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Hand Hygiene Practices and Compliance with Hand Hygiene Protocols by Health Care Workers at a Tertiary Care Hospital in India – An Observational Study

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Abstract

Background: The purpose of this study is to observe the hand hygiene practices being followed in departments of Surgery, Orthopaedics, Medicine and Obstetrics & gynaecology at a tertiary care hospital, in accordance with the WHO guidelines. The objective of this study was to observe hand hygiene practices being followed amongst health care workers, assess the hand hygiene protocol being followed and compare it with the questionnaire filled by the health care workers, and assess the reason for non-compliance.

Methods: An observational study was carried out on 90 health care workers (HCWs). HCWs were observed at random in ward, OPD and emergency. This was followed by assessing the knowledge& awareness of the HCWs regarding hand hygiene with the help of a questionnaire being duly filled by participants.

Results: The result has been discussed under three headings, namely, analysis of the observation tool, analysis of the questionnaire and the comparison of relevant points between the observation tool and the questionnaire. The compliance in the OPD, Ward, Emergency came out to be 74.2%, 52%, 50.2% respectively and the mean compliance came out to be 58.9%. ($p<0.05$). Most common cause cited for non-compliance is that the HCWs are too busy (38%) followed by out of products(19%), forget(11%),unsure of need(11%),products not in convenient location (11%).

Conclusion: The overall compliance rate for hand hygiene by HCWs was 58.9%.The setting wise compliance rate being 74.2%, 52% and 50.2% in the OPD,Ward and Emergency respectively.

Keywords: Hand hygiene protocols, health care workers, hospital acquired infections.

Introduction

The spread of nosocomial infections can be as high as 40% in certain areas.[1] In developed countries health care associated infections (HCAI) concerns 5-15% of hospitalized patients and can affect 9-37% of those admitted to ICUs. [2] High incidence of HCAI leads to increased stay at the health care and a corresponding economic burden as well as morbidity and mortality for the patient.[3] Device associated infections also have a great economic impact. [4] In India, incidence of HCAI varies from 5-30%

according to Hospital Infection Society of India. [5]

The importance of hand hygiene was recognized as early as the seventeenth century by Dr. Ignaz Semmelweis to reduce maternal mortality rate.[6] Hand hygiene is a cost effective method to prevent HCAI. Infections can be stopped through good hand hygiene practice, and patient and health worker harm prevented for less than $10.[7] Transmission through contaminated health care worker's hands is the most common pattern in most settings. Contaminated HCWs hands have been associated with endemic HCAIs and also with several HCAI outbreaks.[8] Hence, WHO recommends hand hygiene to be followed– before touching a patient, before aseptic or clean procedures, after body fluid exposure, after touching a patient, after touching patient surroundings.[2]

Hand hygiene is the primary measure proven to be effective in preventing HCAI and the spread of antimicrobial resistance. However, it has been shown that HCWs encounter difficulties in complying with hand hygiene indications at different levels.[2] Compliance is low mainly due to-inadequate number or inconvenient placement of sinks, inadequate access to soap and water, understaffing, unsure of need, forget.[8,9]

Formal education and training of HCWs in hand hygiene protocols leads to increased compliance as per various studies.[10,11,12] Compliance to hand hygiene protocols varies between different health care workers, hospital settings, type of procedure being performed and hospital area.[13,14,15]

The aim of this study was to observe hand hygiene practices being followed amongst health care workers at a tertiary care hospital, to assess the hand hygiene protocol being followed and compare it with the questionnaire filled by the health care workers at a tertiary care hospital and to assess the reasons for non-.

Material and Methods:

The study was carried out over a span of three months and involved observing the various hand hygiene practices being followed by health care workers in a tertiary care hospital attached with our college with the help of an observation tool.[16] An informed consent was taken from all the participants. Any medical health care professional in the hospital was included in this study. The identity of the participant was kept anonymous. By expecting the compliance to hand washing in HCWs to be 60% with type 1 error as 5% and error of margin of 10%, the sample size worked out to be 90.[17] Hence around 90 health workers were observed at random in OPDs, wards and emergency on various occasions to gather sufficient readings to draw conclusions. This was followed by assessing the knowledge and awareness of the health care workers regarding hand hygiene with the help of a questionnaire being duly filled by the participants. This questionnaire was also filled on an anonymous basis.

The information gathered with the help of the questionnaire was compared with the observations obtained from the observation tool. Chi-squared test was used for group comparisons for categorical data. Linear correlation between two continuous variables was explored using Pearson's correlation (if the data were normally distributed) and Spearman's correlation (for non-normally distributed data). Diagnostic test were used to calculate sensitivity, specificity, NPV and PPV. Statistical significance was kept at $p < 0.05$. Reasons for non-compliance of hand hygiene were also assessed.

The analysis and result of the study were discussed with the health care workers.

Results:

The result has been discussed under the following headings:

- Analysis of the observation tool.
- Analysis of the questionnaire

- Comparison of relevant points between the observation tool and the questionnaire.

Analysis of the observation tool: The healthcare workers were observed in the OPD, Ward and Emergency in the departments of surgery, orthopaedics, medicine and obstetrics & gynaecology at a tertiary care hospital.

Table 1: Analysis of Observation Tool

	OPD(50)	WARD(50)	EMERGENCY(50)
1.Before clean and aseptic procedures	41	32	15
2.After contact with blood,body fluids	45	43	37
3.After removing gloves used for contact with body substances	26	16	8
4.After patient contact	38	7	18
5.After patient equipment contact	46	41	48
6.Gloves used whenever necessary	29	12	42
7.Gloves removed immediately after use	36	31	5

According to the WHO guidelines, the compliance rate of hand hygiene should have been 100% to maintain asepsis for prevention of healthcare associated infections.[2] The following table compares the observed (O) and the expected (E) values (the values have been expressed as percentage) in the settings of OPD, Ward and Emergency in the departments of surgery, orthopaedics, medicine, obstetrics & gynaecology at a tertiary care hospital.

Table 2: Analysis of observation tool observed as a percentage

	OPD (O)	OPD (E)	WARD (O)	WARD (E)	EMERGENCY (O)	EMERGENCY (E)
1.Before clean and aseptic procedures	82%	100	64%	100	30%	100
2.After contact with blood,body fluids	90%	100	86%	100	74%	100
3.After removing gloves used for contact with body substances	52%	100	32%	100	16%	100
4.After patient contact	76%	100	14%	100	36%	100
5.After patient equipment contact	92%	100	82%	100	96%	100
6.Gloves used whenever necessary	58%	100	24%	100	90%	100
7.Gloves removed immediately after use	72%	100	62%	100	10%	100
Total	522	700	364	700	352	700
Mean compliance	74.5%(a)		52%(b)		50.2%(c)	

The overall compliance was found to be 58.9%.

Analysis of the questionnaire:

Table 3: Preferred method of disinfection in different settings

	OPD	WARD	EMERGENCY
ALCOHOL RUB	53	30	58
SOAP & WATER	27	55	19
CHLORHEXIDINE	10	5	13

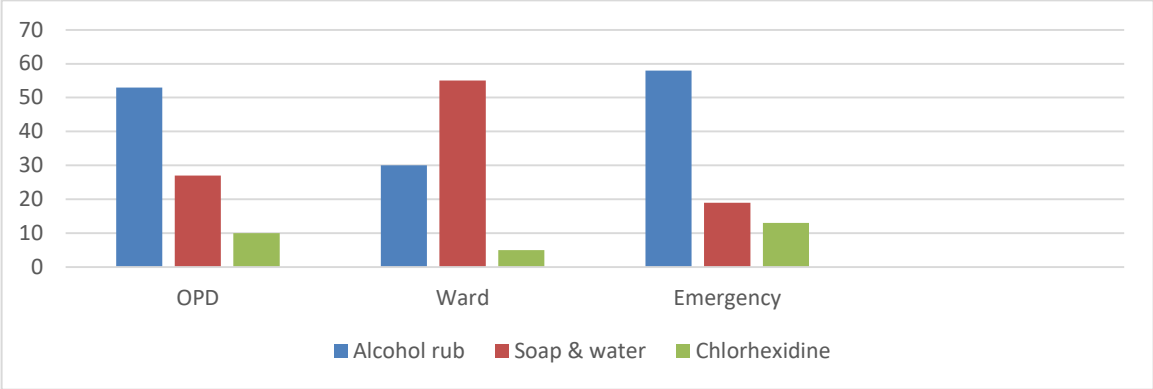

Figure 1: Figure depicting preferred method of disinfection in different settings

Table 4: Is there any hand hygiene protocol that the health care workers are aware of

YES	52%
NO	48%

Table 5: Estimation of Compliance rate by the health care workers.

Compliance Rate (%)	Number of HCWs
0-20%	0
20-40%	11
40-60%	18
60-80%	19
80-100%	42

Mean estimated compliance= [(10*0)+(30*11)+(50*18)+(19*70)+(42*90)]/90 =6340/90=70.4

Standard deviation=√6112.8/90=8.24 (p value <0.0001).

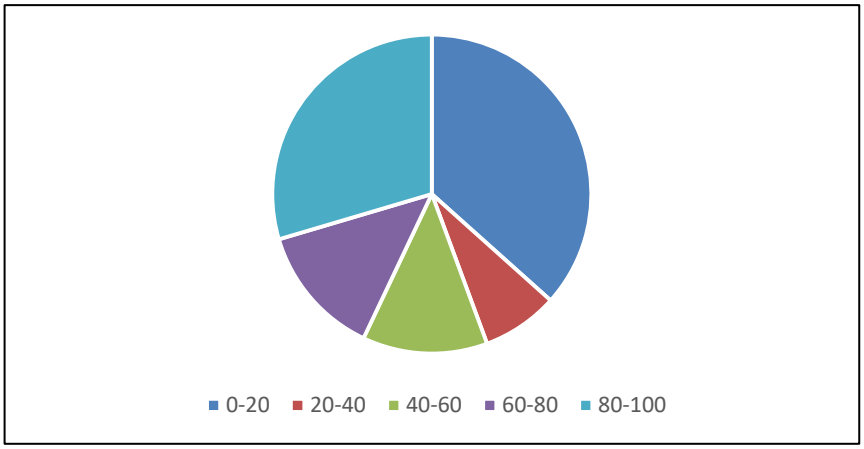

Figure 2: Estimation of compliance rate by the health care workers

Table 6: Are the HCWs satisfied with the current hand hygiene practices at the instituition

Satisfaction level	Number of HCWs
Highly satisfied	0
Satisfied	47
Neutral	37
Dissatisfied	6

Table 7: Compliance of HCWs with hand hygiene protocols in different settings:

	Yes	No
1.Do the HCWs disinfect their hands in between patients in OPD	47	43
2.Do the HCWs disinfect their hands in between patients in wards	41	49
3. Do the HCWs sterilize their hands after coming in contact with blood and body fluids.	82	8
4.Do they sterilize their hands after coming in contact with patient's surroundings	55	35

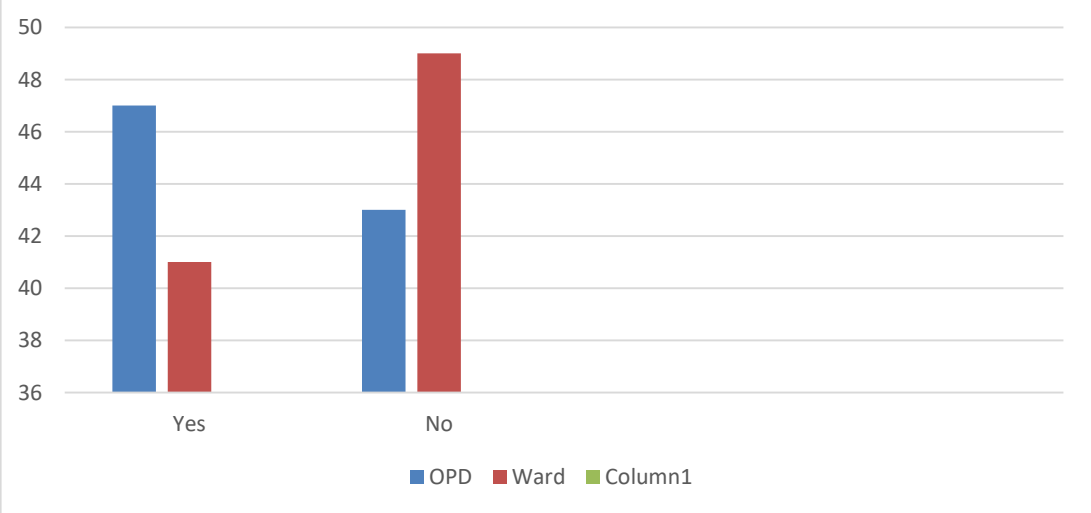

Figure 3: Depicting whether the HCWs disinfect their hands in between patients in OPD and wards

Table 8: Role of leaders in promotion of hand hygiene:

Influence of promotion of hand hygiene by leaders (%)	**Number of HCWs**
0-25%	8
25-50%	11
50-75%	25
75-100%	46

Table 9: Whether the availability of alcohol based hand rubs improve the hand hygiene compliance

Influence of availability of alcohol based hand rubs to improve hand hygiene compliance (%)	Number of HCWs
0-25%	5
25-50%	11
50-75%	33
75-100%	41

Table 10: To what extent the presence of hand hygiene posters improves the compliance with hand hygiene protocols:

Influence of presence of hand hygiene posters to improve the compliance with hand hygiene protocols (%)	Number of HCWs
0-25%	8
25-50%	11
50-75%	27
75-100%	44

Table 11: To what extent does a formal education regarding hand hygiene improve the compliance?

Influence of formal education in improving compliance with hand hygiene protocols (%)	Number of HCWs
0-25%	3
25-50%	13
50-75%	25
75-100%	49

Table 12: Reasons of non-compliance with hand hygiene protocols

Reason	Number of HCWs
1.Too busy	38
2.Forget	11
3.Unsure of need	11
4.Out of products	19
5.Products not in convenient location	11

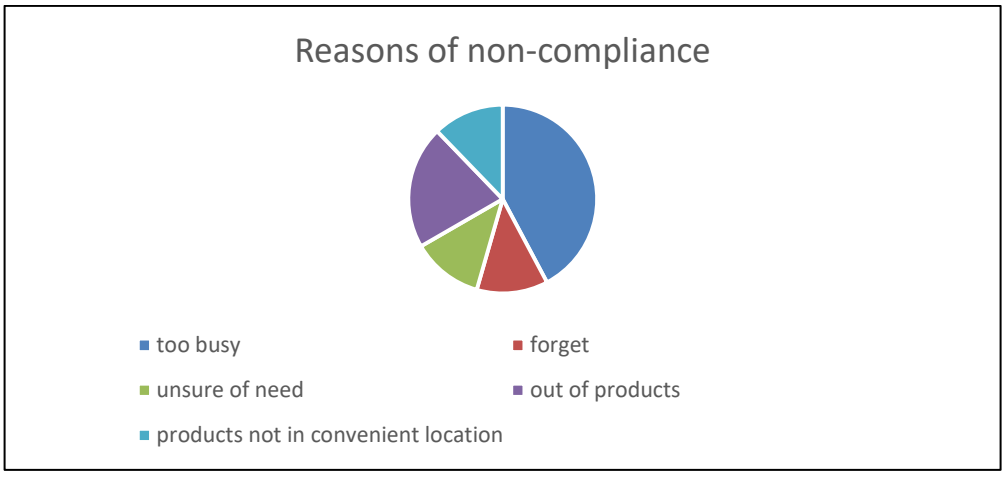

Figure 4: Reasons of noncompliance amongst HCWs

Discussion

The mean compliance of our study came out to be 58.9%.

Table13: Depicting the mean compliance of various studies done on hand hygiene:

Study name	Mean compliance (%)
1.Lam et al[10]	40%
2.Creedon S A et al[11]	51%
3.Novoa et al[13]	20%
4.Erasmus et al[14]	40%
5.Kowitt B et al[15]	83%

As seen from the table above, the compliance rate varies from region to region, circumstance to circumstance. The factors playing role in determining the compliance of hand hygiene being adhered to in different settings are:

- Different protocols being followed in different set ups, despite of a protocol being published by the WHO
- Strict guidelines pertaining to the hand hygiene are not being implemented or stressed upon enough by the senior managers of the hospital.
- Absence of formal education with regard to hand hygiene.
- Patient to Doctor ratio in OPDs and emergencies is very high
- Non availability of products like alcohol rubs, chlorhexidine, sinks etc.
- Lack of reminders such as posters, etc. In appropriate places.
- In developing countries, expenditure on health constitutes a minor part of the total budget.
- Preferred method of disinfection in OPD& Emergency is alcohol rub, while in wards it is soap& water. The reason cited for the same is that alcohol rub is easy to use, cheaper, takes less time to apply, effective against a wide range of microorganisms. Soap& water is preferred in wards as soap is very easily available, does not require many resources. It removes most of the microorganisms if proper technique is followed.

Conclusion

The overall compliance rate for hand hygiene by HCWs is 58.9%.The setting wise compliance rate being 74.2%, 52% and 50.2% in the OPD, Ward and Emergency respectively. The significance of the compliance of hand hygiene in HCWs is essential because it serves as an effective tool in preventing HAIs.

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