order to ensure the wellbeing of the patient. Nurses were open and eager to participate in the study and to explore other approaches to assist them to provide safe patient care.

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Appendix A: APPROVAL FORM-University of Alberta

Date: August 20, 2009

Principal Investigator: [Judith Mill](#)

Study ID: [Pro00008292](#)

Study Title: The Experience of Ugandan Nurses in the Practice of Universal Precautions

Approval Expiry Date: August 19, 2010

Sponsor/Funding Agency (free text): 7/12/09 7/20/09 ID00000534 Aga Khan University

Thank you for submitting the above study to the Health Research Ethics Board (Health Panel). Your application, along with revisions submitted August 17 & 20, 2009, has been reviewed and approved on behalf of the committee.

A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the Health Research Ethics Board does not encompass authorization to access the patients, staff or resources of Capital Health or other local health care institutions for the purposes of the research. Enquiries regarding Capital Health administrative approval, and operational approval for areas impacted by the research, should be directed to the Capital Health Regional Research Administration office, #1800 College Plaza, phone (780) 407-1372.

Sincerely,

Glenn Griener, Ph.D.
Chair, Health Research Ethics Board (Health Panel)

Note: This correspondence includes an electronic signature (validation and approval via an online system).



Appendix B: Recruitment Poster

The Experience of Ugandan Nurses in
the practice of
Universal Precautions

Your input and experience during this study can contribute to new nursing knowledge.

- Are you a qualified nurse with a Certificate, Diploma or Bachelor of Nursing?
- Are you able to complete the interview in English?
- Are you interested in participating in a study exploring nurses' experience in the practice of universal precautions?

If you or someone you know might be interested in participating in the study please take a tag and call. Thank you

For more information contact:

Esther Nderitu

Faculty of Nursing

University of Alberta

Phone: 256 722 363 307

Email: nderitu@ualberta.ca



Universal precaution practice nurses experience Esther Nderitu 256 722 36 3307
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Appendix C: Informed consent form

Title of Project: The experience of Ugandan nurses in the practice of universal precautions

Principal Investigator(s): Esther Nderitu		Phone Number(s): 780 906 3307	
Supervisor: Dr. Judy Mill		Phone Number(s): 780 492 5556	
<hr/>			
Part 2 (to be completed by the research subject):		<u>Yes</u> <u>No</u>	
Do you understand that you have been asked to be in a research study?		<input type="checkbox"/>	<input type="checkbox"/>
Have you read and received a copy of the attached Information Sheet?		<input type="checkbox"/>	<input type="checkbox"/>
Do you understand the benefits and risks involved in taking part in this research study?		<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study?		<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your future employment?		<input type="checkbox"/>	<input type="checkbox"/>
Has the issue of confidentiality been explained to you?		<input type="checkbox"/>	<input type="checkbox"/>
Do you understand who will have access to your records, including personally identifiable health information?		<input type="checkbox"/>	<input type="checkbox"/>
Who explained this study to you?		<hr/>	
I agree to take part in this study:		YES	<input type="checkbox"/>
Signature of Research Subject		NO	
<hr/>			
(Printed Name)			
<hr/>			
Date: <hr/>			
Signature of Witness			
<hr/>			
I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.			
Signature of Investigator or Designee		Date <hr/>	
AND A COPY GIVEN TO THE RESEARCH SUBJECT			

Faculty of Nursing

7-90 University Terrace • University of Alberta • Edmonton • Canada • T6G 2T4
 Telephone: (780) 492-7556 • Fax: (780) 492-1926
 judy.mill@ualberta.ca



Appendix D: Information letter

Title of Project:

The experience of Ugandan nurses in the practice of universal precautions

Principal Investigator(s): Esther Nderitu Phone Number(s):780 906 3307

Supervisor: Dr. Judy mill Phone Number(s):780 492 5556

You are invited to take part in this research study

Background : Approximately 2.5% of Human Immunodeficiency Virus (HIV) cases and 40% of Hepatitis B virus (HBV) and Hepatitis C Virus (HCV) cases among healthcare workers (HCWs) worldwide are the result of exposure at work. Although blood borne exposure results in substantially fewer new HIV infections each year than other routes of transmission, direct exposure of blood to HIV is still the most efficient means of transmission. Effective measures exist to prevent HIV transmission resulting from needlestick injuries and other exposures in healthcare settings. Many countries are making inadequate use of these highly effective equipments and techniques for prevention of staff and patients from infections. The Center for Disease Control and Prevention (CDC) has published guidelines on universal precautions to prevent transmission of HIV, hepatitis and other infectious diseases in health care settings and to protect both healthcare workers (HCWs) and patients. Implementing these guidelines is recommended to protect HCWs from exposure to blood and other body secretions known to transmit diseases.

Purpose of the research study: The purpose of this study is to explore the experience of Ugandan nurses in the practice of universal precautions.

Procedure: You have been asked to take part in an individual interview to discuss your experience in the practice of universal precautions. The interview will last approximately one hour. The interview will be tape-recorded for later transcription and analysis by the researcher.

Possible Benefits and Risks to Participants: You may not receive any benefits from taking part in the interview. I do not expect that you will suffer any harm from taking part in this study. By taking part in this interview, you may provide valuable information about universal precautions practice. You can learn about the study results when it is complete.

Faculty of Nursing



Voluntary Participation: You do not have to take part in this study if you do not wish. If you wish to leave the study, you can do so at any time without giving me a reason. It will not affect your future employment. You can phone me to let me know or inform my supervisor that you do not wish to continue to take part in this study.

Confidentiality: Your name or your family's name will not be revealed to anyone. In addition, your real name will not be written in any report. Only a code (different name) will appear on forms and on the written copy of the discussions. Your real name and code name will be kept in a locked place. The only people that will be able to see this information will be my research study committee members, the person who will type the interview from the tape recorder, and myself. If you agree, I may use the information from this study for a future research study. If so, I will once again receive appropriate approval from a special committee before I begin the next study.

The information and results from this study will be published and presented at conferences. I will not use your name or reveal your identity (who you are). If you have any concerns or questions about this study at any time, please contact my supervisor Dr. Judy Mill or me at the numbers given above.

If you have any concerns about any aspect of this research study, you may contact the Faculty of Nursing Research Office and speak with Ms. Mariam Walusimbi at 011-256 -414- 540440/ Cell 011-256-772-439699.
mariamwalusimbi7@gmail.com.

 Participant Signature Print Name Date

Faculty of Nursing



Appendix E : Field Notes

Participants Code #
 Interview date:
 Length of interview
 Location of interview
 What is the size of the ward Number of patients
 Number of sinks to wash hands
 Description of environment (including personal and time of day and events)

Non verbal behavior (e.g. tone of voice, posture, facial expressions, eye movements, forcefulness of speech, body movements and hand gestures)

Content of interview (e.g. use of key words, topics, focus, exact words, or phrases that stand out)

Researcher's impressions (e.g., discomfort of participant with certain topics, emotional responses to people, events or objects)

Analysis (e.g., researcher's questions, tentative hunches, trends in data and emerging patterns)

Technological problems (e.g., Lost 5 minutes when the tape did not turn on)

Other problems and unseen interruptions (e.g., emergencies in work unit, withdrawal from the interview)

Source Morse & Field (1995, p115)

Faculty of Nursing



Appendix F: Guiding Questions

Code No. Date of birth.....Unit.....

Preamble: You have been asked to take part in an individual interview to discuss your experience in the practice of universal precautions. The interview would last approximately one hour. The interview will be tape-recorded for later transcription and analysis by the researcher. The information will be kept confidential.

Years of experience_____ Years in the Unit_____

Highest level of Education_____ Nursing Cadre_____

Marital status_____ Number of children_____

Hepatitis B Immunization Status _____

Introduction

1. Could you describe what you consider your main clinical roles?

HIV exposure and Experience

1. Would you describe some of the infectious diseases you have been exposed to?
2. Can you describe what measures you take to protect yourself from infectious diseases (HIV/AIDS, hepatitis or TB) in the workplace?
 - a. In addition to gloves, what other practices (eg alcohol cleaner, hand washing) have you used to protect yourself from infectious diseases?
 - b. Can you describe how sharps are disposed of on your unit?
3. Have you encountered any obstacles to protecting yourself from infectious diseases (HIV/AIDS, hepatitis or TB)? Please describe.
4. Does the fear of transmission of the HIV virus affect your practice of universal precautions? Please describe.
5. Does AIDS stigma influence your ability to practice universal precautions? Please describe.

Policies on universal precautions

6. Can you describe your understanding of universal precautions practices?
7. How did you learn about universal precautions?
8. Can you describe the policies in your institution about the use of universal precautions?
9. Can you explain the policies in your institution about the procedure you would follow post exposure to an infectious disease?

Final thoughts...

10. Have you any further thoughts about your experience in caring for patients with infectious diseases that you would like to add?

Faculty of Nursing

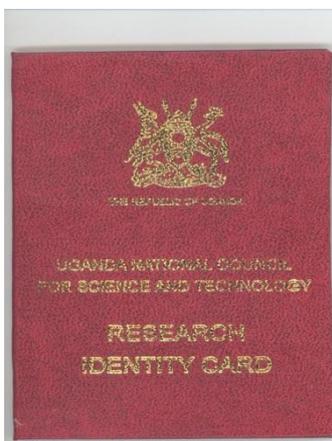
Appendix G: Budget

Item	Quantity	Cost/ unit	Total Amount	Total Amount in CAD 1.00 = 1,925.8 CAD 3 UGX
Principal researcher Housing in Uganda Housing in Canada	1 1	100,000 250,000	2,000,000 500,000	CAD 650
Stationery Reams of ruled paper Rulers Pens Pencils Photocopy papers Spiral binding Computer(laptops) Digital recorder	5 reams 1 1 dozens 5 reams 5reams 1 1	10,000/item 1,000/= 3,600/= 2,000/= 8,000/= 2,500,000/= 400,000	50,000 / 10,000 / 7,200/ = 10,000 / 40,000 / 2,500,000/ 400,000	
Communication Telephone calls (Airtime) Transport Canada to Uganda Within Uganda E-mail (Cyber café)	10units 1 1 1	20,000/= 20,000/= 10,000/= 200	200,000/ 1,200,000/= 600,000	CAD 2400
Proposal development Typing Photocopy Binding	2 ream 2 ream 1	8,000/= 8,000/= 10,000	16,000 / 16,000 / 20,000	
Gifts	15	20,000	300,000	
GRAND TOTAL Contingencies 10%			7,884,000 788,400	
Total			86,724,000	CAD 5,270.804

Appendix H:

Uganda National Council for Science and Technology- Research Identity

Card



File No. <u>HS 699</u>	Holder's Signature	Renewed until
Name <u>ESTHER W. NDERITU</u>		Executive Secretary
Address <u>ASA KHAN UNIVERSITY P.O BOX 8842 KAMPALA</u>	UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY SC Certified Photograph 302 6384 KAMPALA UGANDA Executive Secretary Uganda National Council for Science and Technology P.O. Box 6884, Kampala	Renewed until
Nationality <u>KENYAN</u>		Executive Secretary
Title of Research Project <u>THE EXPERIENCE OF UGANDAN NURSES IN THE PRACTICE OF UNIVERSAL PRECAUTIONS</u>		Renewed until
Date of issue <u>04 NOV 2009</u>		Executive Secretary
Valid Until <u>02 FEB 2010</u>		Renewed until
		Executive Secretary

Appendix I:

UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY- LETTER



Uganda National Council For Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

Your Ref:.....

Our Ref:.....HS.699

Date:.....04/11/09.....

Ms. Esther Wanjiku Nderitu
Aga Khan University
P.O Box 8842
Kampala

Dear Ms. Nderitu,

RE: RESEARCH PROJECT, "THE EXPERIENCE OF UGANDAN NURSES IN THE PRACTICE OF UNIVERSAL PRECAUTIONS"

This is to inform you that the Uganda National Council for Science and Technology (UNCST) approved the above research proposal on **November 02, 2009**. The approval will expire on **February 02, 2010**. The approval also covers the initial cross sectional survey to determine the suitable parish for the main longitudinal study. If it is necessary to continue with the research beyond the expiry date, a request for continuation should be made in writing to the Executive Secretary, UNCST.

Any problems of a serious nature related to the execution of your research project should be brought to the attention of the UNCST, and any changes to the research protocol should not be implemented without UNCST's approval except when necessary to eliminate apparent immediate hazards to the research participant(s).

This letter also serves as proof of UNCST approval and as a reminder for you to submit to UNCST timely progress reports and a final report on completion of the research project.

Yours sincerely,

Leah Nawegulo
for: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

LOCATION/CORRESPONDENCE

Plot 3/5/7, Nasser Road
P.O. Box 6884
KAMPALA, UGANDA.

COMMUNICATION

TEL: (256) 414-250499, (256) 414 705500
FAX: (256) 414-234579
EMAIL: uncst@starcom.co.ug
WEBSITE: <http://www.uncst.go.ug>

Appendix J: Makerere University Ethics Approval

MAKERERE

P. O. Box 7072 Kampala Uganda
E-mail: dean@med.mak.ac.ug



UNIVERSITY

Phone: 256 414 530020
Fax: 256 414 541036/0414 532204

FACULTY OF MEDICINE
OFFICE OF THE DEAN

October 26, 2009

Ms. Esther Nderitu
Department of Nursing

Dear Ms. Nderitu,

Re: Approval of Protocol #REC REF 2009- 163
“The experience of Ugandan nurses in the practice of universal precautions”

Thank you for submitting an application for approval of the above – referenced protocol. The committee reviewed it and granted approval for one year, effective October 26, 2009. Approval will expire on October 25, 2010.

Continuing Review

In order to continue work on this study (including data analysis) beyond the expiration date, the Faculty of Medicine Research and Ethics Committee must reapprove the protocol after conducting a substantive, meaningful, continuing review.

This means that you must submit a continuing report form as a request for continuing review. To best avoid a lapse, you should submit the request six (6) to eight (8) weeks before the lapse date. Please use the forms supplied by our office.

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek Faculty of Medicine Research and Ethics Committee approval before implementing it.

Please summarize the proposed change and the rationale for it in a letter to the Faculty of Medicine Research and Ethics Committee. In addition, submit three (3) copies of an updated version of your original protocol application- one showing all proposed changes in bold or ‘track changes,’ and the other without bold or track changes.

Reporting

Other events which must be reported promptly in writing to the Faculty of Medicine Research and Ethics Committee include:

Suspension or termination of the protocol by you or the grantor

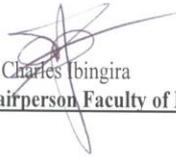
Unexpected problems involving risk to participants or others

Adverse events, including unanticipated or anticipated but severe physical harm to participants.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human subjects in research.

Final approval is to be granted by Uganda National Council of Science and Technology.

Yours sincerely,


Dr. Charles Ibingira

Chairperson Faculty of Medicine Research and Ethics Committee



Appendix K: Consent letter from Mulago Hospital

TELEPHONE: 256-9414-554008/1
 FAX: 256-0414-532591
 www.mulago.or.og
 E-mail admin@mulago.or.og



MULAGO HOSPITAL COMPLEX
 P. O. BOX 7051
 KAMPALA, UGANDA

IN ANY CORRESPONDENCE ON THIS
 SUBJECT PLEASE QUOTE NO.....

THE REPUBLIC OF UGANDA

To all Nurse Managers
 Medical, Surgical & Emergency Units
 Mulago Hospital

23rd October 2009

INTRODUCTION OF ESTHER NDERITU A MASTER'S OF NURSING STUDENT FROM THE UNIVERSITY OF ALBERTA

This is to introduce to you the above student who is pursuing her master's degree as indicated above. Her topic of research is "THE EXPERIENCE OF UGANDAN NURSES IN THE PRACTICE OF UNIVERSAL PRECAUTIONS" The student has made a verbal presentation of her proposal to the Makerere University Ethics Comm.tee. She plans to conduct interviews on nurses in Mulago Hospital.

As you may be aware Mulago Hospital is mandated to provide training health workers and conduct research. One of our strategic objectives is to strengthen collaborative relationships with other institutions nationally and internationally.

Basing on the above information, I wish to inform you that Esther is welcome to conduct her research at Mulago Hospital.

As she conducts her research, she will be under the supervision of the Assistant Commissioner Health Services Nursing / Mulago Hospital. In case of any need consult the office at 0414 540440 or mobile 0772349699

I am looking forward for your positive cooperation.

Yours truly,

Mrs Mariam Louise Walusimbi
 ASSISTANT COMMISSIONER HEALTH SERVICES
 MULAGO HOSPITAL

Appendix L: Makerere University Proposal Review Approval



26th October 2009

The Chairman,
Institutional Review Board
College of Health Sciences
Makerere University

Dear Sir,

Re: Esther Nderitu's proposal

I was appointed to review corrections to the above students' proposal entitled
"The experience of Ugandan nurses in the practice of universal precautions"

The student has done corrections to my satisfaction and hereby recommend
that her research be approved.

Yours Faithfully



Dr Musa Sekikubo
Member, IRB
College of Health Sciences