Journal of Health, Medicine and Nursing
ISSN 2422-8419 An International Peer-reviewed Journal
Vol.26, 2016

Analysis of Compliance with Universal Precautions among Staff and Student Nurses in Olabisi Onabanjo University Teaching Hospital

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Abstract
The study assessed compliance with universal precautions among staff and student nurses in a teaching hospital in Ogun state south west Nigeria. One hundred staff and student nurses were selected, using the convenient sampling procedure, to participate in the study. Required information was collected from the respondents via structured questionnaire. Data gathered included demographic variables, items on hand washing, method of waste disposal, and exposure to body fluid and injury. Data were analyzed using descriptive statistics. The result showed that most of the respondents were female (85%), Christians (88%) with more than 10 years working experience (55%). Further result showed that respondents have good compliance to precautions relating to handling or care of patients and hand washing. Most of the respondents claimed they use universal compliance whether the patients are confirmed to be non-infectious (60%), where potential for exposure to infections are not anticipated (69%) or where the patient been treated is a known person or a colleague at work (86%). However, 64 percent of the respondents had experienced glove failure, 52 percent have had needle-stick injury, and 72 percent had been a victim of accidental unprotected contact with patient's body fluid. Furthermore, many of the respondents did not take adequate precautions in relation to use of masks, gloves, goggles and protective gowns. Major factors limiting the compliance of the respondents with universal precautions include high job demands (52%), unavailable equipments (58%) and cost of equipments or materials (69%). As a provision to enhancing compliance with universal precaution among nurses the health facility (hospital), assisted by government should make provision for availability and affordability of protective materials. Emphasis on periodic and continuous training of health workers on the use of precaution should be highlighted in institutional policy.
Keywords: Compliance, Universal Precautions, nurses, Nigeria

1. Introduction

Studies have established that healthcare workers (HCWs) are highly at risk of occupational hazards as they perform their clinical activities in the hospital especially when disposing bacteriological and other laboratory waste (Aiken, Sloane and Klocinski, 1997; Gurubacharya, Mathura and Karki, 2003). Blood-borne pathogens, such as bacteria and viruses, are present in blood and body fluids and can cause disease in those working with blood or body fluids which is a frequent phenomenon in the hospitals. The blood-borne pathogens of primary concern are Hepatitis B, Hepatitis C and HIV. These and other blood-borne pathogens are spread primarily through direct and indirect contact (Quinn and Markkanen, 2009). According to Sadoh, Fawole, Sadoh, Oladimeji and Sotiloye (2006), nurses are exposed to blood borne infections from sharp injuries and contact with deep body fluids. They further observed that developing countries that accounted for the highest prevalence of HIV-infected patients in the world also recorded the highest needle stick injuries among nurses. Needle stick injuries were the commonest occupational hazard reported from a Nigerian teaching hospital. Sadoh et al (2006) posited that according to the World Health Organization (WHO) estimation, about 2.5% of HIV cases among health care workers, and 40% of Hepatitis B and C cases among health care workers worldwide are the result of their exposure to needle stick injuries. To ameliorate this professional hazard faced by nurses, universal precautions were recommended by the Centre for Disease Control (CDC) to be used on all patients (CDC, 2003). This recommendation includes the appropriate use of protective barrier equipment by health care workers (HCWs) at all times. Studies have shown that non compliance with the universal precautions has placed HCWs in many developing countries like Nigerian at significant health risks (Asuzu and Okojie, 2003).

Universal precautions can be defined as infection prevention control measures that reduce the risk of transmission of blood borne pathogens through exposure to blood and body fluids among patients and health care workers, (Asuzu and Okojie, 2003). According to CDC (2003), compliance with these universal precautions has been shown to reduce the risk of exposure to blood and body fluids. Universal precautions were initially developed in 1987 by the centre for disease control and prevention in the United States and the Bureau of Communicable Disease Epidemiology in Canada (WHO, 2003). The precautions include specific recommendation for the use of gloves, masks, gowns, and protective eyewear when in contact with blood or body secretion is anticipated. Certain other precautionary rules are expected to be followed such as:

1. After use, do not recap, purposefully bend, remove needles from disposable syringes, or

otherwise manipulate by hand.
2. Place into puncture resistance collection containers as close as possible to the areas in which they are used.
3. During use, and at the time of discard, the collection container should be sealed to prevent access to non medical personnel.
4. Collection containers should not be placed in an area accessible to the public while awaiting trash collection and removal.
5. Needles and sharps objects should not be processed in trash compactors prior to trash collection and removal.

The compliance of universal precautions by nurses may be influenced by their varying type of training, the absence of an enabling environment in the health institution, such as a lack of constant running water or a shortage of personal protective equipment (PPE) (The American National Red Cross [ANRC], 2014; Adewale, *Ihiwosa and Ojong,* 2002). It is against this background that this study assessed the determinants of compliance with universal precautions by both student and staff nurses who makes direct contact with patients at the Olabisi Onabanjo University Teaching Hospital (OOUTH), Ogun State. Nigeria.

1.1 Theoretical Framework: The Health Promotion Model (HPM)

As a scientific approach, the concept of universal precautions is based on findings of studies in different aspects of human beings. These findings have been built into theories and models, which describes the response to various conditions. The application of the Health Promotion Model (HPM) is here discussed

Pender (2006) developed the health promotion model which was proposed as a holistic predictive model of health promoting behaviour for use in research and practice. This theory includes two concepts: health promotion and health protection.

1. Health promotion is defined as a behavior motivated by the desire to increase well-being and actualize human health potential. It is an approach to wellness (Kozier, 2008).
2. Health protection or illness prevention is described as a behavior motivated by the desire to actively avoid illness, detect it early, or maintain functioning within the constraints of illness (Kozier, 2008).

The HPM is based on the following assumptions, which relied on both nursing and behavioral science perspectives:

1. Persons seek to create conditions of living through which they can express their unique human health potential.
2. Persons have the capacity for reflective self-awareness, including assessment of their own competencies.
3. Persons value growth in directions viewed as positive and attempts to achieve a personally acceptable balance between change and stability.
4. Individuals seek to actively regulate their own behavior.
5. Individuals in all their bio-psychosocial complexity interact with the environment, progressively transforming the environment and being transformed overtime.
6. Health professionals constitute a part of the interpersonal environment, which exerts influence on persons throughout their lifespan.
7. Self-initiated re-configuration of person-environment interactive pattern is essential to behavior change.

Theoretical statements derived from the model provide a basis for investigative work on health behaviour (Pender, 2006). The HPM is based on the following theoretical propositions:

1. Prior behavior and inherited and acquired characteristics influence beliefs, affect, and enactment of health promoting behavior.
2. Persons commit to engaging in behaviors from which they anticipate deriving personally valued benefits.
3. Perceived barriers can constrain commitment to action, a mediator of behavior as well as actual behavior
4. Perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and actual performance of the behavior.
5. Greater perceived self-efficacy results in fewer perceived barriers to a specific health behavior.
6. Positive effect towards a behavior results in greater perceived self-efficacy, which, can in turn, result in increased positive affect.
7. When positive emotions of are associated with a behavior, the probability of commitment and action is increased.
8. Persons are more likely to commit to and engage in health promoting behaviors when significant number others model the behavior, accept the behavior to occur, and provide assistance and support to enable the behavior.
9. Families, peers, and health care providers are important sources of interpersonal influence that can increase

or decrease commitment and engage in health promoting behavior.

10. Situational influences in the external environment can increase or decrease commitment to or participation in health promoting behavior
11. The greater the commitments to a specific plan of action, the more likely health promoting behaviors are to be maintained overtime
12. Commitment to a plan of action is less likely to result in the desired behavior when competing demands over which persons have little control require immediate attention.
13. Commitment to a plan of action is less likely to result in the desired behavior when others action are more attractive and thus preferred over the target behavior.
14. Persons can modify cognitions, affect, and the interpersonal and physical environment to create incentives for health actions.

The HPM is considered the best strategy to minimize the occurrence of occupational hazards. The explanatory health promotion model is supported by the group of practices and knowledge that influence health care services. Universal precautions as an environmental control program have been developed in response to the continuing increase of contaminants that have been introduced into the hospital environment. The role of the nurse in the practice of universal precaution as a health promoting procedure involves collaborative relationships with client, co-workers, and the hospital authorities as a whole. Simply put the use of universal precautions act as a barrier between an individual and a harmful organism. Health is enhanced once this barrier is intact. On the other hand, deterioration of health is most likely to occur once this barrier is broken.

2. Methodology

The study used the survey research design, to find out the determinants of compliance towards universal precautions among staff and student nurses working with Olabisi Onabanjo University Teaching Hospital (OOUTH), Ogun State, Nigeria. OOUTH was founded in 1986 serving as teaching hospital for the college of medicine of the Ogun state University. The hospital is made up of 10 wards; two medical adult wards, four surgical adult wards, pediatrics' ward, pediatric surgical ward, Gynecological ward, and labor ward. The hospital has a total number of about two hundred and thirty seven trained nurses (237). As mentioned earlier, the target population for this study comprised the trained Staff and student nurses working in OOUTH.

The convenient sampling technique was used in selecting 100 participants for the study. Fifty (50) staff nurses and fifty student nurses were selected. Structured questionnaire was used as data collection instrument. The questionnaire was made up of two sections. First Section focused on demographic information about the participants while second section focused on the other information on the variables selected for this study. The questions were closed ended. The response was to elicit information on inherent determinants of compliance towards universal precautions in OOUTH. Furthermore, the questionnaire was validated and subjected to reliability test using the Cronbach's Alpha test. Result of the test showed that the average Cronbach's Alpha value for all the constructs in the instrument was 0.87 which clearly indicated that the instrument was reliable.

Data gathered were analyzed using descriptive and inferential statistics. The consent of all the participant was sought prior to data collection and ethical clearance was obtained from the teaching hospital (Olabisi Onabanjo teaching Hospital, Ogun state).

3. Results and Discussions

3.1 Respondent's personal statistics

The distribution of respondents' personal characteristics is shown in Table 1. The characteristics of importance considered included gender, occupational status, working experience (number of years of contact with patients) nursing education and religious affiliation.

Results in Table 1 shows that most of the respondents were female (85%), Christians (88%) with more than 10 years working experience (55%). It is not surprising that most of the respondents are women; the nursing profession attracts more women than men especially in developing countries. The fact that most of the respondents had over 10 years of contact with patients even though a good number of them were students (50%), suggests that the student nurses have had previous clinical experiences before advancing in nursing education. This thought is corroborated by the fact that none of the respondents had less than diploma education, in fact; majority had bachelor's degree in nursing (52%). On the whole, it is expected that with their level of education and experience, the respondents are expected to exhibit good compliance with universal precaution utilization while carrying on their nursing activities.

Table 1: Distribution of respondents by demographic characteristics

Variables	Frequency (n = 100)	Percentage
Gender:		
Male	15	15.0
Female	85	85.0
Nursing Occupational status:		
Staff nurse	50	50.0
Student nurse	50	50.0
Working experience (contact with patients):		
1-5 yrs	33	33.0
6-10 yrs	12	12.0
11- 15 yrs	16	16.0
16 and above yrs	39	39.0
Nursing educational status:		
BNSC	52	52.0
Diploma	48	48.0
Religion:		
Christianity	88	88.0
Muslim	12	12.0

Source: computed from field data, 2015

3.2 Compliance with universal precautions among staff and student nurses working in OOUTH

The result of the evaluation of the respondents' level of compliance with universal precaution is presented in Table 2. Result showed that respondents have good compliance to precautions relating to handling or care of patients. Most of the respondents claimed they use universal compliance whether the patients are confirmed to be non-infectious (60%), where potential for exposure to infections are not anticipated (69%) or where the patient been treated is a known person or a colleague at work (86%). Gershon et al., (2002) found out that most diagnostic test carried out during the window period of pathogens always turned out negative, but in the actual sense, the individual tested is naturally positive of the pathogen, but not clinically proven positive. This indicates that if a nurse comes in contact with body fluid of a clinically negative and naturally positive patient or client, that nurse is 80% likely to be infected with the pathogen, if appropriate post exposure measures are not carried out immediately. Thus, the 40 percent of the respondents who agreed to compromise universal precautions because it can delay patients' care (especially those patients that have been tested to be non-infectious) are highly vulnerable. Further result showed that 64 percent of the respondents had experienced glove failure, 52 percent have had needle-stick injury, and 72 percent had been a victim of accidental unprotected contact with patient's body fluid. Some 62 percent of the respondent confirmed that they have enabling environment to practice ideal universal precaution. This suggests that the hospital encouraged compliance with universal precautions and probably have policies entrenching precautions. The unwillingness to participate in transfusion of unscreened blood, even in extreme emergency cases, by 92 percent of the respondents must have been because of institutional prohibitive policy in OOUTH. This is because finding of the American Society of Nurses (2008) posited that some state hospitals in America accept the transfusion of unscreened blood in emergency cases. Their rationale was that donors of blood would have already been screened before withdrawal of blood.

Table 2: frequency of Respondents compliance with universal precaution

Factors	Agree	Disagree
	Percentage	
Using universal precautions delay patients' care (especially those patients that have been tested and confirmed to be non-infectious)	40	60
1 do not bother to use universal precautions once I have anticipated that there is no potential for exposure to infections	31	69
I find it unnecessary to use universal precautions for my hospitalized colleague at work, after my colleague has been tested negative for infectious disease.	14	86
I have not had any situation where I think I am restricted from practicing ideal universal precautions	62	38
I can assist a doctor to transfuse unscreened blood in emergency cases, where blood transfusion is the bridge between life and death.	8	92
I have experienced a case of glove failure	64	36
I have experienced a case of gown failure or wet gown	47	53
I have been a victim of needle-stick injury	52	48
I have been a victim of accidental unprotected contact with patient's body fluid	72	28
I have had previous practical training on the use of personal protective equipment	65	35

Source: computed from field data, 2015

Further result in Table 2 showed that most of the participants (65%) have undergone practical training on the use of personal protective equipments. This shows that the majority of the respondents have no excuse for

not complying with universal precautions at all times. However, there are a few nurses in the hospital who are yet to be trained for proper practice to take place.

3.3 Current universal precaution in use

The respondents were assessed based on the current universal precaution in use. The result is presented in Table 3. Some 88 percent of the respondents practice hand washing more than 5 times a day and 86 percent use liquid soap and disposable napkins. This is in accordance to the conclusion reached by the Centers for Disease and Control (CDC) (2003), that the practice of hand washing as part of the universal precautions should not be observed less than 5 times a day. Even though, most times healthcare workers do not remember exactly how many times they practice hand washing a day. Although most of the respondents (28%) reported that wastes were collected from their wards not less than 3 times a day, 25 percent reported that wastes were collected only once a day. Also, 56 percent of the nurses were not sure of the disposal methods used by the hospital.

Result also showed that the majority of the participants use disposable syringe (92%) and 96 percent discard their sharps into special sharps receptacles. This is a very good and recommendable practice supported by the guidelines of universal precautions (CDC, 2003). According to Ekueme, et al (2002), the occurrence and spread of iatrogenic infections is closely related to the kind of injection syringes used in the ward. Findings in research revealed that disposable needle and syringes had the highest overall cost for device purchase and usage, compared to the money spent on purchasing automatic needle-shielding syringes.

Table 3: Current Universal Precaution in use among respondents

Precautions	Freq	%
Frequency of hand washing		
Three times a day	6	6.0
About five times a day	6	6.0
More than 5 times a day	88	88.0
Frequency of waste collection in the ward		
Once a day	25	25.0
Twice a day	12	12.0
Three times a day	28	28.0
Once the waste bin is full	20	20.0
I do not know	15	15.0
Type of disposal method used		
Open pit burning	22	22.0
Burying	6	6.0
Incineration	15	15.0
Not sure	56	56.0
Methods of disposing sharps in the ward		
Special sharps receptacle	96	96.0
Disposed into the hospital waste bin	4	4.0
Type of syringe mostly used in your ward		
Disposable needle and syringe	92	92.0
Automatic needle - shielding syringes	8	8.0
Preferred Hand washing material		
Reusable washable napkins and liquid soap	6	6.0
Bar soap and disposable napkins	8	8.0
Liquid soap and disposable napkins	86	86.0
Precaution for use of masks, gloves & goggles		
Avoiding the use of face masks in an isolation room	22	22.0
Avoiding the use of gloves in dry wound dressing	22	22.0
Avoiding the use of goggles in the delivery ward	18	18.0
None of the above	38	38.0
Precaution for use of protective gowns		
Ensuring Non- fluid resistance gowns	16	16.0
Ensuring Body fluid resistance gowns	72	72.0
No precaution taken	12	12.0

Source: computed from field data, 2015

The conclusion was that despite their low cost and subsequent high purchase, conventional needle and syringes carry a hidden but huge burden of iatrogenic disease, as this kind of injection syringe creates the opportunity for illegal and indiscriminate recapping and reuse of the needles and syringes by passer-bys of

dumping ground or in rare cases, nurses themselves (WHO, 2003). This fact ultimately identifies 'cost' as a factor responsible for the practice of universal precautions.

Further result showed that 52 percent of the respondents are not taking adequate standard universal precautions in specific situations such as use of masks, gloves and goggle in isolation room, wound dressing and in the delivery wards respectively. According to CDC (2003), the use of these protective materials by health care workers are pertinent to safety and guideline for universal precaution. A major area of concern in is the dressing of dry wound without sterile hand gloves as posited by Asuzu and Okojie (2003). Nurses tend to be more careless when dressing dry wound when compared to wet wounds. The majority of respondents were also not compliant with universal precautions with respect to the use of protective gowns

3.4 Factors limiting the compliance of nurses with universal precautions

Results presented in Table 4 shows that the major factors limiting the compliance of the respondents with universal precautions include high job demands (52%), unavailable equipments (58%) and cost of equipments or materials (69%). Increasing compliance with universal compliance among respondents will require ameliorating these factors.

Table 4: Reasons militating against the practice of universal precautions

Constraints	Frequency*	Percentage
High job demands (busy ward)	52	52
Perception that the patient involved did not pose a risk	40	40
Equipment/resource not available	58	58
High cost of equipment/ materials required	69	69

Source: computed from field data, 2015 * Multiple responses available

4. Conclusion and Recommendations

Despite the existence and promotions of the universal precautions processes, the risk of acquiring various infections by health workers in Nigeria in the course of performing their duties is still apparently high. Though distinct, these infections share similar mode of transmission and risk factors. This paper has identified that there are still nurses in the hospital (OOUTH) who have poor compliance and poor access to facilities that will promote the practice of universal precautions. Based on the result findings in this paper, the following recommendations have been made:

1. Policies to discourage non-compliance with universal precautions should be established in the healthcare facilities in Nigeria.
2. Adequate provision of personal protective devices should be done and national health budget should include provision for subsidies for these materials to make more available, accessible and affordable.
3. Nurses should receive periodic training on universal precautions, with a view to improving overall safety of patients and healthcare providers.
4. Infection control must not focus too exclusively on the establishment of isolation wards but should aim at improving overall hospital hygiene. Proper waste disposal policy must be put in place and communicated throughout the institution.

References

Adewale, O. A., Ihiwosa, T. T. & Ojong, W. A, (2002). Infection Control Strategies in vulnerable groups. (1st ed), 23, 63-67. Retrieved from http://www.LCHE.Cates.oty/nurseuniversal

Aiken, L. H., Sloane, D. M., & Klocinski, J. L., (1997). Hospital nurses' occupational exposure to blood: Prospective, retrospective, and institutional reports. *Am J Public Health, 87:103–7.*

Asuzu, A. N & Okojie, M. C, (2003). Research on knowledge and practice of universal precaution among nurses in Central Hospital, Benin City, Edo State, Nigeria. *Nigeria Postgraduate Medical Journal,* 10,26-31.

Centers for Disease Control and Prevention. Department of Health & Human Services (2003). *Exposure to Blood: What Healthcare Personnel Need to Know.* Atlanta: Oxford University Press, p.105-110

Ekwueme, D. U., Weniger, B. G, & Chen, R. T, (2002). *Model-based estimates of risks of disease* transmission and economic costs of seven injection devices in sub-Saharan Africa.

Gershon, R., Karkashian, C., Ylahov, D., Kummer, L & Kasting, L. (2002). Compliance with Universal Precautions in Correctional Health Care Facilities. *Journal of Occupational & Environmental Medicine, 41(3)181-189.*

Gurubacharya, D. L., Mathura, C. & Karki, D. B. (2003). Knowledge, attitude and practices among health care workers on needle-stick injuries. *Kathmandu Univ Med J (KUMJ), 1:91–4.*

Kozier, B., (2008). Fundamentals of Nursing Concepts, Philadelphia: Procession Education Limited.

Pender, N. J, (2006). Self care model. Adopted from fundamentals of nursing 7th edition.

Quinn, M..M. & Markkanen, P. K. (2009). Sharps, Injuries and Other Blood and Body Fluid Exposures among Home Health Care Nurses. *American Journal of Public Health Supplement 3(3):99*

Sadoh, W. E, & Fawole, A. O. et al. (2006). Practice of Universal Precautions among Healthcare Workers. *Journal of the National Medical Association* 98 (5): 722-725.

The American National Red Cross [ANRC] (2014). Bloodborne Pathogens Training: Preventing the Spread of Bloodborne Pathogens.

World Health Organization, [WHO] (2003). The World Health Report: Reducing Risks, Promoting Health Life. World Health Organization, Geneva.