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Original Research Article

A study on knowledge, attitude and practice of hand hygiene among medical students at a tertiary care center in Indore

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ABSTRACT

Background: Hand hygiene is a critical global healthcare issue and a proven cost-effective measure to reduce healthcare-associated infections. Assessing awareness and compliance among healthcare workers is therefore essential. Aim was to evaluate the knowledge, attitude, and practice (KAP) of hand hygiene among final-year medical students and its association with selected variables.

Methods: A cross-sectional study was conducted among 270 final-year medical students at a tertiary care teaching hospital in Indore, central India. Knowledge, attitude, and practices related to hand hygiene among previously trained and untrained participants were assessed using a self-administered questionnaire, including the WHO hand hygiene knowledge assessment tool. Data were entered into Microsoft Excel and analyzed using the Chi-square test. A p value <0.05 was considered statistically significant.

Results: Overall, participants demonstrated moderate knowledge, attitude, and practice of hand hygiene. Among trained students, 55.7% had adequate knowledge compared to 49.6% of untrained students. Similarly, a positive attitude was observed in 61% of trained versus 51.7% of untrained students. Practice compliance was also higher among trained participants (59.5%) than untrained ones (56.8%). Although both groups showed moderate responses, trained students consistently outperformed untrained peers.

Conclusions: The study highlighted the need for rigorous and comprehensive training programs on hand hygiene. Regular reinforcement of hand hygiene techniques can motivate medical students and ensure they remain updated on current best practices. Effective training during medical education may significantly improve compliance and reduce healthcare-associated infections.

Keywords: Attitude, Hand hygiene, Hospital acquired infection, Knowledge, Practice

INTRODUCTION

Health care-associated infections have proved to be the major cause of mortality, prolonged hospital stays, long term disability and excessive financial burden on the patients and health care facilities, especially in the developing and the underdeveloped nations. Most of these infections are potentially transmitted among the patients via the hands of health care workers (HCWs). Therefore, hand hygiene has been emphasized as the cost-effective measure to control the incidences of health care associated infections globally.[1-3]

Knowledge and practice of hand washing greatly vary among the various health care providers across the globe. Poor adherence to this practice has greatly resulted into

nosocomial infections and outbreaks worldwide. To address this issue, world health agencies including World Health Organization (WHO) have introduced sustainable strategies and training sessions from time to time. In spite of being a simple action, the compliance with the procedure has been reported to be as low as 40%. These concepts are being aptly introduced in our institute so as to improve the understanding, training, monitoring and reporting knowledge of hand hygiene among health care providers.[1-6]

Medical students constitute a large percentage of health care workers and are the reflection of future health care community. Since they are known to spend ample amount of time with patients during their clinical training phase, their compliance with hand hygiene is more vital in preventing the disease transmission among patients. [1-6]

In the central India, there is a paucity of studies exploring this subject. In the present study, WHO's concept of "My five moments of hand hygiene" was used as the basis of evaluation of medical students so as to assess their knowledge and awareness regarding hand hygiene.[7]

METHODS

The present study was conducted during the months of October and November 2021, initiated by the department of microbiology of a teaching tertiary care hospital located in the Indore city of central India. It was a questionnaire based cross sectional study.

A standard self-administered questionnaire containing a set of questions regarding knowledge, attitude and practice of hand hygiene was prepared and handed over to 270 final year medical students. Informed verbal consent was obtained from all the students who volunteered to participate. The participants were briefly instructed about the procedure of filling the questionnaire. The questionnaire was kept anonymous and students who were reluctant or those who could not be contacted even after three consecutive visits were excluded from the study. The filled questionnaire was collected after 30 minutes. The study variable was 'prior training in hand hygiene' whereas the outcome variables were knowledge, attitude and practice of hand hygiene.

The questionnaire had four parts. The first section included general profile of a participant. The second section assessed the knowledge regarding hand hygiene by providing ten multiple choice questions based on WHO questionnaire. In the third and fourth section, their attitude and hand hygiene practice was assessed with the help of seven and six, yes and no type self-structured questions respectively. Ethical clearance was obtained by the institutional ethical committee.

The respondents were scored with one point for each correct response to good level of knowledge, positive attitude and good practices. Zero point was given for poor level of knowledge, negative attitude and poor practices. Therefore, the maximum score was 23 and minimum was zero. A score of >75% was considered good, 50-74% was considered as moderate or fair and <50% was considered as poor.

Statistical analysis

Data collected were checked for compliance and consistency. They were analyzed statistically in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) with the help of chi square test to find the association between knowledge and practice of hand hygiene with the selected variable of interest. P value of <0.05 was considered as statistically significant.

RESULTS

In the present cross-sectional study, there were a total of 270 participants (final year medical students) among which 131 (48.5%) had received a formal training in hand hygiene as documented under the infection control program of our institute. When asked about the correct technique of hand washing, 238 (88.1%) participants said that they knew the correct method of hand washing.

Based on the analysis of questionnaire, the knowledge of hand washing was found to be moderate among study population. An average of 73 (55.7%) trained and 69 (49.6%) untrained medical students revealed good knowledge regarding hand hygiene. The percentage of correct responses shown by the trained and untrained students to the individual questions on knowledge of hand hygiene is given in Table 1.

Few students had a very poor attitude with regard to hand hygiene. However, 80 (61%) trained and 72 (51.7%) untrained students revealed the better attitude towards the hand hygiene. The percentage of correct responses of the two groups of students to the individual questions on attitude towards hand hygiene is given in Table 2.

A total of 78.1 (59.5%) trained medical students and 79.0 (56.8%) untrained students practiced hand hygiene in the correct manner as seen from the responses. The percentage of correct responses of the two groups of students to the individual questions on practices related to hand hygiene have been mentioned in Table 3.

Table 1: Frequency of correct and incorrect responses of medical students based on their knowledge related to hand hygiene.

Questions	Training status	Correct answer		Incorrect answer		P value
		N	%	N	%	
Hands when unclean are the main route of cross-transmission of potentially harmful germs between patients and health care workers	Trained	81	61.8	50	38.1	1.2399E-12
	Untrained	73	52.8	66	47.8	
Hand rubbing is more rapid for hand cleansing than hand washing	Trained	78	59.5	53	40.5	0.418134091
	Untrained	82	59.4	57	41.3	
Germs already present on or within the patient is the most frequent source of germs responsible for healthcare associated infections	Trained	67	51.1	64	48.8	0.28936083
	Untrained	74	53.6	65	47.1	
Hand rubbing is more effective against germs than hand washing	Trained	84	64.1	47	35.8	0.1988355
	Untrained	78	56.5	61	44.2	
Hand rubbing causes skin dryness more than hand washing	Trained	56	42.7	75	57.2	0.132206588
	Untrained	67	48.5	72	52.1	
Minimum time needed by alcohol based hand rub to kill most germs on your hands	Trained	62	47.3	69	52.6	0.43367
	Untrained	59	42.7	80	57.9	
Hand rubbing is better than hand washing before palpation of abdomen	Trained	54	41.2	77	58.7	0.000162246
	Untrained	89	64.4	50	36.3	
Hand washing and hand rubbing are recommended to be performed in sequence	Trained	87	66.4	44	33.5	1.53915E-11
	Untrained	43	31.1	96	69.5	
Hand rubbing is better than hand washing before giving an injection	Trained	73	55.7	58	44.2	0.037232572
	Untrained	58	42.0	81	58.6	
Handwashing is better than hand rubbing after visible exposure to blood	Trained	89	67.9	42	32.0	0.061333

Table 2: Frequency of correct and incorrect responses of medical students based on their attitude related to hand hygiene.

Questions	Training status	Correct answer		Incorrect answer		P value
		N	%	N	%	
Before starting my clinical training, I reviewed the respective WHO and CDC guidelines for hand hygiene	Trained	83	63.3	48	36.6	0.42214368
	Untrained	87	63.0	52	37.6	
Sometimes I have more important things to do than hand hygiene	Trained	73	55.7	58	44.2	0.026066
	Untrained	57	41.3	82	59.4	
I lack proper hand hygiene practices because no living examples (i.e. healthcare providers) are performing them	Trained	94	71.7	37	28.4	0.002034
	Untrained	69	50	70		
I feel frustrated when others omit hand hygiene	Trained	87	66.4	44	33.5	0.039829
	Untrained	68	49.2	71	51.4	
Wearing gloves reduces the need for hand hygiene	Trained	74	56.4	57	43.5	0.029888
	Untrained	94	68.1	45	32.6	
I'm reluctant to ask others to engage in hand hygiene	Trained	64	48.8	67	51.1	0.084652
	Untrained	78	56.5	61	44.2	
The newly qualified staff has not been instructed in hand hygiene during their training	Trained	85	64.8	46	35.1	8.68332E-06

Table 3: Frequency of correct and incorrect responses of medical students based on their practices related to hand hygiene.

Questions	Training status	Correct answer		Incorrect answer		P value
		N	%	N	%	
I follow the steps of hand hygiene	Trained	65	49.6	66	50.3	0.273342
	Untrained	58	41.7	81	58.6	
I wash my hands before performing the aseptic and clean procedure	Trained	76	58.0	55	41.9	0.279283
	Untrained	69	50	70	50.7	
I wash my hands before touching a patient	Trained	69	52.6	62	47.3	0.11231
	Untrained	82	59.4	57	41.3	
I wash my hand after touching a patient	Trained	78	59.4	53	40.4	0.206358
	Untrained	88	63.7	51	36.9	
I wash my hands after being at risk of exposure	Trained	87	66.4	44	33.5	0.321777
	Untrained	94	68.1	45	32.6	
I wash my hands after touching the patient surroundings	Trained	94	71.7	37	28.4	0.166048
	Untrained	83	60.1	56	40.5	

DISCUSSION

Hands of the HCW's carry resident and transient bacterial flora and the transient flora is the main culprit in causing hospital acquired infections (HAI). WHO has provided clear guidelines on the techniques of hand hygiene. It is the simplest and most effective procedures that can be deemed as the important infection control measure. In spite of that the compliance rates by HCW's are generally reported to be low.[1-9] Therefore, the present study was conducted to assess the current situation of hand hygiene and understand the awareness and compliance for hand hygiene.

Our study group was the final year medical students that are involved in clinical activities that frequently need the practical knowledge of hand hygiene. In our study group, almost half (51.4%) of the participants were untrained and had no previous knowledge regarding hand hygiene. The similar fact was also supported by Dutta et al who revealed that 54.9% of their study participants lacked the previous knowledge of hand hygiene.[2] The above reports were against the facts documented by Modi et al and Ahmed et al.[10,11]

In our study, both trained and untrained medical students were found to bear a moderate knowledge on hand hygiene. A report from Dutta et al documented the same finding, while few other authors reported a much better knowledge of hand hygiene among study participants.[12-14] A total of 61.8% of trained and 52.5% untrained respondents answered correctly when they were asked about the main route of transmission of potentially harmful germs, during our study. As such no significant differences were observed in the data related to such knowledge of trained and untrained participants ($p>0.05$). However, Ariyaratne et al and Maheshwari et al reported that 72% and 75% of participants respectively knew that unhygienic hands are the main routes of infections.[15,16]

In our study, only 59.5% of trained and 63.3% of untrained medical students responded that they washed their hands after patient contact or any lab procedures. A significant difference ($p<0.05$) was observed among the trained and untrained participants regarding the knowledge and practices related to the procedures performed over the patients. Also, 56.4% of trained and 67.6% of untrained students thought that wearing gloves reduces the need for hand hygiene. The results were statistically significant ($p<0.05$). Studies by Ra'awji et al and Chakraborty et al also reported a better percentage of respondents who followed good hand hygiene practices.[17,18] The practice of proper hand hygiene techniques are also ignored due to lack of education, training, interest, time constraint, complain of skin irritation, non-availability of infra structure and above all the lack of hospital policies and protocols on strict adherence to WHO recommended hand hygiene guidelines.[19]

Regarding the knowledge that frequent source of germs responsible for health care associated infections were the germs already present on or within the patient, 51.1% of trained and 53.2% of untrained medical students answered correctly. These results were also supported by Khaled et al.[20] Regarding the knowledge that hand rubbing is more effective in killing the germs than hand washing, 64.1% of trained and 56.1% of untrained students answered correctly which was comparatively more than those reported by Bavankar et al (44.2%).[1] Our results were not found to be statistically significant ($p>0.05$). However, study by Anargh et al. reported that 82% of their study participants considered alcohol-based rubs to be more effective than soap and water.[21]

Since last 12 months that our institute medical students were introduced with hand hygiene concept in the first year of their medical study during their induction program. When attitudes were assessed, it was found that medical students had a very low to moderate positive

attitude towards the hand hygiene, like feeling of guilt after omitting hand hygiene by self and feeling of discomfort when others omit hand hygiene. Especially trained medical students revealed better positive response (66.4%) as compared to untrained medical students (48.9%) during our study. The results were found to be statistically significant ($p<0.05$). Poor attitude among our participants may also be attributed to the fact that our final year medical students are not directly involved in patient care as they personally do not follow up the cases. Hence, they do not see the consequences of infection control directly. Paucity of knowledge and attitude among medical students has been reflected in several other studies.[3,4]

Lack of hand hygiene awareness and compliance among medical students in our study is mainly attributed to the factors like absence of curriculum-based training on hand hygiene concepts and skills.[3,4] Behavior of students is greatly influenced by their mentors. Students are likely to be less compliant if they observe a casual attitude of their role models at the bed side or while performing faulty hand hygiene.[3,4]

Our findings indicate that medical students need rigorous, comprehensive and regular education and training on hand hygiene and infection control. Training sessions should be conducted more frequently with continuous monitoring and performance feedback to keep the students motivated. Display of hand hygiene posters at appropriate areas and reinforcement of hand hygiene through demonstrations should also be considered as a priority. In order to bring about a positive change in hand hygiene behaviour, it is important to understand the hurdles that have led to poor compliance. Students should also be made to understand the outcomes of proper and improper hand hygiene through experiments. This study only included final year medical students, more healthcare workers need to be included that will be kept in mind for further study is the limitation of the present study.

CONCLUSION

The differences between the knowledge, attitudes and practices of hand hygiene were comparatively better among the trained medical students as compared to untrained students. However, the differences were not highly significant. Our study therefore, highlights an urgent need for introducing measures to enhance and boost up the knowledge, attitude and good practices of hand hygiene among the future health care providers and also to increase the compliance among the medical students and reduce cross transmission of infections among patients.

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