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A Study on Knowledge, Attitudes and Practices on Hand Hygiene amongst Residents and Nursing Staff at Tertiary Care Hospital, Drug Chhattisgarh, India

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A B S T R A C T

Knowledge of hand hygiene as the single most important precautionary measure to reduce nosocomial and healthcare associated infections. We carried out a study to assess the knowledge, attitudes, practices and satisfaction of facilities available to health care workers amongst residents and nurses in our institute. A cross-sectional, paper-questionnaire was administered to explore the knowledge of, and attitudes towards, hand hygiene practices. Data analysis were done in Microsoft Excel sheet and presented as numbers and percentages. Appropriate statistical tests were applied as and when required. p-value less than 0.05 were considered significant. A total 190 respondents were studied about their knowledge and attitude towards hand hygiene practices. Our study showed that respondents from both groups (95 each) had average knowledge regarding WHO steps of hand washing (55% and 58% respectively), residents has better knowledge than nurses regarding hand rubbing is more effective against germs than hand washing (44.21% and 15.78%). The attitude regarding correct hand hygiene practices to be followed at all times was found to be better among nurses (78.94%) as compared to residents (35.78%) which was found to be highly significant with p-value <0.001. Hand hygiene knowledge attitudes and practices among nurses and residents were moderate to poor. The present study underscores the need for further improvement in the existing training programs to address the gaps in hand hygiene.

Introduction

Health care-associated infections are a serious problem in health care services as they may cause prolonged hospital stays, high mortality, long-term disability, and excess health care costs. Most health care-associated infections can be transmitted from patient to patient via the hands of health care workers. In other words, health care workers' hands due to poor hand hygiene are the most usual type of vehicle for the transmission of health care-associated infections (Allegranzi *et al.*, 2011).

Hand hygiene is an important healthcare issue globally and is a single most cost-effective and practical measure to reduce the incidence of healthcare-associated infection and the spread of antimicrobial resistance across all settings—from advanced health care systems

to primary healthcare centers, these infections are the most common adverse events resulting from a stay in the hospital affecting approximately 5 to 10% of hospitalized patients in the developed world, and the burden is larger in underdeveloped nations. In spite of being a very simple action, compliance with hand hygiene among health care providers is as low as less than 40%. To address this problem of lack of compliance with hand hygiene, continuous efforts are being made to identify effective and sustainable strategies (Azzam al Kadi *et al.*, 2012). It has been proved that training sessions on hand hygiene has resulted in sustained improvement (Gould *et al.*, 2008).

Thus, handwashing is emphasised as the single most important measure to prevent cross transmission of micro-organisms and thus to prevent nosocomial infections (Conly *et al.*, 1989).

This study is planned to primarily determine the awareness amongst Health Care Providers of Tertiary care hospital & to assess their knowledge regarding hand hygiene.

Materials and Methods

The present study was carried out in the Department of Microbiology, Shri Shankaracharya institute of medical sciences, during a time period of 3 months. Participants were supposed to filled a questionnaire which helped us to test their social hand washing knowledge, practices and awareness. It was prepared by using WHO questionaries. (3) This proforma of 39 questions includes multiple choice and "yes" or "no" questions. Attitude and practice were assessed using another self-structured questionnaire which consists of 13 questions where the subjects had to give their opinion on a 1 to 5 point scale ranging from strongly disagrees to strongly agree.

For scoring, 1 point was given for each correct response to good level of knowledge and positive attitude and 0 point was given for poor level of knowledge and negative attitude, 75% and above was considered good, a score between 50-74% was moderate/ average/ fair and below 50% was considered poor. A P value less than 0.05 were considered significant.

Study Population: Health Care Providers of Rims Hospital, Raipur

Inclusion Criteria: All Health Care Providers (HCP) consenting for study.

Exclusion Criteria: All Health Care Providers (HCP) not consenting for study.

Study Type: Cross sectional study.

Sample Size: Non-Repetitive (95 residents and 95 nursing staff) samples in form of questionnaires from Health Care Providers (HCP) of SSIMS hospital, Drug.

Study Time: 3 months.

Procedure for sampling

Health Care Providers will be divided into 2 groups –

Group II (95 Participants): Junior & Senior Residents
Group III (95 Participants): Nursing Staff

After Informed Consent, questionnaires will be given to Health Care Providers (HCP) of SSIMS hospital,

Planned procedure to analyze data

All data was maintained in Microsoft office Excel. All statistical analysis will be carried out using Excel and Appropriate Statistical

tools will be applied wherever required like tests of proportion.

Ethical considerations

Informed Written Consent will be taken from the patient before doing the required investigations. Ethical clearance will be obtained from RAC and Institutional Ethical Committee (IEC).

Results and Discussion

A total of 190 candidates were studied. Out of which 95 were residents and 95 were nursing staff. They were recruited using standard questions. The level of knowledge about hand hygiene was moderate among the total study population.

No significant difference was observed in study group regarding knowledge about routes of transmission of infection, about most appropriate timing for performing hand hygiene actions that prevent transmission of germs to the patient and to the health care worker.

Significant difference of 50(52.63%) and 33 (34.73%) were observed regarding most frequent source of germs responsible for health care associated infections and Significant knowledge difference of 42(44.21%) and 15(15.78%) were observed regarding effectiveness of alcoholic hand rubs being more effective against germs than hand washing in study groups among resident and nurses respectively (Table 1). significant difference was also seen regarding situations like palpation of the abdomen, after emptying a bed pan, after making a patients bed and after visible exposure to blood with 40(42.10%), 58(61.02%), 73(76.84%), 84(88.42%) and 22(23.13%), 11(11.57%), 46(48.42%), 62(65.26%) among the residents and nurses respectively (Table 1).

Regarding knowledge to decrease colonization, a significant difference was observed in use of artificial nails 75(78.94%) against 86(90.52%) amongst residents and nurses respectively (Table 1).

When the attitudes were assessed it was found that nurses had good attitudes as compared to residents like sufficient knowledge and training with respect to hand hygiene, feeling of guilt after omitting a hand hygiene by self and feeling of uncomfort when others omit hand hygiene as well as perception of the dirty areas of the hands (Table 2).

Although hand hygiene is a very simple procedure and has long been deemed one of the most important infection control measures, the compliance rates by health care workers are generally reported to be low (Yuan *et al.,* 2009 and Allegranzi *et al.,* 2011). The present study was conducted to assess the current situation of hand hygiene in our institute and to put forth recommendations to improve hand hygiene measures and thereby reduce the rate of cross transmission of infections.

In this study, both residents and nurses had average knowledge on hand hygiene. Nearly seventy five respondents answered correctly when asked about the main route of transmission of potentially harmful germs between patients.

Our results are comparable with other studies (Ariyaratne MHJD *et al.,* 2013, Veena *et al.,* 2014) which reported that 72% and 75% of participants knew that unhygienic hands of health care workers were the main route of transmission respectively.

In our study, knowledge that alcohol free hand rub is more rapid and more effective against germs than hand washing was better among residents.

Results and Discussion

		Resident 95	Nurses 95	P value	significance
1	Which of the following is the main route of transmission of potentially harmful germs between patients (Health care workers hands when not clean)	74 (77.89%)	75 (78.94%)	0.86	NS
2	What is the most frequent source of germs responsible for health care associated infections? (Germs already present on or within the patient)	50 (52.63%)	33 (34.73%)	0.0129	Significant
3	According to WHO how many steps of hand washing, do you know? (7)	55 (57.89%)	58 (61.05%)	0.65	NS
4	Do you think wearing gloves replaces the need for hand washing practices (N)	82 (86.31%)	80 (84.21%)	0.68	NS

Which of the following hand hygiene actions prevents transmission of germs to the patient?

		Resident 95	Nurses 95	P value	significance
5	Before touching a patient (yes)	90(94.73%)	93(97.89%)	0.247	NS
6	Immediately after risk of body fluid exposure (yes)	75(78.94%)	82(86.31%)	0.180	NS
7	After exposure to immediate surroundings of a patient (no)	41(43.15%)	28(29.47%)	0.049	Significant
8	Immediately before a clean / aseptic procedure (yes)	77(81.05%)	82(86.31%)	0.326	NS

Which of the following hand hygiene actions prevents transmission of germs to the health care worker?

		Resident 95	Nurses 95	P value	significance
9	After touching a patient (yes)	79(83.15%)	94(98.94%)	<0.001	significant
10	Immediately after a risk of body fluid exposure (yes)	91(95.78%)	90(94.75%)	0.73	NS
11	Immediately before a clean / aseptic procedure (no)	31(32.63%)	53(55.78%)	0.0013	significant
12	After exposure to the immediate surroundings of a patient (yes)	60(63.15%)	72(75.78%)	0.326	NS

Which of the following statements on alcohol-based hand rub and hand washing with soap and water is true?

		Resident 95	Nurses 95	P value	significance
13	Hand rubbing is more rapid for hand cleansing than hand washing (true)	75(78.94%)	82(86.31%)	0.1801	NS
14	Hand rubbing causes skin dryness more than hand washing (false)	38(40%)	23(24.21%)	0.0198	NS
15	Hand rubbing is more effective against germs than hand washing (false)	42(44.21%)	15(15.78%)	<0.001	significant
16	Hand washing and hand rubbing are recommended to be performed in sequence (false)	44(46.31%)	14(14.73%)	0.0005	significant
17	What is the minimal time needed for alcohol based rub to kill most germs on your hands? (20 seconds)	42(44.21%)	36(37.89%)	NS	NS

Which type of hand hygiene method is required in the following situations?

		Resident 95	Nurses 95	P value	significance
18	Before palpation of the abdomen (rubbing	40(42.10%)	58(61.02%)	0.009	significant
19	Before giving an injection (rubbing)	36(37.89%)	42(44.21%)	0.3762	NS
20	After emptying a bed pan (washing)	73(76.84%)	84(88.42%)	0.0352	significant
21	After removing examination gloves (rubbing/washing)	75(78.94%)	86(91.52%)	0.0265	significant
22	After making a patients bed (rubbing)	22(23.15%)	11(11.57%)	0.0352	significant
23	After visible exposure to blood (washing)	46(48.42%)	62(65.26%)	0.0191	significant

Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs?

		Resident 95	Nurses 95	P value	significance
24	Wearing jewellery (yes)	74(77.89%)	93(97.87%)	0.2479	NS
25	Damaged skin (yes)	91(95.78%)	89(93.68%)	0.1801	NS
26	Artificial fingernails (yes)	75(78.94%)	86(90.50%)	0.04	significant
27	Regular use of a hand cream (no)	54(56.84%)	73(76.84%)	0.3263	NS

What do you think are the reasons for poor hand washing compliance?

		Resident 95	Nurses 95	P value	significance
28	Lack of knowledge of guidelines/ protocols	88(92.63%)	82(86.31%)	0.1561	NS
29	Wearing gloves/ gowns	23(24.21%)	26(27.36%)	0.6188	NS
30	Understaffing and Overcrowding	62(65.26%)	67(70.52%)	0.4372	NS
31	Poor access to hand washing facilities	77(81.05%)	75(78.94%)	0.7168	NS
32	Non availability of alcohol based hand rubs	84(88.42%)	86(90.52%)	0.6364	NS
33	Non availability of soap and water	81(85.26%)	83(87.36%)	0.6729	NS
34	Hand washing agents cause irritation and dryness	47(49.47%)	50(54.34%)	0.6633	NS

What is the best approach to improve hand washing compliance?

		Resident 95	Nurses 95	P value	significance
35	Motivation	81(85.26%)	89(93.68%)	<0.001	significant
36	Availability of alcohol based hand rubs	48(50.50%)	53(55.78%)	0.716	**NS**
37	Training and education of HCW	65(68.42%)	68(71.57%)	0.026	significant
38	Need for automated soap dispensers	28(29.47%)	33(34.73%)	0.012	significant
39	Instructions demonstrating correct hand washing techniques to be displayed	65(68.42%)	54(56.84%)	0.026	significant

Table.1 Comparison of knowledge amongst resident and nursing student regarding various parameter of hand hygiene. Significance calculated using student T test. P< 0.05= significant value < 0.001= highly significant, NS= non-significant

Attitude

		Resident 95	Nurses 95	P value	significance
1	Correct hand hygiene practices should be followed at all times	34(35.78%)	75(78.94%)	<0.001	significant
2	A health care personnel should have sufficient knowledge and training about hand hygiene	36(37.89%)	82(86.31%)	<0.001	significant
3	I feel guilty when I omit hand hygiene	38(40%)	72(75.78%)	<0.001	significant
4	I feel uncomfortable when others omit hand hygiene	31(32.63%)	68(71.57%)	<0.001	significant
5	Sometime hand washing is not feasible in case of emergencies	15(15.78%)	13(13.68%)	0.6823	significant
6	A health care personnel should enrol in regular training sessions regarding hand hygiene practices	36(37.89%)	47(49.47%)	0.1076	NS
What is your perception of the dirty areas of the hands?					
		Resident 95	**Nurses 95**	**P value**	**significance**
8	Palm	80(84.21%)	84(88.42%)	<0.001	significant
9	Finger	82(86.31%)	78(82.10%)	0.7716	NS
10	Finger tips	79(83.15%)	75(78.94%)	0.026	significant
11	Dorsum of hand	54(56.84%)	59(62.10%)	0.002	significant
12	nails	70(73.68%)	75(78.94%)	0.020	significant
13	Web spaces	69(72.63%)	72(75.78%)	0.618	NS

Attitude towards various aspect of hand hygiene amongst resident and nursing student. Significance calculated using student T test. P< 0.05= significant value < 0.001= highly significant, NS= non-significant

However, only some of the residents and nurses (42% and 36% respectively) were aware about the minimum time needed for effective hand hygiene as mentioned in WHO guidelines.

However, only 50% of residents and 33% of nurses knew that the most frequent source of germs responsible for HCAI's were the germs already present on or within the patient, residents having significantly better knowledge in this aspect. Our findings were similar to a study carried out by Veena *et al.*, (2014) and Khaled *et al.*, (2008). Wherein 23.2% of observed candidates showed inappropriate hand washing due to both short contact time (less than 30 sec) and improper drying after hand washing. Half of the health care worker (HCWs) was unaware of all of the steps of HW advocated by the WHO guideline. These findings were similar to a study conducted in 2015, which revealed that HCWs had knowledge deficits on one or more components of HH steps (Fernandez *et al.*, 2015). These findings may be due to lack of education, regular in-service education, training regarding infection prevention, appropriate feedback, or lack of hospital protocol or policy on strict adherence to WHO recommended Hand hygine guidelines. These findings indicate that health care worker needs more rigorous, comprehensive, and regular education and training on hand hygiene and infection prevention to the HCWs. A study conducted in India showed

that 85% HCWs considered hand rubbing with alcohol-based rubs to be more rapid and less time-consuming than hand wash with soap and water (Anargh *et al.,* 2013) which is similar to our finding (82%).

Both groups had answered below satisfaction level regarding hand hygiene before giving an injection (41%), and after making a patients bed (17.36%).Comparative values given in study of MHID Ariyaratne in Srilanka *et al.,* (2013) are 26% and 25% and in Veena *et al.,* are, 27% and 21% respectively which is similar to present study

Both the groups were aware of the type of hand hygiene method required after removing examination gloves (75% and 86%) and also after emptying a bed pan (73% and 84%) respectively and thus showed good knowledge in this respect.

A majority of the nurses (75%) agreed that correct hand hygiene practices should be followed at all times compared to (35.78%) residents.

More nurses felt guilty about omitting hand hygiene and also felt uncomfortable when others omit hand hygiene (72% and 68% respectively) as compared with residents. Furthermore, our results are comparable with other studies and reports. Corresponding values for MHID Ariyaratne in Sri Lanka are 69% and 39% and in study of veena *et al.,* are 70% and 56% respectively. The present study shows that majority of the respondents had average knowledge, while approximately half of the respondents had good attitudes while majority had poor hand hygiene practices. Despite the fact that hand hygiene is considered as the single best measure for infection control.

Adherence to recommended hand hygiene practices by healthcare professionals is the most effective way to reduce healthcare-associated infections. In our study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices Teaching Hospital, which may play a very important role in increasing hand hygiene compliance among the staff and reducing cross transmission of infections among patients.

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