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Original Research Article

Evaluation of hand hygiene practices of health care workers in tertiary care hospital by systematic hand hygiene audits

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ABSTRACT

Background and Objectives: Hand hygiene (HH) holds a pivotal role in infection control. However, compliance with hand hygiene has remained low worldwide. Hospital Acquired Infection (HAI) incidence is rising in most healthcare facilities. It is postulated that around 30% of HAI can be reduced by following strict hand hygiene protocols by healthcare workers (HCWs). This study was done to evaluate the level of compliance of healthcare personnel in our tertiary care hospital with respect to appropriate hand hygiene practices by employing HH audits.

Materials and Methods: A cross-sectional observational study was conducted in a tertiary care teaching hospital over six months. A single- observer direct observation technique was used to collect the HH compliance data conducted by trained Infection control nurses. HCWs, including doctors, nurses, CRMIs and technicians, were observed for compliance in all the critical areas, outpatient and inpatient sections across all departments. The HH audit form designed based on the WHO's HH audit tool kit was used in the study. The audits were conducted randomly in all the areas for at least 20 minutes per day.

Results: A total of 583 HCWs were observed for the Hand Hygiene Compliance audit. The overall HH compliance rate was 67.88%, with doctors at 74.31%, followed by nurses at 70.42%. Compliance was observed in OBG/Labour ward at 78.7% and the oncology ward at 78.5%. WHO moments-specific hand hygiene adherence showed the least compliance rate of 55% for moment 1, followed by moment 5 with 58.9%. Best compliance was observed for moment 3, with 79.2%.

Conclusion: The overall hand hygiene compliance was comparatively better in our study. Specific measures such as improved facilities, training and monitoring are needed to attain good H'H compliance.

1. Introduction

Hand hygiene (HH) plays a pivotal role in infection control. World Health Organization (WHO) launched an annual global campaign, "SAVE LIVES: Clean Your Hands", in 2009 to improve hand hygiene globally and to progress toward the goal of maintaining an international profile on hand hygiene in health care.[1] This campaign emphasised that all "healthcare workers must clean their hands at the right time and in the right way".

However, compliance with hand hygiene has remained low worldwide. Similar is the situation in India; several studies conducted in India have reported HH compliance ranging from 20–85.5%.[2,3] As a result, the incidence of hospital-acquired infections (HAI) is rising in most healthcare facilities. It is postulated that 15–30% of hospital-acquired infections can be reduced by following strict hand hygiene protocols by healthcare workers (HCWs).[4] This study evaluated the level of compliance of healthcare personnel in our tertiary care hospital with respect to appropriate hand hygiene practices by employing HH audits.

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2. Materials and Methods

A cross-sectional study was conducted between October 2022 and March 2023 at Karpagam Faculty of Medical Sciences and Research Hospital, a 750-bed tertiary care teaching hospital. On the occasion of 'Global Hand Washing Day', an extensive awareness drive regarding hand hygiene was conducted in the hospital for all the HCWs.

A single–observer direct observation technique was used to collect the HH compliance data. HCWs were observed for compliance, including doctors, nurses, Compulsory Rotatory Medical Internship (CRMIs), and technicians. The study was conducted in all the critical areas, outpatient and inpatient sections across all departments.

The HH audit was conducted by trained Infection control nurses (ICN). The HH audit form was designed based on WHO's HH audit tool kit and was used in the study.[3] To reduce the observational bias, the ICNs conducted an audit alongside their other routine work so that the HCWs were unaware of the audit being done. The audits were conducted randomly in all the areas for at least 20 minutes per day.

The following data were recorded by the ICNs: date and time of the audit, the designation of the HCW, HH opportunities, duration of HH performance and the steps performed. The audit was marked as 'Full compliance' or 'Partial compliance'. The name of the HCW was not recorded to maintain confidentiality.

2.1. Statistical analysis

Obtained Data were analysed using MS Excel and SPSS version 22. Categorical data are presented as frequency and percentage. The differences in rates were statistically compared and tested for significance using Fisher's exact test, and a P value was determined, and a P value of < 0.05 is considered significant.

3. Results

A total of 583 healthcare workers were observed for the Hand Hygiene Compliance audit. The distribution of the HCW categories were 213 Nurses (36.54%), 206 doctors (35.3%) CRMI 129(22.1%) and Technical staff 35 (6.01%).

A total of 2080 HH opportunities were observed among which 1412 actions were performed, accounting to the overall HH compliance rate of 67.88%. Among the HCW categories, doctors had the best compliance of 74.31%, followed by nurses with 70.42%. CRMIs had an adherence of 57.7% and the least by technical staff at 47.32%, as shown in Table 1 shows the ward-wise distribution of the HH compliance rate among different categories of HCWs. Best compliance was observed in OBG/Labour ward (78.7%) and oncology ward (78.5%), and least in ICUs (62.4%). Nurses in the OBG ward and Labour room had better compliance rates of 84.21%. Among doctors, those in the oncology department had the best compliance of 82.29%. CRMIs in the OBG and labour ward had a good adherence of 71.43%, but compliance in other areas like emergency, ophthalmology, and ENT was lower (29.1). Technical staff in the Ophthalmology department had the highest compliance rate of 88.24%. The least compliance was seen among the technical team from the pulmonology ward, with only 16.67%. These values observed were significant, with a p-value of <0.01.

Table 2 shows the number of healthcare workers who performed the HH with variable degrees of compliance. Among the 213 nurses, only 40(18.78%) were non-compliant in performing HH. Similarly, doctors' non-compliance was observed among 26(12.63%) and 80 (38.83%) were fully compliant in performing HH properly. Among 129 CRMIs 44(34.11%) were noncompliant. Among 35 technical staff, only 8(22.86%) were fully compliant with HH practices. Overall, most healthcare workers, 279(47.86%), had partial compliance in performing the HH steps, which was statistically significant with a p-value of <0.01.

The HH compliance concerning WHO moments of hand hygiene is shown in Figure 1. The lowest % compliance rate of 55% was seen for moment 1, followed by moment 5 with 58.9% compliance. Best compliance was observed for moment 3, with 79.2%.

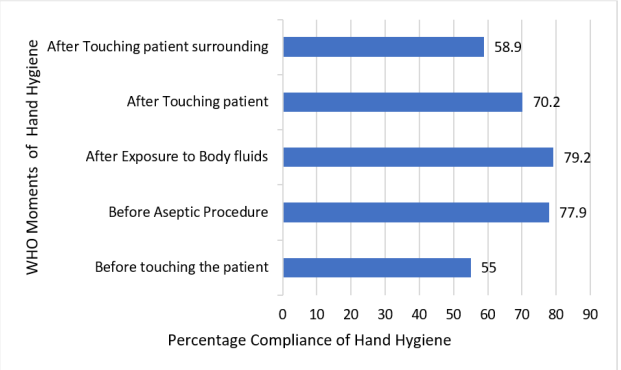

Figure 1: Hand hygiene compliance concerning WHO moments

4. Discussion

Hand hygiene is the simplest and effective way to prevent HAIs, but unfortunately, good compliance is still lacking in many countries.[5] Our study was conducted to shed light on HH compliance among the hospital's HCWs. During the study period, 583 healthcare workers were audited by observational method, and as seen in the previous study,[6] nurses (36.54%) and doctors (35.3%) formed the major categories. The overall compliance rate was 67.88%, better than other hospitals in the country, which reported a rate of 43 to 60%.[2,6,7] Compared globally, the rate is similar to many studies done in Argentina (23.8% to 64.8%) and

Table 1: Ward-wise distribution of hand hygiene compliance rate among various categories of health care workers

Wards	Hand hygiene adherence	Nurse	Doctors	CRMI	Technicians	Total
ICU	Opportunity	225	214	130	64	633
	Actions performed	147	158	66	24	395
	HHCR	65.33	73.83	50.77	37.5	62.4
Surgery Orthopaedics	Opportunity	112	102	62	-	276
	Actions performed	74	67	35	-	176
	HHCR	66.67	65.68	56.45	-	63.7
MedicinePaediatrics Dermatology	Opportunity	120	107	75	16	318
	Actions performed	70	78	54	8	210
	HHCR	65	72.9	72	50	66.03
OBG Labour room	Opportunity	76	92	49	14	231
	Actions performed	64	72	35	11	182
	HHCR	84.21	78.26	71.43	78.5	78.7
Special ward	Opportunity	91	93	59	4	247
	Actions performed	71	73	35	1	180
	HHCR	78.02	78.49	59.32	25	72.8
Pulmonology	Opportunity	55	52	10	12	129
	Actions performed	43	37	4	2	86
	HHCR	78.18	71.15	40	16.67	66.6
Oncology	Opportunity	39	41	-	4	84
	Actions performed	31	34	-	1	66
	HHCR	79.48	82.29	-	25	78.5
Others (Ophthal ENT Emergency)	Opportunity	63	58	24	17	162
	Actions performed	50	45	7	15	117
	HHCR	79.37	77.59	29.1	88.24	72.2

Table 2: Hand hygiene compliance among health care workers

Category	Fully compliance (%)	Partial compliance (%)	No compliance (%)	Total numbers
Nurses	70(32.86%)	103(48.36%)	40(18.78%)	213(100%)
Doctors	80(38.83%)	100(48.54%)	26(12.63%)	206(100%)
CRMI	26(20.16%)	59(45.74%)	44(34.11%)	129(100%)
Technicians	8(22.86%)	17(48.57%)	10(28.57%)	35(100%)
Total	184(31.56%)	279(47.86%)	120(20.58%)	583(100%)

Mexico (45% to 79%).[8,9] This could be due to the HH awareness drive conducted at the study's beginning and monthly refresher sessions. Chavali et al. showed higher HH compliance rates owing to 1 year of dedicated training.[10] This emphasises the importance of regular training for the HCWs.

Doctors have generally been criticised for having poor compliance for HH, but in our study, they performed well with a rate of 74.31%, followed by nurses with 70.42%, as seen in a study done by Jayasinghe IK et al.,[11] which showed HH compliance for doctors & nurses were 54% & 49.6% respectively. A low compliance rate was observed among technicians, 47.32%, similar to a study done by Kamara, G.N et al.[12]

The ICUs in our study had a good adherence rate compared to other studies,[13,14] yet ICUs had a lower compliance rate than other hospital areas. Similar results were observed by Vicki Erasmus et al. in their systemic study.[15] Pittet et al. had shown that regions with higher patient load and a more significant number of Hand hygiene opportunities (> 60/h of patient care) would generally have poor compliance rates when compared with low (0 to 20) HH opportunities.[16] Contrary to other studies,[12] where compliance was most inadequate in OBG wards, our study showed the best compliance in OBG and labour wards among other areas, which is statistically significant with p value <0.01. This could be due to the placement of experienced staff in the labour ward and regular training. HCWs in the oncology department had an equally good compliance rate of 78.5%, similar to the observation by Rynga et al.[13] More immunocompromised patients are admitted to this ward, which might have motivated the staff to follow proper hand hygiene.

While conducting the audit, compliance was observed as fully compliant, partial, and non-compliant. Our study shows that most HCWs had more partial compliance (47.86), and the distribution was similar in all the HCW categories. More education and motivation among these

people regarding proper hand hygiene will significantly increase compliance. Studies have shown that a sustained improvement in HH compliance can be achieved due to the long-running implementation of programs that promote optimal adherence to hand hygiene policies.[17,18]

Moment-specific compliance rate in our study had excellent adherence of 77.9%, 79.2% and 70.2% for moments 2,3 and 4, respectively. Compliance was best after exposure to body fluid (79.2%), in concurrence with that seen by Jayasinghe IK et al., with a 65.2% adherence rate.[11] However, the compliance for moments 1 and 5 were lower at 55% and 59.9%, respectively. Similar observations were made in several studies; Ganesan et al. also showed lower compliance of 48.4% and 47.6% for moments 1 and 5.[14,15] Hence, HCWs need to be constantly sensitised about the five moments of HH, especially for moments 1 and 5, i.e., before touching the patient and after touching a patient's surroundings by highlighting the need to protect the patient from getting infected and a chance of spread of infection from an inapparent source of a patient's environment.

5. Conclusion

The overall hand hygiene compliance was comparatively better in our study, influenced by the extensive training done before and during the period. This emphasises the need to conduct interventional programs like systematic HH training, audit and performance feedback, use of HH displays, and other reminders in the hospital perpetually. System changes with the provision of hand rubs and other HH facilities have been shown to improve HH compliance.

6. Limitation

This study provides insights; hence, the findings cannot be generalised. The sample size was small, and the observed opportunities were unequal for different categories of HCWs, clinical areas and moments of HH during the study period.

7. Sources of Funding

None.

8. Conflicts of Interest

The authors declare no conflict of interest

9. Acknowledgement

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