



ORIGINAL RESEARCH PAPER

Community Medicine

A STUDY TO ASSESS KNOWLEDGE ON HAND HYGIENE AMONG MEDICAL STUDENTS OF A TERTIARY CARE HOSPITAL OF UDAIPUR, RAJASTHAN

KEY WORDS: Hand hygiene, Washing, Medical students

Chandan Mal Fatehpuria*

Assistant Professor, Department of Community Medicine, RNT Medical College, Udaipur, Rajasthan *Corresponding Author

Kavita Pannikar

PG Student, Department of Community Medicine, RNT Medical College, Udaipur, Rajasthan

Ankit Bhagora

PG Student, Department of Community Medicine, RNT Medical College, Udaipur, Rajasthan

GL Bunkar

Professor, Department of Community Medicine, RNT Medical College, Udaipur, Rajasthan

ABSTRACT

Background: Hand hygiene is considered the single most cost-effective public health measure for preventing healthcare associated infection. Introduction of an evidence-based concept of "My five moments for hand hygiene" by World Health Organization has helped to address the problem to good extent. This concept has been effectively used to improve understanding, training, monitoring, and reporting hand hygiene among healthcare workers.

Methods: It was a cross sectional study and purposive sampling method was used to select study subjects. After taking informed consent, a pre-validated questionnaire was distributed. All data was collected by using hand hygiene knowledge questionnaires for Health care workers designed by WHO and analyzed using percentage.

Results: Study revealed moderate knowledge about hand hygiene practices among the medical students. Definitely there is gap in the knowledge regarding hand hygiene amongst study subjects.

Conclusion: Hand hygiene awareness amongst medical students should be achieved by conducting awareness programs like CMEs, workshops, seminars etc. The improved understanding of infection control and hand hygiene among medical students is expected to play a major role in curbing the disease transmission when the students pass out and join the healthcare settings in future.

INTRODUCTION

Hand hygiene is a term referring to any action of hand cleansing. Bacteria can also be acquired on the worker's hands by touching contaminated surfaces in the patient environment. So effective hand hygiene is the single most effective action to reduce health care associated infections.¹ It prevents cross-transmission of microorganisms, nosocomial infections and reduces the chances of other health care associated infections.² Compliance with hand hygiene among health care providers is as low as 40%.³ It is considered that hand hygiene is the single most cost-effective public health measure for prevention of healthcare associated infection.⁴

World Health Organization introduced an evidence-based concept of "My five moments for hand hygiene" to know the problem. These five moments for the use of hand hygiene include the moment before touching a patient, before performing aseptic and clean procedures, after being at risk of exposure to body fluids, after touching a patient, and after touching patient surroundings. This concept has been effectively utilized to improve understanding, training, monitoring, and reporting hand hygiene practices among healthcare workers.⁵

Only few studies explored about this subject in Asia continent, although the prevalence survey about health care associated infections is high in this continent; especially medical and nursing students.^{6,7}

OBJECTIVE

To know the level of knowledge among medical students about hand hygiene practices so that appropriate measures can be taken to promote the concept of hand washing compliance.

METHODS

It was a cross sectional study conducted in RNT Medical College, Udaipur, Rajasthan, India. A total of 90 first final MBBS (VIth semester) students included in our study using purposive sampling method after taking verbal consent. All

data was collected by using hand hygiene knowledge questionnaires for Health care workers designed by WHO and analyzed by using appropriate statistical tests.

RESULT

In our study, 52 were female students and 38 were male students. We observed that majority of students (64.5%) did not receive any formal training on hand washing. However 46.7% students were using alcohol based hand rub routinely. About 51.1% students correctly answered that unclean hands of health care workers are the main route of cross transmission of potentially harmful germs between patients and only 37.8% students were agreed that germs already present on or within the patient are the most frequent source for health care associated infections. Regarding the five moments on hand hygiene actions which prevent transmission of germs to the patient, better awareness was found in aspect to practices like before touching a patient (75.5%) and immediately before a clean or aseptic procedure (73.3%) whereas 40% and 36.7% were agreed about there is no risk of transmission of germs to the patient immediately after a risk of body fluid exposure and after exposure to immediate surroundings of a patient respectively. Out of another five moments regarding hand hygiene actions which prevents transmission of germs to the health care worker, better awareness was found with respect to the practices like after touching a patient (81.1%), after exposure to immediate surroundings of a patient (68.9%) and immediately after a risk of body fluid exposure (64.4%) only 42.2% were aware that there is no risk in transmission of germs to health care worker immediately before a clean/aseptic procedure. About knowledge regarding alcohol-based hand rub and hand washing with soap and water, 64.4% students agreed that hand rubbing is more rapid than hand cleansing. 66.7% were aware that hand rubbing is more effective against germs than hand washing. 38.9% agreed that hand washing causes more skin dryness than hand rubbing.

Only 38.9% were aware that hand washing and hand rubbing are not recommended to be performed in sequence. In our

study, it was noticed that about 42.2% students were aware that minimum 20 seconds time is necessary for alcohol-based hand rub to kill most germs on hands.

Students had awareness that hand rubbing is required before palpation of the abdomen (64.4%), before giving an injection (42.2%) and after making a patient's bed (41.1%).

Students were aware that hand washing is required after emptying a bed pan (80%) and after visible exposure to

blood (83.3%). 60% students followed rubbing and (38.9%) said washing as method of hand hygiene after removing examination gloves.

Out study revealed that students had awareness that wearing jewellery (62.2%), damaged skin (88.9%) and artificial fingernails (84.4%) is associated with increased likelihood of colonization of hands with harmful germs whereas regular use of a hand cream (63.3%) is not associated with increased colonization.

Table 1: Knowledge about Hand Hygiene Practice in Medical Students based on WHO questionnaire (n=90)

No.	Questions (Answers)	n (%)
1	Did you receive formal training in hand hygiene in the last three years?	32 (35.5)
2	Do you routinely use an alcohol-based handrub for hand hygiene?	42 (46.7)
3	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)	46 (51.1)
4	What is the most frequent source of germs responsible for health care associated infections? (Germs already present on or within the patient)	34 (37.8)
5	Which of the following hand hygiene actions prevents transmission of germs to the patient?	
5A	Before touching a patient (yes)	68 (75.5)
5B	Immediately after risk of body fluid exposure (no)	36 (40)
5C	After exposure to the immediate surroundings of a patient (no)	33 (36.7)
5D	Immediately before a clean/aseptic procedure (yes)	66 (73.3)
6	Which of the following hand hygiene actions prevents transmission of germs to the health-care worker?	
6A	After touching a patient (yes)	73 (81.1)
6B	Immediately after a risk of body fluid exposure (yes)	58 (64.4)
6C	Immediately before a clean/aseptic procedure (no)	38 (42.2)
6D	After exposure to the immediate surroundings of a patient (yes)	62 (68.9)
7	Which of the following statements on alcohol-based handrub and handwashing with soap and water are true?	
7A	Hand rubbing is more rapid for hand cleansing than hand washing (true)	58 (64.4)
7B	Hand rubbing causes skin dryness more than hand washing (false)	35 (38.9)
7C	Hand rubbing is more effective against germs than hand washing (true)	60 (66.7)
7D	Hand washing and hand rubbing are recommended to be performed in sequence (false)	35 (38.9)
8	What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands? (20 Seconds)	38 (42.2)
9	Which type of hand hygiene method is required in the following situations?	
9A	Before palpation of the abdomen (rubbing)	58 (64.4)
9B	Before giving an injection (rubbing)	38 (42.2)
9C	After emptying a bed pan (washing)	72 (80)
9D	After removing examination gloves (rubbing)	54 (60)
	After removing examination gloves (washing)	35 (38.9)
	After removing examination gloves (both)	1 (1.1)
	After making a patient's bed (rubbing)	37 (41.1)
	After visible exposure to blood (washing)	75 (83.3)
10	Which of the following should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs?	
10A	Wearing jewellery (yes)	56 (62.2)
10B	Damaged skin (yes)	80 (88.9)
10C	Artificial fingernails (yes)	76 (84.4)
10D	Regular use of a hand cream (no)	57 (63.3)

Our study revealed only 35.5% medical students had received formal training on hand washing which is should be further improved. Sreejith Nair et al found that 79% students had received formal training in hand hygiene whereas Mohesh et al found only 26.3% medical students had formal training in hand hygiene practices.^{8,9} In our study we observed that only 46.7% students use alcohol-based handrub routinely for hand hygiene whereas Das et al reported only 9% students and Kamble VS et al found 58.1% students who used any sanitizers.^{10,11} In our study we observed that 51.1% students were aware about the correct answer regarding main route of cross transmission was health care worker's hand when not clean. Mohesh et al found similar data (48.6%) medical students were able to acknowledge this fact; whereas Kamble VS et al found correctly answer amongst only in 27.2% students.^{9,11}

In our study only 37.8% of students answered correctly that frequent source of health care associated infection is germs on or within the patient whereas Shinde et al found only 26% on nursing students and Kudavidnange et al found 25% on ICU staff.^{12,13}

It was noticed that awareness about hand hygiene before touching a patient (75.5%) was less compared to study by Sreejith Nair et al on medical students (91.6%) and more as compared to study by Kamble VS et al (70.9%) but similar data with study by Mukherjee T et al (75.8%).^{8,11,14} About correct knowledge regarding hand hygiene immediately after risk of body fluid exposure (40%) was more compared to study by Sreejith Nair et al on medical students (17.6%), study by Kamble VS et al (32.8%) and study by Mukherjee et al (24.2%).^{8,11,14} Our study showed that 73.3% and 36.7%

students had correct knowledge regarding hand hygiene for clean or aseptic procedure and risk after exposure to immediate surroundings of a patient respectively. Our results were better than Mohesh et al study where only 17.5% medical students were aware about these actions and also better than study by Kamble VS et al (61.8% and 23.6% respectively).^{8,11}

In this present study, (81.1%, 64.4% and 68.9%) students correctly pointed out regarding the hand hygiene actions, which prevent transmission of germs to the health care worker like after touching a patient, immediately after a risk of body fluid exposure and after exposure to the immediate surroundings of a patient respectively. Our study was relatively poor with comparison of study by Sreejith Nair et al (94.2%, 87.8% and 71.2%). However Kamble VS et al found 72.7%, 69.1% and 58.1% data regarding these actions.^{8,11} In our study 42.2% students had correct knowledge that hand hygiene actions immediately before clean or aseptic procedure had no role to prevent transmission of germs to the health-care worker. Our data was slightly worse than study of Sreejith Nair et al (48.9%) but far better than Kamble VS et al (20%).^{8,11}

It was seen that 64.4% students agreed that Hand rubbing is more rapid for hand cleansing than hand washing and 38.9% students correctly approved that hand washing causes more skin dryness than hand rubbing. Our results were almost similar to study by Sreejith Nair et al where 69.6% and 30.2% students were aware of these facts. In study of Kamble et al observed that 50.9% and 36.3% students were aware for the same facts.^{8,11} As per our study, 66.7% students agreed that hand rubbing is more effective than washing and 38.9% agreed that hand washing and hand rubbing should not be performed in sequence. Whereas the study by Sreejith Nair et al observed 54.3% and 46.3% medical students were aware of both these facts respectively and Kamble VS et al demonstrated 38.2% and 21.8% respectively.^{8,11}

This study noticed that only 42.2% students had correct knowledge that the minimal time needed for alcohol-based hand rub to kill most germs on your hands is 20 seconds. However, our result was similar to study by Mukherjee et al (42.1%) but better than the study of Sreejith Nair et al (38.3%) and Kamble VS et al (38.1%).^{8,11}

It was noticed that students of our study were aware that hand rubbing is the best method of hand hygiene required in situations like palpation of the abdomen (64.4%), before giving an injection (42.2%) and after making a patient's bed (41.1%). A study of Sreejith Nair et al reported that 27.3%, 25.2% and 30.9% medical students were aware about these facts respectively whereas Kamble VS et al also reported that 54.55%, 23.64% and 29.09% students were aware about these facts respectively.^{8,11}

Moreover, students were aware that hand washing is the best method of hand hygiene required in situations like after emptying a bed pan (80%) and after visible exposure to blood (83.3%). Our data were better than the study of Sreejith Nair et al (68.2% & 46.7% respectively) but almost similar to those of Kamble VS et al (80% & 72.7% respectively).^{8,11} In our study we revealed that 60% and 38.9% students reported rubbing and washing as method of hand hygiene practice after removing examination gloves respectively and one student (1.1%) answered that both methods were apt. Kamble VS et al found 70.9% and 29.1% students who reported rubbing and washing as method of hand hygiene practice after removing examination gloves respectively.¹¹ A Study by Sreejith Nair et al reported 65.6% students gave correct knowledge about similar facts.⁸

In our study, students were aware that wearing jewellery (62.2%) damaged skin (88.9%) and artificial fingernails

(84.4%) should be avoided because they are associated with increased likelihood of colonization of hands with harmful germs. Mostly students also agreed that regular use of a hand cream (63.3%) do not increase the risk. Where as in study by Sreejith Nair et al students were aware that wearing jewellery (77.7%), damaged skin (95.3%) and artificial fingernails (80.9%) should be avoided and 54.8% students agreed that regular use of a hand cream do not increase the risk of colonization of hands with harmful germs.⁸ Kamble VS et al and Mukherjee et al also noticed that (45.4%/ 94.5%/ 83.6% / 45.45%) and (53.7%/94.7%/83.2%) students were agreed about all these facts respectively.^{11,14}

CONCLUSION

Hand hygiene is the most effective method of preventing transmission of infections but it seems that the knowledge regarding hand hygiene amongst medical students is not so adequate and definitely there is a requirement for improvement. So to prevent the spread of infections in healthcare settings, medical students should be given proper training in hand hygiene practices right from first year of the medical curriculum. This could be done by organizing workshops, CMEs, regular seminars and making it a requisite for clinical skills assessment. The improved understanding of infection control and hand hygiene among medical students is expected to play a major role in curbing the disease transmission when the students pass out and join the healthcare settings in future.

Acknowledgment

We express our heartfelt thanks and gratitude to our institute and students who participated in the study.

REFERENCES

1. Hand Hygiene Australia. Changes to the Coordination of the National Hand Hygiene Initiative. Available on hha.org.au/hand-hygiene/hha. Accessed on 16 Oct. 2019.
2. Pittet D, Hugonnet S, Harbarth S. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *The Lancet*. 2000;356(9238):1307-12.
3. Tibballs J. Teaching hospital medical staff to hand wash. *Medical Journal of Australia*. 1996;164(7):395-398.
4. Pittet D, Allerganz B, Sax H. Evidence based model for hand transmission during patients care and the role of improved practices. *Lancet Infect Dis*. 2006;6:641-652.)
5. (Sax H, Allegranzi B, Uçkay I, Larson E, Boyce J, Pittet D. My five moments for hand hygiene. A user-centred design approach to understand, train, monitor and report hand hygiene. *J Hosp Infect*. 2007;67:9-21.
6. Buerhaus PI, Auerbach DI, Staiger DO. Recent trends in the registered nurse labor market in the U.S.: short-run swings on top of long-term trends. *Nursing Economics*. 2007;25(2):59-66.
7. Anwar MA, Rabbi S, Masroor M, Majeed F. Self-reported practices of hand hygiene among the trainees of a teaching hospital in a resource limited country. *Journal of the Pakistan Medical Association*. 2009;59(9):631-634.
8. Nair SS, Hanumantappa R, Hiremath SG, Siraj MA, Raghunath P. Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India. *ISRN Preventive Medicine, Volume 2014, Article ID 608927, 1-4.*
9. Mohesh G, Dandapani A. Knowledge, attitude and practice of hand hygiene among medical students- a questionnaire based survey. *Unique Journal of Medical and Dental Sciences*. 2014;02(03):127-131.
10. Das D, Mandal AK, Das J, Sardar S. Practice of Personal Hygiene & Morbidity Pattern among Medical Students of a Rural Medical College, West Bengal, India. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*. 2015;14(5):39-44.
11. Kamble VS, Biradar SM, Takpere A, Reddy S. Knowledge of hand hygiene practices among students of ESIC medical college, Gulbarga, Karnataka, India. *Int J Community Med Public Health* 2016;3:94-98.
12. Shinde MB, Mohite VR. A Study to Assess Knowledge, Attitude and Practices of Five Moments of Hand, Hygiene among Nursing Staff and Students at a Tertiary Care Hospital at Karad. *International Journal of Science and Research*. 2014;3(2):311-321.
13. Kudavidnange BP, Gunasekara T, Hapurachchi S. Knowledge, attitudes and practices on hand hygiene among ICU staff in Anuradhapura Teaching hospital, Anuradhapura Medical Journal. 2011;1:29.
14. Mukherjee T, Mitra PS, Roy S, Chakraborty S, Mondal R, Majumdar M. A study to assess knowledge regarding Hand hygiene amongst medical students in a tertiary care hospital of West Bengal. *IOSR Journal of Dental and Medical Sciences August 2018; 17(8) ver.3:24-28.*