Original Research Article

Knowledge and Practice of hand hygiene among health care professionals at a Tertiary Hospital

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Abstract
Introduction: Health care associated infections (HAIs) affect millions of patients worldwide annually. Hand hygiene (HH) has been identified as an important factor preventing HAIs. Although the prevalence of health care associated infections is high in Asia, but studies regarding hand hygiene is very less here; especially nursing and medical student's knowledge of standard precautions is rarely studied This study was done to determine knowledge and practice of hand hygiene among healthcare professionals in a tertiary hospital. **Material and Method:**A cross-sectional study was conducted among 138 health care professionals (78 doctors, 50 nurses and 10 professors) in a tertiary care hospital in India. Knowledge was assessed using WHO hand hygiene questionnaire and practices were evaluated by using another self-structured questionnaire.**Result:**This study showed that majority (69%) of the participants had only moderate knowledge and practice of Hand Hygiene. A meagre (25 %) of the participants had good knowledge and practice of Hand Hygiene. And minority (6 %) of the participants had poor knowledge and practice of Hand Hygiene. **Conclusion:**This study showed that there is a need for frequent Hand Hygiene training programs to address the gaps in knowledge and practice and improve the level of Hand Hygiene compliance and enhancing patient safety.
Keywords: Doctors, nurses, professors, health care professional, hand hygine, knowledge, practice

Introduction

Health care-associated infections (HAIs) affect millions of patients worldwide annually. Hand hygiene (HH) has been identified as an important factor preventing HAIs. All healthcare worker involved in patient care directly or indirectly, should be aware of HH importance & also be able to carry out HH properly. Hand hygiene involves any action of hand cleansing, rubbing hands with an alcohol made hand rub or washing hands with soap and water to avoid the growth of microorganisms on hands. Normal hand washing with antimicrobial soap and water is the best component of a hand hygiene program to reduce the risk of contracting infection through contaminated hands.

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Although hand hygiene has been identified as an important measure for preventing the spread of antimicrobial resistance and reducing healthcare-associated infections (HCAIs), still healthcare workers compliance with optimal practices remains moderate in most settings. Several barriers to compliance with HH has been seen which include lack of education, lack of persuasion and high work load. Recommended washing time to remove transient flora from the hands is 10 to 15 seconds. At high-risk areas, such as nurseries, hand wash of 2 minutes is recommended. Soiled hands usually require more time than 2 minutes[1]. There are seven steps in proper hand hygiene ,which are

1) Rub both palms together
2) Rub the back of both hands
3) Interface fingers and rub the hands together
4) Interlock the fingers and rub the back of the fingers of both hands

5) Rub the thumbs in a rotating manner followed by the area between the index finger and thumb
6) Rub fingertips on the palms of both hands
7) Rub both wrists in a rotating manner, rinse and dry thoroughly.

Although the prevalence of health care associated infections is high in Asia, but studies regarding hand hygiene is very less here; especially nursing and medical student's knowledge of standard precautions is rarely studied [2]. The observance of some of these type of study which were done reported hygiene of students as being weak[3,4]. Therefore, it is absolutely essential to investigate and know the nurse's knowledge, attitudes, and practices about hand washing so that appropriate.This study was done to determine the knowledge and practice of hand hygiene among healthcare professionals in a tertiary hospital.

Materials and methods

Study area

A Study was done among 138 participants in a Tertiary Hospital with a WHO Hand Hygiene questionnaire which included questions on participants' age, gender, profession, formal training in HH with an aim to assess the HH knowledge and practice.

Study design

Institution-based descriptive cross-sectional study was used to assess the knowledge and practice of hand washing among health professionals in a tertiary care hospital

Study population

The source population for this study was the health professionals of a tertiary hospital including doctors, nurses, and professors. This study enrolled 78 doctors, 50 nurses, and 10 professors. This included total 138 health care professionals.

Eligibility criteria

Inclusion criteria

All healthcare professionals who were available during data collection and interested in participating in the study were included.

Exclusion criteria

Incomplete questionnaire or individual reluctance for participation

Sample technique and procedure

Above said, participants were selected as the study participants . The questionnaires were distributed to them. These questionnaires were filled by health professionals at their work places and collected by data collectors later on. The questionnaire contained closed and open-ended questions about three different parts which included sociodemographic characteristics, knowledge of hand washing, and practice of hand washing among health care professionals.Participants were given the option to select on a 1 to 7 point scale for each question :

A. 'Not Effective' & 'Very Effective',
B. 'No Importance' & 'Very High Importance'
C. 'No effort' & 'A Big Effort'

1 point was awarded for a positive response while 0 was awarded for negative response.1 to 7 scale questions were awarded a minimum of 1 and a maximum of 7 points.Total Score was then computed and the results were concluded on the following basis:

Table 1:Total score and Conclusion

Total Score	Conclusion
More than 75 %	Good
Between 50-75 %	Moderate
Less then 50 %	Poor

'Total Population Sampling' was done and Data Analysis was done using Microsoft Excel

Data analysis and processing: Data was analysed on the following basis:

1. Gender-Male,Female
2. Literacy Level-Postgraduates,Undergraduates
3.Profession-Doctors,Nurses,Rehabilitation Professionals

Finally, the result was presented in the form of tables, graphs, and charts.

Ethical consideration

Data collection process was started after the health professionals were asked for willingness. A verbal consent was also obtained. All health care professionals were informed that participation was voluntary and they can withdraw from the study at any stage without any penalty, and their information would be kept confidential.

Result

There were a total of 138 study participants (50 nursing students, 78 doctors, and 10 professors). This study showed that formal training of Hand Hygiene in the last 3 years was received by 70 %(55/78) of Doctors ,66 % (38/50) of Nurses, 50 % (05/10) of professors.

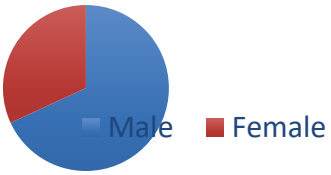

Fig 1:Distribution of participants according to gender

Total participants=138
Male=98 (68%)
Female=44(32%)
Our study showed that 98 participants were male and 44 were female. Male :female ratio was 2.22.

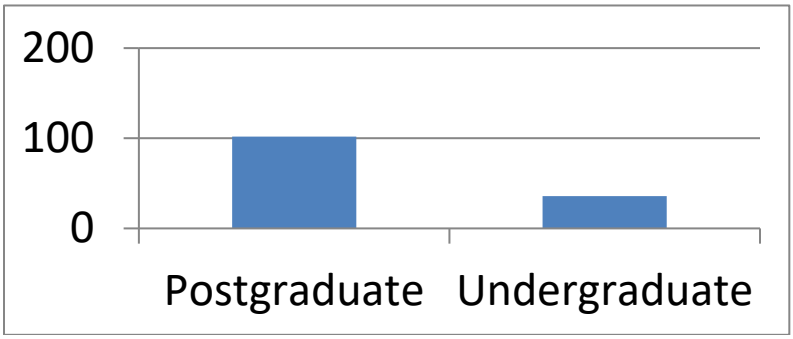

Fig 2:Literacy rate of participants

Literacy rate showed that 102 participants were postgraduate (74%) and 36 % were undergraduate (28%)

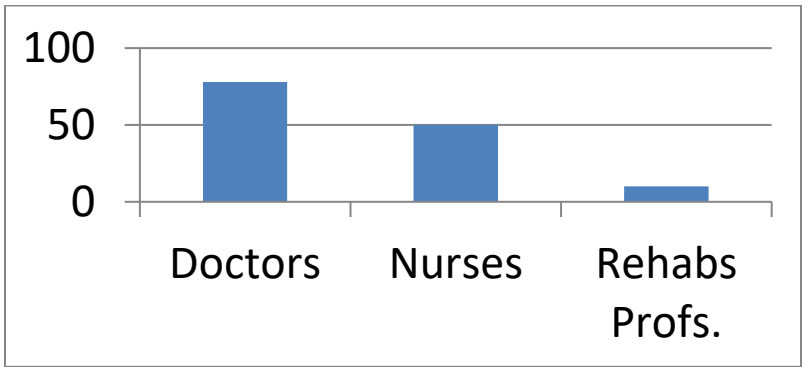

Fig 3: Profession of participants

This study included 78 doctors , 50 nurses, and 10 professors.

Knowledge of health care professionals

This study showed that the majority (69%) of the participants had only moderate knowledge and practice of Hand Hygiene. A meagre (25 %) of the participants had good knowledge and practice of Hand Hygiene. And a minority (6 %) of the participants had poor knowledge and practice of Hand Hygiene. (**Table 2 and 3).**

Table 2: Knowledge and practice of hand hygiene in participants

Result	Criteria	No. of participants	Percentage of participants
Good	**>75%**	**35**	**25%**
Moderate	**50-75%**	**95**	**69%**
Poor	**<50%**	**08**	**06%**

Table 3:Knowledge of hand hygiene among health care professionals

s.no	Question(correct response)	Doctors(n=78)	Nurses (n=50)	Professors (n=10)
1	Which of the following is the main route of transmission of potentially harmful germs between patients? (healthcare workers hands when not clean)	32(41.0%)	21 (42%)	8 (80%)
2	What is the most frequent source of germs responsible for health care associated infections? (germs already present on or within the patient)	23 (29.4%)	27 (54%)	7 (70%)
3	Hand hygiene actions that prevent the transmission of germs to the patient?	34 (43%)	11 (22%)	5 (50%)
4	Which type of HH method is required in the following situations?			
	Before palpation of the abdomen (rubbing)	23 (29.4%)	21 (42%)	4 (40%)
	Before giving an injection (rubbing)	34 (43.5%)	15 (30%)	6 (60%)
	After emptying a bed pan (washing)	26 (33.3%)	23 (46%)	5 (50%)
	After removing the examination gloves (rubbing/washing)	32 (41.0%)	11 (22%)	8 (80%)
	Making the patients bed (rubbing)	21 (26.9%)	12 (24%)	6 (60%)
	After visible exposure to blood (washing)	32 (41%)	22 (44%)	5 (50%)
5	What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands?	11 (14.1%)	9 (18%0	5 (50%)
6	Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs?			
	Wearing jewelry (yes)	23 (29.4%)	11 (22%)	7 (70%)
	Damaged skin (yes)	34 (43.5%)	23 (46%)	5(50%)
	Artificial fingernails (yes)	25 (32%)	12 (24%)	6 (60%)
	Regular use of the hand cream (no)	12 (15.3%0	11 (22%)	4 (40%)
7	Which of the HH actions prevents the transmission of germs to the healthcare worker? (After touching a patient, after a risk of body fluid exposure, After exposure to the immediate surroundings of a patient)	43 (55.1%)	17 (34%)	4 (40%)

Practice of hand hygiene in health care professionals

This study showed that professors followed by nurses have better hand hygiene practices. The percentages of correct responses of these three groups to the individual questions on hand hygiene practices are given in **table 4.**

Table 4:Practice of hand hygiene in participants

s.no	**Questions**	**Doctors (n-78)**	**Nurses (n-50)**	**Professors (n-10)**
1	I adhere to correct hand hygiene practices at all times	12 (15.3%)	11 (22%)	3 (30%)
2	I have sufficient knowledge about hand hygiene	13 (16.6%)	12 (24%)	5 (50%)
3	Sometimes I have more important things to do than hand hygiene	16 (20.5%)	21 (42%)	6 (60%)
4	Emergencies and other priorities make hygiene more difficult at times	21 (26.9%)	32 (64%)	7 (70%)
5	Wearing gloves reduces the need for hand hygiene	54 (69.2%)	23 (46%)	7 (70%)
6	I feel frustrated when others omit hand hygiene	11 (14.1%)	10 (20%)	3 (30%)
7	I am reluctant to ask others to engage in hand hygiene	43 (55.1%)	34 (68%)	6 (60%)
8	Newly qualified staff has not been properly instructed in handhygiene in their training	21 (26.9%)	23 (46%)	5 (50%)
9	I feel guilty if I omit hand hygiene	11 (14.1%)	7 (14%)	4 (40%)
10	Adhering to hand hygiene practices is easy in the current setup	43 (55.1%)	12 (24%)	9 (90%)

Discussion

Our study was done on 138 health care professional including 78 doctors, 50 nurses and 10 professors. It showed 25% ,69% and 6% had good , moderate, and poor knowledge and practice of hand hygiene, respectively.A study done in a hospital at Ikot Ekpene showed 82.4% of participants had good knowledge and 17.6% had poor knowledge of hand hygiene. It also revealed that 42.2% always practiced hand washing , 34.3% practiced occasionally, and 23.5% did not practice hand washing[5].In other study done in Ghana tertiary care showed that doctors followed 9.2% to 57% and nurses follow 9.6% to 54% compliance rate of hand washing[6]. In developing countries like Ethiopia hand washing compliance was low i.e. 5% to 89%; average 38.9% among health care professionals[7].In 2011 , a study in Ethiopia revealed that health care workers do not usually wash hands before putting gloves at work place[8]. In other studies done in Jimma University Hospital showed that hand hygiene was inadequate in their nursing staff. Only 43.2% of nursing staff had adequate hand washing practice while 56.8% followed inadequate practice[9]. A study conducted in Bahir Dar revealed 82.5% of health care professionals perform hand washing practice after performing the procedure and 50.8% wash their hands before conducting any procedure[10].Another study conducted in southwest Ethiopia showed that 68.8% and 82.97% had adequate practice and knowledge about hand washing, respectively[11]. A similar study titled 'Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India' showed that knowledge on hand hygiene was moderate (107 out of 144, 74%) among the total study population. Only 9% of participants (13 out of 144) had good knowledge regarding hand hygiene[12].A study conducted by Feather etal.[3] on 187 candidates at The Royal London Hospital School of Medicine and Dentistry in UK showed that only 8.5% of candidates washed their hands after patient contact.In another study of Saudi Arabia[13], hand hygiene was seen in 70% of medical students, 18.8% of nurses, and 9.1%of senior medical staff. Like most previous studies, our study showed that the overall compliance of hand hygiene by HCWs was less than 30% . However, compliance with hand hygiene practice differed among different professional categories of HCWs. Van de Mortel et al,[14] compared the hand hygiene of nursing and medical students and found that the nursing students had significantly higher knowledge than medical students.Our study showed that the knowledge level of health care professionals who had received formal training in hand hygiene was lower compared to those who had not. This finding is similar with a study conducted by Hosseini-alhashemi et al[15], which also stated that training had no effect on knowledge level. Another study by Calabro et al[16] also showed a similar results as our study. Suchitra et al[17] reported

that education had a positive impact on retention of knowledge, attitudes and practices in all health care workers. A similar study conducted by Duggan et al[18], indicated a negative relationship between professional education and the rate of hand washing compliance.We should re-evaluate the efficacy of the hand hygiene training course and should decrease the intervals between training programs. It seems that programs based on cognitive, emotional and behavioural methods are more effective[19,20]. Our study shows the importance of improving the current training programs targeting hand hygiene practices among medical students, nursing students, and professors.

Conclusion

This study showed that there is a need for frequent Hand Hygiene training programs to address the gaps in knowledge and practice and improve the level of Hand Hygiene compliance and enhance patient safety. Hand hygiene sessions should be conducted more frequently for medical students and professors with monitoring and feedback about their performances to encourage them so that they follow correct hand hygiene practices.

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