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Original Research Article

Assessment of knowledge, attitude and practice to promote hand hygiene among undergraduate medical and nursing students in a teaching hospital

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ABSTRACT

Background: A considerable number of epidemiological evidences proved that efficient hand hygiene practices has reduced the risk of infection cross-transmission in hospital facilities. Despite the effortlessness and simplicity of the practice, compliance with hand hygiene among health care workers has been relatively very less. There is a significant lack of evidence regarding infection control training among undergraduate medical and nursing students, hence it becomes essential to re-examine the efficacy of our hand hygiene sessions and conduct programs, CMEs, workshops frequently to keep health care workers sensitized and oriented towards hand hygiene.

Materials and Methods: The present study was undertaken to assess the overall exposure of medical and nursing students towards basic hand hygiene practices through a knowledge, attitude and practice questionnaire based cross- sectional study. 100 medical and 100 nursing students were grouped into good, moderate and poor categories, based on scores from the questions testing the overall knowledge of hospital acquired infections, attitude towards hand hygiene and actual practice at the field level.

Result: The present study showed poor knowledge among medical and nursing students i.e 41% and 60% of the participants respectively. Nursing staff showed good attitude when compared to medical students (71% and 56%). Regardless of the knowledge, practice of hand hygiene was good in both the groups 59% of medical and 71% of nursing students. On the whole, in comparison nursing population displayed better results compared to undergraduate medical student population. Nevertheless, evidently showing unsatisfactory results among both the study groups in the grounds of knowledge.

Conclusion: Therefore, the study concludes that knowledge and exposure to hand hygiene practices should be improved in undergraduate curriculum for both medical and nursing students which provides an opportunity to correct the bed side hygiene practices of the future health care providers at the foundation level.

1. Introduction

Maintaining proper hand hygiene is an easy, crucial, and economical way to stop the spread of antibiotic resistance and health care-associated illnesses (HAIs)[1,2] WHO launched the "SAVE LIVES: CLEAN YOUR HANDS" campaign, which suggests using the "My Five Moments for Hand Hygiene" method to guard against the transmission of hospital infections among patients and healthcare professionals.[1,2] This method encourages healthcare workers to wash their hands before handling patients, prior to aseptic operations, following contact with bodily fluids, following patient contact, and following contact with the patient's surroundings.[1,2] These days, one of the most important components of infection control efforts is hand hygiene. Ignaz P. Semmelweis, a Hungarian physician, first popularized the idea of hand hygiene in the

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middle of the 1800s. He noticed that postpartum fatalities decreased among women who cleansed their hands prior to childbirth. It has been determined after generations of research that Semmelweis was correct and that washing your hands can save lives.[3]

Health care professionals (HCPs) are focusing on the fundamentals of infection prevention by taking straightforward steps like hand cleanliness in the age of rising health care-associated illness rates, particularly from multi-drug resistant (MDR) bacteria. Hand cleanliness alone can dramatically lower the incidence of cross-transmission of infection at healthcare facilities (HCFs), according to substantial epidemiological evidence.[1,2,4,5]

Act of cleaning hands with water and detergent or using alcohol-based hand sanitizers to get rid of any lingering microorganisms is referred to as practicing hand hygiene.[6,7] Experts in quality improvement have proposed that multimodal strategies, such as protocols, training, routine observation, and feedback, are required to improve hand hygiene, despite the fact that numerous guidelines on the subject are advised.[8] The Hand Hygiene Liason Group recommends teaching medical students at the undergraduate level proper hand hygiene.[9] Health care workers' adherence to hand hygiene practices, despite its apparent simplicity, has been significantly lower, at approximately 39%.[2] With the global spread of COVID-19, hand hygiene is now a crucial aspect of our daily lives. Assessing the knowledge, attitudes, and practices of undergraduate medical students and offering positive role modeling at the undergraduate level is a good proposal, according to a comprehensive study that focused on MBBS students.[10] If infection control training is to be included in the curriculum of the majority of medical undergraduate courses, there is a dearth of evidence that should be taken into account.[11] Therefore, the present study was undertaken to assess the knowledge, awareness, and attitude of the medical students toward basic infection control practice of hand hygiene.

The objective of the study is providing an assessment of Knowledge, Attitude and Practice of standard hand hygiene measures among undergraduate Medical students and nursing staff in a tertiary care teaching hospital

2. Materials and Methods

2.1. Study design

Cross-sectional study.

2.2. Study period

The present study was done for a period of two months (August and September 2020) only after Institutional Ethical Committee approval.

2.3. Type of study

This was Knowledge, Attitude and Practice (KAP) questionnaire based, cross-sectional study carried out in the department of Microbiology in a tertiary care teaching hospital. Approval for the study was obtained prior from Institutional Ethical Committee.

2.4. Study population

The population was selected by the following inclusion and exclusion criteria mentioned below-

2.5. Inclusion criteria

100 undergraduate Medical students and 100 nurses from tertiary care teaching hospital were included in this study.

2.6. Exclusion criteria

Unwillingness to participate in the study.

2.7. Data collection

Verbal consent was taken into consideration for study participation after the researcher described the purpose of the investigation. Following an explanation of the study's objectives, each participant was given about thirty minutes to finish the KAP hand hygiene questionnaire. Three sections made up the questionnaire: Practice (P1-P5), Knowledge (K1-K10), and Attitude (A1-A5). The report concludes with a detailed discussion of the questionnaire.

2.8. Data analysis

One point was given for each accurate response to questions about knowledge, positive attitudes, and best practices under the scoring system. Negative attitudes, improper practices, and incorrect knowledge received zero points. Each participant's questionnaire was examined, and scores were assigned for knowledge (10 points), attitude (5 points), and practice (5 points) independently for each section. With some modification, the cutoff values for good, moderate, and poor knowledge, attitude, and practice levels are drawn from previously published studies.[10,11] Based on the scores received in each section, the knowledge, attitude, and practice of each individual participant were graded.

Grading of the section	Score for each section
Good	≥ 75%
Moderate	50% - 74%
Poor	< 50%

T-test was used to check for statistically significant differences between the two study groups namely medical and nursing students. A p value less than 0.05 was considered significant.

3. Observation & Results

A total of 200 participants consisting of 100 undergraduate Medical students and 100 nurses from teaching hospital were included in the present study. The level of knowledge, attitude and practice among the participants was analyzed by questionnaire provided to each candidate.

3.1. Knowledge on hand hygiene

A majority i.e 41% of medical students had poor knowledge whereas in case of nursing staff, knowledge level was poor for 60% participants. Medical students had better knowledge as compared to nursing students. The percentages of correct responses of the two groups to the individual questions on hand hygiene knowledge are given in Table 3. The main route of cross transmission of potentially harmful germs between patients in a health-care facility was not known to medical students as compared to nurses and the difference was statistically significant.

3.2. Attitudes to hand hygiene

Attitude was moderate for 56% of medical students while 71% nursing staff had good attitude towards hand hygiene. The percentages of correct responses of participants for both the groups for the questions on hand hygiene attitudes are given in Table 4.

3.3. Practice of hand hygiene

Practice of hand hygiene was good in nearly 59% medical students and 71% of nursing staff. The percentages of correct responses of participants for both the groups for the questions on hand hygiene practices are given in Table 1.

Table 1: Grading of knowledge, attitude and practice for medical students (n=100)

	Good	Moderate	Poor	Grading of variables
Knowledge	24%	35%	41%	Poor knowledge
Attitude	38%	56%	06%	Moderate attitude
Practice	59%	35%	06%	Good practice

Table 2: Grading of knowledge, attitude and practice for nursing staff (n=100)

	Good	Moderate	Poor	Grading of variables
Knowledge	04%	36%	60%	Poor
Attitude	71%	29%	0%	Good
Practice	71%	26%	03%	Good

4. Discussion

A total of 200 participants consisting of 100 undergraduate Medical students and 100 nurses from tertiary care teaching hospital were included in the present study. The current study reported that only 24% medical students and 4% nursing staff had good level of knowledge about hand hygiene. Majority of the participants in both the groups had poor knowledge on hand hygiene, which is a major negative finding. The main route of cross transmission of potentially harmful germs between patients in a health-care facility was not known to medical students as compared to nurses and the difference was statistically significant.

Increasing the level of hand hygiene knowledge among all healthcare workers is the first and most crucial step in controlling infections linked to healthcare; therefore, efforts must be focused in this direction. According to Suchitra et al., educational initiatives improved hand hygiene knowledge, attitudes, and practices across all HCW categories.[12] Many demographics' hand hygiene practices are influenced by psychology as well. Additionally, studies indicate that combining behavioral models with educational programs results in greater effectiveness.[13,14]

Unsatisfactory levels of knowledge in the present study may be due to occasional presence of study groups for the hand hygiene workshops. It seems that we need to re-examine the efficacy of our hand hygiene training sessions and conduct these programs frequently to keep the health care workers sensitized and oriented about hand hygiene. Students are bound to develop faulty hand hygiene practice if the curriculum was not enforced with hand hygiene concepts and skills. It has been previously recommended that the importance of hand hygiene must be taught to medical students since beginning and must be an integral part of their curriculum.[15,16] Researchers have suggested that appropriate hygiene behavior can be developed at the early years of medical education.[17,18] In a research study focusing on MBBS students, it noted that assessing the knowledge, attitude and practices of final year MBBS students and providing a positive role modeling at undergraduate level is a good initiative.[19] It is generally noted that nurses have greater opportunities to practice hand hygiene because they work longer shifts in the wards. The COVID-19 pandemic has brought attention to the importance of hand washing for both the general public and healthcare professionals. Public health messages have been disseminated via a variety of media, including print, radio, television, and social media. This could lead to a greater understanding of hand hygiene. Additionally, participants in the current study have good general knowledge or awareness regarding hand hygiene, but they are unable to specifically respond to a questionnaire that indicates a lack of scientific knowledge. Programs to encourage hand hygiene among healthcare workers (HCWs) should emphasize variables that have been shown to significantly impact behavior, using a

Table 3: Comparison of correct responses for knowledge of hand hygiene among undergraduate medical students and nursing staff (n=100)

Questionnaire - Knowledge	Medical Students (n=100)	Nursing Students (n=100)	p value	Significant or not
K1- What is the most common source of the microbes causing healthcare-associated infections? (Pre-existing germs on or in the patient)	21	24	0.554	Not significant
K2- Which of the following is the main route of cross transmission of potentially harmful germs between patients in a health-care facility? (Health-care workers' hands when not clean)	38	63	0.002	Significant
K3 –Hand hygiene refers to_____ (Hand washing using soap and water, Hand washing using alcohol hand rub Both)	82	78	0.535	Not significant
K4 - The benefit of using alcohol hand rubs: they dry quickly, are easier to use than sinks, and can be done more quickly than with conventional methods.	91	71	0.001	Significant
K5 - In which of the following situations should hand hygiene be performed? (Before having direct contact with a patient After contact with body fluids After having direct contact with a patient or with items in the immediate vicinity of the patient)	91	68	0.000	Significant
K6 - If your hands are not visibly soiled or visibly contaminated with blood or other material, which is most preferred way for preventing infection (Applying 1.5ml to 3 ml of alcohol-based hand rub to the hands and rubbing hands together until they feel dry)	56	71	0.062	Not significant
K7 - Which of the following hand hygiene actions prevents transmission of germs to the patient? (Before touching a patient Immediately before a clean/aseptic procedure)	50	17	0.000	Significant
K8- Which of the following hand hygiene actions prevents transmission of germs to the health-care worker? (After touching a patient Immediately after a risk of body fluid exposure After exposure to the immediate surroundings of a patient)	47	14	0.000	Significant
K9- Which of the following infections can be potentially transmitted from patients to clinical staff if appropriate glove use and hand hygiene are not performed? Colonization or infection with MRSA (Methicillin-resistant Staphylococcus aureus)	12	05	0.147	Not significant
K10 - According to you, what is the average percentage of hospitalized patients who develop a health care-associated infection?	27	11	0.001	Significant

flexible and multimodal approach.

Attitude was moderate for 56% of medical students while 71% nursing staff had good attitude towards hand hygiene. The percentages of correct responses of participants for both the groups for the questions on hand hygiene attitudes are given in Table 4.

Insufficient knowledge in the HCWs may be due to infrequent attendance of hand hygiene workshops while their poor attitudes may be due to understaffing, work overload, poor salaries and lack of motivation of the HCW.

Good hand hygiene practices are generally positively correlated with having a positive attitude toward hand hygiene. Approximately 98% of nurses in the current study adhered to the WHO's "My 5 moments of hand hygiene." This is a promising discovery that will inspire other medical professionals as well. According to Fisher et al. (20), medical schools should formally teach hand hygiene using a hands-on approach. During the final MBBS OSCE (Objective Structured Clinical Examination) at The Royal London Hospital School of Medicine and Dentistry

Table 4: Comparison of correct responses for attitude of hand hygiene among undergraduate medical Students and nursing staff

Attitude - Questionnaire	Medical Students (n=100)	Nursing Students (n= 100)	p value	Significant or not
A1 - What is the effectiveness of hand hygiene in preventing HCAI? (High)	82	76	0.313	Not significant
A2 - Among all patient safety issues, how important is hand hygiene at your institution?	24	81	0.000	Significant
A3 - Do you know of anyone who acquired an infection when they were in the hospital, after surgery or after visiting any other healthcare facility?	44	54	0.253	Not significant
A4 - Have you read scientific literature about hand hygiene anytime before?	44	88	0.000	Significant
A5 - Do you think that poor hand hygiene practices of health care personnel is a major factor for cross infection transmission in hospital?	97	85	0.009	Significant

Table 5: Comparison of correct responses for practice of hand hygiene among undergraduate medical students and nursing staff

Practice – Questionnaire	Medical Students (n=100)	Nursing Students (n=100)	p value	Significant or not
P1 - Do you follow "My five moments of Hand Hygiene" recommended by WHO?	79	98	0.001	Significant
P2 - Do you follow a scientific protocol/ procedures for hand wash (30-60 seconds) and hand rubs (20-40 seconds)?	88	88	1.000	Not significant
P3 - Did you receive formal training in hand hygiene anytime?	53	68	0.066	Not significant
P4 - Do you routinely use /have pocket carriage alcohol- based hand rub for hand hygiene?	85	93	0.198	Not significant
P5 - On an average, in what percentage of situations requiring hand hygiene do you actually perform hand hygiene, either by hand rubbing or hand washing	79	98	0.001	Significant

in the UK, Feather et al. examined the hand hygiene habits of 187 candidates. They discovered that, while only 8.5% of candidates washed their hands after patient contact, that percentage increased to 18.3% when hand hygiene signs were visible. Feather et al. further suggested that hand hygiene should be an educational priority utilizing assessment tools like OSCE checklists.[10]

Furthermore, only 29.7% of the HCW could honestly state that they had washed their hands, according to the results of the Erasmus et al. study, demonstrating the extremely low rates of hand hygiene compliance.[20] Comparably, only 56.2% of respondents said they always washed their hands after dealing with patients, and 5.6% said they never did. One possible explanation for this could be the absence of an ongoing hand hygiene education program. Similar research indicates that low compliance rates persist among healthcare workers (HCWs) due to partial noncompliance with recommended hand hygiene practices, even with advancements in infection control.[21]

5. Conclusion

In the current study, medical students and nurses reported poor knowledge of hand hygiene practices, but they also reported good attitudes and practices. Lack of scientific knowledge or failing to read hand hygiene-related literature to address specific questions are the causes of poor knowledge. However, because the current COVID-19 pandemic has brought attention to the importance of hand hygiene, participants were aware of its general significance. As a result, the study participants had positive attitudes and behaviors. The study comes to the

conclusion that nurses and medical students alike need to have a better understanding of scientific hand hygiene practices. Improving the undergraduate curriculum's focus on hand hygiene could enhance students' understanding and hygiene habits.. First-year medical students will learn the fundamentals of hand hygiene thanks to the new curriculum's inclusion of early clinical exposure (ECE) and competency-based medical education (CBME). The inclusion of this subject in the curriculum is a positive move that will increase medical students' understanding. In order to motivate medical students and nurses to practice proper hand hygiene, hand hygiene training sessions involving ongoing performance evaluation and monitoring must be held. By employing ongoing tactics like training that focus on hand hygiene techniques, indications, and recognition of opportunities for this procedure, it is possible to maintain the knowledge and attitude about hand hygiene that were acquired during the COVID-19 pandemic. This study will offer a chance to educate aspiring physicians and nurses on the fundamentals of infection control and solicit input for additional infection control initiatives. Given their prominent position within the healthcare team, physicians should receive the most up-to-date information and appropriate training regarding infectious disease prevention. Research has demonstrated that in-person interactions, education, and constructive criticism can enhance doctors' adherence to good hand hygiene practices. It is advised that the hospital's infection prevention team become more involved in student education and the revision of infection control procedures. Hand hygiene training sessions may need to be conducted more frequently for medical students with continuous monitoring and performance feedback to encourage them to follow correct hand hygiene practices.

6. Source of Funding

None.

7. Conflict of Interest

None.

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