



## Original Research Article

## Evaluation of hand hygiene practices in pediatric unit in a tertiary care hospital, Meerut, Uttar Pradesh

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## ABSTRACT

**Background:** Hand hygiene is a vital aspect of infection control and as such requires monitoring. The Association for Professionals in Infection Control and Epidemiology Guidelines on Hand Hygiene in Healthcare had been available since 2009 yet the average compliance of such practices among healthcare providers (HCPs) has remained unacceptably low.

**Aim:** This study aimed to assess the compliance of hand hygiene practices and strategies for improvement in pediatric unit in a tertiary care hospital, Meerut, Uttar Pradesh.

**Materials and Methods:** This prospective cross-sectional survey was conducted during November 2016 – Feb 2017. Data was collected during day as well as night duty hours in intensive care unit (ICU) and wards using a self-structured questionnaire. Data obtained was analyzed using descriptive statistics.

**Results:** A total of 114 HCPs participated in this survey of which seventy six percent had good knowledge regarding moments and steps of hand hygiene. Good compliance (> 80%) was seen among faculty and nursing staff during day in ICU and was poor (<40%) among residents and interns, being the lowest during night hours in wards. The major reasons reported for low compliance were non-availability of soap & disinfectants, high workload and lack of clear guidelines. Administrative and educational reforms were suggested to improve the compliance.

**Conclusion:** HCPs at Department of Pediatrics have good knowledge and average compliance to hand hygiene practices. However, there is wide scope for improvement. Infrastructural support can be provided along with clear guidelines and robust training to improve these practices.

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### 1. Introduction

Hand hygiene is now regarded as one of the most important element of infection control activities. In the wake of the recent COVID 19 pandemic, increasing burden of health care associated infections (HCAIs), the increasing severity of illness and complexity of treatment, superimposed by multi-drug resistant (MDR) pathogen infections, HCPs are reversing back to the simple practice of hand hygiene. This is because enough scientific evidence supports the observation that hand hygiene alone can significantly reduce

the risk of cross-transmission of infection in healthcare facilities.<sup>1</sup> Healthcare workers' compliance to the optimal practices has been observed to be low in most settings.<sup>2</sup>

Studies have suggested that the most common barriers leading to poor hand hygiene compliance by physicians include lack of time, workload pressures, lack of knowledge, poor role modeling by other HCPs, and poor organizational support.<sup>3</sup> Additional barriers to hand hygiene compliance include lack of scientific information on the definitive impact of improved hand hygiene on hospital infection rates.

There is an urgent need to improve the compliance which includes complex dynamics of behavioral change involving

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combination of education, motivation, and administrative reforms.

The current study aims to evaluate the compliance of hand hygiene practice by HCPs and to determine the possible barriers to its compliance. It also aims to find out the practical ways to change the pessimistic behavior of HCPs regarding the practice of hand hygiene.

## 2. Materials and Methods

This prospective cross-sectional survey was conducted in the Department of Pediatrics, from November 2016 to Feb 2017 after obtaining approval from Institutional Ethics Committee. All HCPs who were willing to provide written informed consent were enrolled in the study. Only those interns and nursing staff who were working in pediatrics department at the time of study were considered for inclusion. HCPs working for less than 15 days in pediatric unit and those who did not provide consent were excluded. Written informed consent was obtained from each participant to accompany him/her during neonatal and pediatric Intensive Care Unit (ICU)/ward rounds for evaluation and recording of hand hygiene compliance during different duty hours. Of all the data fields in case record form, compliance assessment was done by the study team observer while rest of the Multiple Choice Questionnaire was completed after interviewing the participants. Day duty hours are from 0900 hrs to 1800 hrs while night duty hours are from 1800hrs to 0900hrs of next day.

Knowledge assessment was done based on steps of hand washing and moments of hand hygiene. Those who knew about both steps and moments were assessed as having good knowledge; those who were not very clear about these were assessed to have poor knowledge (2 point scale).

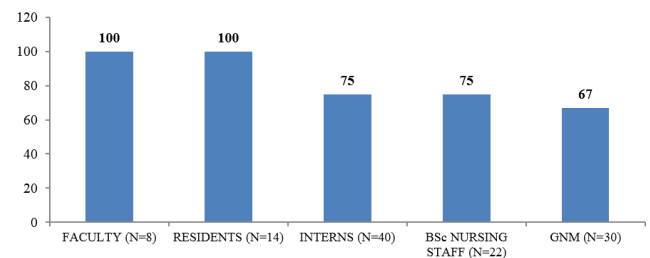
Percentage compliance was calculated as: [Number of times hand washed/sterilized (actual) divided by the number of moments of hand washing during round (ideal)] multiplied by 100.

Compliance was classified into Good (>80%), Average (40-80%) and poor (<40%). To minimize the observer bias, study team was trained by the principal investigator on assessment of compliance and hand washing techniques. Each HCP was observed for compliance to hand hygiene practices at multiple times depending on duty hours and work location (Ward/ICU). Total of 294 forms were obtained out of which 24 were incomplete and the remaining 270 were considered for evaluation. Data obtained was entered into an excel sheet and was analyzed using descriptive statistics.

## 3. Results

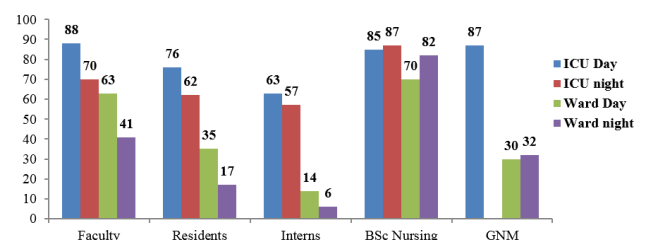
114 HCPs provided consent to participate in the study which included 8 faculty, 14 residents, 40 interns and 52

nursing staff. A total of 270 self-structured questionnaires were evaluated of which 52.6% were completed by doctors (faculty, residents & interns) while 47.4% were completed by nursing staff. Overall good knowledge regarding steps and moments of hand washing was observed in 76% of HCPs in pediatric unit. All the faculty and residents had good knowledge (100%) while the same was seen in only 75% interns and 69.2% nurses (Figure 1).



**Fig. 1:** Shows good knowledge among professionals regarding maintenance of hand hygiene

Compliance to hand hygiene practices varied between ICUs (neonatal and pediatric) and Wards and during day and night duty hours. Among all participants, a trend was observed while assessing the compliance to hand hygiene practices. Compliance was found to be the highest in ICUs during day hours and was the lowest in wards during night hours. Among faculty, compliance to hand hygiene practices was 88% in day hours in ICU, 70% in night hours in ICU, 63% in day hours in ward and 41% in night hours in wards. Similar data for residents, interns and nurses can be seen in Figure 2 drawn below.



**Fig. 2:** Shows average compliance to hand hygiene practices among HCPs in ICU and wards during day and night duty.

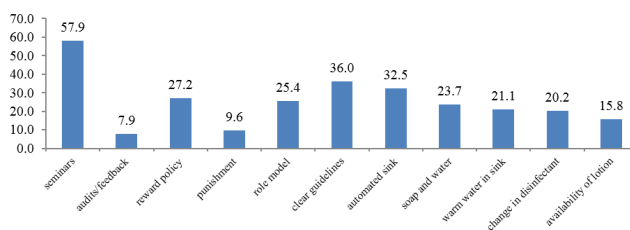
The major reasons reported for low compliance were assessed. Faculty and residents felt that the major hindrance to good hand hygiene practices were non-availability of soaps and water (62.5%, 50%), high workload (50%, 85%), non-availability of warm water in winters (75%, 50%) and skin irritation (62.5%, 43%). Among interns and nurses, reasons reported were lack of clear guidelines (58%, 39%), lack of role model (40%, 19%), high workload (33%, 21%), forgetfulness (27%, 19%), non-availability of soap & disinfectants (25%, 37%), wearing gloves (20%, 29%), skin irritation (17%, 8%) and non-availability of warm water in

**Table 1:** Shows reasons for poor hand hygiene as cited by HCPs

Reasons Reported	Faculty (N=8)	Residents (N=14)	Interns (N=40)	Nursing Staff (N=52)
Non-availability of soap and water	5 (62.5%)	7 (50%)	10 (25%)	19 (37%)
High workload	4 (50%)	12 (85%)	13 (33%)	11 (21%)
Skin irritation	5 (62.5%)	6 (43%)	07 (17%)	4 (8%)
Non-availability of warm water	6 (75%)	7 (50%)	05 (12.5%)	5 (10%)
Lack of clear guidelines	0 (0%)	0 (0%)	23 (58%)	20 (39%)
Lack of role model	0 (0%)	0 (0%)	16 (40%)	10 (19%)
Forgetfulness	0 (0%)	0 (0%)	11 (27%)	10 (19%)
Wearing gloves	0 (0%)	0 (0%)	08 (20%)	15 (29%)

winters (12.5%, 10%). (Table 1)

Administrative (53.8%), educational (37%) and motivational (9.2%) reforms were suggested to improve the compliance. The most common strategies suggested were to conduct seminars/classes (58%), framing of clear guidelines (36%), provision of automated sink (32.5%), reward policy for those performing exceptionally well (27%), creation of role model (25.5%) and many others.(Figure 3)



**Fig. 3:** Shows the various strategies for improving compliance to hand hygiene practices

#### 4. Discussion

Our study has revealed that HCPs at Department of Pediatrics, Chhatrapati Shivaji Subharti Hospital, Meerut have good knowledge of hand washing (76%). This finding is similar to the figures reported among HCPs in Cairo in Elgalea Government Hospital (73.1%) and Cleopatra Private Hospital (72.7%)<sup>4</sup> but is marginally low than that reported in ICU of a multispecialty hospital in India (90%).<sup>5</sup> It is also much better than the findings at the University of Port Harcourt Teaching Hospital (UPTH) in which more than half of the HCPs (55.4%) lack good knowledge of hand washing.<sup>6</sup> The high level of knowledge on hand washing by the respondents is not unexpected by virtue of their medical background.

The average compliance rate with hand hygiene recommendations is estimated to be 55% at a private Nigerian Tertiary Hospital which is comparable to 56.44% in our study.<sup>7</sup> This rate of compliance is much higher than that reported by Nantasit et al in a review of hand hygiene studies which was 38.7%.<sup>8</sup> This difference can be explained

by Hawthorne effect. Variations in hand washing practice have been reported by type of unit (pediatric personnel have been shown to have higher frequency of hand washing) and profession (in general, nurses wash hands more often than physicians).<sup>9</sup> Similarly, in our study, variations in compliance to hand hygiene practices were observed. The compliance rate varied from 41% to 88% among faculty, 17% to 76% in residents and was 30% to 87% among nurses. We observed distinctly high rates of compliance among nurses towards hand hygiene (81%) which is similar to the findings of researchers in Taif, Saudi Arabia.<sup>10</sup> Indeed it has been proven that nursing personnel are more compliant with hand hygiene than physicians as evident by a study from Nair et al in India who showed that nursing students were more compliant to hand hygiene when compared to medical students.<sup>11</sup> However, these results are in disagreement with the UPTH study in which doctors were found to have a better hand washing practice than the nurses.<sup>6</sup> Our study findings are also better than those reported in an observational study conducted among HCPs in a tertiary hospital in Ghana where a hand washing compliance rate ranged from 9.2% to 57% among doctors and 9.6% to 54% among nurses.<sup>12</sup> In a study conducted by Randle J et al in pediatric ward,<sup>13</sup> there was no evidence of an association between time of day and their hand hygiene compliance but in our study, we have seen that compliance is higher in day and lower in night hours. This can be explained by the pessimistic behavior of HCPs in the absence of seniors.

Similar to findings from other studies by Schneider et al and Pittet et al,<sup>14,15</sup> our respondents strongly alluded to the fact that busy work schedule may hinder their hand washing compliance in addition to non-availability of soap and water, lack of clear guidelines within the institution, lack of role model at work place and many others. These excuses may not be far-fetched, considering the fact that there is dearth of medical personnel in our society and the available ones are often overworked, often leaving them with little or no time in between patient care for proper hand washing.

More than half (53.8%) of the respondents strongly agreed that hand washing may be improved by administrative orders closely followed by educational

and motivational reforms. Most preferred strategies were conduction of regular trainings and seminars followed by introduction of clear guidelines in the department. Least preferred strategy was punishment policy and regular quality audits. However, feedbacks were accepted will fully. In another multicenter survey,<sup>16</sup> similar results were obtained in the form that most respondents were not in favor of interventions involving rewards or punishment but were more attracted to interventions that make hand washing easier such as provision and easy accessibility to hand washing materials and continuous health education on infection control and hand washing. These measures if put in place may improve hand washing practices among HCPs.

## 5. Study Limitations

This study was initiated by a professor of pediatrics department and there is high possibility of bias as junior staff generally tends to be perfect under observation (Hawthorne Effect). It is a non-interventional study so the impact of any intervention cannot be derived.

## 6. Conclusion

HCPs at Department of Pediatrics have good knowledge and average compliance to hand hygiene practices. However, there is wide scope for improvement especially among interns and nursing staff. Though much may not be done in terms of workload, infrastructure such as soap, water, dryer, automated sinks can be provided along with educational seminars, clear guidelines and robust training to further enhance these practices.

## 7. Source of Funding

None.

## 8. Conflict of Interest

None.

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