THE PRACTICE OF UNIVERSAL PRECAUTIONS AMONG STUDENT RADIOGRAPHERS IN THEIR CLINICAL PHASE OF TRAINING

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Abstract

Background: Radiography students, like other healthcare personnel, are at high risk of occupational exposure to blood and body fluid borne pathogens within the hospital. Universal precaution lowers this risk, of contracting nosocomial infections.

Objective: This study aimed at assessing the level of knowledge and practice of universal precaution among radiography students in their clinical phase of study.

Method: A cross sectional survey was conducted using a structured questionnaire among radiography students in their clinical phase of study. Ethical approval was obtained from institutional committee on research and ethics. The questionnaires were administered by personal contacts and the response rate over a period of three months was 62.9% (n = 220). Data collected were analyzed with statistical package for social sciences (SPSS) version 16.0, where descriptive statistics such as mean, frequency and percentages were generated.

Results: This study found majority of the respondents having good knowledge of universal precautions (96.4%, n=212). The source of information were majorly from the class (89.5%, n = 197), and only (33.4%, n=158) practiced universal precaution. It was also found that the management did provide the necessary personal protective equipment and the clinical supervisors lacked strict stance on the practice of universal precaution were the reasons for laxity among students.

Conclusion: This study found student radiographers in the clinical phase of their training having good knowledge of universal precaution, which did not match their level of practice, much needs to be done on enforcing the practice of universal precautions among radiography students while clinical postings.

Keywords: Knowledge, Nosocomial infections, Practice, Radiography Student, Universal precaution.

Introduction

Universal precautions are not well understood or implemented by health care practitioners, albeit crucial in the prevention of the transmission of human immunodeficiency virus (HIV), hepatitis B virus, Ebola virus and other blood-borne pathogens [1]. There is a growing concern about the transmission of blood borne pathogens, during radiographic procedures, from patients to healthcare workers (radiography students) and among patients [2].

Infection is one of the most challenging problems in healthcare services worldwide[2], and radiography students just like any other health care worker are exposed to these infections by pathogens such as human

immunodeficiency virus (HIV), hepatitis B and C viruses and recently the dreaded Ebola virus from sharp injuries and contacts with blood and other body fluids by virtue of their contacts with patients during clinical posting as a result of their poor knowledge and practice of universal precautions [3] .

World health organisation, estimated that sharp injuries resulted in 16,000 hepatitis C virus, 66000 hepatitis B virus and 1000 HIV infections among health care workers worldwide [3].

Universal precautions are the infection control techniques, that were recommended following the HIV/AIDS outbreak in the 1980s by the Centre for Disease Control and Prevention (CDC) and it essentially entails that every patient is treated as if they are infected with the virus, and therefore precautions are taken to minimize the risk. Exposure of healthcare workers/radiography students, to blood and body fluid borne pathogens can significantly be reduced by the practice of universal precautions, which will reduce the risk of contracting infections, as universal precautions are designed to reduce the risk of transmission of microorganisms, from both recognized and unrecognized sources of infection in hospitals [4-6].

It's been observed that the attitude of clinical radiography students to universal precaution is very poor during clinical postings when participating in procedures in which there is a possibility of coming in contact with patient's blood and body fluid[6].

Healthcare workers especially students in the healthcare profession, are at increased risk of occupational exposure to blood and body fluids. Proper knowledge and practice of the universal precautions (Ups) can significantly decrease the incidence of occupational exposure amongst students[5]. Radiography students are taught the concepts and procedures for infection control during their preclinical phase of study and during their laboratory demonstration sessions, before proceeding to the clinical phase of study. They are responsible for complying with infection control precautions, to avoid the risk of contracting nosocomial infections which will lead to loss or depletion in manpower [7]. Radiography students need understand that universal precautions are recommended for the care delivery to all patients regardless of their presumed infection status. It is also important when handling equipment and devices such as couches, cassettes, chest stands, radiographic markers and other accessories that are soiled with patient's blood and body fluids [8]. Universal precaution practices are important, as any healthcare organization has a responsibility to protect its staff from potential danger and itself from loss of manpower, should the staff suffer from occupational injuries or illnesses [9].

Methodology

This was a cross sectional survey conducted among all radiography students in their clinical phase (300 – 500 level) in two institutions running radiography program in Northern Nigeria, they are; University of Maiduguri (UNIMAID) and Bayero University, Kano (BUK) from December 2014 to April, 2015. Ethical approval was obtained from institutional research and ethics committee. Permission to commence the study was obtained from the heads of departments of the participating institutions after submitting the ethical approval letter, and informed consent was sought for and obtained from the participants as acceptance to participate in the study was considered as consent. Confidentiality of the data was maintained as no name of any student or identity was used in the study.

Data was collected using a 19 item, structured self completion questionnaire administered to all the radiography students during their clinical phase of training in these institutions. A total of three hundred and fifty

(350) questionnaires were distributed and Two hundred and twenty (220) were filled out and returned giving a response rate of 62.9%. The questionnaire was validated by a pilot study and by the project supervisor before venturing to the field to collect the data, and reliability test of the questionnaires indicated that Cronhba's alpha was 0.76, making them reliable for the study.

Data was analyzed using statistical package for social sciences (SPSS) version 16.0; descriptive statistics was used for the analysis.

Result

Table 1: Demographic Characteristics Of The Respondents

AGE GROUP (YEARS)	FREQUENCY	PERCENTAGE (%)
18-23	89	40.5
24-29	79	35.9
30-35	23	10.5
36 and above	29	13.2
TOTAL	220	100
SEX	FREQUENCY	PERCENTAGE (%)
MALE	129	58.6
FEMALE	91	41.4
TOTAL	220	100
LEVEL OF STUDY	FREQUENCY	PERCENTAGE (%)
300	110	50.0
400	52	23.6
500	58	26.4
TOTAL	220	100
INSTITUTION OF TRAINING		
INSTITUTION	FREQUENCY	PERCENTAGE (%)
BUK	106	48.2
UNIMAID	114	51.8
TOTAL	220	100

Table 2: Knowledge Of Universal Precaution

Awareness of universal precaution?	YES		NO		TOTAL
Frequency	212		8		220
Percentage (%)	96.4		3.6		100
Source of information	CLASS	COLLEAGUES	INTERNET	OTHERS	TOTAL
Frequency	197	13	10	0	220
Percentage (%)	89.5	5.9	4.5	0	100
Period of information	PRECLINICAL	300Level	400 Level	500 Level	TOTAL
Frequency	179	31	4	6	220
Percentage (%)	81.4	14.1	1.8	2.7	100
Have knowledge of nosocomial infection?	YES		NO		TOTAL
Frequency	212		8		220
Percentage (%)	96.4		3.6		100
Knew about its mode of transmission	YES		NO		TOTAL
Frequency	211		9		220
Percentage (%)	95.9		4.1		100
Knew what universal precaution is meant for?	AGREED	DISAGREED	NO IDEA		TOTAL
Frequency	205	5	10		220
Percentage (%)	93.2	2.3	4.5		100
All patients treated as potential reservoir of pathogens.		YES	NO		TOTAL
Frequency		185	35		220
Percentages (%)		84.1	15.9		100
X-ray equipment as reservoir of pathogens		YES	NO		TOTAL
Frequency		211	9		220
Percentage (%)		95.5	4.1		100

Table 3: Practice Of Universal Precaution

Practicing of hand washing in between patients.	YES		NO	TOTAL
Frequency	127		93	220
Percentage (%)	57.7		42.3	100
Changing of gloves in-between patients.	YES		NO	TOTAL
Frequency	128		92	220
Percentage (%)	58.2		41.8	100
Cleaning of x-ray equipment and its accessories with?	CHEMICAL DISINFECTANTS		WATER	TOTAL
Frequency	218		2	220
Percentage (%)	99.1		0.9	100
Practice of universal precaution is good for your health and that of your patients?	AGREED	DISAGREED	NO IDEA	TOTAL
Frequency	216	1	3	220
Percentage (%)	98.2	0.5	1.4	100
Willing to practice universal precaution after graduation?	YES		NO	TOTAL
Frequency	210		10	220
Percentage (%)	95.5		4.5	100

Table4: Factors Affecting Compliance To The Practice Of Universal Precaution

Provision of protective equipments by the management?	YES	NO	TOTAL
Frequency	134	86	220
Percentage (%)	60.9	39.1	100
Availability of the protective articles to the students by their clinical supervisors?	YES	NO	TOTAL
Frequency	133	87	220
Percentage (%)	60.5	39.5	100

Out of the 350 questionnaires distributed, 220 (62.9%) were filled out and returned. A total of 106 (48.2%) participants were from Bayero University, Kano and 114 (51.8%) participants were from University of Maiduguri. There ages ranged from 18 – 36years and above. About 129 (58.6%) were males and 91 (41.4%) females. A total of 89 (40.5%) participants were within the ages of 18-23 years, 79 (35.9%) were within the ages of 24-29 years, and 29 (13.2%) were 36 years and above. The respondents were in the following level of studies; 300 level, 110 (50%), 400 level, 52 (23.6%) and 500 level, 58 (26.4%) as shown in table 1.

The study found majority of the participants have good knowledge of universal precaution with 212 (96.4%), while 197 (89.5%) knew about it through the class room lectures and 13 (5.9%) knew about it through friends and colleagues and 10 (4.5%) learnt about it through the internet. Majority of the respondents 205 (93.2%) knew that universal precaution is meant to protect them from nosocomial infections, and about 5 (2.3%) did not know, while 10 (4.5%) had no idea about it. About 185 (84.1%) treat all patients as potential carriers of infection in the department while 35 (15.9%) did not. Majority of the respondent 211 (95.9%) were aware that x-ray equipment and accessories were possible reservoirs of infections, while 9 (4.1%) did not know, as shown in table 2.

About 127 (57.7%) of the participants washed their hands before and after attending to each patient, while 93 (42.3%) of respondents do not practice hand washing techniques in between patients. A significant majority of the participant 218 (99.1%) use chemical disinfectants to clean x-ray equipment and accessories when soiled with patients blood and body fluids. About 216 (98.2%) participants agreed that practice of universal precaution benefits both the healthcare giver and the patient, while 3 (1.4%) had no idea, as seen in table 3.

A significant number 134 (60.9%) of the participants agreed that personnel protective articles and clean water sink were provided in the radiology department, while 86 (39.1%) disagreed that such were not readily provided. About 33 (60.5%) of the participants agreed that their clinical supervisors do provide them with personnel protective devices during procedures in which they might be at risk of coming in contact with blood and body fluids of patients while 87 (39.5%) of the respondents disagreed as shown in table 4.

Discussion

Universal precautions are designed to reduce the risk of acquiring occupational infection from both known and unexpected sources in the healthcare setting. Strict adherence by healthcare personnel and students, to universal precautions may prevent the risks of contracting nosocomial infections. Universal precautions recommend that all patients should be regarded and treated as potential carriers of infections irrespective of their presumed health status or state of health [10].

A total of 220 respondents participated in the study, more than half of them were males 129 (58.6%) and 91 (41.4%) were females. This signifies that more of the clinical radiography students in northern Nigerian Universities were males. This concurs with the findings of Luntsi et al [10], who found more than half of their respondents 40 (63.5%) were males among radiology staff in northern Nigeria. This could be due to the perceived fear of effects of ionizing radiation amongst the females within our locality, as most female students preferred to join the Nursing Sciences, Medical Laboratory Science, Physiotherapy, Medicine and Dental Surgery programs, as was the case in the 2014/2015 admissions by Unified Tertiary Matriculation Examination (UTME) into the College of Medical Sciences in University of Maiduguri.

The results of the study also showed that majority of the respondents had good knowledge of universal precautions 212 (96.4%). This is in agreement with the findings of Okaro et al [11], Jayasinghe et al[12] and Luntsi et al [10]. This did not however agree with the findings of Motamed et al [9], Van der Berg et al [5], Chan et al [13] and Omiepirisa et al[14], who found that knowledge and understanding of universal precautions among health care workers in general is poor. This difference may be due to the studied population, nature of environment and it

could also be as the result of the recent out brake of the dreaded Ebola virus in this part of the world that lead to availability of information on both the electronic and print media and even in the class rooms on how to protect from contracting nosocomial infections.

The source of knowledge may help to determine the level of knowledge one may have about universal precautions. Formal training in class is much better because opportunities are given for students to ask questions on grey areas and in turn gets answers to their questions, about 197 (89.5%) got their awareness through formal classroom lectures and seminars. This is similar to the findings of Tavolacci et al [15] and Okaro et al [11] in which (92%) and (58.3%) of their participants had formal training in class and through seminar/symposium as their main source of information respectively. This findings were however higher compared to those of Bello, et al [16], and Petrit et al [17], in with only (36%) and (41%) respectively. Factors like the sample size, location of study might be responsible for the variations. This could be because much light is shade on universal precautions in the classroom setting; seminars and symposium nowadays probably due to scourge of some infectious diseases that are common nowadays even among health care providers like the dreaded Ebola virus, hepatitis A, B, C viruses, HIV/AIDS among others. Early exposure of the students to the concept and practice of universal precautions will not only help in preventing the spread of nosocomial infections among them, but also serve as a safety precaution during their training years and as practice guidelines in the future. Hospitals provide a favorable transmission pathway for the spread of nosocomial infections, owing partly to poor infection control practices among health care workers on one hand and overcrowding of patients in most clinical settings on the other. The spread of infection serves as a major source of worry for managers in health care practice, particularly in developing countries where the health care system is already overstretched Petrit et al [17].

Majority of the respondents 205 (93.2%) knew what universal precaution is meant for, and 185 (84.1%) agreed that all patients should be treated as potential reservoir of pathogens. This is in agreement with the findings of Jayasinghe et al [12], Luntsi et al [10], and Motamed et al [9], who proposed universal precautions for all patients irrespective of their infection status. These findings conflicts with the study by Young et al [18], who found that nurses did not always use adequate protection if they thought a patient was HIV negative or if they did not know the patient's HIV status.

Most participants 211 (95.9%) agreed that x-ray equipment and accessories could be a reservoir of pathogens. This agrees with the findings of Ochie et al [8], Fox et al[19] and Tugwell et al [4]. X-ray equipment and accessories like couches, chest stands, control panel, exposure buttons, cassettes, anatomic maker, cassette stands, positioning aids and used patient gowns have been found to act as reservoir of pathogens, it is recommended that all these equipment and accessories be disinfected daily and between patients to avoid nosocomial infections.

On the practice of universal precautions among the respondents, it was observed that radiography students rarely wash their hands in between patients during radiography procedures 93 (42.3%) and 92 (41.8%) did not change their gloves in between patients. It might take only a single exposure to acquire nosocomial infections. Clinical instructors, lecturers and student supervisors need to pay more attention in ensuring strict adherence to universal precautions among students on clinical posting. This is similar to the finding of Okaro et al [11], Sadoh et al [20], and Luntsi,et al[10], who found that many

radiographers do not clean couches, cassettes and wash hands after every patients and that the alleged knowledge of universal precautions did not match the practice among radiographers.

This study found only 127 (57.7%) practice hand washing; this could be because of inadequate provision of water, sink, wash hand basins, disinfectants among others. This is in agreement to the findings in a study by Luntsi et al [10], who found that poor practice of universal precautions among radiology staff which be attributed to lack of appropriate facilities for such purposes. Several studies have shown that students and health care personnel practiced poor infection control by hand washing Basurrah and Madani [21], and Azzam and Sajad [1] found poor hand hygiene by students and health care personnels.

On the factors contributing to poor practice or non-compliance of the respondents to universal precautions, findings revealed that the management and clinical supervisors do provide personal protective equipment (PPE) such as hand gloves, aprons were provided by the management and clinical supervisors to students 134 (60.9%). This is in contrast with the findings of Luntsi et al [10], who found managements' laxity in the provision of PPE as the reason why radiology staff do not practice universal precautions in northern Nigeria. This poor practice of universal precautions recorded among clinical radiography students could be as a result of the students' inadequate knowledge on the efficacy of universal precautions or their presumed loss of dexterity while positioning patients with protective gloves or the clinical supervisors' laxity in provision of PPE to radiography students while on clinical posting. This is similar to the findings of Vaz et al [2]. It is the duty and responsibility of the employer to provide personnel protective equipment and the appropriate training for the correct use. Non-compliance among health care workers could be due to perceived increase in workload, time wastage by continually repeating the cleaning and washing/changing of hand gloves, making it seemingly difficult to accommodate this in the day to day work schedules.

Conclusion

The study found that radiography students in their clinical phase of training have good knowledge of universal precaution, though this did not actually match the level of practice. This could be attributed to the students' inadequate knowledge of the efficacy of universal precautions or their presumed loss of dexterity with gloved hands or the clinical supervisors' laxity in provision of personnel protective equipment. However, much needs to be done on enforcing the practice of universal precautions amongst radiography students while on clinical posting.

Limitation of the study

This study focused on the practice of universal precautions among radiography students in their clinical phase of study, and covered only two institutions that run radiography programmes in Nigeria, this limited our sample size.

Recommendations

We recommend a similar studies focusing on all the medical students at their clinical phase of training and among more institutions in Nigeria to generate sufficient data.

We also recommend that the hospital management should regularly make available personnel protective equipment and clinical instructors and supervisors should make them available to student when on clinical posting and strict enforcement should be followed up and defaulters penalized

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