

Knowledge, attitudes and practices on hand hygiene among ICU staff in Anuradhapura Teaching hospital

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Abstract

Introduction : Hand hygiene practices of health care workers has been shown to be an effective measure in preventing hospital acquired infections.

Methodology : We carried out a study to assess the knowledge, attitudes, practices and satisfaction of facilities available to health care workers in the intensive care units with regard to hand hygiene in the Anuradhapura Teaching hospital using a self administered questionnaire.

Results : Our study showed that majority of respondents (72.5%) had moderate knowledge of hand hygiene. Knowledge on the correct use of hand washing and alcohol hand rubs was not consistent. When the attitudes were assessed for each individual respondents 47.5% had good attitudes whereas a majority (62.5%) was seen to have poor hand hygiene practices. The level of satisfaction among the health care workers regarding the facilities available for hand hygiene was poor (55%).

Conclusion : Hand hygiene knowledge attitudes and practices among ICU staff in Anuradhapura Teaching hospital was moderate to poor. Our study highlights the urgent need for introducing measures to increase the knowledge, attitudes, practices and facilities available for hand hygiene in the ICUs in Anuradhapura Teaching Hospital, which may play a

very important role in increasing hand hygiene compliance among the ICU staff and reducing cross transmission of infections among the ICU patients.

Introduction

Hospital acquired infections (HAIs) are *infections acquired in hospital by a patient who was admitted for a reason other than that infection*¹. HAIs are one of the important public health problems in many countries throughout the world. A WHO study, have also shown that the highest prevalence of nosocomial infections occurs in intensive care units and in acute surgical and orthopaedic wards².

HAIs results in higher morbidity, mortality, and additional costs. It is well recognized that the risk of transmission of pathogens when providing medical care and the incidence of HAIs can be kept low through appropriate standardized prevention procedures. However, it has been well documented that the level of compliance with the use of proven HAI measures by healthcare workers (HCWs) has been disappointing³. In order to overcome this problem it is vital to implement and practice prevention and control strategies with demonstrated value consistently and rigorously. Among the different strategies, the adherence to guidelines for disinfection is an essential ingredient for activities aimed at preventing the HAIs.

The importance of hands in the transmission of hospital infections has been well demonstrated⁴, and can be minimized with appropriate hand hygiene^{5,6,7,8}. However, compliance with handwashing, is frequently suboptimal. In the Sri Lankan theatre settings a study demonstrated that only 60% of the doctors performed appropriate hand washing before entering the theatre⁹. Non compliance with hand washing may be due to a variety of reasons, including: lack of appropriate facilities for hand washing, high staff-to-patient ratios, insufficient knowledge and attitudes of the staff, and allergies to hand washing products. Therefore it is important to address these issue in hospital infection control.

The prevalence of HAIs are high in intensive care unit due to patient and environmental factors. The patients are critically ill and usually immunocompromised which predispose them to acquire infections more easily. Critically ill patients requiring urgent and emergency interventions in ICU may cause difficulties to the health care workers to engage in recommended hand hygiene practices. There are several guidelines published by both international and local organizations such as WHO³, CDC⁵ and the Sri Lankan college of microbiologists¹⁰ on hand hygiene. It is important to carry out regular training programs and surveys to assess the hand hygiene practices among the health care workers in Sri Lanka, especially in the intensive care units in order to implement infection control measures.

This study is carried out with the objectives of assessing the knowledge, attitudes, practices and satisfaction of facilities available to health care workers in the intensive care units with regard to hand hygiene in the Anuradhapura Teaching hospital.

Method

Setting and Study population

The Anuradhapura Teaching Hospital has 4 ICUs which was included in this study. The hospital houses a Surgical, Medical, Paediatric and Neuro ICUs. The ICU staff members include the consultant, medical officers, nursing staff, paramedical technicians and health care assistants. In addition the medical and nursing students visit the ICU during their training. Verbal consent will be obtained from these health care workers who volunteer to participate in the study.

Study design

This was a cross sectional study of health care workers hand hygiene knowledge, attitudes, practices and satisfaction with the facilities available for hand hygiene. A self administered questionnaire was given to those health care workers in the ICU, who volunteered to participate in the study. Questionnaires were collected at the end of their work shift by the investigators.

Ethical clearance for the study was obtained from the Anuradhapura Teaching hospital, where the study was conducted.

Self administered questionnaire

The questionnaire will consist of five parts; demographic information, assessment of knowledge, attitudes, practices and facilities available for hand hygiene. Knowledge will be assessed using 8 questions which included multiple choice questions with single answers as well as yes (true)/ No (false) answers. Attitudes will be measured using 10 statements and the respondents were given the option to select on a 1 to 7 point scale between strongly agree and strongly disagree, out of which the first two responses are taken as

positive responses (strongly agree) and the rest taken as negative responses. Similarly practices and satisfaction with facilities available were assessed in the same method.

Overall knowledge attitudes practices and satisfaction with facilities were assessed for each individual using a scoring system (1 for correct knowledge, good attitudes, correct practices, and satisfaction, 0 for incorrect knowledge, poor attitudes, incorrect practices and dissatisfaction with the availability of facilities for hand hygiene). The average of the score for each category (knowledge, attitudes, practices, satisfaction) was used for calculating the percentage of each category. A percentage of 75% for knowledge, satisfaction with the facilities available or 70% for attitudes and practices was considered as good, 50% - 74% for knowledge and satisfaction of facilities or 50% - 69% for attitudes and practices

was considered as moderate while less than 50% was considered as poor. obtaining the percentage of correct responses for knowledge, good attitudes, and correct practices, and satisfaction with availability of facilities Data was analysed using EXCEL software.

Result

There was a total of 40 volunteers from the NICU (n=2), PICU (n=9), MICU (n=11) and SICU (n=18) of Anuradhapura Teaching Hospital. Of these respondents 8 (20%) were doctors while 30 (75%) were nursing staff. Majority of the volunteers were female (n=31,77.5%). Most of the participants had 2-5 years work experience (57.5%). Only 45% of the study population had received formal training on hand hygiene within the past 3 years while some had never received any formal training. (Table1)

	Unit				Total	%
	MICU	NICU	PICU	SICU		
Number of respondents	11	2	9	18	40	100
Gender						
Male	1	1	1	6	9	22.5
Female	10	1	8	12	31	77.5
Occupation						
Doctors			2	6	8	20
Nursing staff	11	2	7	10	30	75
Other staff						
Experience						
Less than 2 yrs	1			3	4	10
2 - 5 yrs	4	2	7	10	23	57.5
More than 5 yrs	6		2	5	13	32.5
Have received formal training on hand hygiene						
Never	2	1	5	7	15	37.5
Within the past 3 years	8	1	4	5	18	45
Not sure	1			6	7	17.5

Table 1. Demographic information

Knowledge on hand hygiene

(22.5%) had good knowledge on hand hygiene. while 5% had poor knowledge. (Table2)

Our study showed that a majority of the respondents (72.5% n=29) had moderate knowledge, 9 respondents

	Good (%)	Moderate (%)	Poor (%)
Knowledge	22.5	72.5	5
Attitudes	47.5	42.5	10
Practices	10	27.5	62.5
Satisfaction with facilities	17.5	27.5	55

Table 2. Analysis of individual respondents knowledge attitudes practices and satisfaction with facilities available for hand hygiene

Many respondents (92.5%) recognized the importance of health workers hands as a route of cross transmission of harmful germs. While 85% (n=34) said that hand hygiene before a clean aseptic procedure prevents transmission of germs, all agreed (100%) that hand hygiene before touching a patient was required to prevent cross transmission of germs to patients. 90% were knowledgeable on the importance of hand hygiene after immediate risk of body fluid exposure. However interestingly 70% said that the most frequent source of germs responsible for health care associated infections came from the hospital environment while only 25% knew that germs present on the patient was the main source of infection.

More than 70% of the respondents had correct knowledge on actions to prevent transmission of germs to the health care worker. However 55% still thought that

hand washing immediately before a clean/aseptic procedure was important in preventing transmission of germs to the health care worker.

Knowledge on the correct use of hand washing and alcohol hand rubs was not consistent. While majority (80%) correctly said that hand rubbing was more rapid than washing, they believed it causes skin dryness (55%), and that rubbing should be followed by hand washing in routine practice(60%). Only 35% knew that hand rubbing for 20seconds was recommended to remove most germs from their hands. From our study the respondents had poor knowledge on the situations where hand rubbing can be used as an alternative to hand washing. However the knowledge on the factors that contribute to hand colonization was good as more than 90% respondents said that wearing jewellery, damaged skin, artificial fingernails should be avoided. (Table 3)

	MICU (n=11)	NICU (n=2)	PICU (n=9)	SICU (n=18)	Total	%
1. Which of the following is the main route of cross-transmission of potentially harmful germs between patients in a health care facility ?						
Health workers hands when not clean	10	2	9	16	37	92.5
2. What is the most frequent source of germs responsible for health care associated infections ?						
hospital air	1			1	2	5
*germs present on patient	4		1	5	10	25
hospital environment	6	2	8	12	28	70

3. Which of the following hand hygiene actions prevent transmission of germs to the patient ?						
a. Before touching a patient						
*yes	11	2	9	18	40	100
no						
b. Immediately after risk of body fluid exposure						
*yes	9	2	9	16	36	90
no	2			2		
c. After exposure to the immediate surroundings of a patient						
yes	3		8	10	21	52.5
*no	8	2	1	8	19	47.5
d. Immediately before a clean aseptic procedure						
*yes	9	2	9	14	34	85
no	2			4	6	15
4. Which of the following hand hygiene actions prevents transmission of germs to the health care worker ?						
a. After touching a patient						
*yes	10	2	9	18	39	97.5
no	1				1	2.5
b. Immediately after a risk of body fluid exposure						
*yes	10	2	9	17	38	95
no	1			1	2	5
c. Immediately before a clean/aseptic procedure						
yes	6	1	7	8	22	55
*no	5	1	2	10	18	45
d. After exposure to the immediate surroundings of a patient						
*yes	8	1	6	14	29	72.5
no	3	1	3	4	11	27.5
5. Which of the following statements on alcohol based hand rub and hand washing with soap and water are true ?						
a. Hand rubbing is more rapid for hand cleansing than handwashing						
*True	9	1	9	13	32	80
False	2	1		5	8	20

b. Hand rubbing causes skin dryness more than hand washing						
True	8	2	4	8	22	55
*False	3		5	10	18	45
c. Handrubbing is more effective against germs than hand washing						
True	5	2	0	4	11	27.5
*False	6		9	14	29	72.5
d. Hand washing and hand rubbing are recommended to be performed in sequence						
True	9	1	4	10	24	60
*False	2	1	5	8	16	40
6. What is the minimal time needed for alcohol based hand rub to kill most germs on your hands?						
*20seconds	5			9	14	35
Others	6	2	9	9	26	65
7. Which type of hand hygiene method is required in the following situations?						
a. Before palpation of the abdomen						
*rubbing	5		8	13	26	65
washing	5	1	1	5	12	30
b. Before giving an injection						
*rubbing	4	1		1	6	15
washing	6		9	17	32	80
c. after emptying a bed pan						
rubbing	2			3	5	12.5
*washing	8	1	9	15	33	82.5
d. After removing examination gloves						
*rubbing	4			4	8	20
*washing	6	1	8	11	26	65
e. after making a patients bed						
*rubbing	2			2	2	5
washing	8	1	9	15	33	82.5
f. after visible exposure to blood						
rubbing	5	1		3	9	22.5
*washing	5		9	14	28	70

8. Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs ?						
a.wearing jewellery						
*yes	10	1	9	16	36	90
no	1	1		2	4	10
b.damaged skin						
*yes	10	1	9	16	36	90
no	1	1		2	4	10
c.artificial fingernails						
*yes	10	1	9	17	37	92.5
no	1	1		1	3	7.5
d. regular use of a hand cream						
yes	3	1	2	7	13	32.5
*no	8	1	7	11	27	67.5

*correct response

Table 3. Knowledge on hand hygiene

Attitudes on hand hygiene

When the attitudes were assessed for each individual respondents 47.5% had good attitudes while 42.5% had moderate attitudes. Ten percent showed poor attitudes.

Only 40% agreed that they adhered to correct hand hygiene practices at all times. 42.5% said that emergencies and other priorities made hand hygiene more difficult. 60% said that they felt guilty if they omitted hand hygiene. More than 75% disagreed

that they miss out hand hygiene as they forget it or because they have more important things to. Regarding the attitude towards others hand hygiene, 62.5% disagreed that they felt frustrated when others omit hand hygiene, and 75% disagreed that they are reluctant to ask others to engage in hand hygiene. Only 35% were of the attitude that newly qualified staff were not properly instructed on hand hygiene methods. Half of the respondents believed that adhering to hand hygiene practices is easy in the current ICU setup. (Table 4)

	MICU (n=11)	NICU (n=2)	PICU (n=9)	SICU (n=18)	Total	%
9.I adhere to correct hand hygiene practices at all times						
Agree	8		1	7	16	40
Disagree	3	2	8	11	24	60
10. Sometimes I have more things to do than hand hygiene						
Agree	5			5	10	25
Disagree	6	2	9	13	30	75
11. Sometimes I miss out hand hygiene simply because I forget it						
Agree	2			3	5	12.5
Disagree	9	2	9	15	35	87.5
12. Emergencies and other priorities make hygiene more difficult at times						
Agree	5		4	8	17	42.5
Disagree	6	2	5	10	23	57.5
13. Wearing gloves reduce the need for hand hygiene						
Agree	1		1	3	5	12.5
Disagree	10	2	8	15	35	87.5
14. I feel frustrated when others omit hand hygiene						
Agree	4		4	7	15	37.5
Disagree	7	2	5	11	25	62.5
15. I am reluctant to ask others to engage in hand hygiene						
Agree	1		2	7	10	25
Disagree	10	2	7	11	30	75
16. newly qualified staff has not been properly instructed in hand hygiene in their training						
Agree	4		4	6	14	35
Disagree	7	2	5	12	26	65
17. I feel guilty I omit hand hygiene						
Agree	5		4	15	24	60
Disagree	6	2	5	3	16	40
18. Adhering to hand hygiene practices is easy in the current ICU setup						
Agree	6	2	1	11	20	50
Disagree	5		8	7	20	50

Table 4. Attitudes towards hand hygiene

Practices on hand hygiene

Regarding the practices on hand hygiene, when the individual responses were assessed for practices, 10% had overall good practices, while 27.5% had moderate practices. However majority (62.5%) was seen to have poor hand hygiene practices.

However 60% claimed that they had sufficient knowledge about hand hygiene. Half of the respondents said that they practiced hand hygiene as a non negotiable part of his/her role. Majority of respondents (57.5%) said that there were no adverts regarding hand hygiene in their work place.

Surprisingly 82.5% said that the frequency of hand hygiene required was not difficult to achieve. However 67.5% felt that the facilities for hand hygiene in their work place was adequate. The influence towards hand hygiene by the infection prevention team or infection prevention notices was low. (32.5%, 47.5%). (Table 5)

	MICU (n=1)	NICU (n=2)	PICU (n=9)	SICU (n=18)	Total	%
19.I have sufficient knowledge about hand hygiene						
Yes	6	1	7	10	24	60
No	5	1	2	8	16	40
20.Hand hygiene is no negotiable part of my role						
yes	2	1	8	9	20	50
No	9	1	1	9	20	50
21.There are adverts or newsletters about Hand hygiene in my work place.						
yes	4	1	6	5	16	40
No	7	1	2	13	23	57.5
22. The frequency of hand hygiene required makes it difficult for me to carry it out as often as necessary						
Yes	2			5	7	17.5
No	9	2	9	13	33	82.5
23. Facilities are inadequate for hand hygiene in my area of work						
Yes	5	1	4	3	13	32.5
No	6	1	5	15	27	67.5
24. Infection prevention team have a positive influence on my hand hygiene						
Yes	5	1	1	6	13	32.5
No	6	1	8	12	27	67.5
25. Infection prevention notice boards remind Me to do hand hygiene						
Yes	8	1	1	9	19	47.5
No	3	1	8	9	21	52.5
26.It is difficult for me to attend hand hygiene courses due to time pressure						
Yes	1		7	3	11	27.5
No	10	2	2	15	29	72.5

Table 5. Practices regarding Hand hygiene

Satisfaction regarding the facilities available for hand hygiene

The satisfaction of the volunteer health care workers regarding the facilities available for hand hygiene was poor (55%). Only 17.5% felt that the

facilities were sufficient while 27.5% felt moderately satisfied with the current facilities.

While 65% were satisfied with the soap/antiseptics and water availability, 75% were satisfied with the availability of alcohol hand rub. However

paper/cloth for drying hands and number of sinks with running water were not satisfactory (60% and 65% respectively). Majority of the volunteers (82.5%) were not satisfied with the training programmes on hand hygiene available to them (Table 6).

	MICU (n=11)	NICU (n=2)	PICU (n=9)	SICU (n=18)	Total	%
27. Are you satisfied with the facilities available for hand hygiene ?						
yes	3		4	11	18	45
no	8	2	5	7	22	55
I am satisfied with the availability of the ;						
28. Infection prevention notices in ICU						
yes	6		6	5	17	42.5
no	5	2	3	13	23	57.5
29. soap/antiseptic and water for hand washing						
yes	8		5	13	26	65
no	3	2	4	5	14	35
30. Alcohol rub						
yes	9		8	13	30	75
no	2	2	1	5	10	25
31. Paper/cloth for drying hands						
yes	6		4	6	16	40
no	5	2	5	12	24	60
32. Gloves are available						
yes	7		4	12	23	57.5
no	4	2	5	6	17	42.5
33. number of sinks with running water						
yes	4		3	7	14	35
no	7	2	6	11	26	65
34. training programmes on hand hygiene conducted by hospital						
yes	3		3	1	7	17.5
no	8	2	6	17	33	82.5

Table 6. Satisfaction regarding facilities available for hand hygiene

Discussion

Hand hygiene is a simple procedure which is instrumental in reducing hospital acquired infections and cross transmission of pathogens in the hospitals and specially among the ICU patients. The present study shows that majority of the

respondents had moderate knowledge, while approximately half of the respondents had good attitudes while majority had poor hand hygiene practices. In addition almost half of the respondents felt that the facilities available for hand hygiene was not adequate. Despite the fact that hand hygiene is

considered as the single best measure for infection control, compliance of health care workers regarding hand hygiene remains consistently poor¹¹.

The present study was conducted to assess the current situation of hand hygiene in the Anuradhapura Teaching hospital and to put forth recommendations to improve hand hygiene measures and thereby reduce the rate of cross transmission of infections in the ICUs. A study has shown that constant motivation through movies, brochures, posters etc. results in transient improvement in hand hygiene¹². Our results suggest that there is wide scope for improvement in hand hygiene practices in the Anuradhapura Teaching hospital ICUs as well as wards. It was interesting to note that less than half of the respondents had received formal training in hand hygiene. This can be addressed by routinely conducting hand hygiene training programmes using the teaching materials from WHO and making the health care workers knowledgeable on hand hygiene guidelines put forth by the WHO. It is also important to encourage the infection control team to play a more active role in hand hygiene awareness and training in the hospitals specially in the ICU setup. They should be encouraged to interact with the staff members and thereby exert a positive influence on their attitudes and practices regarding hand hygiene. The current ICUs do not have displays of infection prevention notices/ five moments of hand hygiene. Therefore it is possible that by introducing these notices to the ICUs it is possible to increase hand hygiene knowledge and compliance among the attending staff members.

It was interesting to note that although hand rub was satisfactorily available the respondents were not aware of the situations that hand rub can be used in place of hand washing. As hand washing takes up about one minute and requires a sink with

running water, soap/ antiseptic as compared to hand rubbing which takes only 20 seconds, it is important to make the health care workers knowledgeable on the appropriate use of hand rubbing and to encourage its use further to improve compliance.

Similar to studies reported from other developing countries, the health care workers in our ICUs were not satisfied with the facilities available for hand hygiene. Therefore we need to address this issue and improve facilities such as improving the availability of soap/antiseptics, paper/cloth for drying hands and gloves. Further it is essential to conduct hand hygiene training programmes for the ICU staff members.

Our study has several drawbacks which need to be considered when interpreting this data. Data was collected by using a self administered questionnaire, which allows the respondent to check others responses or discuss the answers as well as document the expected response rather than the health care workers own practice or attitudes. This can be overcome by incorporating an observational study which will enable the investigator to observe the actual hand hygiene practices among these health care workers. However it is not easy to conduct such a study currently due to the high work load and time restraints.

In conclusion our study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices and facilities available for hand hygiene in the ICUs in Anuradhapura Teaching Hospital, which may play a very important role in increasing hand hygiene compliance among the ICU staff and reducing cross transmission of infections among the ICU patients.

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