Knowledge and Awareness of the Preventive Measures of Nosocomial Infections among Clinical Physiotherapy Students in Northern Nigeria

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Abstract

Nosocomial infections form a major worldwide public health problem despite advances the understanding of infections. This study was aimed to determine the level of knowledge and awareness of the preventive measures of nosocomial infections among clinical physiotherapy students in northern Nigeria. The study was a cross-sectional survey with a total sample size of 75 students, recruited using convenience sampling technique. The participants were clinical physiotherapy students of Bayero University, Kano in Kano State (n = 60) and University of Maiduguri in Borno State (n = 15). The instruments that were usad for this study included a research proforma, a modified hospital-acquired infection knowledge questionnaire and a modified hand hygiene questiounaire. Deseriptive statistics of mean, standard deviation, percentage and frequency were used to summarise the data. Inferential statistic of Mann-Whitney U test was used to determine mean differences in knowledge based on gender of the participants at a probability level of 0.05. There was no significant gender difference based on knowledge and awareness of the preventive measures of nosocomial infections (U = 1.664; p = 0.096). There was no significant difference between the level of clinical physiotherapy students and the preventive measures of nosocomial infections (U = -1.067; p = 0.286). There was higher level of awareness of nosocomial infections than knowledge of the preventive measures of nosocomial infections among the clinical physiotherapy students in northern Nigeria. It was concluded that majority of the clinical physiotherapy students in northern Nigeria were aware of nosocomial infections. However, they are lacking in adequate knowledge of the preventive measures of such infections.

Keywords: *Nosocomial Infection; Clinical Physiotherapy Students; Preventive Measures.*

Introduction

Nosocomial Infection (NI) is an infection that was not present or incubating prior to the patient's being admitted to the hospital, but occurring seventy-two (72) hours after admittance to the hospital (Custodio, 2014). A rough estimate of 1.7 million hospital-

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associated infections, from all types of bacteria carried out by the Centers for Disease Control and Prevention (CDC) revealed that NI causes or contributes to 99,000 deaths yearly. Developing countries are up to 20 times at risk of contracting nosocomial infections compared to developed countries (World Health Organization [WHO], 2009).

Hospitals provide a favourable pathway for transmission of infections partly due to the poor infection control practices among healthcare workers on one hand and overcrowding of patients in most clinical settings on the other (Samuel, Kayode & Musa, 2009). NI is contracted from the environment or staff of a health care facility. It can be spread from the hospital environment, nursing home environment, rehabilitation facility or other clinical settings (Ducel, Fabry & Nicholle, 2002). It is spread to the susceptible patient through a number of means. It can be interspersed between patient and staff, in addition to contaminated equipment, bed linens or air droplets (Custodio, 2014). In some cases, the cause of the infection is not known, but sometimes, the microorganism originates from the patient's own skin microbiota, providing opportunity for infection after surgery or other procedure that compromises the protective skin barrier. Though the source of the infection is the patient's own skin, it is considered nosocomial since it develops in the healthcare setting (Custodio, 2014). Nosocomial Infections, also known as Hospital-Acquired Infections (HAIs) are caused by bacteria, virus, fungi or other pathogens. The commonly encountered infections are blood stream infections, pneumonia, urinary tract infection, burns and surgical site infection as well as skin infections (Custodio, 2014). According to Robert (2001), acquiring nosocomial infection can prolong duration of hospitalisation, increase the cost of healthcare and place a serious economic burden on patients and their families.

Prevention of nosocomial infection is a multidisciplinary approach and evidence-based management can be a feasible approach. It is also the responsibility of all individuals and services providing healthcare. Everyone must work cooperatively to reduce the risk of infection for patient and staff (Ducel, Fabry & Nicholle, 2002). Many programmes and committees have been developed for infection control in hospitals (WHO, 2002). Thorough hand washing and/or use of alcohol rubs by all medical personnel before and after each patient contact is one of the most effective ways to combat nosocomial infections (McBryde, Bradley, Whitby & McElwain, 2004).

Clinical physiotherapy students are the same everywhere and have direct contact with patients in the hospitals and clinics, and thus they may encounter similar problems. Majority of the studies documented (Biberaj, Gega & Bimi, 2014; Bello, Asiedu, Adegoke, Quartey, Appiah-knbi & Owusu-Ansa, 2011; du Pessis & Monkoe, 2010; Tavolacci, 2008) were carried out on other clinical students across the globe, but none was conducted on clinical physiotherapy students.

Clinical physiotherapy students are exposed to the hospital environment and patient care as soon as they come to the clinical section of their training programme without any formal training or teaching on nosocomial infections and the preventive measures to be taken in order to protect themselves, the patients and other healthcare workers, thereby becoming at risk of contracting HAIs. This study therefore intends to find out

the level of knowledge and awareness of clinical physiotherapy students about Nl and its protective measures.

Methods

A cross sectional survey research design was employed using convenience sampling technique. The population for the study were all clinical physiotherapy students of the Faculty of Allied Health Sciences, College of Health Sciences of Bayero University, Kano in Kano State and those of the Faculty of Allied Health Sciences, College of Medical Sciences, University of Maiduguri in Borno State. The sample size for the study was eighty-four (84) which comprises all clinical physiotherapy students of both universities. The instruments used for this study were a research proforma, modified hospital-acquired knowledge questionnaire and modified hand hygiene questionnaire. Ethical approval was sought and obtained from the Ethical Committee of Aminu Kano Teaching Hospital prior to the commencement of the study with an ID number REC/21108/2008/AKTH/EC/1714. The students were briefed on the nature and importance of the research and the purpose of the study via an information sheet with an informed consent form before administration of questionnaires. The questionnaires were distributed to those who signed the consent form and agreed to participate. The distribution of the questionnaires was done by the researcher during lecture hours, and the students filled out the questionnaires and returned on the spot.

Description of questionnaire

Section A of the questionnaire examined the demographics of the respondents (age, gender and current academic level). Section B consists of six questions on knowledge and awareness on nosocomial infections. Section C comprises nine items (questions) on hand hygiene. Data collected was analysed using descriptive and inferential statistics. Descriptive statistics of mean, standard deviation, percentage and frequency were used to summarise the data. Inferential statistic of Mann-Whitney U test was used to determine mean differences in the awareness and knowledge of the preventive measures based on the gender and current academic level of the students at a probability level of $p = 0.05$. The Statistical Package for the Social Sciences (SPSS) version 20 was used for data analysis.

Results

Seventy five (75) clinical physiotherapy students from Bayero University, Kano (BUK) and University of Maiduguri (UNIMAID), Borno with a mean age of 24.24 years±3.448 participated in the study out of a total number of 84 clinical physiotherapy students in both universities. 60 (80%) students were from BUK while 15 (20%) were from UNIMAID. A greater proportion of the students (73.3%) were males while few (23.7%) were females. The result also showed that 500 level students (5^{th} year) make up 64% of the study population while 36% constitutes the 400 level students (4^{th} year).

Figure 1 indicates that majority (90.7%) of participants were aware of nosocomial infections. However, most of them (75%) did not have knowledge of the preventive measures of the infections as shown in Figure 2. Formal training is the main source of information for the students (73.3%) and 14.7% through informal learning. Less than

half of the students (41.3%) claim to acquire their knowledge of nosocomial infection while they were in level 400 (4th year) whereas 34.7% acquired theirs from level 500 (5th year). The result also showed that 21.3% of the students had compulsory orientation/induction training or lecture on infection control while the majority (78.7%) had no compulsory orientation/induction training or lecture on infection control. It also revealed that a majority of the students had moderate knowledge of nosocomial infection based on low, moderate and high criteria.

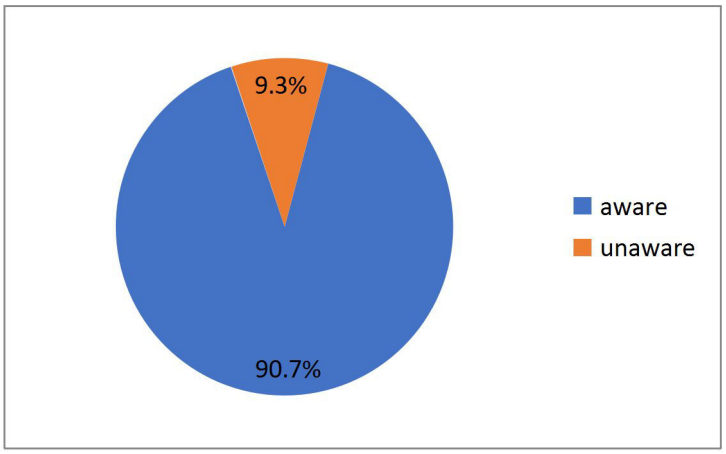

Figure 1: *Awareness of nosocomial infection*

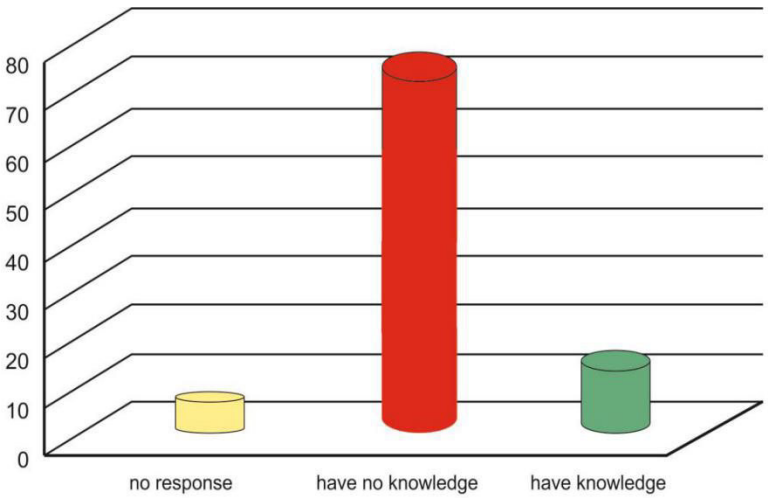

Figure 2: *Knowledge of preventive measures of nosocomial infections*

Table 1 indicates the percentage of students who had awareness of the presence of hand hygiene protocol in the hospital they were trained. The table also shows that 50.4% had high level of compliance to the hand hygiene protocol. It was also observed that 41.3% of the students forget to wash their hands when they should. Table 2 reveals that the most common hand hygiene methods that were effective in killing bacteria, as observed

by the students, were antimicrobials (70.7%). It can also be noted from Table 2 that majority (38%) of the students more frequently used soap and water to disinfect their hands.

Table 1: *Awareness of hand hygiene protocol, compliance level and hand disinfection*

Variable		**n**	**%**
HHP	Yes	70	93.3
	No	5	6.7
Compliance	Never	5	6.7
	1-10%	32	42.7
	11-40%	38	50.7
HD	Too busy	10	13.3
	Forget	31	41.3
	Unsure of need	7	9.4
	ILP	15	20
	Others	12	16
Bacteria	Antimicrobials	53	70.7
	Hand washing	15	21.3
	Others	6	8.0
	Total	75	100.0

HHP = hand hygiene protocol, HD = hand disinfection, ILP = inconvenient location of products

Table 2: *Frequency of hand disinfection materials used*

	n	**%**
Soap and water	38	50.7
Alcohol gel and foam	13	17.3
Both	14	18.7
Neither	10	13.3
Total	75	100

Majority of the students were somewhat satisfied in both practice and hygiene materials in their various training departments as shown in Table 3. Table 4 shows that there was no significant gender difference based on awareness and knowledge ($p > 0.05$) and also there was no significant difference between the levels of clinical physiotherapy students (year) and the preventive measures of nosocomial infections.

Table 3: *Practice and material satisfaction*

Variables	n	%
Practice satisfaction		
Dissatisfied	2	2.6
Somewhat satisfied	30	40.0
Satisfied	14	18.7
Neutral	29	38.7
Total	75	100.0
Material satisfaction		
Dissatisfied	2	2.6
Somewhat satisfied	35	46.7
Satisfied	15	20.0
Neutral	23	30.7
Total	75	100.0

Table 4: *Gender difference in awareness and knowledge*

Gender	Mean rank	Z	*p*
Awareness			
Male	39.27	1.664	0.096
Female	34.50		
Knowledge			
Male	38.34	-0.304	0.761
Female	37.08		
Preventive Measures			
400	41.31	-1.067	0.286
500	36.14		

Discussion

Awareness and adequate knowledge of nosocomial infections and their preventive measures are essential requirements for all health care students and workers because exposure to infections is one of the frequently encountered occupational hazards and in recent years, with antibiotic resistance becoming a worldwide major problem. This study determined the level of awareness and knowledge of the preventive measures of nosocomial infections among clinical physiotherapy students in Northern Nigeria. The study revealed that, although there was high (90.7%) level of awareness of nosocomial infections, knowledge on the preventive measures was not satisfactory (16%). This is in agreement with a study carried out by Biberaj, Gega and Bimi (2014) in which medical students had the highest mean score for the infections and standard precautions domain whereas physiotherapy students had the highest score on the hand hygiene domain but recorded the lowest score for the nosocomial infection domain. Majority of the clinical physiotherapy students reported no compulsory orientation or induction training/lecture on infection control; this might be a valid reason for the finding.

Formal training (73.3%) in class was shown to be the main source of information influencing students' awareness about nosocomial infections. This proportion contrasted with that obtained in a study by Biberaj, Gega and Bimi (2014) in which 41% of the students cited formal training as their main source of information. In contrast, a study (Wiwanitkhit, 2002) revealed 92% of sampled students citing formal training as

their main source of information. The latter study involved a much larger number of students who were also from various health care departments. Also, the study location might have influenced the differences in outcomes of the studies. However, the highest reference made to formal training sufficiently suggests a more theoretical approach to campaign about nosocomial infections. The study indicates that many of the students had awareness of the presence of hand hygiene protocol in the hospital they were trained and showed high (50.4%) level of compliance to the protocol. On the other hand, students generally did not rate their compliance at high level in a study by Kermode *et al*. (2012) which may suggest a more socially acceptable response on their side. It was also observed that majority (41.3%) of the students forgot to wash their hands followed by 20% in which hand hygiene products were not in convenient location. The students preferred the use of antimicrobials (antiseptics, sanitizers, disinfectants) for effective killing of bacteria but most frequently used soap and water for this purpose. This may be associated with availability problem and/or inadequate knowledge on the use of antimicrobials even if available.

A very strong relationship was reported by students based on good hand hygiene practices and prevention of hospital-acquired infections. This is in agreement with a similar study but compliance was the major problem especially among the physiotherapists and radiographers who contributed the least of the overall hand hygiene compliance rate (DuPlessis & Monroe, 2010).

The mean rank for the preventive measures of nosocomial infections was a bit higher for level 400 students which may be due to habituation on the 500 level students' side, though the difference was not much of statistical significance. This also suggests reduction in level of compliance as physiotherapists get used to the clinical setting, which can create room for further research. There was no significant gender difference observed in both knowledge and awareness of nosocomial infections.

Conclusion

It was concluded that the majority of the clinical physiotherapy students in northern Nigeria were aware of nosocomial infections. However, they were lacking adequate knowledge of preventive measures of the infections. Thus, physiotherapy students should be equipped with adequate knowledge of basic infection control principles before going into clinical postings in hospitals.

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