

A Study to Assess Knowledge Regarding Hand Hygiene amongst Medical Students in a Tertiary Care Hospital of West Bengal

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Abstract:

Background: Nosocomial infection due to poor hand hygiene is significant cause of increasing morbidity, mortality and health care costs among hospitalized patients worldwide. But, compliance with hand hygiene among health care providers is as low as 40%. "My five moments for hand hygiene" by WHO has helped to address the problem to a great extent. This study was undertaken to identify gaps in knowledge regarding hand hygiene practices among medical students using WHO hand hygiene questionnaire to promote hand washing compliance.

Aim: This study was conducted to assess level of knowledge among medical students of Burdwan Medical College & Hospital, West Bengal.

Methodology: This cross sectional study was performed by selecting 95 Second Professional MBBS students with verbal consent and their level of knowledge was assessed by using WHO hand hygiene questionnaire and analysed using percentages.

Results: Study revealed that only 38.95% students had formal training in hand hygiene and only 49.47% students routinely use alcohol based hand rub. Out of total 27 questions, only 13 questions were answered correctly by more than 50% students whereas 6 questions had correct response by less than 30% students. Definitely there is a gap in the knowledge regarding hand hygiene amongst medical students.

Conclusions: Hand hygiene training sessions with monitoring and performance feedback are cornerstone for generating awareness amongst students and to be conducted frequently by the Infection control committee in the medical college campus.

Key words: Hand hygiene, Rubbing, Washing, Infection, Medical student

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I. Introduction

Healthcare-associated infection is an evolving problem worldwide affecting morbidity and mortality, and horizontal transmission of pathogens continues to cause a high nosocomial infection rate in health care settings. Nosocomial infections due to poor hand hygiene are a major cause of increasing morbidity, mortality and health care costs among hospitalized patients worldwide.¹

The high prevalence of these infections, as high as 19%, in developing countries poses a challenge to health care providers.² Hand hygiene is considered the single most cost-effective public health measure for preventing healthcare associated infection (HCAI).³

Transmission of healthcare-associated pathogens generally occurs via the contaminated hands of healthcare workers often transmitting virulent and multi-drug resistant strains. Though preventable with a simple hand washing, health care workers are reluctant to adopt recommended practices to curb these infections.⁴ Compliance with hand hygiene among health care providers is as low as 40%.⁵⁻⁷

The World Health Organisation (WHO) has issued guidelines for procedural hand washing in order to reduce the prevalence of hospital associated infections but lack of knowledge amongst health care workers is associated with poor compliance.⁸ An alarming revelation was that compliance was found to be worst before high risk procedures.⁹⁻¹⁰

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.¹¹

In Asia there are few studies (especially amongst medical and nursing students) exploring this subject, although the prevalence of health care associated infections is high in this region.¹²⁻¹⁵ The observance of hygiene by medical students is reported as being weak.¹⁶⁻¹⁷

With this background, the present study was undertaken to assess the level of knowledge among medical students of Burdwan Medical College & Hospital, West Bengal, regarding hand hygiene practices and also to identify gaps in knowledge regarding hand hygiene practices among medical students to promote hand washing compliance.

II. Material & Methods

This cross sectional study was undertaken in a tertiary care hospital, Burdwan Medical College, Burdwan, West Bengal, India in the month of May 2018 and purposive sampling method was used to select a total of 95 Second Professional MBBS students (4th Semester) and after taking verbal consent they were included in the study and pre-validated questionnaire was administered to respondents. Their level of knowledge was assessed on the basis of the Hand Hygiene Knowledge Questionnaires for Health-Care Workers designed by WHO and analyzed using percentages. Data analysis and management was done using Microsoft EXCEL 2010 software and appropriate statistical tests were applied as and when required.

III. Results

In this present study, we noticed that 38.95% students received formal training in hand washing and 49.47% students were using alcohol based hand rub routinely. 44.21% students correctly responded that health care workers' unclean hands are the main route of cross transmission of potentially harmful germs between patients in a health-care facility and only 25.26% students were aware that germs already present on or within the patient are the most frequent source for health care associated infections (Table 1).

Regarding hand hygiene actions which prevents transmission of germs to the patient, (the five moments) better awareness was seen with respect to practices like before touching a patient (75.79 %) and immediately before a clean or aseptic procedure (75.79 %) whereas only 24.21% and 44.21% were aware that 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 (Table 1).

Amongst the five moments regarding hand hygiene actions which prevents transmission of germs to the health care worker, better awareness was seen with respect to the practices like after touching a patient (69.47%), immediately after a risk of body fluid exposure (61.05%) and After exposure to immediate surroundings of a patient (60%) whereas only 25.26% were aware that there is no risk in transmission of germs to health care worker immediately before a clean/aseptic procedure (Table 1).

Regarding knowledge of alcohol-based hand rub and hand washing with soap and water, 63.16% students agreed that hand rubbing is more rapid than hand washing. 33.68% were aware that hand rubbing is more effective against germs than hand washing. 17.89% agreed that hand washing causes more skin dryness than hand rubbing. Only 32.63% were aware that hand washing and hand rubbing are not recommended to be performed in sequence (Table 1).

In this study, it was observed that only 42.11% students were aware that minimum 20 seconds time is needed for alcohol-based hand rub to kill most germs on hands (Table 1).

Study showed that, students were aware that hand rubbing is required before palpation of the abdomen (48.42%), before giving an injection (38.95%) and after making a patient's bed (17.89%). Students were also aware that hand washing is required after emptying a bed pan (68.42%) and after visible exposure to blood (75.79%). Moreover, we noticed that 27.37% and 62.11% students reported rubbing and washing as method of hand hygiene practice after removing examination gloves respectively and one student (1.05%) correctly opined that both methods were apt (Table 1).

This study also revealed that students had knowledge that wearing jewellery (53.68%), damaged skin (94.74%) and artificial fingernails (83.16%) are associated with increased likelihood of colonization of hands with harmful germs whereas regular use of a hand cream (74.74%) is not associated with increased colonization (Table 1).

Table 1: Knowledge about hand hygiene practice in medical students based on WHO questionnaire.
(N=95)

No.	Questions (answers)	n (%)
1.	Did you receive formal training in hand hygiene in the last three years?	37(38.95%)
2.	Do you routinely use an alcohol-based handrub for hand hygiene?	47(49.47%)
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)	42(44.21%)
4.	What is the most frequent source of germs responsible for health care associated infections? (Germs already present on or within the patient)	24(25.26%)

5.	Which of the following hand hygiene actions prevents transmission of germs to the patient?	
5A	Before touching a patient (yes)	72(75.79%)
5B	Immediately after risk of body fluid exposure (no)	23(24.21%)
5C	After exposure to the immediate surroundings of a patient (no)	42(44.21%)
5D	Immediately before a clean/aseptic procedure (yes)	72(75.79%)
6.	Which of the following hand hygiene actions prevents transmission of germs to the health-care worker?	
6A	After touching a patient (yes)	66(69.47%)
6B	Immediately after a risk of body fluid exposure (yes)	58(61.05%)
6C	Immediately before a clean/aseptic procedure (no)	24(25.26%)
6D	After exposure to the immediate surroundings of a patient (yes)	57(60%)
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)	60(63.16%)
7B	Hand rubbing causes skin dryness more than hand washing (false)	17(17.89%)
7C	Hand rubbing is more effective against germs than hand washing (true)	32(33.68%)
7D	Hand washing and hand rubbing are recommended to be performed in sequence (false)	31(32.63%)
8.	What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands? (20 seconds)	40(42.11%)
9.	Which type of hand hygiene method is required in the following situations?	
9A	Before palpation of the abdomen (rubbing)	46(48.42%)
9B	Before giving an injection (rubbing)	37(38.95%)
9C	After emptying a bed pan (washing)	65(68.42%)
9D	After removing examination gloves (rubbing)	26(27.37%)
	After removing examination gloves (washing)	59(62.11%)
	After removing examination gloves (both)	1(1.05%)
9E	After making a patient's bed (rubbing)	17(17.89%)
No.	Questions (answers)	n (%)
9F	After visible exposure to blood (washing)	72(75.79%)
10.	Which of the following should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs?	
10A	Wearing jewellery (yes)	51(53.68%)
10B	Damaged skin (yes)	90(94.74%)
10C	Artificial fingernails (yes)	79(83.16%)
10D	Regular use of a hand cream (no)	71(74.74%)

IV. Discussion

Our study showed only 38.95% medical students had claimed to have received formal training in hand washing which is an area to be further improved. A study by Sreejith Nair et al, 79% students said they had formal training in hand hygiene and Kamble VS et al found 85.4% students are formally trained in hand hygiene whereas Glad Mahesh et al reported only 26.3% medical students had formal training in hand hygiene practices.^{17,20,24}

In the present study we observed that only 49.47% students routinely use alcohol-based handrub for hand hygiene whereas Kamble VS et al reported 58.1% students and Das et al demonstrated only 9% students who used sanitizers.^{21, 24}

In our study we noticed 44.21% students are aware of the correct answer regarding main route of cross transmission was health care workers' hand when not clean whereas Kamble VS et al found correct response amongst only 27.2% students. In a study by Sreejith Nair et al 75.6% and by Glad Mahesh et al 48.6% medical students were able to acknowledge this fact.^{17,20,24} The knowledge of our students is poor compared to other studies.

In this study only 25.26% of students answered correctly that frequent source of health care associated infection is germs on or within the patient whereas Kamble VS et al found only 23.6%. These results were similar to study by Shinde et al on nursing students (26%) and by Kudavidnange et al on ICU staff (25%).^{22,23} Whereas Sreejith Nair et al reported that 41.5% medical students, gave correct answer.¹⁷

It was noticed that awareness about hand hygiene before touching a patient (75.79%) 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 correct knowledge regarding hand hygiene immediately after risk of body fluid exposure (24.21%) was more compared to study by Sreejith Nair et al on medical students (17.6%) and less compared to study by Kamble VS et al (32.8%).^{17, 24}

Our study demonstrated 75.79% and 44.21% students had correct knowledge about hand hygiene for clean or aseptic procedure and risk after exposure to immediate surroundings of a patient. These results were better than Glad Mohesh et al study where only 17.5% medical students were aware about this actions and also better than study by Kamble VS et al (61.8% and 23.6% respectively).^{20,24}

In this present study, (69.47%, 61.05% and 60%) students were aware about 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 and these findings were almost at par with that of Kamble VS et al (72.7%, 69.1% and 58.1%). However in comparison to the data of Sreejith Nair et al (94.2%, 87.8% and 71.2%) our experience was relatively poor.^{17,24}

25.26% students, in our study, correctly pointed out 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 better than that of Kamble VS et al (20%) but worse than that of Sreejith Nair et al (48.9%).^{17,24}

It was seen in our study that 63.16% students agreed that Hand rubbing is more rapid than washing which is better than the observation of Kamble et al (50.9%) and worse than that of Sreejith Nair et al (69.6%). Only 17.89% students responded correctly that hand washing causes more skin dryness than hand rubbing and our finding was much poorer than those of Kamble et al (36.3%) and Sreejith Nair et al (30.2%) .^{17,24}

As per our observation, only 33.68% students agreed that hand rubbing is more effective than washing and 32.63% agreed that hand washing and Hand rubbing should not be performed in sequence. Whereas the study by Sreejith Nair et al demonstrated 54.3% and 46.3% medical students were aware of both these facts respectively and Kamble VS et al reported 38.2% and 21.8% respectively.^{17,24}

This study showed only 42.11% students knew that the minimal time needed for alcohol-based hand rub to kill most germs on your hands is 20 seconds. These results were better than the those of Sreejith Nair et al (38.3%) and Kamble VS et al (38.1%).^{17,24}

In this study, it was so found that students were aware that hand-rubbing is the best method of hand hygiene required in situations like palpation of the abdomen (48.42%), before giving an injection (38.95%) and after making a patient's bed (17.89%). A study by Sreejith Nair et al reported 27.3%, 25.2% and 30.9% medical students were aware about these facts respectively and the data of Kamble VS et al were 54.55%, 23.64% and 29.09% respectively.^{17,24}

Moreover, students were aware that hand washing is the best method of hand hygiene required in situations like after emptying a bed pan (68.42%) and after visible exposure to blood (75.79%). Our data were better than the study of Sreejith Nair et al (68.2% & 46.7% respectively) but comparable to those of Kamble VS et al (80% & 72.73% respectively).^{17,24}

In our study we noticed that 27.37% and 62.11% students reported rubbing and washing as method of hand hygiene practice after removing examination gloves respectively and one student (1.05%) correctly opined 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. Both methods are correct. A Study by Sreejith Nair et al reported 65.6% medical students gave correct answer.^{17,24}

In this study, students were aware that wearing jewellery (53.68%) damaged skin (94.74%) and artificial fingernails (83.16%) should be avoided, as they are associated with increased likelihood of colonization of hands with harmful germs. Also they agreed that regular use of a hand cream (74.74%) 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. The corresponding figures in the study of Kamble VS et al (45.4%,94.5%,83.6% and 45.45%) were all comparable to our observations.^{17,24}

V. Conclusion

From the overall observation, it was seen that only 38.95% students had formal training in hand hygiene in last three years and only 49.47% students were using alcohol based hand rub for hand hygiene routinely. Out of total 27 questions, only 13 questions were answered correctly by more than 50% students and 6 questions had correct response by less than 30% students. It seems that the knowledge regarding hand hygiene amongst medical students is not adequate and definitely there is room for improvement as it is one of the most important technique in infection control practices. If there is no curriculum set with hand hygiene concepts and skills, students might end up by developing faulty hand hygiene practices.²⁵ Hence hand hygiene training sessions are needed to be conducted more frequently for medical students with continuous monitoring and performance feedback to encourage them to follow correct hand hygiene practices. Hand hygiene awareness amongst students can be improved to a great extent just by conducting awareness programs frequently by the Infection control committee in the medical college campus.

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