

Knowledge, Attitude and Practice of Hand Hygiene among Medical Students of CIMS Multan, Pakistan

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ABSTRACT

Background: One of the most crucial methods for preventing the spread of infections in the health care system is hand hygiene (HH). Health Care Professionals (HCPs) place a high value on HH knowledge, attitude, and practice, and non-compliance may have unfavorable effects.

Objectives: This study, which is being conducted at the CMH Multan Institute of Medical Sciences (CIMS), Multan, Pakistan (PK), aims to evaluate and compare the knowledge, attitude, and practice of medical students in their clinical year, interns, and between male and female students while also identifying knowledge gaps.

Methods: This study was cross-sectional in nature. 188 medical apprentices and students enrolled in the clinical year (99 men and 89 women). From the beginning of February 2022 till June 2022, five months, this study was finished. The standard self-structured hand hygiene (HH) questionnaire was utilized, and Statistical Package for the Social Sciences (SPSS-20) was used to analyze the results.

Results: 188 students overall, both male and female, responded to the survey. About 92% (173 out of 188) of the responders were in the 18–24 age range. In general, it was discovered that clinical year medical students at CIMS, Multan, Pakistan, had a moderate level of knowledge, attitude, and behaviors about hand cleanliness (50% -75%). In terms of HH, female participants had better attitudes and knowledge than male participants (i.e., >75%), but there was no difference in terms of practice.

Conclusion: Concerning hand hygiene, there are 'overall' satisfactory knowledge, attitude and practice towards HH. Future research in this field should focus on both self-reported responses and directly observed data to assess the practical application of good hand hygiene practices.

Keywords: Hand hygiene; Knowledge; Attitude; Practice; Medical students; Self-structured Questionnaire.

INTRODUCTION

A healthcare-associated infection (HCAI), or hospital-acquired infection, is any infection not present at the time of admission that a patient acquires during or after hospital discharge. According to the World Health Organization, hundreds of millions of people will be affected by HCAI each year. The complexity of treatment caused the health care providers to revert to the basics of infection prevention, such as hand hygiene. Medical students in their clinical year work as members of healthcare teams are heavily involved in patient care. Additionally, during clinical training, students swap through infection-sensitive areas such as operating rooms, intensive care units, maternity and delivery rooms, neonatal intensive care units, and exposing them to a variety of surfaces that may be contaminated with a variety of pathogens. Surfaces that are frequently handled can transfer infections to healthcare staff and patients as HCAs [1].

Hand hygiene (HH) is widely acknowledged as the best operative way to minimize microorganism cross-transmission and lower the prevalence of health-care-associated illnesses. Regardless of the relative simplicity of this process, adherence to hand hygiene among healthcare contributors are very short [2].

The World Health Organization has also launched a science-based idea called My 5 Moments for Hand Hygiene. These five actions include moments beforehand touching a patient, before performing sterile and clean procedures, after risk of exposure to bodily fluids, after touching a patient, and after touching the patient's surroundings. [3].

Washing your hands with soap and water has been a measure of personal cleanliness for generations [4]. But HH practices are very poor among students in lower and middle-income countries. The reasons for low hand hygiene practice in developing countries have not been determined, most likely due to a lack of observation and studies on the subject [5].

Healthcare workers have been found to be the most common carriers of most hospital-acquired disease transmissions from patient to patient and within the healthcare setting. Infected or draining wounds, often contaminated parts of intact patient skin,

patient gowns, bedding, bedside furniture and other items in the patient's surrounding atmosphere are all possible source of health care associated infections. These infections are possibly fatal and difficult to treat [5].

Hand hygiene is a basic, cost effective, easily implemented and an effective practice that can reduce the risk of infection. Hand hygiene is a widely acknowledged approach for preventing respiratory infections and seen as a critical, yet easy and economical, precaution that person can take to prevent the spread of contagious diseases [6].

After the worldwide reaction to the coronavirus (COVID-19) epidemic in recent years, governments all around the world have emphasized the necessity of hand hygiene in limiting the spread of the disease. As a result, the general population has become more interested in hand hygiene. To keep safe against the coronavirus disease (COVID-19) pandemic, it is critical to understand and use of alcohol-based hand sanitizer on a regular basis [6]. During the COVID-19 epidemic, especially healthcare workers (HCWs) were heavy consumers of Alcohol based hand sanitizer users (ABHSs). These measures can have an impact on their own safety, as well as the safety of their personnel, clients, and community [7].

There have been few recent studies in Pakistan assessing the prevalence of medical students' knowledge, attitudes and practices regarding hand hygiene, but no significant scientific assessments have been made. As a result, it is critical to investigate the situation in order to improve the development of appropriate tactics to promote HH for users in the future [6]. The purpose of this study is to identify knowledge gaps in order to increase medical students' awareness and compliance regarding hand hygiene.

The purpose of this study was to evaluate and compare hand hygiene knowledge, attitudes, and practices of medical students from 3rd year of MBBS to 6th year/Interns of MBBS of CIMS, Multan, Pakistan.

MATERIALS AND METHODS

A questionnaire-based cross-sectional descriptive study was conducted from February 2022 to June 2022 at the CMH Multan

Institute of Medical Sciences (CIMS), Multan, Pakistan to assess hand hygiene knowledge, attitudes and practices. A stratified random sampling technique was used to collect the data.

The medical students of 3rd, 4th, 5th and 6th year of MBBS/Interns from CIMS Multan devoid of any chronic illness after obtaining informed consent were included in the study. Medical students suffering from any severe disease were excluded from the study.

A total of 188 study subjects participated in the current study. Keeping in view 5% margin of error, confidence level 95%, population proportion 40% and population size 380 our sample size comes out to be 188. The sample size has been calculated using online sample size calculator [8].

WHO recommended structured questionnaire with all steps of hand washing was designed, which was distributed among the study subjects [9,10]. To assess knowledge, 12 questions were provided. Attitude and practices were assessed using another 6 and 5 questions respectively.

Questions were answered "yes" or "no". A counting system was used, with 1 point for each correct answer, with a maximum of 12 points for knowledge, 6 points for positive attitude, and 5 points for good practice. Wrong reactions to knowledge, negative attitudes and bad habits were given zero points. A score above 75% is considered good, 50-75% fair, and less than 50% poor [2].

For the statistical analysis SPSS version-20 was used. Chi-square test was applied for comparison of the level of knowledge, attitude, and practices of hand hygiene among medical students of different years. P-value of less than 0.05 was considered to be statistically significant. Frequencies and percentages were used to present categorical variables in tables form.

RESULTS

A total of 188 questionnaires were filled by medical students from CIMS Multan. The maximum percentage of students participation was from 3rd year (28.7%) and least was from interns (14.9%). Out of total 188 respondents, male participants were 99(52.7%) and female were 89(47.3%) as shown in Table 1. The 18-24 age group formed the majority of the respondents about 92% and 2% respondents were from age group 25-29.

Table 1: Frequency and Percentage of Male and Female Students, MBBS Students of different years and Age groups of Students.

Sex	Frequency	Percent
Male	99	52.7%
Female	89	47.3%
Total	188	100.0%
MBBS Students from different year of Study	Frequency	Percent
Third year	54	28.7%
Fourth year	53	28.2%
Final year	53	28.2%
Intern /Sixth year	28	14.9%
Total	188	100.0%
Age Groups (Years)	Frequency	Percent
18-24	173	92.0%
25-29	15	8.0%
Total	188	100.0%

The results were divided into three sections according to the group of questions being asked:

1. Knowledge in Hand hygiene.
2. Attitudes towards Hand hygiene.
3. Self-reported Hand hygiene practices.

Knowledge in hand hygiene: Participants were asked 12 questions to evaluate their data regarding hand hygiene as shown in Table 2. The 4th and 5th year students (96.2 %) had the maximum knowledge in healthcare settings, the primary method of spreading potentially hazardous bacteria between patients is through the unclean hands of healthcare personnel (Table 2). 3rd year students (100 %) ,with a significant p- value of 0.002 .

Average knowledge of hand hygiene among medical students was assessed on the basis all 12 questions. In 3rd year medical students, 41.6% have good knowledge of hand hygiene

while 25% have moderate and 33.3% have poor knowledge. In 4th year medical students, 41.6% have good knowledge, 16% have moderate and 41% have poor knowledge of hand hygiene. 42.6% of fifth year medical students and interns (sixth year) have good knowledge, 25% have moderate and 33.3% have poor knowledge.

In Table 2, male and female ratio of knowledge of hand hygiene has been expressed as frequencies with percentages of Yes and No answers and p- value for each question. 41.6% males and 41.6% females have good knowledge while 33.3% males and 16.6% females have poor knowledge of hand hygiene.

Table 2: Frequency and percentage of correct answer among medical students regarding KNOWLEDGE of hand hygiene and their corresponding p-value.

#	QUESTIONS	Year of MBBS	Correct Answer (Frequency & %)	P-VALUE
1	Hands when not clean is the main route of cross-transmission of potentially harmful germs between patients in health-care settings.		YES	0.957
		3 rd (n=54)	51 (94.4%)	
		4 th (n=53)	51 (96.2%)	
		5 th (n=53)	51 (96.2%)	
		6 th (n=28)	27 (96.4%)	
2	The most frequent source of germs for healthcare associated infections is bacteria.		YES	0.002
		3 rd	54 (100%)	
		4 th	40 (75.5%)	
		5 th	47 (88.7%)	
		6 th	23 (82.1%)	
3	In order to clean your hands, hand rub is quicker than washing.		YES	0.302
		3 rd	28 (51.9%)	
		4 th	26 (49.1%)	
		5 th	28 (52.8%)	
		6 th	9 (32.1%)	
4	It's better to rub your hand in order to fight the germs instead of washing it.		YES	0.968
		3 rd	16 (29.6%)	
		4 th	14 (26.4%)	
		5 th	15 (28.3%)	
		6 th	9 (25%)	
5	In order to kill most germs on your hands, 20 seconds is the minimum time needed to apply an alcohol based hand rub:		YES	0.947
		3 rd	30 (55.6%)	
		4 th	28 (52.8%)	
		5 th	31 (58.5%)	
		6 th	16 (57.1%)	
6	Before the palpation of the abdomen, it is best to rub your hands instead of washing:		YES	0.169
		3 rd	31 (57.4%)	
		4 th	36 (67.9%)	
		5 th	38 (71.7%)	
		6 th	14 (50%)	
7	Before giving the injection, you should rub your hand instead of washing it.		YES	0.753
		3 rd	21 (38.9%)	
		4 th	25 (47.2%)	
		5 th	20 (37.7%)	
		6 th	11 (39.3%)	
8	After taking off your exam gloves, hand rubbing is preferable than hand washing.		YES	0.441
		3 rd	20 (37%)	
		4 th	21 (39.6%)	
		5 th	14 (24.4%)	
		6 th	8 (28.6%)	
9	After coming into contact with blood, cleaning your hands is preferable than rubbing them.		YES	0.960
		3 rd	42 (77.8%)	
		4 th	43 (81.1%)	
		5 th	42 (79.2%)	
		6 th	23 (82.1%)	
10	Damaged skin should be avoided since it's likely that hazardous bacteria will get on your hands from it.		YES	0.855
		3 rd	48 (88.9%)	
		4 th	49 (92.5%)	
		5 th	47 (88.7%)	
		6 th	26 (92.9%)	
11	Avoid using hand cream on a regular basis.		YES	0.071
		3 rd	26 (48.1%)	
		4 th	18 (34%)	
		5 th	19 (35.8%)	
		6 th	17 (60.7%)	
12	Avoid wearing artificial fingernails.		YES	0.798
		3 rd	47 (87.0%)	
		4 th	48 (90.6%)	
		5 th	46 (86.8%)	
		6 th	26 (92.9%)	

Attitude towards hand hygiene: Table 3 exhibits each year student's attitude towards hand hygiene. 4th year students exhibited the best attitude towards hand hygiene 69.8 %, with a significant p-value 0.006. According to these tables, 50% of 3rd year students had moderate and 50% had poor attitude. In 4th year medical students, 16.6% had good attitude, 50% had

moderate while 33.33% had poor attitude towards hand hygiene. 50% 5th year students had moderate and 50% had poor attitude. 66.6% 6th year had poor attitude towards hand hygiene while 16.6% had good and 16.6% had moderate attitude. Males (66.6%) exhibited moderate attitude when compared with females (33.3%) as shown in Table 5.

Self-reported Hand hygiene practices: Medical students were asked five questions regarding the use of hand hygiene as shown in Table 4. 82.1% of 6th year students exhibited the best practices towards hand hygiene, significant p – value of 0.001.

Table 5 exhibited that there is no difference between male and female hand hygiene practice ratio. 80% males and 80% females have good practice of hand hygiene and 20% of males and 20% of females have moderate practice.

Table 3: Frequency and percentages regarding ATTITUDE of hand hygiene among medical students.

Questions	Year of Mbbs	Correct Answer (Frequency & %)	P-Value
The relevant WHO and CDC Guidelines for hand hygiene have been revised as follows:		YES	0.894
	3rd	27 (50.0%)	
	4th	23 (43.4%)	
	5th	24 (45.3%)	
	6th	12 (42.9%)	
I'm not practicing proper hand hygiene.		NO	0.142
	3rd	24 (44.4%)	
	4th	31 (58.5%)	
	5th	35 (66.0%)	
	6th	17 (60.7%)	
I've got bigger things to do than washing my hands sometimes.		NO	0.006
	3rd	22 (40.7%)	
	4th	35 (66.0%)	
	5th	37 (69.8%)	
	6th	13 (46.4%)	
The need for hand hygiene is reduced by wearing gloves.		NO	0.783
	3rd	22 (40.7%)	
	4th	20 (37.7%)	
	5th	23 (43.4%)	
	6th	9 (32.1%)	
It makes me feel frustrated when others don't wash their hands.		YES	0.492
	3rd	40 (74.1%)	
	4th	42 (79.2%)	
	5th	38 (71.7%)	
	6th	24 (85.7%)	
I'm not comfortable asking other people to wash their hands.		NO	0.655
	3rd	29 (53.7%)	
	4th	27 (50.9%)	
	5th	23 (43.4%)	
	6th	12 (42.9%)	

Table 4: Frequency and percentages regarding PRACTICE hand hygiene among medical students

#	Questions	Year of Mbbs	Correct Answer (frequency & %)	P-VALUE
1	I'm following the procedure to wash my hands.		YES	0.904
		3rd	43 (79.6%)	
		4th	40 (75.5%)	
		5th	42 (79.2%)	
		6th	23 (82.1%)	
2	Before I perform the aseptic and clean procedure, I wash my hands.		YES	0.445
		3rd	48 (88.9%)	
		4th	45 (84.9%)	
		5th	48 (90.6%)	
		6th	27 (96.4%)	
3	After being exposed, I wash my hands.		YES	0.402
		3rd	52 (96.3%)	
		4th	50 (94.3%)	
		5th	47 (88.7%)	
		6th	25 (89.3%)	
4	When I touch the patient's body or his surroundings, my hand is washed.		YES	0.817
		3rd	49 (90.7%)	
		4th	47 (88.7%)	
		5th	45 (84.9%)	
		6th	25 (89.3%)	
5	I've been carrying and using hand sanitizers.		YES	0.001
		3rd	40 (74.1%)	
		4th	26 (49.1%)	
		5th	43 (81.1%)	
		6th	23 (82.1%)	

Table 5: Students' AVERAGE knowledge, attitude and practice of hand hygiene between Male and Female medical students from different years of MBBS at CIMS (expressed as "average" of frequencies and percentages)

GENDER	AVERAGE HH KNOWLEDGE		
	Frequency	Percentage	Results
MALE (n=99)	64.75	65.4%	Moderate (50-75%)
FEMALE (n=89)	53.4	60.0 %	Moderate (50-75%)
GENDER	AVERAGE HH ATTITUDE		
	Frequency	Percentage	Results
MALE (n=99)	51.66	52.18%	Moderate (50-75%)
FEMALE (n=89)	49.8	55.98%	Moderate (50-75%)
GENDER	AVERAGE HH PRACTICE		
	Frequency	Percentage	Results
MALE (n=99)	81.6	82.42%	Good (>75%)
FEMALE (n=89)	76	85.38%	Good (>75%)

DISCUSSION

The present work sought to evaluate knowledge, attitudes, and hand hygiene behaviors among CMH Institute of Medical Sciences Multan students who will soon be working as healthcare providers. Hand washing causes a significant reduction in the transmission of potential pathogens between health care workers and patients. The importance of correct hygiene behavior and development of sense of responsibility regarding hand hygiene is necessary for the young medical students to help them apply it practically throughout their profession.

In order to assess the knowledge, attitudes and practices concerning hand hygiene, our study has addressed a number of questions. Either yes or no answer was given to the questions. A grading system based on points given for each good answer has been applied. A score of 75% or higher was considered a good one, between 50 to 74% moderate and below 50% weak. The results show that for various questions, the medical student's knowledge about hand hygiene varied between 12 % and 100 %.

After visible exposure to blood or body fluid representing adequate knowledge, most participants were satisfied with the fact that washing hands is more effective than hand rub. According to this study, 94.4% of third year students agreed in the view that a possible source of pathogens is health care staff's hands if they are not clean and 96.6% of interns agree with it [1] which says that antibiotic resistant pathogens are frequently spread via the contaminated hands of clinical staff.

As far as attitude is concerned, more than half of the students showed lack of interest in reviewing and gaining knowledge of CDC and WHO guidelines for hand hygiene. A number of students considered that the need to wear gloves decreases hand hygiene, showing a negative attitude when they have not kept their hands clean after wearing gloves because they do not use gloves at work. These results are in contrast with the previous study on hand hygiene to prevent covid'19 [7] in which 91% participants agreed that hand hygiene is required even when using gloves. This negligence in the attitude of students towards hand hygiene needs to be overcome by conducting lectures on regular intervals on hand hygiene and its importance.

The results for assessment of hand hygiene practices were quite positive since majority of students were practically applying the knowledge of hand hygiene in their medical profession. Washing hands after touching patient or patient's environment was found in almost (about 90%) all the students while considerable amount of students also carried a hand sanitizer with them. Another study concerning hand hygiene [6] also shows that majority of medical practitioners carry alcohol based sanitizers with them.

According to our results, only a small percentage of students were unaware of proper hand hygiene procedures, which is quite possible to reach 100% if the Infection Control Committee manages to conduct annual awareness seminars in medical colleges. It was also seen that final year students and interns are maintaining better hand hygiene as compared to fresh medical students since 100% students of final year and interns lie in the category of good (>

75%) regarding hand hygiene practices which is also proved by previous studies [4].

As far as differences of hand hygiene among male and female students is concerned, our results showed that both genders were equally capable in knowledge and practice of hand hygiene with 46.1% and 80% of both the genders lying in the category of good (>75%) for knowledge and practice of hand hygiene respectively. But female students were found to excel in the domain of attitude towards hand hygiene with 16.6% of females being in the category of good while none of the male students could succeed to fall under this category. These results are in contrast with the previous researches [4, 13] that show female students to be more competent than males in hand hygiene practices.

Pakistan ranks lower in hand hygiene practices and comparatively fewer studies have been done on this topic which shows the general negligent behaviour. The findings of this study indicate the possibility that with minimum efforts, maximum practical outcome can be achieved on hand hygiene to reduce the spread of nosocomial infections that cause a significant amount of morbidity and mortality. A study in Kenya found that after including the programme into their curriculum, medical students' awareness of hand hygiene improved significantly. Sharing facts concerning In addition, improving their compliance with hand hygiene can help to reduce the morbidity and mortality of clinical year medical students due to inadequate hand hygiene.

CONCLUSION

The study showed that medical students in the CIMS had good attitudes, practices and knowledge with regard to hygiene of hands. Although, they did have certain perceptions of hand hygiene and their views were shaped by them. The level of compliance significantly depends on the medical year since final year and interns showed better attitudes and practice of hand hygiene and were found practically applying the knowledge of hand hygiene during their clinical rotations. Differences in hand hygiene maintenance among male and female students were also reflected in their attitudes showing the females to be more careful regarding hand hygiene maintenance. In order to encourage compliance with hand hygiene standards, systematic organisational monitoring mechanisms such as valid trained observation and feedback on continuous professional development and education should be suggested as an incentive for improvement of performance. Future research in this area should emphasise both self-reported replies and directly observed observations to tackle the real use of appropriate hand hygiene practices. This will disclose whether there is a discrepancy between what is reported and what is observed.

Recommendations: It is recommended that to address the actual use of correct hand hygiene practices, future research on this area should focus on both self-reported replies and direct observation. Systematic organizational monitoring mechanisms, such as a valid trained observation, and feedback for continuous professional

growth and training, as an incentive for performance improvement are recommended to promote adherence to hand hygiene standards. Loopholes in hand hygiene needs to be overcome by conducting awareness lectures on regular intervals on hand hygiene and its importance. To comply with practice of hand hygiene religiously it is advisable to install hand washing basins and hand sanitizers outside every ward specifically for healthcare workers and generally at every public place.

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