Int.JMed.Pharm.Res.(P-ISSN:2958-3675|E-ISSN:2958-3683)
Availableon:https://ijmpr.in/

InternationalJournal
of Medical and PharmaceuticalResearch

ORGINALARTICLE **OPENACCESS**

Impact of Training Programs on Awareness of Nursing Students Regarding Nosocomial Infections, Standard Precautions & Hand Hygiene

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OPENACCESS

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Received:01-06-2024
Accepted:21-08-2024
Available online:23-08-2024

A B S T R AC T

Background: Nursing and midwifery workforce accounts for nearly 50% of the global health workforce. Nurses play a critical role in health promotion, disease preventionand primary care. Unfortunately, few studies on the training and adherence of health personnel to hygiene recommendations have been done, despite the obvious implications forpatientsafety. ***Objectives***:Toassesstheknowledgeofnursingstudents regarding nosocomial infections, standard precautions and hand hygiene & thenconduct training & assess the effectiveness of the intervention. ***Materials & Methods****:* A cross-sectional cum interventional study with 92 nursing students were targeted for lecture on nosocomial infections, standard precautions, and hand hygiene based on the CDC and WHO guidelines. Infection Control Standardized Questionnaire ICSQwas administered as a pre and post-test. ***Results***: Pretest score mean = 35.8 with SD = 3.95, Post test score mean = 41.52 with SD = 6.28. On applying paired T test there was statistically significant difference in pretest and post test score with p value = 0.04, t value = 8.169. ***Conclusion***: There was significant increase in knowledge of students as a result of the intervention lecture hence repeated sessions of such trainings can help in reduction of nosocomial infections which will improve the overall quality of patient health care
Keywords:Nurses,HandHygiene,Nosocomialinfection,Standardprecautions.

INTRODUCTION

Health care-associated infection (HCAI) – also referred to as nosocomial infection – is defined as “an infection occurring in a patient during the process of care in a hospital or other health-care facility that was not present or incubating at the time of admission. This also includes infections acquired in the hospital but appearing after discharge, and occupational infections among staff of the facility”. From the definition it is clearly understandable that the occurrence ofthisinfectionis linked to health-care deliveryand that it mayresult, althoughnot always, as a consequence of the failure of health-care systems and processes as well as of human behaviour. Therefore, it represents a significant patient safety problem [1].

Overall estimates indicate that more than 1.4 million patients worldwide in developed and developing countries are affected at any time [2]. A large cohort multicentric international study has reported at least one ICU acquired infection in 18.9% of patients, with an incidence ranging from 2.3% to 49.2% across the centers [3]. The magnitude of this problems in a developing country like India is even more serious since there is no available established statistics. A studyconducted in the ICU of a tertiarycare centre in Karnataka showed the incidence of HCAI as 17.7% [4]. In a study conducted at a surgical unit of a tertiary care hospital in Nanded district of Maharashtra the prevalence of HCAI was found to be 6.01% [5]. Similar studies conducted in ICUs of tertiary care centres in Goa and Eastern India showed the

incidence of HCAI as 16% & 11.8% respectively [6, 7].

Nurses play a critical role in health promotion, disease prevention and delivering primary and community care [8]. Because they spend more time with patients than any other HCWs, their compliance with hand washing guidelines seems to be more vital in preventing the disease transmission among patients[9]. Therefore, it is vital to sensitize the regarding nosocomial infections and the measures that can be taken in the form of basic things like standard precautions and hand hygiene to prevent them.

MATERIALS&METHODS

This was a cross-sectional cum interventional, questionnaire based, single centre study carried out at a tertiary care medical college of India. Ethical approval was obtained before commencing the study, and a total of 92 students participated using complete enumeration sampling. Prior to the study, students were briefed about the procedures, privacy, confidentiality, and voluntary nature of participation, and written informed consent was obtained.Students who were not present at the time of the training session were excluded from the study. For our study a semi-structured self-administered questionnaire with two parts was distributed to the students before and after a training session. Questionnaire included the socio-demographic informationof each participantand Infection Control Standardized Questionnaire (ICSQ), (Figure 1) with Cronbach α test (internal consistency coefficient) value of 0.61 [10, 11], which consisted of questions in the following three main domains, with 25 close-ended questions: Nosocomial infection (5), Standard precautions (12) and Hand hygiene (8). Responses were scored as Correct = 2, Don't know = 1, Incorrect = 0, with a maximum score of 50for this questionnaire.As training session, a brief didactic session covering the key concepts ofnosocomialinfections,universalstandardprecautions,andhandwashingbasedonCDC[12]andWHOguidelines [13]wastakenforthefirst-yearnursingstudents.

Data was entered into Microsoft Excel and analyzed using SPSS (Statistical Package for Social Sciences)version 22. Descriptive statistics were expressed in proportions and non-parametric tests were used to assess the statistical significance of differences between pre and post-test scores.

A. General Information

1. Name (Optional): _____
2. Gender: O Male O Female
3. Age: ____
4. Course (please tick): O Medical O Dental O Nursing
5. Class (please tick): O 1st Year O 2nd Year O 3rd Year O 4th Year O Intern

B. The Infection Control Standardized Questionnaire

1. Nosocomial infection	YES	NO
A. The environment (air, water, inert surfaces) is the major source of bacteria responsible for nosocomial infection.		✔
B. Advanced age or very young age increases the risk of nosocomial infection.	✔	
C. Invasive procedures increase the risk of nosocomial infection.	✔	
D. Nosocomial infection has a prevalence of 10%-20% in India.	✔	
E. More than 1.4 million people all over world are suffering from nosocomial infections.	✔	

2. Precaution standards	YES	NO
A. Include the recommendations to protect only the patients.		✔
B. Include the recommendations to protect the patients and the healthcare workers.	✔	
C. Apply for all the patients.	✔	
D. Apply for only healthcare workers who have contact with body fluid.		✔

3. When is hand hygiene recommended?	YES	NO
A. Before or after a contact with (or care of) a patient.		✔
B. Before and after a contact with (or care of) a patient.	✔	
C. Between patient contacts.	✔	
D. After the removal of gloves.	✔	

4. The standard precautions recommend use of gloves	YES	NO
A. For each procedure.		✔
B. When there is a risk of contact with the blood or body fluid.	✔	
C. When there is a risk of a cut.	✔	
D. When healthcare workers have a cutaneous lesion.	✔	

5. When there is a risk of splashes or spray of blood and body fluids, the healthcare workers must wear	YES	NO
A. Only mask.		✔
B. Only eye protection.		✔
C. Only a gown.		✔
D. Mask, goggles, and gown.	✔	

6. What are the indications for the use of alcohol-based hand rub (on unsoiled hands)?	YES	NO
A. Instead of a traditional hand washing (30 s).	✔	
B. Instead of an antiseptic hand washing (30 s).	✔	
C. Instead of surgical hand washing (3 min).	✔	
D. A traditional hand washing must be done before hand washing with alcohol-based hand rub.		✔

Figure1:InfectionControlStandardizedQuestionnaire(ICSQ)

RESULTS

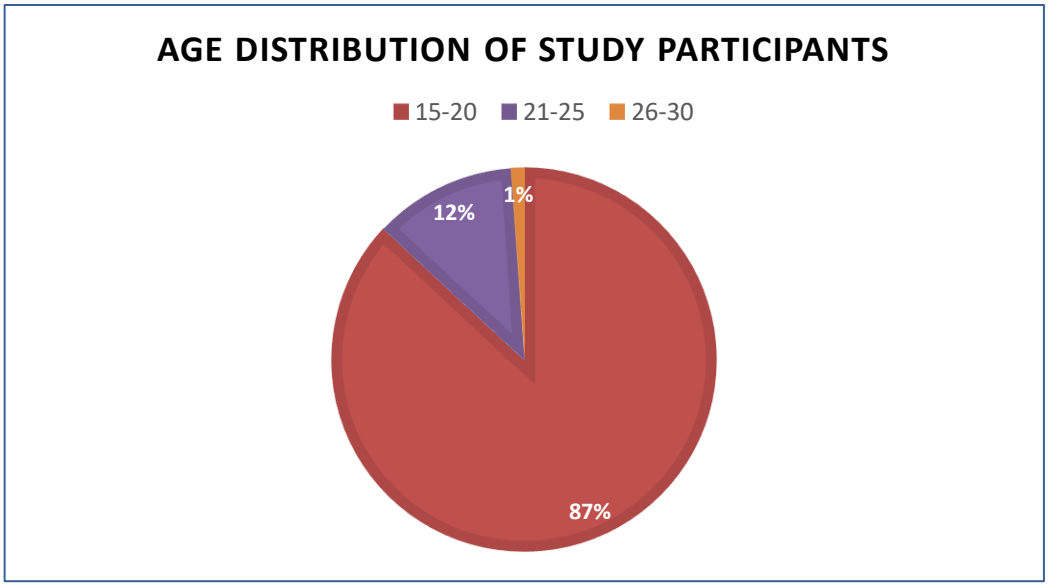

Figure2:Socio-demographicProfileofStudyParticipants

In Figure 2, we present the socio-demographic profile of the study participants.Among the 92 participants, the majority fell into the 15 to 20 years age group, with a mean age of 19.38 years. Notably, all participants were female nursing students.

Table1:PairedTTest

	Pre-testMean	Post-testMean	MeanDifference	SD	T value	P value
NosocomialInfections	6.06	6.152	-0.87	1.92	-0.43	0.66
StandardPrecautions	19.63	18.19	1.43	4.22	3.26	**0.002**
HandHygiene	10.11	10.26	-0.15	3.22	-0.45	0.65
Total Score	35.8	34.6	1.19	5.56	2.06	**0.04**

The paired-samples t-test conducted to assess the impact of educational and training programs on nursing students' knowledge showed a significant difference between pretest (M = 35.8) and post-test (M = 34.6) scores, with a mean difference of 1.19, standard deviation (SD) of 5.56, t value of 2.06, and p value ≤ 0.005. This indicates astatistically significant impact of the training sessions on increasing awareness among nursing students regarding nosocomial infections, standard precautions, and hand hygiene.

DISCUSSION

Our study demonstrated a significant impact of training sessions on increasing awareness among nursing students regarding nosocomial infections, standard precautions, and hand hygiene. This finding is consistent with previous studies.For example, Goyal M *et al*., reported a significant 15.12% increase in knowledge status among BSc Nursing students following a training session(11). Similarly, Ali Qasim *et al*., observed a substantial improvement in knowledgeandawarenessamongnursesregardingnosocomialinfectionspost-training[14].Additionally,JissirS*etal*.,'s study revealed statistical differences in nurses' knowledge about nosocomial infections before and after participating in a training program [15].

These collective findings highlight the effectiveness of training sessions in enhancing awareness and knowledge among healthcare professionals regarding infection control measures.But despite the fact that nurses are well-versed in the principles of hand hygiene and express willingness to implement them (as reported by up to 94% of nurses), only52% perform the technique correctly, and sometimes even fewer. It is crucial for nurses to adhere to proper techniques and performhand hygiene correctly.Otherwise, there isa riskofincreased incidence ofnosocomialinfections,leadingto potential complications [16].

CONCLUSION

The study revealed a notable impact only on the understanding of standard precautions, while no significant change was observed in knowledge related to nosocomial infections and hand hygiene. This suggests that relying solely onlecturesmaynotbesufficient,indicatingthenecessityforamorehands-onapproach.Theoverallscoreshowed

statistical significance, indicating a significant positive impact of these training sessions on the awareness of nursing students regarding nosocomial infections, standard precautions, and hand hygiene. Repeated training sessions of this nature could contribute to reducing nosocomial infections, thereby enhancing the overall quality of patient healthcare.

ConflictsofInterest: Theauthor(s)declare(s)thatthereisnoconflictofinterestregardingthe publication ofthispaper.

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