



Original Article

Hand Hygiene Compliance among Healthcare Workers in Paediatric Nursery of a Tertiary Healthcare Centre

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Hand hygiene compliance is essential to prevent healthcare associated infections. Direct observation is the gold standard to monitor optimal hand hygiene compliance.

Objectives: The aim of this study was measure healthcare workers (HCWs) hand hygiene compliance using the five moments of hand hygiene.

Methods: An observational study of HCWs hand hygiene compliance was conducted in a paediatric nursery of a tertiary care teaching hospital.

Result: A total of 713 hand hygiene opportunities were observed, with 51.6% overall hand hygiene compliance rate for healthcare workers. Among doctors and nurses, the compliance rates were found to be 49% and 56.35% respectively. Overall compliance with hand rub was better than hand washing with soap and water. The overall compliance of hand hygiene with hand rub for doctors and nurses were 28.6% and 29.6% respectively. Doctors were found to be having higher hand hygiene compliance with hand rub as compared to soap and water whereas nurses were at ease with both hand washing soap and water and hand rub as well. Nurses mostly prefer to wash their hands with soap and water after body fluid exposure whereas before doing aseptic procedure, more nurses preferred using hand rub. Both doctors and nurses showed lower compliance rates after touching patients surroundings.

Discussion & Conclusion: Educational interventions to recognise the hand hygiene opportunities, improved availability of hand hygiene facilities and multifaceted approach to tackle various barriers (poor attitude, workload, etc) of adherence are needed to be accorded priority.

Key Words: Hand Hygiene, Healthcare associated infections.

1. INTRODUCTION

Hand hygiene is now regarded as one of the most important element of infection control activities. Keeping hands clean is one of the best ways to prevent the spread of infection and illness. Hand hygiene is a core element of patient safety for the prevention of health care associated infections (HAIs)

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and spread of antimicrobial resistance. Its promotion represents a challenge that requires a multimodal strategy¹. Hand hygiene is the most simple, most effective measure for preventing HAIs. Despite advances in infection control and hospital epidemiology, Semmelweis' message is not consistently translated in to clinical practice, and HCWs adherence to recommended hand hygiene practice is unacceptably low. Average compliance with hand hygiene recommendations varies between hospital wards, among professional categories of HCWs, and according to working conditions, as well as according to the definitions used in different studies². Compliance with hand hygiene recommendations is the most important measure in preventing health care-associated infections. Alcohol based hand rub may be better than traditional hand washing as they require less time, acts faster, are less irritating, and contribute to sustained improvement in compliance associated with decreased infection rates^{2,3}.

2. MATERIAL AND METHODS

A prospective observational study was conducted in the nursery of Kalawati Saran Children's Hospital which is associated with Lady Hardinge Medical College, New Delhi. It's a 774 bedded tertiary level institution providing preventive care, palliative care and treatment to patients of Delhi and adjoining states. The nursery is divided into three cubicles and has total bed strength of 20 cots. There are two sinks for hand washing. The compliance of hand hygiene was observed amongst doctors and nurses working in nursery. The study was done over a period of three months from January 2016 to March 2016.

The indications of hand hygiene were WHO's five moments of hand hygiene. The healthcare workers had two options for practicing hand hygiene i.e. Soap and water or Sterillium (Alcohol based hand rub composed of 70% ethyl alcohol and glycerine). The study was conducted by observing the compliance of hand hygiene directly by the observer. The WHO's observation form for hand hygiene compliance was used in this study. Observers were the infection control nurses who were trained in hand hygiene practices and were taught in detail about how to fill up the WHO observation form. The observer visited the nursery daily for two hours between 9.00 am to 11.00 am during which maximum activity occurred in the nursery and made concealed observations. The healthcare workers were not aware of the purpose of visit of the observer and also of the fact that they were being observed.

3. RESULTS

WHO's hand hygiene observational audit was adopted and hand hygiene compliance rates were calculated for both doctors and nurses using soap and water and alcohol based hand rub against the WHO's five moments of hand hygiene.

$$\text{Hand Hygiene Compliance rate} = \frac{\text{Number of times hand hygiene performed}}{\text{Number of opportunities}} \times 100$$

A total of 713 hand hygiene opportunities were observed, with 51.6% overall hand hygiene compliance rate for healthcare workers. Among doctors and nurses, the compliance rates were found to be 49% and 56.35% respectively. Compliance rates among nurses were found to be better than doctors.

Table 1: Hand Hygiene Compliance rates among doctors and nurses

Nurses			Doctors		
Hand Hygiene opportunities	Hand Hygiene actions	Compliance Rate (%)	Hand Hygiene opportunities	Hand Hygiene actions	Compliance Rate (%)
252	142	56.35	461	226	49

Hand hygiene compliance rate for WHO's five moments of hand hygiene among doctors is shown in table 2. Highest compliance was seen before doing aseptic procedure whereas compliance rate was very low after touching patients surroundings.

Table 2: Hand hygiene compliance rate among nurses according to WHO's five moments of hand hygiene

Nurses			
Five moments of hand hygiene	Hand hygiene opportunities	Hand hygiene actions	Compliance rate
Before touching a patient	80	55	68.5%
Before clean / aseptic procedure	25	19	76.5%
After body fluid exposure risk	38	24	62%
After touching a patient	75	39	52%
After touching patient surroundings	34	8	23.5%

Hand hygiene compliance rate for WHO's five moments of hand hygiene among nurses is shown in table 3. Highest compliance was seen after body fluid exposure. Low compliance after fifth moment of hand hygiene was similar to doctors.

Table 3: Hand hygiene compliance rate among doctors according to WHO's five moments of hand hygiene

Doctors			
Five moments of hand hygiene	Hand hygiene opportunities	Hand hygiene actions	Compliance rate
Before touching a patient	126	75	59.5%
Before clean / aseptic procedure	78	43	55%
After body fluid exposure risk	86	57	66%
After touching a patient	115	44	38%
After touching patient surroundings	56	15	26.7%

The hand hygiene compliance rate using soap & water and hand rub for WHO's five moments of hand hygiene is depicted in table 4. Overall compliance with hand rub was better than hand washing with soap and water. Doctors were found to be having higher hand hygiene compliance with hand rub (28.6%) than soap and water (20.44%) whereas nurses were at ease with both hand washing with soap and water (26.9%) and hand rub (29.6%) as well.

Table 4: Hand hygiene compliance rate for soap & water and hand rub

Five moments of hand hygiene	Nurses		Doctors		p value
	Soap and water (%)	Hand rub (%)	Soap and water (%)	Hand rub (%)	
Before touching a patient	36.5	32	19.5	40	0.56
Before clean / aseptic procedure	32.5	44	20	35	0.04
After body fluid exposure risk	38	24	42	24	0.24
After touching a patient	22	30	16	22	0.12
After touching patient surroundings	5.5	18	4.7	22	0.59

Nurses mostly prefer to wash their hands with soap and water after body fluid exposure whereas before doing aseptic procedure, more nurses preferred using hand rub. Doctors washed hand with soap and water after body fluid exposure but preferred hand rub before patient contact and before doing any aseptic procedure. Both doctors and nurses showed lower compliance rates after touching patient's surroundings.

A variety of difficulties have been perceived by the care providers in terms of hand hygiene practices. Dryness of hands, unpleasant smell of Sterilium, inconsistent supply of facilities was few among the many difficulties revealed by the care providers.

4. DISCUSSION & CONCLUSION

The adherence to good hand hygiene practices is necessary for preventing all health care associated infections. Hand hygiene is the most important and effective infection prevention strategy to prevent the spread of microorganisms causing HAIs. Despite this, compliance with hand hygiene protocols by health care providers continues to be challenging. Different methods have been advocated for monitoring hand hygiene compliance; we used direct observation which is considered as the 'Gold Standard' by most authors^{4,5}. Compliance was observed by Infection control nurses and documentation was made as per WHO perform for hand hygiene. Direct observation helps to pinpoint the areas of strength or weaknesses in HH behavior, to identify the number of HH opportunities and their indications and to provide feedback to healthcare workers (HCWs). However, there is potential bias occurring from hand hygiene direct observations. One of the most important ones is the Hawthorne effect, which is attributed to the tendency of people being observed in a research context to behave differently from the way they would otherwise⁶.

The present study aimed to determine the compliance with HH among health care workers. The hand hygiene compliance among doctors and nurses was 50.7% and 57.5% respectively. The overall compliance among HCWs was 54.1%. In India, hand hygiene compliance varies from 30 to 60%⁷⁻¹². Even in developed countries compliance to HH differs in the reports ranging from 33 to 75%¹³⁻¹⁵. On literature review we found the compliance rate in our study is consistent with other studies¹⁶⁻¹⁸. Similar to many studies in the literature, compliance with HH among nurses is better than doctors¹⁹. The current study also reports similar results. This finding corroborated with many other studies^{11,12}. Dedrick et al observed hand hygiene compliance rate of 48.6% among nurses, 20.6% in physicians, and 30.8% among other HCWs¹³. Van De Mortel et al. observed that nursing students' hand hygiene knowledge, percentage compliance and self-reported hand hygiene practices were significantly higher than that of medical students¹⁵. Other studies also showed that nurses had greater practical skills regarding hand hygiene²⁰⁻²². Nursing staff usually have a positive attitude and follows the correct practicing habits.

Hand hygiene, before and after all patient or patient environment contact, before aseptic procedure, and/ or after body fluid exposure, which are WHO indications, is recommended in all published infection control and public health guidelines and is considered the standard of care for all HCWs⁵⁻⁹. Furthermore, the current study attempted to evaluate the use of hand hygiene techniques based on these WHO five indications. The researchers noticed that most of the HCWs prefer to use HH after patient contact or after blood or body fluid exposure, in contrast to a very low rate after touching patient's surroundings. These findings lead to the assumption that HCWs prefer to protect themselves first. There was significant difference in the hand hygiene compliance rate among five different moments of hand hygiene. The nurses showed highest compliance rate before performing aseptic procedure and before touching a patient whereas in case of doctors, highest compliance rate was observed after body fluid exposure. This shows that HCWs are very cautious against exposure to blood and body fluid. They are also very much aware of aseptic precautions before performing any invasive procedure, but their attitude was careless when they touch the patient or their surroundings. Low compliance rate after fifth moment of hand hygiene among both doctors as well as nurses could be attributed to careless behavior and the psychology that if they are not touching the patient, they will not acquire the infection. Compliance rate with hand rub is higher than soap and water for all the moments of hand hygiene except moment three i.e. after exposure to blood and body fluid. In this case both doctors and nurses preferred hand washing with soap and water because of HCWs psychological fear that hands are soiled so more chances of getting infection. This is in

accordance with WHO guidelines that recommend use of soap and water in case of soiled hands²².

The HCWs in our study preferred alcohol based hand rubs over hand washing with soap and water and this was in accordance with the study carried out in tertiary care Centre in Chennai.²⁰ The compliance to the WHO guidelines regarding adequate hand hygiene was higher in our study than the study done in Ludhiana (41.3%) among nurses working in ICU settings of tertiary care hospital.²¹ Higher compliance with alcohol hand wash may be explained by their perception that hand rubbing with alcohol based rubs is more rapid than hand washing with soap and water. Compliance rate is found to be better for hand rub significantly in both nurses and doctors. The advantage for using hand rub are its easy availability at bed site, less time is required and it is less irritant to skin. Compliance with handwashing with soap and water remains low mainly because it is a time-consuming procedure. Alcohol rubbing was made readily available by means of personal flasks and numerous wall-mounted distributors, whereas conventional handwashing required leaving the room, moving to the sink, and returning to the room. The availability of alcohol rubbing significantly improved compliance with hand disinfection in situations involving patient care.

This study has several strengths and limitations. The strengths include: it was conducted at a major teaching hospital experienced in promoting good HH practices; it included a large number of observations but could be confounding by seasonal variations as all quarters were not covered during the study year. Also our study was limited to paediatric nursery and unable to compare the covert and overt observers in different departments.

In conclusion, by improving hand hygiene practices, major problems such as healthcare associated infections and emergence of antimicrobial resistance can be prevented. Educational interventions to recognize the hand hygiene opportunities, improved availability of hand hygiene facilities and multifaceted approach to tackle various barriers (poor attitude, workload etc) of adherence are needed to be accorded priority. Every hospital should start hand hygiene program which include education, training and raising the awareness among HCWs regarding HH practices followed by monitoring and feedback.

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