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January 2014

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J. Mill

*University of Alberta*

Esther Nderitu

*Aga Khan University, esther.wanjiku@aku.edu*

S. Richter

*University of Alberta*

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## Recommended Citation

Mill, J., Nderitu, E., Richter, S. (2014). Post exposure prophylaxis among Ugandan nurses accidents do happen. *International Journal of Africa Nursing Sciences*, 1, 11-17.

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## Post-exposure prophylaxis among Ugandan nurses: “Accidents do happen”



J. Mill <sup>a,\*</sup>, E. Nderitu <sup>b</sup>, S. Richter <sup>a</sup>

<sup>a</sup> Faculty of Nursing, University of Alberta, Edmonton, Alberta, Canada

<sup>b</sup> Advanced Nursing Studies, School of Nursing and Midwifery, East Africa, Aga Khan University, Nairobi, Kenya

### ARTICLE INFO

#### Article history:

Received 12 August 2013

Received in revised form 2 May 2014

Accepted 23 May 2014

Available online 5 June 2014

#### Keywords:

Post-exposure prophylaxis

Needle-stick injuries

Uganda

Nurses

Universal precautions

### ABSTRACT

**Purpose:** In 2009 we conducted a study to explore Ugandan nurses' practice of universal precautions while caring for persons living with HIV. During our interviews about universal precautions, nurses' also shared their experience with post-exposure prophylaxis (PEP) following needle-stick injuries. We present findings related to nurses' understanding of PEP and their experience with, and reporting of, needle stick injuries.

**Background:** Nurses have high rates of exposure to blood-borne pathogens. Although there is minimal risk of the transmission of blood-borne pathogens from health care workers (HCWs) to patients and vice versa, post-exposure prophylaxis, has become routine following the occupational exposure of HCWs to HIV.

**Methods:** Focused ethnography was used to guide the data collection and in-depth interviews were used to collect the data between October and November 2009.

**Results:** Sixteen nurses from a variety of units in a large teaching hospital participated. Needle-stick injuries were a fairly common occurrence, but written policies were frequently inaccessible to nurses and they did not have adequate knowledge of PEP. Some nurses were reluctant to report injuries and avoided following PEP procedures due to lack of knowledge about PEP, concerns about anti-retroviral side effects and the stigma associated with PEP. Participants were aware of PEP however there was a wide variation in their understanding of the procedure to follow after a needle-stick injury.

**Conclusion:** Employers have a responsibility to update PEP guidelines and to orientate HCWs to these. Educators must ensure that undergraduate nurses have a comprehensive understanding of universal precautions and current practice for PEP.

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## 1. Introduction

Nurses have prolonged contact with patients and often carry out procedures that place them at increased risk of preventable occupational exposure to blood-borne infections (Kuruuzum et al., 2008; Sadoh, Fawole, Sadoh, Oladimeji, & Sotiloye, 2006). Therefore the Centres for Disease Control (CDC) recommends that nurses and all health care workers (HCWs) practice universal precautions when providing patient care. Universal precautions are a set of guidelines, such as the use of gloves, masks and gowns, to protect patients and HCWs from exposure to pathogens including blood-borne viruses (Center for Disease Control & Prevention, 1987; Sadoh et al., 2006; World Health Organization, 2003). Despite the low risk of transmission of blood-borne pathogens

from HCWs to patients and vice versa (Shafraan, 2010), should an occupational exposure to HIV occur the use of anti-retroviral therapy, termed post-exposure prophylaxis (PEP), has become routine (Bassett, Freedberg, & Walensky, 2004; Hamlyn & Easterbrook, 2007; Merchant, Moran, & Mount, 2006). PEP refers to the use of a combination of antiretroviral medications for up to 28 days by health workers who have experienced a significant exposure to HIV-infected blood or body fluids (Hamlyn & Easterbrook, 2007). The likelihood of transmission of HIV following occupational exposure is influenced by the type of exposure (e.g., percutaneous needlestick versus mucous membrane injury) and the viral load of the HIV sero-positive patient (Hamlyn & Easterbrook, 2007; Merchant et al., 2006). In 2009 we conducted a study to explore Ugandan nurses' practice of universal precautions while caring for persons living with HIV. During our discussions about universal precautions, nurses' also shared their experience with PEP following needle-stick injuries. In this paper we present findings related to

\* Corresponding author. Tel.: +1 888 492 8089; fax: +1 7804922551.

E-mail address: [judy.mill@ualberta.ca](mailto:judy.mill@ualberta.ca) (J. Mill).

nurses' understanding of PEP and their experience with, and reporting of, needle stick injuries. Findings related to the practice of universal precautions more generally are reported elsewhere (Nderitu, 2010).

### 1.1. Background

Nurses, and particularly those in countries where disease burden is high and resources are limited, are at risk of exposure to blood-borne infections from needle-stick injuries. Phillips, Chung, and Perry (2012) reported a high rate of sharps injuries among 442 Zambian HCWs, with nurses having the highest number of injuries (244/346 nurses). In a study with 428 Indian HCWs Muralidhar, Singh, Jain, Malhotra, and Bala (2010) reported that 80% ( $n = 343$ ) of participants had experienced a needle-stick injury in the previous year with 100% ( $n = 49$ ) of nurses reporting an injury and 85.3% ( $n = 59$ ) of nursing students reporting a needle-stick injury. Reda, Vandeweerd, Syre, and Egata (2009) examined the use of universal precautions by 330 Ethiopian HCWs and reported that 29% ( $n = 96$ ) of participants had experienced a needle-stick injury in the previous year and 41% ( $n = 137$ ) reported risky practices such as re-capping needles; HCWs with more experience were less likely to have a needle-stick injury. Odongkara et al. (2012) examined the occupational exposure of 235 HCWs in northern Uganda to HIV and reported that 46% (108) of respondents had been exposed to potentially infectious body fluids and that HCWs with more experience were less likely to report needle-stick injuries. Nsubuga and Jaakkola (2005) reported that 57% ( $n = 299$ ) of 526 Ugandan nurses suffered a needle-stick injury in the previous year. Lack of training, long hours, recapping needles, and not using gloves to handle needles were significant risk factors for needle-stick injuries. In a more recent Uganda study (Kamulegeya, Kizito, & Balidawa, 2013) with 209 participants, 38 (18.2%) recently graduate HCWs reported a needle stick injury in the previous 12 months.

There has been limited research to evaluate the efficacy of PEP in preventing HIV following occupational exposure (Bassett et al., 2004; Merchant et al., 2006) and the efficacy has not been demonstrated in a randomized control trial [RCT] (Hamlyn & Easterbrook, 2007). This may be related to the ethical limitations associated with conducting an RCT to evaluate the efficacy of PEP. A case-control study with 33 health workers demonstrated an 81% decline in risk for HIV among individuals who took zidovudine for 28 days post-exposure (Cardo et al., 1997). Recent American guidelines (Merchant et al., 2006) emphasize the need to start PEP as soon as possible after exposure to HIV and the importance of consultation with experts in PEP management following exposure. Although a three-drug PEP regimen is more common than a two-drug PEP regimen in the United States and Europe, Bassett et al. (2004) compared the efficacy of the two approaches, and concluded that completing a two drug PEP regimen might be more beneficial than adding a third drug. Newer drugs such as raltegravir, an HIV integrase inhibitor, may be useful for PEP therapy due to their lower toxicity, potential to delay administration, and ability to suppress the replication of the HIV virus (Marsden, Krogstad, & Jack, 2012). PEP regimens with fewer side effects might improve adherence and encourage HCWs to start, and complete, PEP after exposure to the HIV virus.

Stigma and discrimination related to HIV and AIDS generally, and by HCWs toward persons living with HIV specifically, have been reported not only in low and middle income sub-Saharan Africa countries (Bemelmans et al., 2011; Mill et al., 2013; Rosenberg et al., 2012) but also in high income countries such as Canada (Gardezi et al., 2008; Mill et al., 2009, 2010) and the United States (Yannessa, Reece, & Basta, 2008; Zukoski & Thorburn, 2009). Nurses and other HCWs may be hesitant to access PEP because

both steps in the process may be stigmatizing. First, the nurse must agree to have an HIV test and second, if positive, must disclose her status to hospital administration to access PEP treatment. Recent advances in immunization (e.g., for hepatitis B) and antiretrovirals (for HIV) and strict adherence to universal precautions have reduced the risk of transmission from HCWs to patients to very low levels (Bednarsh & Klein, 2003; Shafran, 2010), calling into question the need for mandatory disclosure. Aultman and Borges (2011) argued that the mandatory disclosure of HIV status may actually fuel stigma, while McGinn, Caine, and Mill (2013) suggest that mandatory disclosure of blood-borne pathogens, including HIV, may be related more to the need to assuage the fears of the public than to accurately assess the real risk of transmission.

Based on very limited information about the use of universal precautions by nurses in a low income country such as Uganda, we designed a study to explore this phenomenon. The term universal precautions was used in the current study to focus specifically on the prevention of exposure to blood and body fluids; findings related to Ugandan nurses practice of universal precautions are reported elsewhere (Nderitu, 2010). During the discussion of universal precautions, participants also discussed the use of PEP in their organizations; these findings are reported in the current paper.

## 2. Methods

Focused ethnography (Morse & Field, 2001) was used to guide data collection and analysis and in-depth interviews were used to collect the data between October and November 2009. 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) argues 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. Focused ethnography is an appropriate methodology when the researcher plans to explore a shared experience in a narrow and specific area of inquiry (Morse & Richards, 2007; Speziale & Carpenter, 2003) as was the case in the current study. We were interested in exploring the specific area of the practice of universal precautions among Ugandan nurses. While exploring the research question "What is the experience of Ugandan nurses in the practice of universal precautions", participants also shared their experience with PEP following needle-stick injuries.

Ethical approval was obtained from the Makerere University Ethics Committee, the University of Alberta Research Ethics Board (Panel B) and the Uganda National Council for Science and Technology. Administrative approval for the study was obtained from the Ugandan teaching hospital where the study was conducted. Nurse managers placed information letters in clinical units around the hospital and purposeful sampling (Vidich & Lyman, 2011) was used to recruit participants. Informed consent was obtained from those who agreed to participate. The inclusion criteria for the study included nurses: with a minimum of a 2 year education certificate, diploma or bachelor of nursing; working on medical, surgical or casualty units; with at least 1 year of nursing experience; and willing to participate.

Each participant completed one in-depth interview with the second author to explore the practice of universal precautions; the interviews were audio-recorded and transcribed verbatim. The interviews ranged from 40 min to 1 h in length and were conducted in a private room in a large teaching hospital in Uganda between October and November 2009. The researcher took field notes 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. Guiding questions (Morse & Richards, 2007) were used in the interviews to ensure that the researcher explored the issues in a similar way with each participant. The guiding questions focused on nurses' experience with universal precautions practice and their knowledge of the procedure to follow if they were exposed to an infectious disease. We also probed the participants' knowledge of policies in their institutions related to universal precautions and PEP. The interviews were cleaned and entered into the NVivo 8 software program to assist with the organization and retrieval of the data. Morse's taxonomy (Morse, 1994) was used to guide the inductive analysis process and included comprehending, synthesizing, theorizing and re-contextualizing the data during face to face meetings with all authors. In addition, the guiding questions helped to focus the analysis process. The principles of trustworthiness as described by Guba (1981) were adhered to in order to enhance the rigor of the study.

### 3. Results

Sixteen participants (14 general nurses, 1 infection control nurse and 1 nurse manager) from medical, surgical, emergency and casualty units participated in an interview; 14 participants were female and two were male. The age of the participants ranged from 36 to 48 years with an average of 41.4 years. Nurses had worked for 2 to 32 years and had an average of 16 years of experience. Eleven nurses had diplomas in nursing, four had a certificate and one had a Bachelor of Nursing degree. In the following quotations, the identity of each participant's voice was protected by replacing names with pseudonyms.

#### 3.1. Needle-stick injuries: "Accidents do happen"

Many of the nurses reported that it was fairly common for them to experience needle-stick injuries while carrying out their regular duties:

It is quite common, especially in casualty, it is so, so common...because there is a lot of use of sharps...there. There is use of stitching, the use of syringes, and the use of needles...So that is why it is so common...but our nurses and doctors get pricked and even cut. (Penny)

Jack believed that the incidence of needle-stick injuries in the emergency ward where he worked was quite rare, however on other units such as the labour ward, "...it is very common...". When asked about the frequency of needle-stick injuries on her unit, Ann commented:

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.

Helen believed that needle-stick injuries among HCWs placed increased stress on the remaining staff:

...Sometimes there are too many needle stick injuries. Normally the victims are put on PEP and given time off. This means if two or more nurses become victims the ward is left with a shortage.

Isabella on the other hand, did not really know how often needle-stick injuries occurred on her own unit because nurses reported directly to a PEP officer in casualty if a needle-stick occurred:

Actually you can't really know much, who is pricked and who is not. Me, I have never heard [about] anybody being pricked. But I heard one nurse who was pricked from 4c. Actually, she had come for...knowledge about it, of where she should go after the incident, things like that. Me, I told her there is a PEP officer at casualty, you go there...

Most of the nurses expressed fear of getting pricked by an HIV-infected needle during certain procedures or when working in some of the units in the institution. Penny worked in casualty and believed that nurses did not want to work there due to a fear of a needle-stick injury:

It is in fact a threat because people tend to fear that place [casualty] because of one of the factors why most nurses they don't want to work in casualty, because of that. Coming in contact with blood is their worry.

Isabella suggested that needle-stick injuries were quite common, particularly with certain procedures or patients:

...There are procedures you feel you don't want to perform because of the fear that you may get a prick. For example if a patient is so, so aggressive and...you have to put on a cannula. You know, pricking now, very many nurses have got pricks when inserting cannula to such aggressive patients. You insert a cannula, God help you if you finish without a prick.

Several measures were taken by nurses to avoid needle stick injuries but they still occurred, especially when staff were careless in the disposal of used equipment. Many of the participants shared stories about how needle-stick injuries occurred:

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

Amber was very fearful of getting a needle-stick injury but believed that the introduction of sharps containers was a very positive step in preventing them:

...The good thing is the hospital has come up with those safety boxes where we discard our sharps, and at least on each and every trolley we have a box where we discard our sharps.

Dinah believed that it was important to know the HIV sero-status of all patients so that PEP could be started as soon as needle-stick injuries occurred:

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 directly 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.

This participant also recalled an incident when a patient intentionally removed the syringe and "...pricked the nurse..." with the contaminated syringe after being given an injection.

#### 3.2. Understanding of PEP

The frequent occurrence of needle-stick injuries made it necessary to have a policy in place for PEP. As Isabella explained "...if the patient is positive, and the nurse is negative...they call it post exposure prophylaxis". There was a wide variation, however, in the understanding of nurses about the PEP procedure. Some of the

participants 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. Betty explained her understanding of PEP:

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, [she] rushes for that assistance or first aid. But before rushing there, we encourage them to squeeze blood under running water maybe get detergent jik [bleach] and water and wash hands...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.

Several of the nurses were able to describe immediate strategies to minimize the risk following a needle-stick injury. Penny shared her understanding:

If you prick yourself you are supposed to go under running water at least to let the blood to flow under running water, you are supposed to let it flow spontaneously...You can cover it with piece of gauze afterwards when the blood has stopped coming out to prevent other infections from entering...and then you continue processing for your post exposure prophylaxis drugs.

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

...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. She recommended keeping "...at least 2 doses..." of anti-retrovirals to use on the unit during these times:

...you may find someone gets a needle prick at night, at 8 pm, 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.

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

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)

Paula on the other hand worked in a special unit for patients with HIV and was very comfortable with the PEP policy in her area:

So we have post exposure prophylaxis in the institute and we have the drugs accessible, then we have someone who is responsible, a doctor who is responsible for that. In case, given that we are mainly dealing with HIV, and someone can easily,

may be getting an accident. 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 drugs.

Hanna emphasized the responsibility of employers to ensure that nurses received the necessary PEP following a needle-stick injury:

[If] she is not able to afford drugs which are expensive, it doesn't mean you leave the nurse to die because she can't manage to raise the money. If she is your health worker and she is your employee, if she can't manage to buy those drugs, come in, buy for her the drugs.

Although most nurses had some understanding of the policy for post-exposure prophylaxis following a needle-stick injury, participants felt that there was insufficient information at the unit level about measures to prevent infectious diseases. For example several nurses did not have adequate information about the availability of, and access to, immunization. Ann believed that the availability of information was dependent on where you worked:

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.

The arrangements for immunizations were not clear to all 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 multi-dose. However this plan was not easy for the nurses who were already overwhelmed by work in their wards. Misinformation about who was eligible for immunization and the belief that nurses had to pay for immunizations meant that some nurses were unprotected:

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

### 3.3. Reporting and treating needle-stick injuries

Despite the fear of exposure to HIV, several nurses had not considered receiving PEP following a needle stick injury. Mercy had recently experienced a needle-stick injury but had not received PEP because "it might have been the drug which was in the syringe when it pricked me".

A few nurses never went for the PEP after a needle stick injury because they trusted God to keep them safe. 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 and I said "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.

Similarly, Angelina and Paula trusted God to protect them from infectious diseases. Angelina found masks to be very uncomfortable and could not talk to patients with a mask on:

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.

Paula relied on God to protect her when there were insufficient infection control supplies:

...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.

The stigma associated with needle stick injuries may have also contributed to some nurses' reticence to report their injury. Ann believed that nurses kept their needle-stick injuries secret until they were sure that their HIV test was negative:

...So you try to keep it [HIV test] 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.

Mercy shared her 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 had actually had her blood tested for HIV after the incident; she was HIV negative but she had not yet been back to talk with the counselor because she thought that that risk of transmission was low. Peter on the other hand believed that there was much less stigma associated with needle-stick injuries and PEP: "There is no stigma as today it may be this person and tomorrow it is you".

### 3.4. Education about PEP

Nurses described participating in or leading PEP education sessions. For example, Helen described her role in education:

The sister in charge [of staffing] asks me to give sessions on precaution measures. I look at the best time and I integrate [with] other units so that many nurses are able to attend. You find the nurses need these CMEs [Continuing Medical Education Credits] in order to ensure safe practice. These are some of the activities we do in our facility.

Hanna had recently experienced a needle-stick injury. At the time of the injury she remembered what she had been told in a workshop about PEP:

...During that workshop it is when they told us the procedure. That whoever gets a problem, a needle prick you follow these steps and so I followed them and that is when I learnt. I didn't know who to call but I knew the ward.

Ann recalled learning about universal precautions during her initial training as a nurse and also as part of hospital in-services:

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.

## 4. Discussion

Participants were aware of policies related to universal precautions practice and vaccination against hepatitis B and PEP; however, the written policies were frequently inaccessible to nurses, they had not been immunized against hepatitis B and did not have sufficient information about PEP. The lack of formal policies for the care of HIV positive nurses in the workplace has also been reported in South Africa, despite nurse managers believing that the care of HIV positive nurses is an important part of their role (Minnaar, 2005). In a recent Ugandan study (Harrowing & Mill, 2010) nurses also reported that infection control documents were not accessible. Tebeje and Hailu (2010) reported that among 254 Ethiopian HCWs, 213 (83.9%) had inadequate knowledge about PEP; 174 (68.5%) participants had been exposed to HIV risk conditions however of those exposed only 32 (18.4%) had accessed PEP. The Ethiopian HCWs cited lack of information and understanding of PEP, and fear of stigma and discrimination as reasons for not accessing PEP. Nurses in the current study sometimes avoided following the PEP procedure, even when aware of it, due to concerns with the side effects of the anti-retrovirals and the stigma associated PEP.

Nurses were very interested in protecting themselves from infectious diseases however they 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 relation to infected HCWs, Kagan, Ovardia, and Kaneti (2008) argue that "...coherent policy would ideally serve to protect the interest of the public, infected HCWs, and the health care system." (p. 582). Wu et al. (2008) stressed that effective universal precaution interventions need to target both administrators and providers, and address both structural barriers and individual attitudinal and behavioral factors. Although the overall negative impact of HIV and AIDS has been devastating in Uganda, the Ugandan government is highly committed to the successful implementation of universal precaution 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 PEP. From the perspective of participants however, written documents to ensure that nurses had accurate information about universal precautions practices were missing.

The reticence of some of the participants in the current study to inform hospital officials about their needle-stick injuries has been reported previously (Aultman & Borges, 2011). In a study of 103 HCWs in India (Aggarwal et al., 2012), the initiation of PEP was delayed beyond the recommended 72 h of exposure to blood and body fluids in almost 25% of participants. In Muralidhar and colleagues' study (Muralidhar et al., 2010) with 428 HCWs in India, only 167 (39%) of participants were aware of PEP, and of the 49 student nurses who had experienced a needle-stick injury 75% did not seek PEP. Similarly, Omorogbe, Omuemu, and Isara (2012) examined injection safety practices among 122 Nigerian nurses and reported that 71 (58.2%) nurses had experienced a needle-stick injury but only 4 (0.6%) of these nurses received PEP. In a recent study to explore occupational exposure to HIV among 224 Ugandan HCWs, Kumakech, Achora, Berggren, and Bajunirwe (2011) reported that 43 (19.2%) participants had received a needle-stick injury however almost half of the participants did not report occupational exposure to HIV and the uptake of PEP was low. Furthermore, these authors reported that nurse-midwives were the group most affected by needle-stick injuries. Winchester et al. (2012) examined 120 British HCWs perceptions of risk to blood borne

viruses and barriers to reporting incidents. They found that more than 92% (104/113) of respondents believed it was important to report all exposures; however, 38% (18/48) had not done so. Zenner, Tomkins, Charlett, Wellings, and Ncube (2009) reported that among HCWs in the United Kingdom, the uptake of PEP was associated with known risk factors for HIV transmission and that doctors were more likely to initiate PEP than nurses.

In deciding whether to access HIV testing, Aultman and Borges (2011) argued that HCWs must balance their right to privacy and personal freedom with the benefits of testing to society at large. These authors reported that American medical students were often afraid to get tested for HIV because they were fearful of the ramifications that disclosing a positive test would have on their employment status, reputation, and insurance. Further they recommended that medical educators provide a safe environment for students to explore the issues surrounding HIV testing and disclosure of HCWs. Ko et al. (2011) examined 1134 Taiwanese nurses behavior following exposure to blood and body fluids and found that of the 802 (71%) nurses who were exposed to blood and body fluids, 121 were advised to take PEP; of these less than half (44.6%) returned to the clinic for monitoring and only 2 of the 8 nurses prescribed HIV PEP completed the 4 week regimen of ARV therapy. Similarly Mashoto, Mubyazi, Makundi, Mohamed, and Malebo (2013) reported that although PEP was initiated in the 58 HCWs exposed to HIV at 2 Tanzanian hospitals between 2006 and 2011, none of the HCWs returned for follow up HIV testing.

Several authors (Bemelmans et al., 2011; Uebel, Nash, & Avalos, 2007) have made recommendations related to HIV testing and AIDS treatment and support for HCWs in low resource countries with a high burden of disease. Health care workers in southern Africa for example are often reluctant to access HIV testing and care due to concerns about stigma and discrimination, confidentiality, and barriers to accessing services (Bemelmans et al., 2011; Tebeje & Hailu, 2010; Uebel et al., 2007). In addition HCWs often experience emotional burden and burnout in settings where resources are limited but workload is high. Researchers in Southern Africa (Uebel et al., 2007) and Malawi (Bemelmans et al., 2011) argue that there is an urgent need to provide HCWs HIV testing and services that ensure confidentiality, are integrated into other services, remove barriers to services, include counseling and support, and are designed specifically for HCWs. It is of concern that even when services are available, HCWs do not access them consistently.

## 5. Conclusion

Needle-stick injuries were a fairly common occurrence among the nurses in this study and most expressed fear of getting pricked by an HIV-infected needle during certain procedures or when working in some of the units in the institution. Although most of the participants had some knowledge of the PEP policy in their work setting, there was variation in their understanding of the procedure following a needle-stick injury. The findings highlight the critical role of educators in ensuring that undergraduate nurses have a comprehensive understanding of universal precautions and the current practice for PEP should an occupational exposure to a blood-borne pathogen such as HIV occur. Once nurses graduate and practice independently, employers have a responsibility to ensure that policies related to PEP are accessible to HCWs and are updated regularly, nurses and other HCWs receive a thorough orientation to the PEP procedure, the necessary supplies are available for HCWs to practice universal precautions, and should a needle-stick injury occur, HCWs including nurses can access appropriate medical advice in a timely manner. These strategies in combination will help to ensure that nurses, particularly those working in low

and middle income countries settings with a high burden of HIV disease, feel well supported by employers to perform their nursing responsibilities.

## Conflict of Interest

None declared.

## References

- Aggarwal, V., Varun, A., Anju, S., Jagdish, C., Rohini, G., Praveen, K., et al. (2012). Occupational exposure to human immunodeficiency virus in health care providers: A retrospective analysis. *Journal of Community Medicine*, 37(1), 45–49. <http://dx.doi.org/10.4103/0970-0218.94024>.
- Aultman, J. M., & Borges, N. J. (2011). The ethical and pedagogical effects of modeling "not-so-universal" precautions. *Medical Teacher*, 33(1), e43–e49. <http://dx.doi.org/10.3109/0142159X.2011.530310>.
- Aultman, J. M., & Borges, N. J. (2011). The ethics of HIV testing and disclosure for healthcare professionals: What do our future doctors think? *Medical Teacher*, 33(1), e50–e56. <http://dx.doi.org/10.3109/0142159X.2011.530311>.
- Bassett, I. V., Freedberg, K. A., & Walensky, R. P. (2004). Two drugs or three? Balancing efficacy, toxicity, and resistance in post-exposure prophylaxis for occupational exposure to HIV. *Clinical Infectious Diseases*, 39(3), 395–401.
- Bednarsh, H. S., & Klein, B. (2003). Legal issues for healthcare workers with bloodborne infectious disease. *Dental Clinics of North America*, 47(4), 745–756.
- Bemelmans, M., van den Akker, T., Pasulani, O., Tayub, N. S., Hermann, K., Mwagomba, B., et al. (2011). Keeping health staff healthy: Evaluation of a workplace initiative to reduce morbidity and mortality from HIV/AIDS in Malawi. *Journal of the International AIDS Society*, 5(14), 1. <http://dx.doi.org/10.1186/1758-2652-14-1>.
- Cardo, D. M., Culver, D. H., Ciesielski, C. A., Srivastava, P. U., Marcus, R., Abiteboul, D., et al. (1997). A case-control study of HIV seroconversion in health care workers after percutaneous exposure. Centers for Disease Control and Prevention Needlestick Surveillance Group. *New England Journal of Medicine*, 337(21), 1485–1490. <http://dx.doi.org/10.1056/NEJM199711203372101>.
- Center for Disease Control and Prevention (1987). Universal precautions for prevention of transmission of HIV. *MMWR*, 36(Suppl No. 2S), 1–17.
- Gardezi, F., Calzavara, L., Husbands, W., Tharoo, W., Lawson, E., Myers, T., et al. (2008). Experiences of and responses to HIV among African and Caribbean communities in Toronto, Canada. *AIDS Care*, 20(6), 718–725. <http://dx.doi.org/10.1080/09540120701693966>.
- Guba, L. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology Journal*, 29, 75–92.
- Hamlyn, E., & Easterbrook, P. (2007). Occupational exposure to HIV and the use of post-exposure prophylaxis. *Occupational Medicine (Oxford, England)*, 57(5), 329–336. <http://dx.doi.org/10.1093/occmed/kqm046>.
- Harrowing, J. N., & Mill, J. (2010). Moral distress among Ugandan nurses providing HIV care: A critical ethnography. *International Journal of Nursing Studies*, 47(6), 723–731. <http://dx.doi.org/10.1016/j.ijnurstu.2009.11.010>.
- Kagan, I., Ovadia, K. L., & Kaneti, T. (2008). Physicians' and nurses' views on infected health care workers. *Nursing Ethics*, 15(5), 573–585. <http://dx.doi.org/10.1177/0969733007088362>.
- Kamulegeya, A., Kizito, A. N., & Balidawa, H. (2013). Ugandan medical and health science interns' infection control knowledge and practices. *Journal of Infection in Developing Countries*, 7(10), 726–733. <http://dx.doi.org/10.3855/jidc.2486>.
- Knoblauch, H. (2005). Focused ethnography. *Forum: Qualitative Social Research*, 6(3), Art. 44.
- Ko, N. Y., Yeh, S. H., Tsay, S. L., Ma, H. J., Chen, C. H., Pan, S. M., Feng, M. C., Chiang, M. C., Lee, Y. W., Chang, L. H., & Jang, J. F. (2011). Intention to comply with post-exposure management among nurses exposed to blood and body fluids in Taiwan: Application of the theory of planned behaviour. *Journal of Hospital Infection*, 77(4), 321–326. <http://dx.doi.org/10.1016/j.jhin.2010.09.025>.
- Kumakech, E., Achora, S., Berggren, V., & Bajunirwe, F. (2011). Occupational exposure to HIV: A conflict situation for health workers. *International Nursing Review*, 58(4), 454–462. <http://dx.doi.org/10.1111/j.1466-7657.2011.00887.x>.
- Kuruuzum, Z., Yapar, N., Avkan-Oguz, V., Aslan, H., Ozbek, O. A., Cakir, N., & Yuce, A. (2008). Risk of infection in health care workers following occupational exposure to a noninfectious or unknown source. *American Journal of Infection Control*, 36(10), e27–e31. <http://dx.doi.org/10.1016/j.ajic.2008.05.012>.
- Marsden, M. D., Krogstad, P. A., & Jack, J. A. (2012). Virological evidence supporting the use of raltegravir in HIV post-exposure prophylaxis regimens. *Antiviral Therapy*, 17, 1375–1379. <http://dx.doi.org/10.3851/IMP2255>.
- Mashoto, K. O., Mubyazi, G. M., Makundi, E., Mohamed, H., & Malebo, H. M. (2013). Estimated risk of HIV acquisition and practice for preventing occupational exposure: A study of healthcare workers at Tumbi and Dodoma Hospitals, Tanzania. *BMC Health Sciences Research*, 13, 1–7. <http://dx.doi.org/10.1186/1472-6963-13-369>.
- McGinn, M., Caine, V., & Mill, J. (2013). Mandatory disclosure of infection with blood-borne pathogens: Implications for nursing. *The Journal of the Association of Nurses in AIDS Care*. <http://dx.doi.org/10.1016/j.jana.2013.01.005>, pii: S1055-3290(13)00007-1.

- Merchant, R. C., Moran, G. J., & Mount, J. (2006). Update on emerging infections: News from the Centers for Disease Control and Prevention. *Annals of Emergency Medicine*, 47(5), 492–494. <http://dx.doi.org/10.1016/j.annemergmed.2006.02.013>.
- Mill, J., Edwards, N., Jackson, R., Austin, W., MacLean, L., & Reintjes, F. (2009). Accessing health services while living with HIV: Intersections of stigma. *The Canadian Journal of Nursing Research*, 41(3), 168–185.
- Mill, J. E., Edwards, N., Jackson, R. C., MacLean, L., & Chaw-Kant, J. (2010). Stigmatization as a social control mechanism for persons living with HIV and AIDS. *Qualitative Health Research*, 20(11), 1469–1483. <http://dx.doi.org/10.1177/1049732310375436>.
- Mill, J., Harrowing, J., Rae, T., Richter, S., Minnie, K., Mbalinda, S., et al. (2013). Stigma in AIDS nursing care in sub-saharan Africa and the Caribbean. *Qualitative Health Research*, 23(8), 1066–1078. <http://dx.doi.org/10.1177/1049732313494019>.
- Minnaar, A. (2005). HIV/AIDS issues in the workplace of nurses. *Curationis*, 28, 31–38.
- Morse, J. M., & Field, P. A. (2001). *Qualitative research methods for health professionals*. Thousand Oaks, CA: Sage Publications.
- Morse, J. M. (1994). "Emerging from the data": The cognitive processes of analysis in qualitative inquiry. In J. M. Morse (Ed.), *Critical issues in qualitative research methods* (pp. 23–43). Thousand Oaks, CA: Sage.
- Morse, J. M., & Richards, L. (2007). *Readme first for a user's guide to qualitative methods*. Thousand Oaks, CA: Sage.
- Muecke, M. A. (1994). On the evaluation of ethnographies. In J. M. Morse (Ed.), *Critical issues in qualitative research methods* (pp. 187–209). Thousand Oaks: Sage.
- Muralidhar, S., Singh, P. K., Jain, R. K., Malhotra, M., & Bala, M. (2010). Needle stick injuries among health care workers in a tertiary care hospital of India. *Indian Journal of Medical Research*, 131, 405–410.
- Nderitu E. The Experience of Ugandan Nurses in the Practice of Universal Precautions. Unpublished Master's Thesis, Faculty of Nursing, University of Alberta, 2010.
- Nsubuga, F. M., & Jaakkola, M. S. (2005). Needle stick injuries among nurses in sub-Saharan Africa. *Tropical Medicine & International Health*, 10(8), 773–781.
- Odongkara, B. M., Mulongo, G., Mwetwale, C., Akasiima, A., Muchunguzi, H. V., Mukasa, S., Turinawe, K. V., Adong, J. O., & Katende, J. (2012). Prevalence of occupational exposure to HIV among health workers in Northern Uganda. *International Journal of Risk & Safety in Medicine*, 24, 103–113. <http://dx.doi.org/10.3233/JRS-2012-0563>.
- Omorogbe, V. E., Omuemu, V. O., & Isara, A. R. (2012). Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. *Annals of African Medicine*, 11(1), 36–41. <http://dx.doi.org/10.4103/1596-3519.91020>.
- Phillips, E. K., Simwale, O. J., Chung, M. J., Parker, G., Perry, J., & Jagger, J. C. (2012). Risk of bloodborne pathogen exposure among Zambian healthcare workers. *Journal of Infection and Public Health*, 5(3), 244–249. <http://dx.doi.org/10.1016/j.jiph.2012.02.005>.
- QSR International. NVivo 8. Victoria, Australia: 2008.
- Reda, A. A., Vandeweerd, J. M., Syre, T. R., & Egata, G. (2009). HIV/AIDS and exposure of healthcare workers to body fluids in Ethiopia: Attitudes toward universal precautions. *Journal of Hospital Infection*, 71(2), 163–169. <http://dx.doi.org/10.1016/j.jhin.2008.10.003>.
- Rosenburg, N., Taliaferro, D., & Ercole, P. (2012). HIV-related stigma among nursing students in Cameroon. *The Journal of the Association of Nurses in AIDS Care*, 23(2), 170–176. <http://dx.doi.org/10.1016/j.jana.2011.09.003>.
- Sadoh, W. E., Fawole, A. O., Sadoh, A. E., Oladimeji, A. O., & Sotiloye, O. S. (2006). Practice of universal precautions among healthcare workers. *Journal of the National Medical Association*, 98(5), 722–726.
- Shafran S. The Physician With Blood-Borne Viral Infection: What Are The Risks To Patients And What Is An Appropriate Approach To The Physicians? E-book (2010) Accessed at [http://www.cmpa-acpm.ca/cmpapd04/docs/submissions\\_papers/pdf/com\\_physician\\_with\\_blood\\_borne\\_viral\\_infection-e.pdf](http://www.cmpa-acpm.ca/cmpapd04/docs/submissions_papers/pdf/com_physician_with_blood_borne_viral_infection-e.pdf).
- Speziale, H. J., & Carpenter, D. R. (2003). *Qualitative research in nursing* (4th ed.). London: Lipincott, Williams and Wilkins.
- Tebeje, B., & Hailu, C. (2010). Assessment of HIV post-exposure prophylaxis use among health workers of governmental health institutions in Jimma Zone, Oromiya Region, Southwest Ethiopia. *Ethiopian Journal of Health Sciences*, 20(1), 55–64.
- Uebel, K. E., Nash, J., & Avalos, A. (2007). Caring for the caregivers: Models of HIV/AIDS care and treatment provision for health care workers in Southern Africa. *Journal of Infectious Diseases*, 1(196 Suppl. 3), S500–S504. <http://dx.doi.org/10.1086/521113>.
- Vidich, A. J., & Lyman, S. M. (2011). Qualitative methods: Their history in sociology and anthropology. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 40–41). Thousand Oaks, CA: Sage.
- Winchester, S. A., Tomkins, S., Cliffe, S., Batty, L., Ncube, F., & Zuckerman, M. (2012). Healthcare workers' perceptions of occupational exposure to blood-borne viruses and reporting barriers: A questionnaire-based study. *Journal of Hospital Infection*, 82(1), 36–39. <http://dx.doi.org/10.1016/j.jhin.2012.05.013>.
- World Health Organization [WHO]. (2003) *Fact sheet 11: HIV and the work place and universal precautions*. World Health Organization HIV/AIDS Electronic Library. Accessed at: [http://www.who.int/hiv/mediacentre/2006\\_EpiUpdate\\_en.pdf](http://www.who.int/hiv/mediacentre/2006_EpiUpdate_en.pdf).
- Wu, S., Li, L., Wu, Z., Cao, H., Lin, C., Yan, Z., et al. (2008). Universal precautions in the era of HIV/AIDS: Perception of health service providers in Yunnan, China. *AIDS and Behavior*, 12(5), 806–814. <http://dx.doi.org/10.1007/s10461-007-9278-8>.
- Yannessa, J. F., Reece, M., & Basta, T. B. (2008). HIV provider perspectives: The impact of stigma on substance abusers living with HIV in a rural area of the United States. *AIDS Patient Care and STDs*, 22(8), 669–675. <http://dx.doi.org/10.1089/apc.2007.0151>.
- Zenner, D., Tomkins, S., Charlett, A., Wellings, K., & Ncube, F. (2009). HIV prone occupational exposures: Epidemiology and factors associated with initiation of post-exposure prophylaxis. *Journal of Epidemiology and Community Health*, 63(5), 373–378. <http://dx.doi.org/10.1136/jech.2008.081463>.
- Zukoski, A. P., & Thorburn, S. (2009). Experiences of stigma and discrimination among adults living with HIV in a low HIV-prevalence context: A qualitative analysis. *AIDS Patient Care and STDs*, 23(4), 267–276. <http://dx.doi.org/10.1089/apc.2008.0168>.