

# Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Dental Undergraduates of Bareilly International University: A Cross-sectional Survey

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## ABSTRACT

**Background:** Hand hygiene is of utmost importance for the prevention and dissemination of antimicrobial resistance associated with health-care infections. Among interdisciplinary undergraduate students in healthcare, the definition of hand hygiene needs to be discussed.

**Materials and Methods:** A cross-sectional observational study was conducted among the medical and dental undergraduate students of Bareilly International University. The questionnaire was adapted from the WHO hand hygiene awareness questionnaire for health workers, consisting of 13 questions and was distributed in print formats. *P*-value was calculated using Chi-square test. *P* = 0.05 or less was used as cut-off level for statistical significance.

**Results:** Total 200 students were selected out of which 100 were medical and 100 were dental students. In our study, medical students had better knowledge, attitude, and practice toward hand hygiene as compare to dental students.

**Conclusion:** None of the medical and dental students were fully aware of hand hygiene knowledge, attitude, and practices and the risk of infection associated with health care has increased.

**Key words:** Dental, Hand hygiene, Medical, Undergraduate

## INTRODUCTION

World Hand Hygiene Day takes place on May 5, 2019.<sup>[1]</sup>

According to the WHO, “hand hygiene is a general term referring to any action of hand cleansing, that is, it is the act of cleaning one’s hands with or without the use of water or another liquid, or with the use of soap, for the purpose of removing soil, dirt, and/or micro-organisms.”<sup>[2]</sup>

The healthcare workers’ hands play a major role in the transmission of pathogens linked to health care from one patient into the next.<sup>[3]</sup>

The hand which is considered the most contagious part of the body.<sup>[4]</sup> Infections that were acquired while receiving healthcare have increased thousands of death rates worldwide. Hands serve as the primary source of germ transmission. Health-care staff or others should be in a position to properly practice hand hygiene.<sup>[5]</sup>

Healthy hand hygiene can lessen the risk of disease associated with healthcare as these infections have been related to an unacceptably high level of cost of morbidity, mortality and healthcare.<sup>[6]</sup>

Maintaining good hand hygiene is a very easy step but the compliance is bad and to overcome this, continuous efforts are

being made. The WHO evidence-based concept of “My five moments for hand hygiene” is one of them [Figure 1].

This concept has been appropriately used to make better understanding, training, monitoring, and reporting hand hygiene among healthcare workers.<sup>[7]</sup>

All health-care staff, or any person directly or indirectly involved in patient care, need to practice good hand hygiene.<sup>[8]</sup>

The most productive and realistic component of minimizing infections associated with healthcare is hand hygiene. The WHO has come up as a global effort with the launch of “SAVE LIVES: Clean Your Hands” campaign in 2009 for infection control as well as to assure patient safety and to reduce healthcare associated infections.<sup>[9]</sup>

Since previous reports demonstrated insufficient compliance by undergraduate students with hand hygiene practices.<sup>[10]</sup>

This study was conducted to assess the knowledge on hand hygiene practices among Indian medical and dental undergraduates.

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### MATERIALS AND METHODS

A cross-sectional survey was conducted among 100 Indian medical and 100 dental undergraduates. The questionnaire consisting of 13 questions was adapted from the WHO hand hygiene knowledge, attitude, and practices questionnaire for healthcare workers and was distributed in print formats. Percentages were used to analyze the reaction to each question.<sup>[5]</sup>

The questions of the questionnaire were designed to assess their basic knowledge, attitude, and practice toward hand hygiene in clinics and hospitals. Data were collected and descriptive statistics were computed for each question’s responses. Statistical analysis was performed using SPSS version 22. Chi-square test carried out and value <0.05 was considered statistically significant.

### RESULTS

A questionnaire study was conducted among 100 dental and 100 medical students of Bareilly international university (Uttar Pradesh), to determine their level of knowledge regarding hand hygiene. A pre-tested self-administered questionnaire consisting of 13 questions concerning their knowledge, attitude, and practices regarding hand hygiene was given to the students.

Figure 2 shows the distribution of data based on gender among the medical undergraduates. Nearly 53% of respondents were males and 47% were females.

Figure 3 shows the distribution of data based on gender among the dental undergraduates. Nearly 84% of respondents were males and 16% were females.

About 92% of medical students and 44% of dental students who took part in this study received formal hand hygiene instruction and 92% of medical and 47% of dental students claimed they routinely used alcohol-based hand rub for hand washing. About 69% of medical and 45% of dental students knew about percentage of hospitalized patients who would develop a healthcare associated infection. About 8% of medical and 16% of dental claimed that a healthcare-related infection had a very strong impact on the clinical outcome of a patient. Almost 66% of medical and 31% of dental students claimed that hand hygiene was very effective in preventing infections associated with health care. The majority of 61% medical students state very high priority of hand hygiene at their institution. Around 75% of medical and 35% of dental students knew about percentage of situations requiring hand hygiene where healthcare workers actually performed hand hygiene either by hand rubbing or hand washing.

When asked whether their leaders and seniors managers at institution support and openly promote hand hygiene 62% of medical and 32% of dental students agreed affirmatively.

When asked about the availability of alcohol based hand rub, 62% of medical and 33% of dental students strongly agreed on its easy availability. About 60% of medical students and 33% of

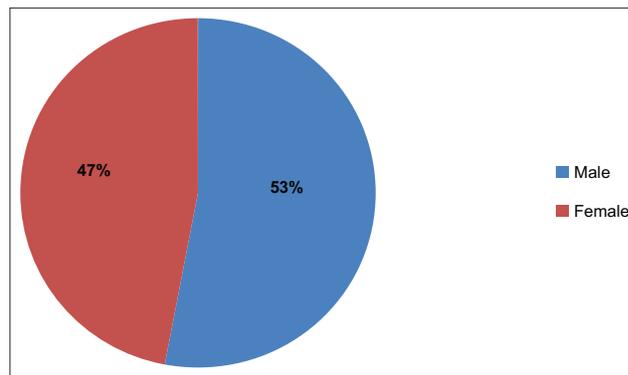


Figure 2: The distribution of data based on gender among the medical undergraduates

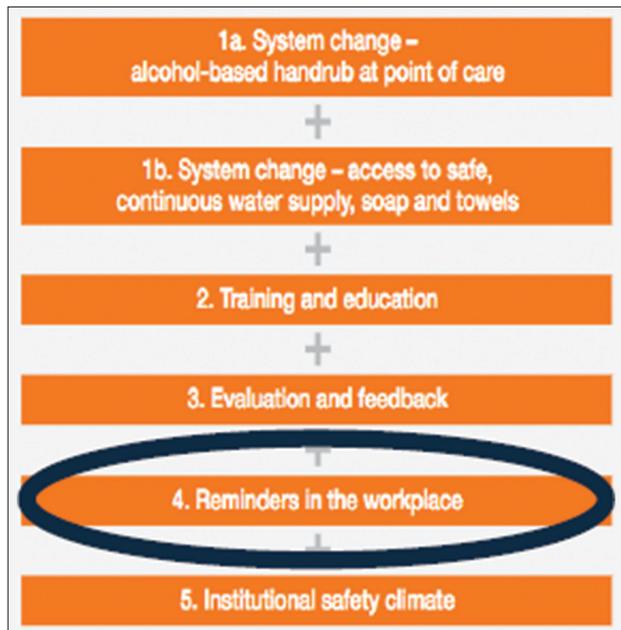


Figure 1: Five components of the WHO multimodal hand hygiene improvement strategy

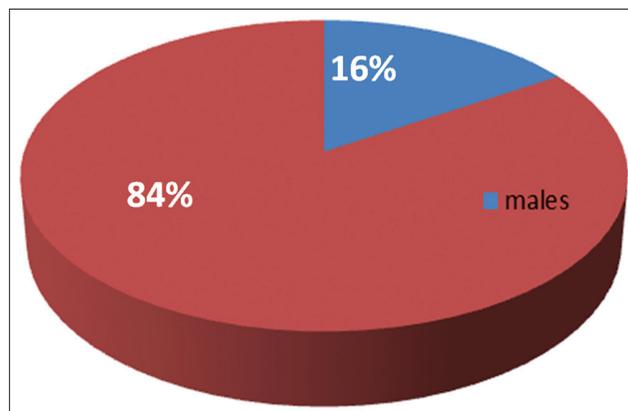


Figure 3: The distribution of data based on gender among the dental undergraduates

dental students also felt that adequate hand hygiene posters were displayed as reminders at point of cure.

About 61% of medical and 34% of dental students felt that they had received adequate education on hand hygiene. Similarly 64% of medical and 24% of dental students concurred on clarity and simplicity of hand hygiene instructions. When asked whether health workers received regular feedback on their hand hygiene performance, only 11% of medical and 19% of dental students agreed on the same. About 58% of medical and 29% of dental students always performed hand hygiene as recommended. Only 18% of medical and 14% of dental students agreed that patients were asked to remind healthcare workers to do hand hygiene. About 58% of medical and 24% of dental students attached high importance to their head of their department in performing optimal hand hygiene. Interestingly, 12% of medical and 20% of dental students acknowledged that their patients had high priority regarding

optimal hand hygiene. When asked about the effort required to perform good hand hygiene during patient care, 13% of medical and 27% of dental students felt the effort required to perform hand hygiene was high. It was observed that 79% of medical and 42% of dental students actually performed hand hygiene either by hand rubbing or hand washing.

## DISCUSSION

Hand cleaning can be done in hospitals in either way: Hand scrubbing and hand washing. Hand washing using water and soap and alcohol based hand rub for hand rub. Hands should be washed for at least 15 s to kill germs, ensuring that all parts of the hands are cleaned well. In a healthcare set up, hand rubbing is the best method for hand cleaning. It kills deadly germs more efficiently as compare

Response	Percentage		P value	
	Medical	Dental		
Yes	92	92	0.676	
No	8	8		
Yes	92	47	0.872	
No.	8	53		
Know	69	45	0.680	
I don't know	31	65		
Very low	10	3	0.398	
Low	12	29		
High	70	52		
Very high	8	16		
Very low	4	2	0.717	
Low	12	11		
High	18	56		
Very high	66	31		
Low priority	3	6	0.267	
Moderate priority	12	18		
High priority	24	48		
Very high priority	61	28		
Know	75	35	0.276	
I don't know	25	65		
a. Your institution's leaders and senior managers support and openly promote hand hygiene.	1. Not effective 2. Somewhat effective 3. Moderately effective 4. Effective 5. Effective 6. Effective 7. Very effective	8 4 3 11 8 4 62	4 14 7 16 12 15 32	0.627
B. The health-care facility always makes hand rubbing based on alcohol available at every point of care.	1. Not effective 2. Somewhat effective 3. Moderately effective 4. Effective 5. Effective 6. Effective 7. Very effective	5 5 8 4 10 6 62	4 5 13 20 13 12 33	0.753

(Contd...)

Response		Percentage		P value
		Medical	Dental	
c. Hand hygiene posters are displayed as reminders at the point of cure.	1. Not effective	4	4	0.754
	2. Somewhat effective	1	4	
	3. Moderately effective	7	9	
	4. Effective	12	20	
	5. Effective	10	16	
	6. Effective	6	14	
	7. Very effective	60	33	
d. Healthcare worker receives hand hygiene training	1. Not effective	3	7	0.376
	2. Somewhat effective	4	6	
	3. Moderately effective	2	6	
	4. Effective	5	25	
	5. Effective	15	12	
	6. Effective	10	10	
	7. Very effective	61	34	
e. For every healthcare worker, clear and simple instructions for hand hygiene are made visible.	1. Not effective.	8	5	0.017
	2. Somewhat effective.	5	6	
	3. Moderately effective.	2	8	
	4. Effective	7	25	
	5. Effective	10	15	
	6. Effective	4	17	
	7. Very effective.	64	24	
f. Healthcare workers regularly receive feedback on the performance of their hand hygiene	1. Not effective.	2	8	0.168
	2. Somewhat effective.	11	5	
	3. Moderately effective.	29	10	
	4. Effective	25	18	
	5. Effective	15	18	
	6. Effective	7	22	
	7. Very effective.	11	19	
g. Hand hygiene is always performed as prescribed (being a good example for your colleagues).	1. Not effective.	1	8	0.463
	2. Somewhat effective.	2	2	
	3. Moderately effective.	9	6	
	4. Effective	8	14	
	5. Effective	12	23	
	6. Effective	10	23	
	7. Very effective.	58	24	
h. Patients are encouraged to remind healthcare workers to maintain hand hygiene.	1. Not effective.	1	13	0.034
	2. Somewhat effective.	1	9	
	3. Moderately effective.	2	12	
	4. Effective	17	15	
	5. Effective	48	17	
	6. Effective	13	20	
	7. Very effective	18	14	
What importance does the head of your department attach to the fact that you carry out hand hygiene?	1. No importance.	3	9	0.996
	2. Somewhat important	3	7	
	3. Moderately important	1	6	
	4. Important	3	9	
	5. Important	16	19	
	6. Important	16	26	
	7. Very high importance.	58	24	
What importance do your colleagues attach to the fact that you carry out hand hygiene?	1. No importance.	5	6	0.673
	2. Somewhat important	2	5	
	3. Moderately important	1	10	
	4. Important	9	15	
	5. Important	6	14	
	6. Important	64	29	
	7. Very high importance.	13	21	

(Contd...)

Response		Percentage		P value
		Medical	Dental	
What importance do patients attach to the fact that you carry out hand hygiene?	1. No importance.	4	3	0.377
	2. Somewhat important	2	4	
	3. Moderately important	1	9	
	4. Important	3	18	
	5. Important	14	17	
	6. Important	64	29	
	7. Very high importance.	12	20	
How do you consider the effort required by you to carry out good hand hygiene when caring for patients?	1. No effort	4	9	0.759
	2. Somewhat effort.	2	4	
	3. Moderately effort.	1	5	
	4. Effort	3	15	
	5. Effort	14	13	
	6. Effort	64	27	
	7. A big effort	12	27	
On average, in what percentage of situations requiring hand hygiene do you actually perform hand hygiene, either by hand rubbing or hand washing (between 0 and 100%)?	1. 0–30%	11	14	0.000
	2. 31–60%	10	44	
	3. 61–100%	79	42	

to soap and consumes less time. Hand rubbing is more convenient than hand washing as it does not irritate or dry the skin.<sup>[5]</sup>

The most significant factor in managing the spread of infections is considered to be good hand hygiene.<sup>[11]</sup>

This is the study where an integrative comparison was made in between medical and dental students.<sup>[10]</sup>

Many studies have examined the importance of hand hygiene among health-care professionals. The present study was done to assess the knowledge, attitude, and practice among 100 medical and 100 dental students of Bareilly International University. Regarding knowledge on hand infection, various questions were asked to the participants such as hand hygiene training, hand hygiene effectiveness in reducing the infection, and hand hygiene importance at the institution. The majority of the medical students had more knowledge than the dental students which was statistically significant. It is in accordance to a study conducted by Jagdish *et al.*<sup>[9]</sup> As far as attitude was concerned, in our study, medical students showed better attitudes toward hand hygiene than dental students which is in agreement with study conducted by Nair *et al.*<sup>[12]</sup> With respect to their practices like use of alcohol based hand rub, impact of infection associated with healthcare on clinical outcomes of patients, and medical students fared better than their dental counterparts.

Low knowledge, low attitude, and practice toward hand hygiene have been identified by individual studies focused on dental students.<sup>[13-15]</sup> However, there exists paucity on comparison studies regarding hand hygiene between dental students and medical students.<sup>[10]</sup>

The findings of this study indicate a need to instill formal training in hand hygiene at the undergraduate level. A systematic hand hygiene instruction can have a positive influence on undergraduate education attitude and practice. It is critical that undergraduate or health-care professionals maintain good hand hygiene because they

are directly involved in primary care for patients. Hand hygiene education, behavior, and the implementation of hand hygiene training modules should be emphasized in order to improve hand hygiene among undergraduates.<sup>[10]</sup>

#### Limitation of the Study

This study was conducted in single institute with a small sample size. To identify the possible gaps in hand hygiene among undergraduate health-care students, more multicenter studies and qualitative evaluations are required.

## CONCLUSION

In our study, the knowledge, attitude, and practices regarding hand hygiene among medical and dental students was found to be insufficient.

Health-care students handle patients on regular basis so they must be educated regarding the hand hygiene and a formal training should be made compulsory to improve hand hygiene.

## ACKNOWLEDGMENTS

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## QUESTIONNAIRE

1. Did you receive formal training in hand hygiene in the past 3 years?  
A. Yes B. No
2. Do you routinely use an alcohol-based hand rub for hand hygiene?  
A. Yes B. No
3. In your opinion, what is the average percentage of hospitalized patients who will develop a healthcare-associated infection (between 0 and 100%)?  
A. % B. I don't know
4. In general, what is the impact of a health care-associated infection on a patient's clinical outcome?  
A. Very low B. Low C. High D. Very high
5. What is the effectiveness of hand hygiene in preventing healthcare-associated infection?  
A. Very low B. Low C. High D. Very high
6. Among all patient safety issues, how important is hand hygiene at your institution?  
A. Low priority B. Moderate priority C. High priority D. Very high priority
7. On average, in what percentage of situations requiring hand hygiene do healthcare workers in your hospital actually perform hand hygiene, either by hand rubbing or hand washing (between 0 and 100%)?  
A. % B. I don't know
8. In your opinion, how effective would the following actions be to improve hand hygiene permanently in your institution?  
Please tick one " " on the scale according to your opinion.
  - A. Leaders and senior managers at your institution support and openly promote hand hygiene.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - B. The health-care facility makes alcohol-based hand rub always available at each point of care.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - C. Hand hygiene posters are displayed at point of care as reminders.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - D. Each health-care worker receives education on hand hygiene.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - E. Clear and simple instructions for hand hygiene are made visible for every health-care worker.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - F. Health-care workers regularly receive feedback on their hand hygiene performance.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - G. You always perform hand hygiene as recommended (being a good example for your colleagues).  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
  - H. Patients are invited to remind health-care workers to perform hand hygiene.  
Not effective 0 - - - 0 - - - 0 - - - 0 - - - 0 Very effective
9. What importance does the head of your department attach to the fact that you perform optimal hand hygiene?  
No importance 0 - - - 0 - - - 0 - - - 0 - - - 0 Very high importance
10. What importance do your colleagues attach to the fact that you perform optimal hand hygiene?  
No importance 0 - - - 0 - - - 0 - - - 0 - - - 0 Very high importance
11. What importance do patients attach to the fact that you perform optimal hand hygiene?  
No importance 0 - - - 0 - - - 0 - - - 0 - - - 0 Very high importance
12. How do you consider the effort required by you to perform good hand hygiene when caring for patients?  
No effort 0 - - - 0 - - - 0 - - - 0 - - - 0 A big effort
13. On average, in what percentage of situations requiring hand hygiene do you actually perform hand hygiene, either by hand rubbing or hand washing (between 0 and 100%)?  
%