

HAND WASHING KNOWLEDGE, ATTITUDE AND PRACTICES AMONG MEDICAL STUDENTS

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ABSTRACT

Correct and effective hand hygiene knowledge, practices and skills are essential for reducing healthcare associated infections. However, compliance of healthcare workers to hand hygiene guideline are reportedly not up to the mark. It is important to instil adequate knowledge, positive attitudes and good practices at the time of primary care training of healthcare workers including medical students. The study was done to judge basic knowledge, identify gaps in knowledge, attitudes, skills and practices on hand hygiene among under-graduate medical students. A pre-tested questionnaire based cross-sectional study was done among various batches of medical students. Results show that participants has basic knowledge on various aspects of hand hygiene, but various aspects of hand washing like frequency, correct method of hand washing, use of right temperature of water used for hand washing, hand drying, and skills at health care facility needs further improvement, which can be done by reinforced training, observation and improving skills. This will go a long way in preventing noso-comial infections.

KEYWORDS : Medical Students, Hand Hygiene, Washing Technique, Infectious Diseases, Noso-comial Infections

Health care-associated infections affect hundreds of millions of patients worldwide every year. Noso-comial infections are caused by many different factors related to systems and processes of care provision as well as to human behaviour that is conditioned by education, societal norms and beliefs. Most infections however are preventable.

Hand hygiene is the primary measure to reduce infections. WHO First Global Patient Safety Challenge, Clean Care is Safer Care, is focusing part of its attention on improving hand hygiene standards and practices in health care workers.

Annually more than 3.5 million under 5 years children die due to diseases of GI Tract, Respiratory infections, etc. (Abd and Bakr, 2009). Studies have suggested that most of this morbidity and morbidity can be prevented by simple intervention measures, like proper hygiene, hand washing, availability of safe water, food hygiene, education etc. Medical establishments have a major role in training their staff in basic hand hygiene practices. The first historical evidence on importance of hand washing was revealed in maternity clinics on Vienna, as early as in 1847. Many studies carried across the world have demonstrated that proper hand washing practices reduces risk of infectious diseases. It has been suggested that the incidence of hospital acquired infections can be reduced by app. 15 %, if hand hygiene recommendations are implemented (Curie et.al, 1997). Hand-washing can reduce the risk of severe intestinal infections and shigellosis up to

48% and 59% % respectively Another meta-analysis reported that all eligible studies showed a 6.0% to 44% reduction in respiratory diseases with proper hand washing (ISFHH et al., 2011).

A study among medical and university students in Turkey found hand washing less than 5 times a day among 27 % students, reasons for skipping hand washing was the students belief of 'no need' (63.7%) (Kennedy et al., 2004). In a study conducted among medical and nursing students in Shrilanka found moderate knowledge (77%), but attitudes, practices and satisfaction of facilities was found to be poor (<50%) (Kennedy and Burnett, 2011). Similar study in Nigeria in teaching hospital among health worker found hand washing after interacting with patients to be 9.3% among nurses and 51.2% among doctors (Larson et al., 1997).

Present study evaluated knowledge, attitude and practices among medical students of 1st year to 4th year MBBS students of a Medical College.

MATERIALS AND METHODS

Present study was conducted at Major SD Singh Medical College, Farrukhabad, (UP) India among medical students of 1st, 2nd and 4th year during the period from Jan 2015 to April 2015. All necessary permission from medical administration including that of ethics committee was obtained. Consent of participants was also taken. Purpose of the study and important aspects related with hand washing

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were explained to participants. Questionnaire was prepared by using previously published studies (Balafama et al., 2011, Jerry et al., 2013, Kennedy and Burnett, 2011) Questionnaire was pretested to validate questions and necessary amendments were made to obtain correct responses. Questionnaire was filled under guidance in a separate session; doubts were clarified to obtain correct responses. Responses were statistically analyzed and validated using software SPSS.

RESULTS

In all 279 medical students from 3 batches of MBBS participated in the study. Ages of the students were in between 18-26 years. Percentage of male participants was 76.1, 66.7 & 63.7 % for 1st, 3rd and 4th year MBBS students respectively (Table1). Basic qualification of majority of participants was Intermediate , 51.1% & 60.4% students in 1st and 3rd year were from semi-urban background, whereas in 4th year majority (92.9%) were from urban background.

Responses of students with regard to their hand washing knowledge, practices and skills are presented in table 2, 3, 4 and 5 respectively. A general analysis of the responses show a gradual learning, improvement in knowledge, practices and skills related with hand washing.

Majority of students were educated about basic knowledge of hand washing by their parents. Majority of students in 3rd and 4th year have received training on hand washing (97.2 % & 100% respectively). More than 80 % of students of 3rd and 4th year wash their hand more than 6 times a day, whereas same is only 18.4% for 1st year students. Reasons for skipping hand washing were mentioned as no time, keep forgetting etc. Table 4 shows responses on various aspects of hand washing knowledge, notable increases in responses from 'Sometime' To ' Always' for important aspects of hand washing like washing hands after coming home, using public transport, when hands are soiled, after touching sick people etc. Majority of students (>95%) were aware of the basic fact of need of hand washing for prevention of infection (Table -2). Most of them (>75%) were told of the importance by their parents. Majority use soap or hand wash solutions for hand wash. Only 60% students of 1st year agreed of having received any training for hand washing, whereas 100% students of 4th year stated of having received formal training in hand washing. Frequency of hand washing (3-5 time a day) was observed in 71.4%, 78.9% and 83.5% students of 1st, 3rd and 4th year respectively, which is less than the desirable frequency of 6-10 times a day (Table 2). P values for various responses analysed statistically have been mentioned in last column of tables 2,3,4 and 5.

Table 1 : General Characteristics of Participants

Sr. No.	Parameter		1 st Year MBBS		3 rd Year MBBS		4 th Year MBBS	
1.	Nos. of Students in the Batch		100		103		95	
	Participants, No's (%)		92 (92%)		96 (93.2%)		91(95.7%)	
			Nos.	%	Nos.	%	Nos.	%
2.	Gender	Male	70	76.1	65	67.7	58	63.7
		Female	22	23.9	31	32.3	23	25.3
3.	Age profile	Under 19 yrs.	65	70.9	72	75.0	-	-
		19-21 yrs.	21	22.9	18	19.0	2	2.2
		21-23 yrs.	4	4.2	4	4.0	54	59.3
		Above 23 yrs.	2	2.0	2	2.0	25	27.5
4.	Qualification	Intermediate	86	93.9	88	91.7	80	88.4
		Graduation	4	4.1	6	6.2	11	11.6
		Post Graduation	2	2.0	2	2.1	--	--
5.	Resident	Urban	35	38.3	29	30.2	85	92.9
		Rural	10	10.6	9	9.4	1	1.2
		Semi- urban	47	51.1	58	61.4	5	5.9

Table 2 : Basic Knowledge, Practices Level With Regard to Hand Washing

Sr. No.	Parameter	Response in affirmative						X ² p value	
		1 st Year		3 rd Year		4 th Year			
		Nos. (92)	%	Nos. (96)	%	Nos. (91)	%		
1.	Hand washing is necessary for prevention of transmission of infections?	90	97.9	91.4	95.3	90	98.9	2.367 p>0.05	
2.	Who told you about importance of hand washing?							16.104 P<0.01	
	A. Parents	73	79.6	79	82.3	84	87.7		
	B. At School	16	18.4	15	15.4	7	12.3		
	C. Friends	3	2.0	2	3.2	--	--		
3.	Do you routinely use soap for hand washing?	62	68.8	74	77.2	76	83.9	4.21 <0.05	
4.	Do you routinely use hand wash solution for hand washing?	75	81.6	87	91.0	83	92.0	3.217 p>0.05	
5.	Have you received any training in hand washing?	55	60.4	93	97.2	91	100%	13.600 P<0.01	
6.	How many times you wash your hands?	(1-2 times)	9	10.2	34	3.5	1	1.2	7.863 P=0.05
		(3-5 times)	67	71.4	16	17.6	14	15.3	
		(6-10 times)	16	18.4	76	78.9	76	83.5	
7.	Main reason for Skipping hand washing?	(No need)	22	23.9	6	5.8	0	0.0	19.775 P<001
		(No time)	16	17.4	65	67.4	69	75.6	
		(Keep forgetting)	30	32.6	2	2.1	13	14.0	
		(Others)	24	26.1	23	24.7	9	10.4	

Table 3 : Participants Knowledge About Hand Washing

Sr. No.	Parameter	1 st Year			3 rd Year			4 th Year			P Value
		Agree	Disagree	Don't know	Agree	Disagree	Don't know	Agree	Disagree	Don't know	
1.	Cold water should be used for hand washing?	47.9	37.5	14.6	32.9	63.4	3.7	18.6	76.7	4.7	20.365 P<0.001
2.	Luke warm water should be used for hand washing?	85.3	10.2	5.5	94.7	5.3	--	97.2	2.8	--	4.701 p>0.05
3.	No need to remove watch and bracelets before hand washing?	12.5	81.3	6.3	11.1	88	0.9	8.0	90.8	1.1	3.676 P>0.05
4.	Need to remove rings before hand washing?	75.5	20.5	4.1	80.1	17.8	2.1	85.1	14.9	-	4.455 p>0.05
5.	Need to wash wrists also?	44.3	55.7	-	85.8	12.2	2.0	90.8	8.0	1.1	1.840 p>0.05
6.	Hands need to be washed at least 20 seconds?	93.9	6.1	-	94	6	-	94.1	5.9	-	0.003 p>0.05
7.	Need drying after washing the hands?	93.8	2.1	-	94.4	4.1	1.5	96.6	2.3	1.1	1.299 p>0.05

DISCUSSION

Present study examined medical student's hand washing knowledge, practices and skills. It also determined association with some social parameters (Ariyaratne et al., 2013). these study indicate wide spread insufficient hand

hygiene in various groups. Main reasons for skipping hand washing were participants believe of No need and No time. Another study encompassing health workers enquired about the reasons for not washing their hands pointed out similar responses such as Not think about it at the moment,

Table 4 : Hand Washing Practices Among Medical Students of Different Batches*

Sr. No.	Parameter	1 st Year			3 rd Year			4 th Year			P Value
		Always	Some times	Never	Always	Some times	Never	Always	Some times	Never	
1.	I wash my hands before meals.	93.7	6.3	--	92.7	7.3	--	98.9	1.1	--	9.770 p<0.01
2.	I wash my hands after meals.	95.8	4.1	--	95.7	4.3	--	95.1	4.7	--	2.842 p>0.05
3.	I wash my hands after using bathroom.	95.9	4.1	--	96.2	3.6	0.2	95.4	3.4	1.1	5.572 p>0.05
4.	I wash my hands when come home.	67.3	28.6	4.1	68.2	29.2	2.6	89.0	11.0	--	0.598 p>0.05
5.	I wash my hands before going to bed.	30.6	46.9	22.4	32.5	42.7	24.8	39.1	54.0	6.9	3.626 p>0.05
7.	I wash my hands after using public transportation.	66.3	26.5	6.1	72.9	24.7	2.4	96.6	3.4	--	22.630 P<0.001
8.	I wash my hands after waking up in the morning.	82.1	15.0	3	88.8	11.2	--	98.7	1.3	--	0.604 p>0.01
9.	I wash my hands after touching animals.	87.8	8.2	4.1	96.4	2.2	1.4	98.9	1.1	--	8.152 P<0.05
10.	I wash my hands only if they are soiled.	81.7	14.3	4.0	87.9	12.1	--	98.7	1.3	--	28.608 p<0.001
11.	I wash my hands after blowing the nose.	95.9	4.1	--	96.3	3.5	0.2	98.8	1.2	--	0.014 p>0.05
12.	I wash my hands after touching garbage.	95.8	2.1	2.1	94.4	3.4	2.2	98.8	1.2	--	1.199 p>0.05
13.	I wash my hands before touching sick people.	52.1	33.3	14.6	56.7	35.7	7.6	57.6	29.4	12.9	1.967 p>0.05
14.	I wash my hands after touching sick people.	87.8	8.2	4.1	88.8	7.6	3.6	98.6	1.2	1.2	0.385 p>0.05
15.	I wash my hands after cleaning my home.	100	--	--	98.1	1.9	--	98.6	2.4	--	5.562 p>0.05

*All Responses in percentage

forgetting and being busy (Pitted et.al, 2004). Other study on hand washing showed that skin drying effect of hand hygiene products, soap or paper towel unavailability, Lack of time, lack of knowledge, forgotten were the main reasons of skipping hand washing.

In present study highest number of participants correctly stated that one should dry their hands after hand washing. A good number of Medical students were not aware of the fact that water temperature is an important hand hygiene issue. High number of students stated that they wash their hands after handling garbage, cleaning room, touching animals, using public transport etc. Another study showed that majority of students washes their hands after using washrooms (Ariyaratne et al., 2013).

It is not possible to define universally recommended number of daily hand washings to ensure proper hand hygiene as it depends upon types of daily activities. However this frequency increases significantly in

persons engaged in medical training and profession, a good number of students wash their hands less than 5 times a day which indicates a lack of perception, though there is increase in hand washing frequency among senior students. In one study, it was shown that 41.5 % wash their hands 11 times a day which was recommended as the cut off point for proper hand washing in the study (Ariyaratne et al., 2013).

In a study carried out in Turkey among university students frequency of hand washing was found to be 6-10 times a day (Kennedy and Burnett, 2011), another study found only 41.4 % of participants wash their hands 11 times a day which was recommended as the cut off point for proper hand washing (ISFHH, 2011). Study also indicates widespread insufficient hand hygiene practices and knowledge among students groups. Main reason for skipping hand washing were students believes of 'no need' and 'keep forgetting'. Another study also encountered the same responses among health workers such as not think

Table 5 : Hand Washing Skills of Participants*

S.No	Parameter	1 st Year	2 nd year	3 rd Year	X ² /PValue
1	Main cause of transmission of harmful germs between patients in a hospital?				
A	Staff hands are not clean	14.3	12.5	10.6	15.293 P<0.01
B	Unclean air in the hospital	14.3	22.3	6.7	15.325 P<0.01
C	Unclean patients bed, linens etc.	42.9	52.3	64.7	
D	Instruments used by staff	28.6	12.9	18.0	
2.	Main Source of infection in a hospital to the patient?				
A	The hospital staff	4.2	4.3	5.9	17.160 P<0.01
B	The Hospital air	6.3	42.6	56.5	5.323
C	Germs present on patients	27.1	28.6	37.6	2.453
D	Hospital environment	62.5	24.5	--	12.226
3.	Which hand hygiene action prevents transmission of germs to patients?				
A	Hand washing before touching a patient	95.8	88.7	63.5	1.279
B	After exposure to body fluids	93.9	98.4	100	1.667
C	Exposure to immediate surroundings to patients	91.8	93.3	97.6	4.389
D	Before a aseptic procedure	93.8	87.9	67.1	0.025
4.	Which hand hygiene action will prevent transmission of germs to you?				
A	After touching a patient	95.9	90.6	90.6	1.279 p>0.05
B	After exposure to body fluids	95.8	88.4	89.4	1.667 p>0.05
C	Before a aseptic procedure	91.3	79.9	76.5	4.389 P<0.05
D	Exposure to patients surroundings	95.8	95	96.4	0.025 p>0.05
5.	Minimum time needed for chemical solution hand rub to kill germ?				
A	20 seconds	34.7	76.9	87.1	50.524 P<0.001
B	5 seconds	--	2.1	4.7	
C	1 minute	24.5	12.6	1.2	
D	10 seconds	40.8	10.5	7.1	

*All Reponses in percentage

about it at the moment, forgetting and being busy (Curie et al., 1997). In another study the most common responses were 'no need' and 'lack of time', 'lack of knowledge'(Global Hand Washing Guide, 2011). Other studies on hand washing showed that 'skin drying effect of hand hygiene effects, soap or paper towel unavailability, lack of time, lack of knowledge, not thought and forgotten, lack of role models were the main reason for improper hand washing practices.

Majority of students responded correctly that one should dry his hands after washing. However, most of the students were unaware that the right temperature of water is

an important factor of hand hygiene. High number of students responded that the wash their hands after touching garbage, after using toilets, after using public transport, after touching animals. Larson et al, 1997 in their study found that 'Washing hands after using toilets received full marks, however 'washing hands before meals' scored less.

In a study carried out in Turkey among University students, they found more positive response among female students, However a study from Africa did not show any difference in frequency of hand washing between genders (Jerry, 2013). No such evaluation was done with regard to gender in current study. A similar study on evaluation of

compliance to hand hygiene guidelines among health care workers and the medical students were found to be more compliant (Curie,1997).

There were some limitations to the present study , no structured observations were made to analyse the inputs given to students on hand hygiene practices at various stages of their study, no correlation was made with sex and socio-economic status. We were concerned with their learning with regard to an important parameter and a factor on noso-comial infections in a medical setup, as proper hand hygiene practices, knowledge, practices and skills are basics for a good medical practitioner. Study highlights to improve current training programmes on hand hygiene practices among medical students with continuous monitoring and evaluation. It is important to provide the best appropriate knowledge and proper training regarding basic preventive practices.

CONCLUSION

The medical students have moderate knowledge, attitude and skills.. There is need to give structured inputs based on WHO guidelines and reinforcement and subsequent evaluations.

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