



## Original Article

# Assessment of the Knowledge, Attitude and Practices Regarding Hand Hygiene amongst the Healthcare Workers in a Tertiary Health Care Centre

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## ARTICLE INFO

## ABSTRACT

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**Introduction:** Hand hygiene is an important strategy to prevent health care-associated infections (HAI) and limits the transmission of microorganisms. Poor hand hygiene practices are a major threat and pose a huge risk to the health of the patients. **Objective:** We compared the level of knowledge attitude and practice regarding hand hygiene among doctors and nurses. **Results:** Training sessions were conducted for 100 healthcare workers (56 doctors and 44 nurses) and their assessment for knowledge, attitude and practice was done through pretest and posttest questionnaire. There was a significant improvement in the KAP score for both doctors and nurses after the training sessions. Doctors have better knowledge of hand hygiene. Although nursing staff have relatively less knowledge about the hand hygiene, but a good percentage of this category has a positive attitude and follows the correct practicing habits. WHO recommends alcohol based hand rub (ABHR) for hand antisepsis as it is fast acting and has broad spectrum antimicrobial activity. In our study, most of the doctors still believe that soap and water is the best way of hand hygiene. Nurses were found to be more aware about ABHR as best method. **Discussion & Conclusion:** Overall, level of awareness regarding the importance of hand hygiene and WHO's five moments of hand hygiene is low in both doctors and nurses and there is a need of regular training sessions and monitoring of hand hygiene compliance under strict supervision. **Keywords:** Hand hygiene, Healthcare associated infections, Knowledge, Attitude, Practices

## 1. INTRODUCTION

Implementation and adherence to hand hygiene practices in a healthcare facility can prevent health care-associated infections (HAI) and limit the transmission of microorganisms, including multidrug resistant pathogens. It is a required practice for all health care providers and is recommended in all

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national and international infection control guidelines and is a basic expectation of patients and their families. Hand hygiene is one of the five key initiatives set out by the World Alliance for Global Patient Safety Challenges <sup>1</sup>.

Over the years, there has been massive advancement in the health care system but it is strange that health-care settings, which restore and maintain health, also threaten patient's health. One major hazard arises from poor hand hygiene practices, which poses a huge risk not only to the health of the patients but also to the health care professionals <sup>2</sup>.

The total number of hand exposures in a hospital may range from several tens to thousands per day. With each hand-to-surface exposure a two directional exchange of microorganisms occurs between hands and the touched object and the transient hand-carried flora is thus continuously changing. Most of the healthcare workers hand flora gradually gets replaced by pathogenic microorganisms, which can spread throughout a health care environment in a short span of time.

Hand hygiene in the health care setting has been encouraged for generations and is recommended as the single most important procedure for preventing the transmission of infection.

## 2. MATERIAL & METHODS

Our hospital is a 1247 bedded tertiary care hospital in Delhi providing out-patient, in-patient and intensive care services. We have a dedicated infection control team including five infection control nurses to assess and record the current infection control practices, fill existing gaps through training and continuous review of procedures to address new issues.

Training sessions were conducted for all Health care workers in different categories including doctors and nurses by the Microbiology departments. A pre-designed questionnaire was given to all. These sessions

were completed over a period of three months (January 2015- March 2015). First, a pretest questionnaire was given to all participants to evaluate their base line knowledge about hand hygiene practices. The first presentation focussed on the Overview and WHO guidelines for Hand Hygiene: Techniques. The second presentation focused on the Monitoring of hand hygiene and Innovations. The Implementation of Action Plan for Hand Hygiene improvement was discussed in the third presentation which was followed by a discussion on Hand Hygiene practices in India. In the group activity, demonstration of Glogerm, smart app, preparation of in house Hand rub and various types of Hand Hygiene products and dispensers were shown.

After the presentation a posttest evaluation was conducted in questionnaire format. This questionnaire consisted of twenty questions of one mark each. Questionnaire was assessed in three parts depicting response to Knowledge, Attitude and Practices (Table 2, 3 and 4). Questionnaire for doctors and nurses were similar. KAP score assessment was done which is shown in table 1. On the basis of their performance, each participant was given a KAP score. A KAP score of 1-9 was considered poor, 10-14 as fair; 15-18 as good and above 18 as excellent. On the basis of these scores, all the participants were graded as Excellent, good, satisfactory and unsatisfactory.

Statistical testing was conducted with the statistical package for the social sciences system version SPSS 16.0 (Chicago, IL, USA) and Microsoft Word and Excel were used for generation of tables and graphs. Categorical variables were analyzed using either the chi square test or Fisher's exact test. For all statistical tests, p value less than 0.05 was taken to indicate a significant difference.

## 3. RESULTS

Training sessions were conducted for 100 healthcare workers (56 doctors and 44 nurses) and their assessment for knowledge, attitude and practice was done through pretest and posttest questionnaire. KAP Score was calculated which is shown in table 1.

**Table 1: Assessment of KAP scores among doctors and nurses.**

KAP score(0-20)	Pretest		Posttest	
	Doctors(n=56)	Nurses(n=44)	Doctors(n=56)	Nurses(n=44)
Excellent	0(0)	0(0)	2(3.5)	0(0)
Good	4(7.1)	1(2.2)	26(46.4)	20(45.5)
Satisfactory	10(17.8)	14(31.8)	15(26.7)	16(36.4)
Unsatisfactory	42(75)	20(45.4)	13(23.2)	8(18.2)

(Figures in parenthesis shows percentage)

There was a significant improvement in the KAP score for both doctors and nurses.

Table 2 shows response to knowledge based questions among healthcare workers. Knowledge about World Hand Hygiene Day, Electronic monitoring system was significantly higher among doctors in pre test evaluation. Similarly, nurses were more aware about hand hygiene methods best at killing bacteria, global hand washing day and WHO 5 moments of hand hygiene.

**Table 2: Response to Knowledge based questions**

S. No.	Question	Response	Pretest (%)	p	Posttest (%)	p
			Doctors	Nurses	Doctors	Nurses
1	World Hand Hygiene Day	5 <sup>th</sup> May	71.4	27.3	0.001	85.7
		15 <sup>th</sup> October	14.3	36.4		7.1
		1 <sup>st</sup> May	14.3	18.2		7.1
		1 <sup>st</sup> December	0	18.2		0
2	Which hand hygiene method is best at killing bacteria	Plain soap and water	78.6	36.4	0.001	35.7
		Antimicrobial soap and water	7.1	9.1		9.1
		Alcohol based hand rub (ABHR)	14.3	54.5		64.3
		None	0	0		0
3	All of the following are required to prepare hand rub	Ethanol 70%	42.9	18.2	0.112	7.1
		Isopropyl alcohol 99%	7.1	27.3		78.6
		Ethanol 80%	0	0		0
		Isopropyl alcohol 70%	50	54.5		14.3
4	Which of the following moment is not captured by electronic monitoring	Moment 1 & 2	42.9	63.6	0.025	14.3
		Moment 2 & 3	28.6	27.3		78.6
		Moment 1 & 4	21.4	0		7.1

	system?	Moment 3 & 4	7.1	9.1	0	9.1	
5	Which of the following is considered as Gold standard for determining Hand Hygiene Compliance?	Measurement of product usage Direct Observation of HCW's Observation by patient Electronic system	7.1 42.9 7.1 42.9	0 27.3 18.2 54.5	0.053	0 92.9 0 7.1	0 0 18.2 36.4
6	All are the disadvantages of direct observation method for monitoring for hand hygiene complex except	Time consuming Provide low hand hygiene opportunity Expensive Avoid Hawthorne effect	7.1 28.6 21.4 42.9	18.2 9.1 9.1 63.6	0.205	7.1 14.3 14.3 64.3	9.1 0 0 90.9
7	Global hand washing day	5 <sup>th</sup> May 15 <sup>th</sup> October 1 <sup>st</sup> May 1 <sup>st</sup> December	85.7 14.3 0 0	36.4 45.5 18.2 0	0.001	50 50 0 0	27.3 63.6 9.1 0
8	All are part of the WHO 5 Moments except	Before touching a patient After body fluid exposure risk After touching a patient Before touching patient files After touching patient surroundings	0 7.1 0 35.7 57.1	18.2 27.3 9.1 36.4 9.1	0.001	0 7.1 0 78.6 14.3	0 18.2 9.1 63.6 9.1

During post test evaluation, level of knowledge significantly increased in both doctors and nurses about preparation of hand rub, electronic monitoring system, gold standard method for hand hygiene compliance and disadvantages of direct observation method for monitoring.

Table 3 shows results of attitude based questions which were five in number. During pretest evaluation most of the doctors were aware about the most important reason for HCW to practice good hand hygiene. 100% doctors answered correctly that after coming in contact with a patient on isolation, visitors are encouraged to perform hand hygiene upon leaving the patient's room.

Post education responses significantly improved in both doctors and nurses.

**Table 3: Response to Attitude based questions**

S. No.	Question	Response	Pretest (%)		p	Posttest (%)		p
			Doctors	Nurses		Doctors	Nurses	
1	In a facility where hand hygiene improvement activity has to be initiated from scratch the first step plan for next is:	Introducing the improvement Base line evaluation Facility preparedness Developing a plan for next 5 year	0	27.3	0.299	0	18.2	0.718
			92.9	27.3		50	27.3	
			0	36.4		42.9	45.5	
			7.1	9.1		7.1	9.1	
2	What is the single most important reason for healthcare workers to practice good hand hygiene?	To remove visible soiling from hands To prevent transfer of bacteria from the home to the hospital To prevent transfer of bacteria from the hospital to the home To prevent infections that patients acquire in the hospital.	0	9.1	<b>0.001</b>	0	9.1	0.056
			0	9.1		7.1	18.2	
			0	18.2		7.1	0	
			100	63.6		85.7	72.7	
3	Hand hygiene compliance monitoring in high risk areas should be done at least once in	1 month 3 months 6 months 12 months	42.9 57.1 0 0	54.5 0 27.3 18.2	0.186	28.6 71.4 0 0	36.4 36.4 18.2 9.1	0.261
4	How much time would an ICU nurse save during an eight hour shift by using an alcohol-based hand rub instead of soap and water	15 minutes 30 minutes 1 hour 2.5 hours	7.1 21.4 57.1 8	0 18.2 72.7 9.1	0.515	7.1 21.4 64.3 7.1	0 9.1 81.8 0	<b>0.029</b>
5	After coming in contact with a patient on isolation, visitors are encouraged	Wear gloves before eating or handling food Leave the facility to prevent	0	0	<b>0.001</b>	0	0	<b>0.001</b>
			0	27.3		0	18.2	

to	contamination of others.				
	Perform hand hygiene upon leaving the patient's room.	100	72.7	100	81.8
	Use an empty room to talk with family members.	0	0	0	0

Table 4 depicts responses to practice based questions. Nurses were more aware about practical questions like which method is recommended in case of soiled hands, best method for hand hygiene, time duration when washing hands with soap and water.

**Table 4: Response to practice based questions**

S. No.	Question	Response	Pretest		p	Posttest		p
			Doctors	Nurses		Doctors	Nurses	
1	All of the following leads to skin irritation except	Donning gloves on wet hand Use of hot water for hand wash Patting skin with clean towel after hand wash Washing hand regularly before or after hand rub	42.9 0 57.1 0	36.4 0 0 63.6	0.299	28.6 0 71.4 0	27.3 0 27.3 45.5	<b>0.002</b>
2	Irritant contact dermatitis is seen most commonly in	Iodophores Chlorhexidine Chloroxyleneol Alcohol based product	35.7 7.1 0 92.9	27.3 9.1 9.1 54.5	<b>0.001</b>	50 7.1 0 42.9	27.3 9.1 9.1 54.5	0.067
3	In case of soiled hand which one is preferred	Chlorhexidine ABHR Soap and water	0 0 7.1	0 0 72.7	0.186	0 14.3 57.1	0 0 63.6	0.096
4	Best method for hand hygiene	Both b and c Soap and water Alcohol based hand rub Antimicrobial soap Plain water	92.9 100 0 0 0	27.3 27.3 72.7 0 0	0.515	28.6 50 50 0 0	36.4 18.2 81.8 0 0	<b>0.001</b>
5	How long should you scrub your hands together for when washing	5 seconds 10-20 seconds 20-30 seconds 40-60 seconds.	7.1 14.3 57.1 21.4	0 0 27.3 72.7	<b>0.001</b>	7.1 7.1 14.3 71.4	0 0 27.3 72.7	0.572

with soap and water?								
6	Your ungloved hands come in contact with the drainage from the patient's wound. To clean your hands you should	Wash them with soap and water. Use an alcohol-based hand cleaner. Rinse them and use the alcohol-based hand cleaner. Wipe them with a paper towel.	42.9	36.4	0.022	64.3	45.5	0.01
			28.6	0		14.3	0	
			28.6	63.6		21.4	54.5	
			0	0		0	0	
7	How long should you use ABHR?	5 seconds 10-20 seconds 20-30 seconds 40-60 seconds.	0 57.1 42.9 0	9.1 54.5 36.4 0	0.252	0 71.4 28.6 0	9.1 63.6 27.3 0	0.413

#### 4. DISCUSSION

The participants involved in this study were assessed for knowledge, attitude and practice of hand hygiene. Interestingly, this study revealed that the awareness and proper practice of hand hygiene was not satisfactory in the pretest evaluation. There was significant difference in the pretest and posttest responses. Posttest evaluation after the educational training program, both the groups showed significant improvement.

The comparison of Knowledge, with Attitude and practice of groups showed that the people with higher education, as doctors have better knowledge of hand hygiene. This can be attributed to their accountability, commitment in patient and ward management. Although nursing staff have relatively less knowledge about the hand hygiene, but a good percentage of this category has a positive attitude and follows the correct practicing habits. Nurses had greater practical skills regarding hand hygiene. Their response to practice based questions were better than doctors. Similar findings have been reported in other studies<sup>3,4</sup>.

Average KAP score for both doctors and nurses was between 10 and 15. In a study done in India in an ICU of a multispeciality hospital showed higher level of awareness (90%) about hand hygiene<sup>5</sup>. Ariyaratne reported that 72% unhygienic hands of HCW were

main route of transmission of infection<sup>6</sup> whereas a study done in Cairo in Elgalia Government hospital showed good level of knowledge in 73% of HCWs<sup>7</sup>.

Doctors had better level of knowledge as compared to nurses. Nurses had a positive attitude towards Hand hygiene. Many studies have shown similar findings<sup>(8)</sup>. A study done in Cairo, 96% nurses showed positive attitude<sup>9</sup> and in Italy were 86% HCP in ICU showed positive attitude.

WHO recommends ABHR for hand antisepsis as it is fast acting and has broad spectrum antimicrobial activity. In our study, most of the doctors still believe that soap and water is the best way of Hand hygiene. Nurses were found to be more aware about ABHR as best method. This could be because of low level of awareness and lack of availability of ABHR. Similar finding is seen in many studies<sup>10, 11, 12, 13</sup>. Study conducted in Emergency unit of Royal Infirmary in UK in which the nurses had a better Hand hygiene practice than doctors<sup>14</sup> whereas UPTH study says that doctors have better hand hygiene practice than nurses<sup>10</sup>.

#### 5. CONCLUSION

In the present study, we have observed that level of awareness regarding the importance of hand hygiene and WHO's five moments of hand hygiene is low in both doctors and nurses. A single training session is not sufficient for effective and complete practice of hand hygiene. There is a need for refresher training programs at regular time interval to repeatedly train and re-train all the staff with special importance to the new comers. All the newcomers including doctors, nursing staff and students must be trained on joining. There is also a need for orientation programs for the newcomers to understand the significance of hand hygiene. It is better to include hand hygiene practices in the academic curriculum of medical and nursing students. Clean hands are the single most important factor in preventing the spread of pathogens and

antibiotic resistance in healthcare settings. Hand hygiene reduces the incidence of healthcare associated infections.

This is a questionnaire based study and one major limitation is that we have not calculated the actual hand hygiene compliance rate. In general adherence of HCW regarding hand hygiene procedures is poor. Studies show overall adherence rates which averaged about 40%. Very few Indian data is available on the hand hygiene compliance. Eighty five percent of HAI are due to poor hand hygiene practices. Therefore, there is a need to raise the awareness about hand hygiene practices among HCWs. We recommend monitoring of hand hygiene compliance under strict supervision and regular surveillance should be done in day-to-day hospital activities.

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