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Hand Hygiene Auditing: An Effective Tool To Improve The Adherence To Hand Hygiene Practices Among Healthcare Workers.

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ABSTRACT

Hand hygiene (HH) is cornerstone among infection control practices. Hand hygiene is an important and effective measure in the prevention of healthcare-associated infections. Hand hygiene compliance is one of the quality indicators of the hospital infection control department. Aim was to determine the adherence rates of Hand hygiene in different types of healthcare workers& to determine the compliance of hand hygiene among healthcare workers. A prospective observational study was conducted by the Department of Microbiology in Gynecology ward in Bharat RatnaAtal Bihari Vajpayee Medical College & Hospital, Pune.Total 21 patient care activities and 69 HH opportunities were observed. Out of 69 opportunities, 21 opportunities performed by doctor, 31 opportunities performed by Nursing staff and 17 opportunities performed by others. HHTAR for doctors observed was 38.09%. HHTAR for Nursing staff was 48.38%. HHTAR for other HCWs was 47.05%. HHCAR for doctors, Nurses and others were 19%, 12.9%, 17.6% respectively. HHPAR for doctors, Nursing staff and others were 14.2%, 35.48%, 23.52% respectively. Hand Hygiene adherence rates calculated from this HH audit in current study shows that Healthcare workers should emphasize on proper hand hygiene practices among HCWs.

Keywords: Hand Hygiene audit, Infection control practices, Hand hygiene adherence rate.

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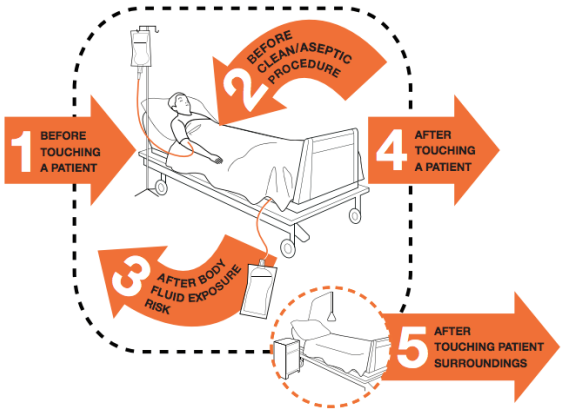
INTRODUCTION

Hand hygiene (HH) is cornerstone among infection control practices. Healthcare-associated infections (HAI) are major problem in health care settings. They can be caused by endogenous (present on the skin, nose, gastrointestinal tract, etc.) or exogenous infectious agents, with the healthcare professional's hands being the most common transmission route [1]. HAIs can lead to increased length of hospital stay, co-morbidities in the long-term, antimicrobial resistance, and a significant economic impact on health institutions, patients, and families. Moreover, the analysis of HAI-related costs should take into account personal and family losses, given that a longer hospitalization affects the patient's physical and emotional well-being, family income, among other aspects [2]. It is estimated that hundreds of thousands of people are affected by preventable HAIs each year. The multiple determinants of HAIs are associated with a complex combination of gaps found in health-related policy, infrastructure, organization, and knowledge, as well as with professional's inadequate practices and behaviours [3].Failure to comply with hand hygiene is considered the leading cause of health care-associated infections, contributes to the spread of multidrug resistant organisms, and is recognized as a significant contributor to outbreaks of infection.

The concept of cleaning hands with an antiseptic agent probably emerged in the early 19th century [5] and the first evidence of its superiority over plain soap and water in reducing transmission of health care-associated infection was provided by Ignaz Semmelweis in 1846[5, 6]. Formal written guidelines on hand washing practices in hospitals have been developed by the Centres for Disease Control and Prevention (CDC) and Association for Professionals in Infection Control [7-10] in 1985.

Therefore, health professionals should perform hand hygiene according to the "Five Moments" model proposed by the World Health Organization (WHO) in the *WHO Guidelines on Hand Hygiene in Health Care* [4]: before touching a patient; before a clean/aseptic procedure; after body fluid exposure risk; after touching a patient; and after touching patient surroundings. Since microorganisms are mostly transmitted through health professionals' hands, hand hygiene is considered a key procedure for the prevention of HAIs.



Courtesy – WHO's Five Hand Hygiene Moments

Proper Adherence to hand hygiene by healthcare professionals is very important. Despite of this knowledge, hand hygiene compliance among healthcare workers is very poor. In order to improve the HH adherence, we conducted this study to determine the compliance of hand hygiene among healthcare workers in tertiary care hospital.

Objective

- To determine the adherence rates of HH in different types of healthcare workers.
- To determine the compliance of hand hygiene among healthcare workers.

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METHODOLOGY

A prospective observational study was conducted by Department of Microbiology in Gynecology ward in Kamala Nehru Hospital Pune affiliated to Bharat RatnaAtal Bihari Vajpayee Medical College, Pune. Twenty-One Healthcare workers were observed during the recommended Hand hygiene practice. 21 patient care activities and 69 HH opportunities were observed. As recommended by WHO, the study analysed five moments of HH: (1) HH before touching a patient, (2) HH before clean/ aseptic procedures, (3) HH after body fluid exposure risk, (4) HH after touching a patient, and (5) HH after touching patient surroundings. Furthermore, we assessed hand washing technique by considering different components – A] Handwash or Hand rub performed. B] Ornaments removed or not while performing HH. C] Complete or Partial steps of HH followed. We calculated HHCAR (Hand Hygiene complete adherence rate), HHPAR (Hand Hygiene Partial adherence rate), HHTAR (Hand Hygiene total adherence rate) as follows-

HHCAR –Number of complete steps of Hand hygiene performed (complete compliance) divided by Number of hand hygiene opportunities.

HHPAR - Number of partial steps of Hand hygiene performed (partialcompliance) divided by Number of hand hygiene opportunities.

HHTAR – Hand Hygiene total adherence rate is the combination of HHCAR and HHPAR.

Data Collection

Data collected from the Hand hygiene audit was compiled. The format of compiled data as follows

Hand Hygiene Audit												
Department of Microbiology, BAVMC,Pune												
							Moments with Description					Sign
PT care activity	SR NO		Tick	Ornaments removed or not	Glove	Handwash or Handrub	Partial steps followed	Before touching patient (WHO Moment 1)	Before aseptic procedure (WHO Moment 2)	Body fluid exposure risk (WHO	After touching patient (WHO moment 4)	touching patient's surrounding (WHO Moment 5)	
1		Doctor						handrub not done before plaster and touching hand	NOT done removing old IV cathter	NOT done after removing IV	NOT done	NOT APPLICABLE	
	1	Nursing staff	√	NOT	NO	NO	YES						
		Housekeeping											
		Other											
		Missed											
		Doctor											
COMPLIANCE								NC	NC	NC	NC		
2	2	Nursing staff						YES while appling alcohol swab and palpating	NOT done blood drown from new born	YES after blood draun	YES	NOT APPLICABLE	
		Housekeeping											
		Other											
		Missed											
		Doctor	√	YES	NO	HR	YES						
COMPLIANCE								PARTIAL	NC	PARTIAL	PARTIAL		
3	3	Nursing staff	√	NOT	NO	HR	YES	NOT done handrub and side prepration	YES applying IV catheter	YES after IV catheter inserted	NOT DONE after touching hand for applying sticking	DOUBLE COUNTINGBEFORE TOUCHING PT NOT DONEafter touching patient's bed to help lie down	
		Housekeeping											
		Other											
		Missed											
		Doctor											
COMPLIANCE								NC	PARTIAL	PARTIAL	NC	NC	
4	4	Nursing staff	√	YES	NO	HR	COMPL	YES before patient examination	NA	NA	YES	YES After completion of task while touching pt file	
		Housekeeping											
		Other											
		Missed											
		Doctor											
COMPLIANCE								COMPLETE			COMPLETE	COMPLETE	
5	5	Nursing staff						NOT DONE before pules checking and history taking				DOUBLE COUNTINGBEFORE TOUCHING PT NOT DONE after touching pt bed to make him sit	
		Housekeeping											
		Other											
		Missed											
		Doctor	√	NO	NO	HR	YES		NA	NA	NOT DONE		

Table1: Format in which Hand Hygiene Audit Data was collected.

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The data was analysed using appropriate statistical methods. The due approval from Institutional Research Committee was obtained.

RESULTS

Total 21 patient care activities and 69 HH opportunities were observed. Out of 69 opportunities, 21 opportunities performed by doctor, 31 opportunities performed by Nursing staff and 17 opportunities performed by others (nursing students, physiotherapist, attendant etc)[fig.1].

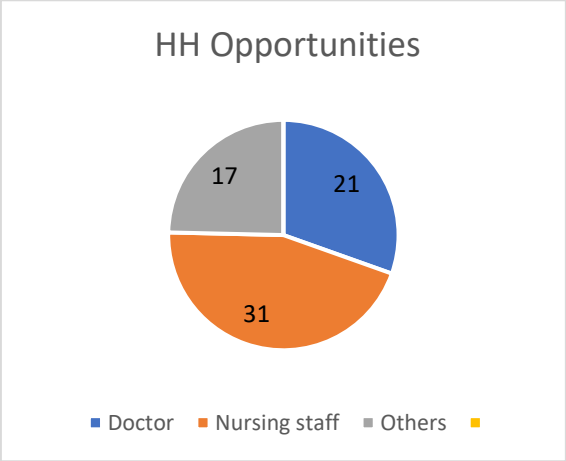

Figure 1: HH Opportunities

Among 69 HH opportunities, 25 Number of HH observed for WHO moment 1, 6 Number of HH observed for WHO moment 2, 6 Number of HH observed for WHO moment 3, 18 Number of HH observed for WHO moment 4, 14 Number of HH observed for WHO moment 5 (diag.1)

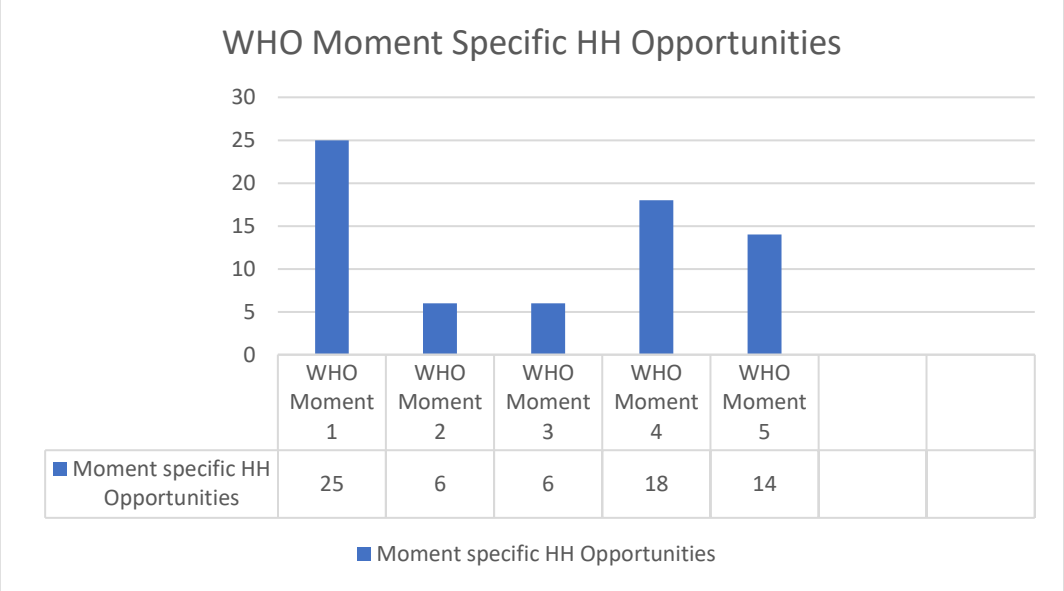

Diagram 1 – WHO Moment Specific HH Opportunities

Hand Hygiene Total Adherence Rate (HHTAR)

HHTAR for doctors observed was 38.09%.HHTAR for Nursing staff was 48.38%. HHTAR for others was 47.05% (fig.3).

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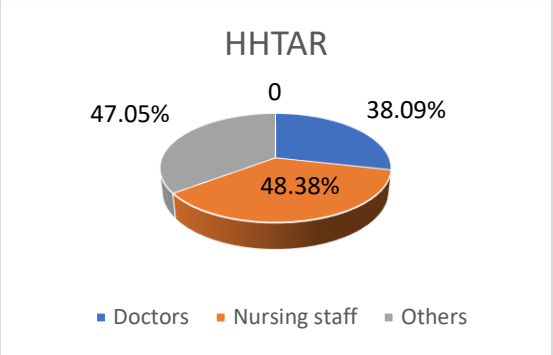

Figure 3 – HHTAR

WHO Moment specific HHTAR observed wereas shown in Table 2 &Diagram 2

1.	WHO Moment 1 HHTAR	40%
2.	WHO Moment 2 HHTAR	50%
3.	WHO Moment 3 HHTAR	50%
4.	WHO Moment 4 HHTAR	33.3%
5.	WHO Moment 5 HHTAR	57.14%

Table2: WHO Moment specific HHTAR

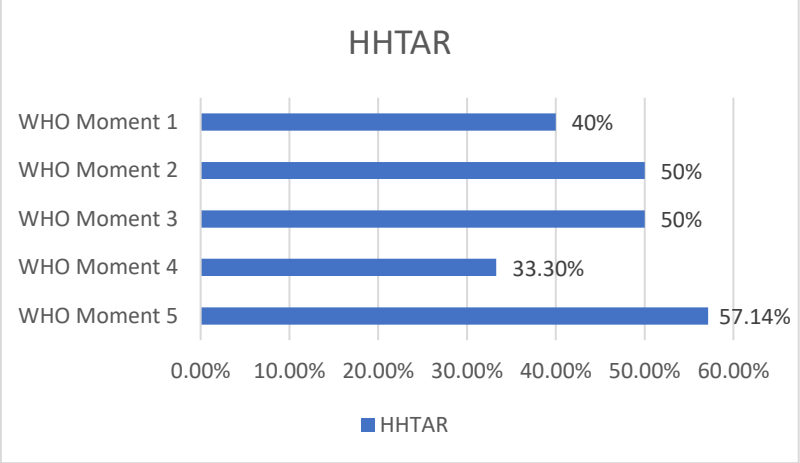

Diagram 2: HHTAR

Hand Hygiene Complete Adherence Rate (HHCAR)

HHCAR for doctors , Nurses and others were 19%, 12.9% , 17.6% respectively (fig.4).

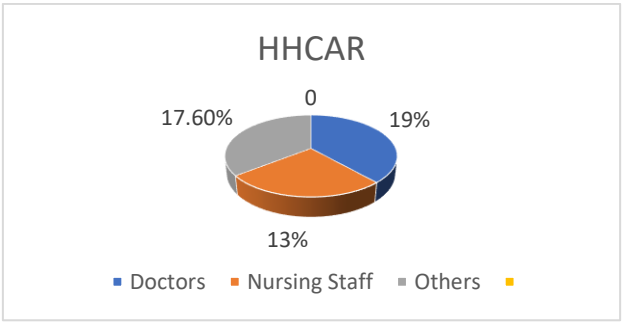

Figure 4: HHCAR

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Moment specific HHCAR was observed were as shown in Table 3 and Diagram 3

1.	WHO Moment 1 HHCAR	12%
2.	WHO Moment 2 HHCAR	16.6%
3.	WHO Moment 3 HHCAR	0%
4.	WHO Moment 4 HHCAR	16.6%
5.	WHO Moment 5 HHCAR	28.57%

Table 3: Moment specific HHCAR

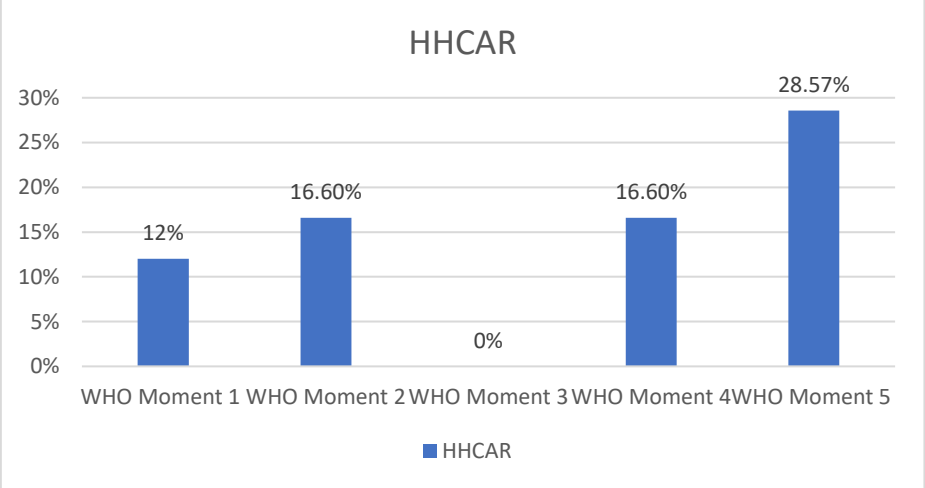

Diagram 3: HHCAR

Hand Hygiene Partial Adherence Rate (HHPAR)

HHPAR for doctors , Nursing staff and others were 14.2%, 35.48%, 23.52% respectively (fig.5).

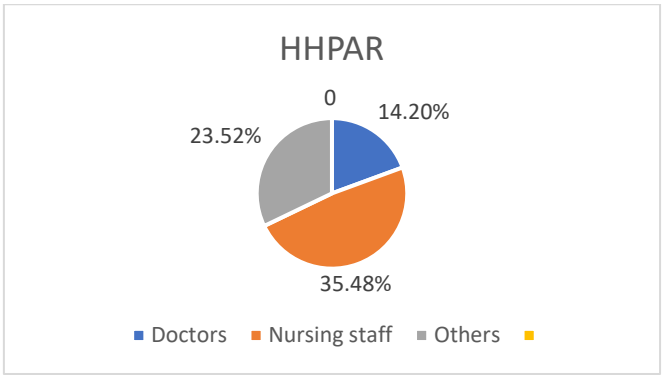

Figure 5: HHPAR

Moment specific HHPAR were were as shown in Table 4 andDiagram 4

1.	WHO Moment 1 HHPAR	28%
2.	WHO Moment 2 HHPAR	33.3%
3.	WHO Moment 3 HHPAR	50%
4.	WHO Moment 4 HHPAR	16.6%
5.	WHO Moment 5 HHPAR	28.57%

Table 4: Moment specific HHPAR

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DISCUSSION

Adherence to the WHO's "my five critical moments of hand hygiene" guidelines is vital in the prevention and control of HAI among the service providers, patients, and their guardians in the health care setting [21]. The current study measured hand hygiene adherence in tertiary care centre. In spite of the recognition of HH as the most important infection control practice, compliance continues to be suboptimal, as reflected in the overall compliance of the current study. Based on the observations carried out in this study, the average overall compliance among doctors, Nursing staff was 38.9 % and 48.38% respectively. Although there is no universally agreed minimum acceptable level of compliance, a number of countries (e.g. Australia, Canada, New Zealand, Ireland) use 80% or 90% as a baseline compliance target, and the WHO recommends that HH role models have compliance of at least 80% (WHO, 2010)[11].However, several studies shown compliance to be between 20-40% [22]. Even when intensive educational training campaigns were introduced, hand hygiene compliance only increased to 66% [23]. The highest compliance levels were found among nursing staffwhile doctors were the least likely professional group to comply compared to nurses. This is unsurprising; historically, compliance has been much higher in nurses than in doctors [12],while Allegranzi B *et al* observed higher compliance rate among doctors compared to nurses. According to Allegranzi B et al this higher rate might be due to higher level of education and stronger perception of their professional role [24]. In current study the results were 43.47%, 15.94% and 27.53% for Hand Hygiene total adherence rate (HHTAR), Hand Hygiene Complete adherence rate (HHCAR) and Hand Hygiene partial adherence rate (HHPAR) by all Healthcare workers. A study done by Arun Kumar *et al* in Kolhapur 2019 observed Hand hygiene adherence rate (HHAR) was 35.4% [18]. Similarly, a study in South India by Angura*jet al* observed Hand Hygiene Partial Adherence rate (HHPAR) was 34.5% [19]. Hand Hygiene complete adherence rate (HHCAR) in current study was 15.94% while a study by Vithiya Ganesan *et al* found HHCAR rate was 29.9% [20]. As we can see rates found at other places were slightly higher compared to our study, because of Hand Hygiene audit, we could notice it (low rate). Hence there is need to do more training sessions on Hand Hygiene among Health care workers.

It was found that HCWs were more likely to engage in HH practices that protect themselves (e.g. after patient contact) than those that protect the patient (e.g., before an aseptic task). In present study, HHCAR for WHO Moment 2 was 16.6% and WHO Moment 5 was 28.57%. This finding statistically confirms the tendency of HCWs towards prioritising the protection of oneself from infection rather than patient safety. It has been suggested that in order to improve compliance, attempts should be made to refocus from a self-protection practice to a practice that benefit of self and others[13].

There were a number of strengths associated with this study. First, direct observation was used, which is considered the 'gold standard' method of measuring HH compliance [14]. Further, the audit was comprehensive as it observed various HCWs[15]. A detailed observation of hand hygiene was conducted along with description of each WHO moment Furthermore, we assessed hand washing technique by considering different components – A] Handwash or Hand rub performed. B] Ornaments removed or not while performing HH. C] Complete or Partial steps of HH followed. Hand hygiene total adherence rate (HHTAR), Hand hygiene complete adherence rate (HHCAR), Hand hygiene partial adherence rate (HHPAR) were analyzed. Profession specific and moment specific rates (for each WHO moment) were also calculated.

There were also some limitations that should be noted that the current study did not give consideration to other situational factors or conditions of the working environment that may have impacted on HH compliance, such as patient dependency and acuity of staffing and other features of context. Such factors affect HCW workload, and in turn affect compliance[17]. Current study did not involve educational training, comparison of compliance rate in pre& post interventions. It is one time study only. Finally, some of the samples within categories are relatively small, which will have influenced the generalisability of the findings and resulted in wide confidence intervals.

CONCLUSION

This study has shown various rates of adherence to Hand hygiene practices& HH moments among different HCWs.HH adherence rates calculated from this HH audit in current study shows that HCWs should emphasize on proper Hand Hygiene practices. Hand Hygiene audit should be used as an effective tool to improve the adherence to HH practices among healthcare workers.

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