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The Experience of Ugandan Nurses in the Practice of Universal Precautions

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In Uganda, nurses do not always practice universal precautions unless they know the patients' HIV status. In our study, focused ethnography was used to explore the experiences of Ugandan nurses in the practice of universal precautions while caring for persons living with HIV. In-depth interviews were completed with 16 participants from a variety of units at a large teaching hospital in Uganda. Although participants were knowledgeable about universal precautions, the primary challenge to the practice of universal precautions was the inadequate supply of resources, both material and human. Despite challenges, the nurses displayed an enthusiasm for their work and a dedication to provide the best possible care for patients. The findings highlight the urgent need for governments and institutions, particularly in resource-constrained countries, to develop and implement policies related to universal precaution practice and to provide a consistent supply of protective equipment to ensure that universal precautions are consistently used.

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The risk of blood-borne pathogen transmission from health care workers (HCWs) to patient, and vice versa, is minimal (Shafraan et al., 2010). Shafraan and colleagues (2010) estimated that the risk per needle-stick injury from an infected, untreated source patient to a susceptible recipient is

30% for hepatitis B virus, 1.8% for hepatitis C virus, and 0.3% for HIV. 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 health care settings, but many countries are making inadequate use of these highly effective tools.

HCWs, and particularly nurses, are at an increased risk of preventable, life-threatening occupational infections (Sadoh, Fawole, Sadoh, Oladimeji, & Sotiloye, 2006) because they carry out procedures that may put them at risk. Universal precautions are a set of practices designed to protect HCWs and patients from infection with a range of pathogens including blood-borne viruses (Centers for Disease Control and Prevention [CDC], 1987; Sadoh et al., 2006). In 1970 the first *Blood-borne Pathogen Guidelines from the Centers for Disease Control (CDC) Isolation Techniques for Use in Hospitals* were published; these guidelines are now known as universal precautions (Siegel, Rhinehart, Jackson, &

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Chiarello, 2007). In addition to protecting the patient and the HCW from blood-borne diseases, universal precautions eliminate the need for specific isolation procedures for patients known to have a blood-borne disease (CDC, 1987) and protect the privacy of HIV-infected patients and caregivers (Osterman, 1995). Universal precaution 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-re-capping of hypodermic needles after use and the immediate disposal to a biohazard container for contaminated objects. The practice of universal precautions requires that the highest level of barrier protection methods, sterilization of equipment, and appropriate use of disposable equipment be used for all patients without regard to HIV serostatus (CDC, 1987). Gammon, Morgan-Samuel, and Gould (2008) argued that the practice of universal precautions also involved decontamination of equipment and the environment, patient placement, and linen and waste management.

It is not feasible, cost-effective, necessary, or even helpful to test all patients for all pathogens prior to giving care (Sadoh et al., 2006; Wu et al., 2008). Therefore, universal precautions have been recommended when caring for all patients, regardless of diagnosis (CDC, 1987). Despite this recommendation, HCWs, and particularly nurses (Kumakech, Achora, Berggren, & Bajunirwe, 2011), often find it difficult to translate the principles of universal precautions into practice and may be noncompliant in their use (Aultman & Borges, 2011; Cutter & Jordan, 2004; Reda, Vandeweerd, Syre, & Egata, 2009). Several authors (Gammon et al., 2008; Kumakech et al., 2011) reported that practitioners were selective in the application of universal precautions and that compliance with infection control precautions was suboptimal. Studies have shown that nurse compliance with universal precautions is affected by the availability of protective equipment, the perceived commitment of management to safety, and perceptions that universal precautions interfere with job performance (Lee, 2009).

When practicing universal precautions in a low-income country, resources may be insufficient and the number of patients may be overwhelming (Aggarwal et al., 2012; Fournier, 2004). Several

authors (Furin, Haidar, Lesia, Ramangoela, & Rigodon, 2012; Relf et al., 2011) have commented on the challenges that confront nurses in Africa, where they have to cope with a very high burden of care for HIV-infected patients, colleagues, and families, while at the same time trying to cope with a shortage of HCWs. 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. In a study to explore occupational exposure of Ugandan HCWs to HIV, Kumakech and colleagues (2011) reported that less clinical experience and work in a surgical unit were risk factors for occupational exposure to HIV. In a similar study, Odongkara and colleagues (2012) found that almost half (48%) of the HCWs in their northern Uganda study had been exposed to HIV-infected body fluids in the previous 5 years and that HCWs with less experience were more likely to have been exposed to HIV. Ugandan nurses typically do not practice universal precautions unless they know their patient's HIV status (Fournier, 2004); this may represent an effort to cope in the context of limited resources. 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.

Based on the literature review, it is evident that the decision to practice universal precautions in low-income settings is made within a challenging context. There has been limited investigation of the use of universal precautions by nurses in low-income countries such as Uganda where the burden of disease is higher and resources are fewer. 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 the inability to provide optimal care for their patients using the available resources. Therefore, the purpose of our study was to explore the experience of Ugandan nurses in the practice of universal precautions and to identify factors that influenced the use of universal precautions by nurses while caring for persons living with HIV. The specific research question that guided the study was, "What is the experience of Ugandan nurses in the practice of universal precautions?"

Methods

A focused ethnography (Morse & Richards, 2007; Speziale & Carpenter, 2003) was used to guide data collection, data analysis, and report writing. Focused ethnography is used primarily to evaluate or to elicit information on a specific topic or shared experience in a narrow and specific area of inquiry (Morse & Richards, 2007; Speziale & Carpenter, 2003). We specifically focused on the practice of universal precautions by Ugandan nurses. Focused ethnography is short term and not continual, whereas conventional ethnography requires that the researcher become deeply involved in the field, and the process is time intensive (Knoblauch, 2005). The goal of focused ethnography is chosen before collecting data and focuses on developing knowledge and improving practice regarding the phenomenon studied (Morse & Field, 1995). Based on previous research and our own experiences, we were aware that nurses, particularly in low-income settings, faced numerous issues related to the practice of universal precautions and, therefore, anticipated that study findings could be utilized to improve nursing practice. Ethical approval for the study was received from the University of Alberta Research Ethics Board (Panel B), the Makerere University ethics committee, and the teaching hospital in Uganda where the study was conducted. In addition, the Uganda National Council for Science and Technology gave permission for the study.

Recruitment and Analysis Process

The recruitment process began with a visit to the relevant hospital authority to request permission to conduct the study. An information letter was placed in units and assured nurses they were not obliged to take part in the research study and that their participation would not impact their employment. Those who volunteered to participate approached the researcher and an informed consent was obtained. The recruitment process continued using purposeful and network sampling. Informational adequacy (Morse, 1991) was achieved by recruiting informants who were experts and willing to participate in the interviews.

An in-depth interview was carried out with each participant to explore the practice of universal precautions. All interviews were conducted by the first author in English, audio-recorded, and transcribed verbatim. Interview notes were recorded to capture impressions of the interviews and to guide subsequent interviews. The interviews were semi-structured and used guiding questions (Morse & Richards, 2007) to ensure that the researcher explored the issues in a similar way with each participant. The guiding questions explored participants' experiences with the practice of universal precautions, including challenges and strategies to cope with the challenges; previous exposure to infectious diseases; and understanding of the concept of universal precautions, including policies in his/her institution. In this paper, we present findings related to nurses' experiences practicing universal precautions, including challenges faced and strategies used to overcome them. Findings from the study related to the nurses' experiences with postexposure prophylaxis following needle-stick injuries are published elsewhere (Mill, Nderitu, & Richter, 2014). "Universal precautions" was used specifically to refer to the prevention of exposure to blood and body fluids. Data analysis was carried out simultaneously with data collection, using a content analysis process (Speziale & Carpenter, 2003). The data were cleaned and entered into the NVivo software program (QSR International Inc., Burlington, MA, USA) to assist with organization and retrieval of the data. The last step in data analysis involved interpreting the data within the context of the literature. The rigor of the research study was enhanced by adhering to the principles of trustworthiness as described by Guba (1981), including truth-value, applicability, consistency, and neutrality.

Results

Setting and Sample

The research was conducted at a national referral and teaching hospital in Uganda. Despite being a teaching hospital, other authors (Fournier, Kipp, Mill, & Walusimbi, 2007; Harrowing & Mill, 2010) have reported that Ugandan nurses frequently have

insufficient protective equipment to practice universal precautions with all patients, and work in units with inadequate hand-washing facilities. This is particularly significant based on the knowledge that nurse compliance with universal precautions is influenced by the availability of protective equipment (Lee, 2009). The inclusion criteria for the study included nurses (a) with a minimum of a 2-year education certificate, diploma, or bachelor of nursing; (b) working on medical, surgical, or casualty units; (c) with at least 1 year of nursing experience; and (d) willing to participate. The identity of each participant has been protected by replacing names with a pseudonym in the quotations.

Sixteen participants (14 general nurses, one infection control nurse, and one nurse manager) from medical, surgical, emergency, and accidents units participated in an in-depth interview; 14 participants were female and two were male. The average age of the participants was 41.4 years, with a range of 36 to 48 years. Nurses had an average of 16 years of experience, ranging from 2 years to 32 years. Eleven nurses had diplomas in nursing, four had a certificate, and one had a bachelor of nursing degree.

Practicing Universal Precautions

Most of the participants in our study understood the concept of universal precautions, but some were more conversant with infection control measures. The nurses understood that universal precautions should be observed in health care settings and were meant for all HCWs. Participants stated that they knew how to practice universal precautions but at times were forced by circumstances to take shortcuts. For example, a patient's symptoms of a disease or serostatus sometimes influenced the nurse's decision to practice universal precautions. Nancy indicated that, despite many patients with HIV infection, the decision to practice universal precautions was determined by the serostatus 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 their serostatus and know if they have ever been tested." Nurses' decisions to practice universal precautions were often based, not on standard protocols, but on their own perceptions and experiences. This occurred mostly when an infectious disease was indi-

cated on the patient's admission profile. Jack shared how he made decisions about universal precautions:

Patients who come with TB [tuberculosis] 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 [a] patient comes with any of the two diseases.

Similarly, 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 ... gloves, we use them when we are giving treatment, when we are carrying out a procedure on a patient, or 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.

Universal precaution practices varied not only from one unit and hospital to the next, but also from one nurse to another. For example, a few participants had observed a difference in the availability of supplies between the wards and hospitals in general and private settings. Ann believed that the resources in the latter were more available to nurses and their patients:

... 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 5 patients or 10 patients, it was a nightmare.

Several participants admitted that they rarely practiced universal precautions in their wards. Nurses reused gloves when they believed the gloves were not dirty or they were carrying out a procedure they did not feel was risky. Gail justified this by saying:

We are supposed to use a pair after every patient but because of shortages we can't do ... If blood doesn't come on it [the glove] you can use for 5-10 patients but when it is contaminated, that is the time you need to change.

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 Angelina 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.

Nurses were able to order supplies twice a week from the hospital storeroom. 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 that was not always accessible. Anne recalled that, "Maybe your boss locked them [supplies] and did not leave them out so, you can't pick them from the store." At times patients were forced to buy supplies for their care when the ward stock was depleted. Despite challenges related to supplies, most of the time, managers ensured that nurses had the necessary resources and that universal precautions were maintained to the best of their ability.

A few participants mentioned the practice of double gloving. Nurses stated they used double gloves when doing certain procedures, if the patient was uncooperative, or when they felt the quality of the glove was inferior. Paula stated that when patients were treated well, they cooperated and one pair of gloves was enough. Nancy wore two pairs of gloves because of the poor quality of disposable 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."

At times nurses provided nursing care without any gloves, sometimes to increase the comfort level of

their patients. Sabrina reported that she did not use gloves when putting in an intravenous drip as long as the vein was easy to see. She stated that:

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

Isabella, on the other hand, had noticed some nurses not using 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.

The practice of not using gloves increased when the number of patients was overwhelming or in emergencies when nurses did not have time to take out their gloves or go looking for new ones. Overall, the use of gloves by nurses was inconsistent and, in some instances therefore, nurses were exposed to blood and body fluids without their knowledge.

Challenges to Practicing Universal Precautions

Participants tried very hard to practice universal precautions based on their knowledge, but there were many challenges related to implementing precautions in practice. Lack of resources, policy issues, and overcrowding were frequent and recurring challenges related to the practice of universal precautions. Nurses described many challenges related to the lack of resources, both material and human. Angelina shared:

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, just for 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.

Nurses stated that sometimes they had no basic protective gear in very grave situations. In these instances, nurses asked patients and relatives to go and buy some of the supplies that were missing. Dinah recalled, "Sometimes even the gloves themselves are not there. Patients are forced to go and buy so that you can help them." Isabella 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. Like if you look for gloves in the ward and you fail to get [them], you tell the patient to buy and the patient refuses, you just look on [ignore it].

Hand washing is fundamental to the practice of universal precautions, but several participants expressed frustration when they found that there was no soap at the sink, despite knowing correct hand-washing technique. Ann shared her frustration:

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 ... You find that at the sink there is even no soap.

Sinks were not always easily accessible and at times were not functioning. Sometimes when nurses tried to get sinks repaired, they ended up being locked or worse than they were initially. Jack shared his aggravation with the lack of water:

Hand washing! It is very necessary. Unfortunately our ward is having a problem with taps. 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 are going to another one, after a procedure. So we usually use the hand gel ... which we carry with us.

In order to facilitate hand washing, 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."

Resource challenges were amplified by maintenance problems with the material resources that were available. Issues of maintenance focused primarily on sinks that were not working. This hindered universal precaution practices that required nurses to wash their hands after every procedure. When sinks were not working, nurses and patients struggled to use what was available. Ann shared: "Things are now not functional, and you try to call the mechanical people [but] they are not responding." Nurses in several units had reported nonfunctioning sinks to maintenance for repair but things got worse and nurses were more frustrated. Gail stated:

... it [maintenance] is something 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.

With regard to waste and sharps disposal, participants had concerns about procedures to be followed after the handling of needles and related materials. Nurses often needed to be reminded about the use of preventive measures while handling and disposing of such materials. Nevertheless, safe disposal of sharps was not always practiced; some HCWs were seen to be careless and to endanger the lives of their colleagues. Ann shared her frustration with the waste disposal she had witnessed:

At times the paper waste, the way I told you, the mixing up of papers and clinical waste ... You try to pick them [up] 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.

Challenges to the practice of universal precautions were also related to the shortage of human resources. Nurses stated that this was a fundamental problem

that caused nurses to take shortcuts to complete the care of their patients. Helen commented:

Maybe another obstacle is human resources. So you know like infection control really needs you to have the things available ... but now if the human resources are not there – like two nurses per shift for over 60 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].

Shortages of staff meant that some nurses were overworked. This led to burnout and lack of cooperation that, in turn, impacted on workload. Nurses were seen leaving the wards and going to attend to personal activities while on duty. Nancy commented: "... staff, they are not very cooperative ... they don't follow time. 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." Several nurses believed that time constraints as a result of staff shortages impacted their abilities to practice universal precautions. This was particularly true 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.

Some institutional policies had been developed to provide guidance for infection control; however, they were often not adequately disseminated to staff. In addition, when staff were aware of policies, the availability of supplies hampered implementation. Helen reflected on this problem:

Our policy guidelines – we have done one in waste management, health care 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 ... for us, we are still at infancy level where availability and accessibility still remains very big challenge ... the amount, quantity, and quality still has a long way to go.

Participants were also concerned about the lack of information they needed to protect themselves from infectious diseases, including methods to dispose of waste. For example, Sabrina was frustrated with a colleague's lack of information about waste disposal: "... he (a physician) was not informed about the red bin, where to put what ... he will come and mix up everything. So that is how you can fail to maintain the system." Ann was knowledgeable about 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 so good. I think it depends where you are, like Casualty, they get such information.

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, while others did not take advantage of the opportunity due to concerns related to cost. There were plans to immunize the entire staff, but not everyone was immunized, for one reason or another. Dinah shared her experience with hepatitis B immunization:

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 [that] health care workers should be vaccinated against Hepatitis B. Some people got [vaccinations] and some organized for the nurses and doctors in the surgical units to get that.

Despite knowing the importance of immunizations, the arrangements to receive them were not always clear to participants. Some nurses thought they were required to pay for this service, unlike other services that were free in the institution. Arrangements were made for nurses to be immunized in groups because the vaccine vials were multi-dose.

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. As Dinah pointed out:

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 workload, 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.

Similarly, Sabrina missed her first opportunity to be immunized due to a lack of funds:

No, I had a chance but I never [went] 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 vaccine] the second time, the vaccine was not enough and I did not get a chance ... we missed.

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 strained 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 believed that:

... because of overwhelming numbers of patients, you find that things like gloves, we run short of them ... It is hard handling patients, it becomes a bit difficult and as we are overwhelmed with patients, we always work in an emergency, doing things faster. Some health workers get blood ... directly flushed in their eyes or get pricked, this always happens.

Lucy believed that the failure to control the flow of 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." The set-up of the ward was frustrating when nurses had to care for large numbers of patients. Amber 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 conditions ... 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 [Oxygen] and is being surrounded by only TB patients, but because he is dyspneic, you don't have another cylinder you have to put him there.

Coping With Challenges

Despite severe challenges to the practice of universal precautions, most nurses used the experiences they had in other units and hospitals to inform and inspire their practice. Nurses shared many strategies that they used to cope with challenges to the practice of universal precautions. These strategies included both structural interventions and personal approaches to minimize nurses' exposures to infectious diseases and maximize their abilities to practice universal precautions.

Participants suggested that the design of the unit, including the placement of patients, in combination with efforts to decrease congestion, could minimize their exposure to infectious agents. Paula believed the design of the ward could "protect" nurses from infectious diseases:

As a team, we do the setting up of the workplace in a way that it is, it is [a] safe working environment ... 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.

Similarly, the placement of patients was felt to prevent cross infection. Nancy commented:

... They cannot mix them [infectious patients] with these [cardiac patients] even if there was one patient on that side they can't take them there. They just squeeze them after 2, 3 days if the sputum culture is out, if it is negative they can either leave, or if it is not, they stay. The ones who have positive sputum are moved to the middle wing because they are proven TB.

Gail believed that having adequate ventilation was one strategy to compensate for the overcrowding and decreased the likelihood of the spread of infections. She suggested: "So the design of the ward, it is quite open giving free air entry on the ward. The ward is quite crowded but we make sure the ward is aerated, well aerated."

In addition to altering the design of the unit and the placement of patients, a few participants networked with those in higher positions and lobbied for extra supplies. Some in positions such as budgeting helped out because ordering supplies was a long, bureaucratic process. At times, the supplies received did not meet the demand and those who had influence would go a step further and convince the stores' staff to issue more. At other times, nurses had to follow up to ensure supplies were received. Gail explained her efforts:

... today we have received 20 boxes of disposable gloves, [each containing] 1000 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 ... However I have tried to lobby, physically I have gone down there ...

In addition to lobbying for more supplies, Jack had successfully lobbied for an autoclave to sterilize equipment: "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, [so] she got us an autoclave."

In addition to structural interventions, nurses shared several personal approaches, including education and self-protection, which they utilized to miti-

gate the risk of exposure to infectious diseases. Many of these approaches did not provide optimal protection to the nurses because they were not implemented consistently or were based on false beliefs.

Although nursing 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 their hospitals. Dinah recalled: "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."

Similarly, Ann commented that she had received additional training from the hospitals she had worked in: "I learned universal precautions through the training of infection control; I learned universal precautions when I went to work in unique hospitals."

In addition to their own education, nurses mentioned that they had to teach patients and relatives how to be actively involved in infection control, not only in the hospital, but also at home when patients were discharged. Penny shared:

... 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 a patient 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 should try to protect the family from getting the disease in that way. That's what we always do.

Often, when supplies were unavailable to practice universal precautions or to teach about them, participants had to improvise. Ann captured the need to improvise in her comment "you improvise until you improvise nothing."

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 with more immediate risk, such as casualty and emergency, took steps to protect themselves by buying personal protective gear. At times, the lack of support from

management made them realize they had to take care of themselves. Mercy shared: “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 [it], I clean it and keep it.”

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

Paula also believed that it was God who protected her from infectious diseases:

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 ... God protects me but nothing else.

Discussion

Universal precautions emphasize the need for HCWs to consider all patients as potentially infected with HIV or other blood-borne infections and to adhere rigorously to infection control precautions. When HCWs do not use universal precautions consistently and correctly, they may perpetuate the stigma associated with infectious diseases and act as poor role models for health professions students (Aultman & Borges, 2011). In low-resource countries where HIV stigma is high (Mill et al., 2013; Reda et al., 2009), it is particularly important for nurses to use universal precautions with all patients and with all required procedures. The benefits of practicing universal precautions extend beyond the primary issue of infection control. When HCWs use universal precautions consistently and correctly, the health conditions of both patients and workers can remain anonymous.

Findings from our study provide a better understanding of Ugandan nurses’ experiences in decision-making 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 past experiences when they were unable to practice universal precautions or did not have policies and standards to guide their practice. The experience of nurses in our study illuminated 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. 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, the nurses frequently balanced the availability of resources with the risk to themselves or their patients. Nurses felt overwhelmed with the number of patients in their care, particularly when they lacked the resources 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 they lacked the resources required to provide safe, comprehensive care. In our study, participants used many strategies to overcome the challenges, demonstrating their resiliency and commitment to their patients’ well-being.

The practice of universal precautions varied among study participants; at times, nurses made decisions to use precautions based on their experiences and perceptions of whether the patient was infectious. Several researchers (Aultman & Borges, 2011; Mill et al., 2013) have also reported that HCWs made decisions about the practice of universal precautions based on whether the patient looked infectious. A few participants demonstrated some hesitation to care for patients whom they suspected had a communicable disease. For example, some participants described the practice of double gloving for certain procedures or when a patient was uncooperative. Harrowing and Mill (2010) also

reported that some Ugandan nurses felt uncomfortable taking care of HIV-infected patients and practiced double gloving to protect themselves.

Aultman and Borges (2011) suggested that treating patients differently (e.g., double gloving) based on disease status was an ethical issue because with adequate knowledge and the use of universal precautions HCWs can treat all patients equally. These authors suggested that differential treatment of patients with communicable diseases perpetuated stigma. The authors also suggested that not practicing universal precautions when they knew there was a risk of disease transmission might have caused needless harm to patients and themselves. Similarly, Mill, Edwards, Jackson, Maclean, and Chaw-Kant (2010) reported that the consistent use of universal precautions was seen by both persons living with HIV and HCWs as a key factor to reduce stigma.

Many of the patients the nurses cared for were infected with HIV, and some nurses expressed the desire to know the HIV status of their patients. HCWs in Ethiopia (Reda et al., 2009) and nurses in sub-Saharan Africa (Mill et al., 2013) also believed that they should know the HIV status of their patients. Despite this finding, most of the participants realized that there were many infectious diseases, in addition to HIV, that required exposure protection. In our 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; some nurses reporting using no gloves to make their patients more comfortable. Mill and colleagues (2009) also 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.

Education and training have been identified as important components to improve adherence to universal precautions (Aultman & Borges, 2011; Odongkara et al., 2012); nursing curricula in Uganda include information about the prevention and treatment of HIV infection (Walusimbi & Okonsky, 2004). Following a study to explore American medical students’ knowledge of and attitudes toward universal precautions, Aultman and Borges (2011) stressed the need to educate clinical faculty about the importance of role modeling universal precautions. Furthermore, it is important for govern-

ments and institutions to have policy related to universal precaution practice. In a recent Tanzanian study, Mashoto, Mubayazi, Makuni, Mohamed, and Malebo (2013) found that more than 50% of the observed hospital units did not have guidelines to prevent and manage occupational exposure to HIV. Based on findings from a recent study with Ugandan health sciences graduates, Kamulegeya, Kizito, and Balidawa (2013) recommended creating environments within hospitals to help HCWs practice infection control measures consistently.

Although knowledgeable about universal precautions, some nurses in our study were frustrated when they did not have the needed protective equipment. 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 of resources, both material and human. Several authors have reported this challenge in many low-income countries, especially in Sub-Saharan Africa (Fournier et al., 2007; Harrowing & Mill, 2010; Reda et al., 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 was reported previously when Ugandan nurses were unable to provide optimal nursing care with limited resources (Fournier et al., 2007; Harrowing & Mill, 2010). The overwhelming number of patients in relation to the number of nurses was also a significant challenge to universal precaution practice.

Almost all nurses reported hand hygiene as a problem. Several authors have evaluated the problem with hand washing and use of hand gel as an alternative (Guilhermetti et al., 2010). Although hand gel is a recommended alternative to hand washing, it should be used only when soap and water are unavailable to clean the hands. In our study, soap was often not available and sinks were often not functioning; therefore, nurses were frequently forced to rely on hand gel to clean their hands. Similarly, when preparing to do an invasive procedure, nurses commonly weighed the risk of exposure to an infectious agent with the availability of gloves. In a study to explore needle-stick injuries

among nurses in Uganda (Nsubuga & Jaakkola, 2005), participants stated that a poor supply of gloves was one of the reasons that gloves were not used regularly. Similarly, a study to examine infection control practices among Ugandan health science graduates (Kamulegeya et al., 2013) reported that the lack of gloves and glove use not being common practice were the most common reasons for not wearing gloves.

When nurses were faced with these challenges they focused on their nursing skills to ensure that 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, improvising when equipment was unavailable, and borrowing from other units. 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, an indication of the strong commitment of nurses to provide care for their patients. Several studies (Fournier et al., 2007; Harrowing & Mill, 2010) have also reported that Ugandan nurses engaged relatives in patient care and improvised when equipment was unavailable. At times, some nurses worked without observing universal precautions.

Wu and colleagues (2008) argued that promoting adherence to universal precautions was the best method to reduce risk in resource-poor settings. Knowledge about universal precautions and the resources to implement them, are critical requirements for Ugandan nurses to implement universal precautions. Provision of basic equipment such as gloves and ensuring that HCWs are trained in safe methods can be very effective. On-going education programs are recommended to encourage compliance with universal precautions, but 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.

Despite the positive outcomes that can be achieved with consistent practice of universal precautions, Osterman (1995) highlighted the limitations of universal precautions based on their reliance on the "... active compliance of individuals ..." (p. 1051). Osterman (1995) argued that universal precautions must be augmented by passive measures: environmental and engineering controls, administrative procedures, and safer workplace practices. Cutter and Jordan (2004) also stated that education was 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. For example, 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.

Conclusion

Nurses in our study were highly committed to providing the best care possible to all of their patients. Despite their commitment, protective gear was often insufficient 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. Despite the challenges, Ugandan nurses displayed an overall enthusiasm for their work and a dedication to provide the best possible care for their patients. Participants shared a wide range of strategies to minimize the challenges they faced when they did not have sufficient resources to practice universal precautions; many of these strategies demonstrated nurses' commitments to their patients and a willingness to use their own resources to improve 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 well-being of the patient. Nurses were open and eager to explore other approaches to help them provide safe patient care.

Key Considerations

- Ugandan nurses experienced challenges in the practice of universal precautions that were related to the lack of resources, maintenance issues, lack of information, and overcrowding.
- Ugandan nurses typically had a good understanding of universal precaution practices. However, because of limited resources they often had to choose when, and with which patients, to use protective gear.
- The practice of universal precautions varied among study participants; at times, nurses made decisions to use precautions based on their experiences and perceptions of whether the patient was or looked infectious. In their decision-making, nurses frequently balanced the availability of resources with the risk to themselves or their patients.
- Nurses used a variety of creative strategies, including teaching relatives to get involved in care, improvising when equipment was unavailable, and borrowing from other units, to address the care challenges.
- Despite challenges to the practice of universal precautions, nurses displayed an overall enthusiasm for their work and a dedication to provide the best possible nursing care for their patients.

Disclosures

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

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