KNOWLEDGE AND PERCEPTION OF HEALTH CARE WORKERS TOWARDS CLEAN CARE PRACTICES IN A TERTIARY CARE HOSPITAL

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ABSTRACT: INTRODUCTION: Ten to thirty percent of the patients admitted to hospitals in India acquire nosocomial infections as against 5% in the developed world. The first and foremost principle of Universal Safety Precaution is "HANDWASHING". But the Health Care Workers often forget to wash their hands before interacting with the patient. Such contaminated hands plays major role in transmitting infections. HCWs are also at an increased risk of needle stick injuries. According to data from EPINet system, hospital workers incur approximately 30 needle stick injuries per 100 beds per year on average – an alarming figure by no exaggeration.[5] **OBJECTIVE:** To assess the knowledge and perception of HCWs towards hand hygiene and to know the incident of NSI and the factors associated with it. **STUDY METHOD:** Cross sectional study with purposive sampling was carried out in a tertiary care hospital. Out of 275 participants 55 were doctors, 143 nurses and 77 interns. Self administered questionnaire was used to collect information. **RESULTS**: Ninety one percent doctors, 86% interns and 81% nurses had good knowledge about hand hygiene. 73% doctors, 61% interns and 56% nurses knew the duration required for hand rub. The main hindrance for not practicing hand hygiene was due to lack of resources (37%). Knowledge about recapping of the needle was poor and incident of injury due to needle stick was 50% among nurses. **CONCLUSIONS**: Study demonstrated adequate knowledge regarding hand hygiene. The knowledge should be converted into practice. There is a need for educational programme about universal precautions especially about handling of the sharps.

KEY-WORDS: Nosocomial infection, Hand Washing, Needle Stick injury, Universal precautions

INTRODUCTION: The care provided in a hospital should be curative and preventive. Curative aspect deals with the disease of the patient and preventive aspect deals with the prevention of nosocomial infection. An infection is called as nosocomial, if it manifests for 48 hours or more after hospital admission or within 30 days of discharge of the patient.[1] Hospitals are the major source of nosocomial infection. Ten to thirty percent of the patients admitted to hospitals in India acquire nosocomial infections as against only 5% in developed world.[2] Nosocomial infections are transmitted from one patient to another through the health care workers (HCWs)

who forget to practice control measures such as hand washing, use of gloves etc." In 1847, Ignaz Semmelwies, a Hungarian physician proposed the importance of Hand Washing for first time. [3] Hand hygiene, has been recognized as the most cost effective measure to prevent the spread of such infections and also is the first and foremost principle of Universal Safety Precaution. But there exists a gap between the knowledge and practice of HCWs who often forget to wash their hands before interacting with the patients. Such contaminated hands play an important role in transmitting the infections.

HCWs are at an increased risk of needle stick injuries (NSI) due to the environment in which they work. HCWs are risk of acquiring 20 different pathogens by injury with sharp objects or needle sticks.[4]On average HCWs acquire 30 NSI per 100 beds per year.[5]The reporting of such infection is a critical step in initiating early prophylaxis.

Thus the study was carried out to assess knowledge and perception of HCWs towards hand hygiene and to know incident of NSI and the factors associated with it.

MATERIALS AND METHODS: A cross sectional study with purposive sampling was carried out in a tertiary care hospital. After seeking permission from the concerned authorities, all the doctors, nurses and interns were contacted. A total of 275 HCWs were included in the study after their verbal consent.

A pre designed, pretested, self-administered questionnaire was used to determine the knowledge and perception of HCW towards hand hygiene and to assess factors associated with the incident of NSI. The questionnaire had three sections - 1. Background information. 2. Knowledge, perception and the hindrance factors associated with hand hygiene.3. Details pertaining to the incident of injury due to needle stick or sharp objects and the factors associated with it. Twenty five questions were used to assess the level of knowledge. Correct answer was given 1 mark and wrong zero, maximum being 25 and minimum being zero. The points were divided into 5 equal categories from very poor knowledge to very good knowledge. For perception of hand hygiene the subjects were asked to grade on a scale of 1 to 5 .The data obtained was compiled and analyzed using MS Excel. Chi square test was applied wherever necessary.

RESULTS: The participants (N=275) of present study were doctors (20%), nurses (52%) and interns (28%). Mean years of experience for doctors was 11.9 $\pm$ 10.25 yrs and nurses 3.8 $\pm$ 1.82 yrs. Statistically significant association was found between experience and knowledge of hand hygiene ($\chi 2$= 33.44). Statistically significant association was found between discipline and knowledge of hand hygiene($\chi 2$=7.12).

From the study sample 92% doctors, 5% nurses and 16% interns had very good knowledge about hand hygiene. 59% of doctors, 59% of nurses and 72% interns received formal education on hand hygiene. A statistically significant association was not found between formal education and knowledge of hand hygiene ($\chi 2$= 32.22) (Table no 1). As shown in table no 2, most of the respondents knew about the optimal duration of hand rub (60 sec). However, the association between the profession and optimal duration of hand rub was not found to be statistically significant

($\chi 2$= 4.69).

Perception of HCWs about importance of hand hygiene was found to be good in general (Table no 3). Around 95% of respondents felt that hand hygiene is effective for themselves as well as patients and colleagues. Responses about the effective measures to improve hand

hygiene at workplace were making hand rubs easily available (94%), regular hand hygiene education (88%), acceptable soap product made easily available (84%) and hand hygiene posters displayed (74%) as per table no 4.

The most common reason reported for poor adherence to hand hygiene was inconveniently placed sinks followed by lack of soap/water, insufficient time and unacceptable soap.

The incident of NSI was reported by 50% nurses, 31% doctors and 25% interns. Among the factors associated with NSI, recapping was commonest cause reported by 68% of nurses, 40% of doctors and 52% of interns. Most of them reported incident NSI during emergency care. As per hospital policy all were immunized with Hepatitis B. A statistically significant association was found between profession and incident of NSI ($\chi 2 = 25.59$).

DISCUSSION: The knowledge scores ranged from adequate to very good in doctors, nurses and interns in this study. In a study conducted in Pakistan by Anwar et al [6] found that 17% of the physicians were aware of WHO recommendations of hand hygiene. They had also found that hand hygiene was not practiced due to unavailability of sinks, soap, water and disposable towel. Similar findings were found in our study also. The perceived barriers in our study were divided into three categories which were – lack of resources, attitude, and behavior of HCWs. Lack of resources (37%) was the main reason for poor adherence which included factors such as sinks not available or placed at inconvenient place, no adequate water supply, lack of soap, towel etc. This was followed by attitude (35%) which included factors such as disbelief, disagreement with recommendations, insufficient time etc. The last reason being related to behavior of HCWS (28%) which included factors such as forgetfulness, no role model etc. Another study conducted by Zimakoff et al [7] has shown the same factors as barriers for hand washing.

Our study concluded that the year of experience in the hospital significantly correlates with the level knowledge. A study by JB Suchitra and N Lakshmi Devi [8] also showed that years of experience significantly associated with level of knowledge.

In an intervention study in Nigeria examined the impact of systematized education's impact on their knowledge, attitudes and compliance with universal precautions. The research revealed that a number of changes occurred especially with respect to the knowledge of universal precautions. The study concluded that it is very important for education to be incorporated within undergraduate and in-service training programs for nurses about Universal Precautions.[9] A study conducted by JB Suchitra and N Lakshmi Devi [8] showed the similar findings. Our study also showed statistically significant association between formal education received on hand hygiene and knowledge on hand hygiene.

Optimal duration for performing hand rub is 1 min [10] and the knowledge about it was significantly lower in nurses. The test also showed statistical significant difference, which means that the nurses should be adequately explained about the hand rub which is effective than hand wash.

Our study suggests that the participants are aware of importance of hand hygiene, which are similar to the findings of Jumaa[11] and Yuan et al.[12] The factors identified by the participants for improving hand hygiene practices in their institution are hand rubs made easily available and regular hand hygiene education.

The prevalence rate of NSI in last two years was 38.9% which was similar to the study conducted by Bayapa Reddy N et al [13] and Haile D and Berhane Y in Northwest Ethiopia. [14] Regarding the cause of NSI it was found that most number of injuries i.e., 83% occurred due to

injection needle and only 17% while suturing. The study conducted by Moges T and Takele T [15] in Awassa city southern Ethiopia found the same prevalence rate.

In a study conducted by Khurram S et al [16] in Rawalpindi, Pakistan showed that 43.3% of NSI occurred in those who work in surgical department followed by 23% who work in non surgical departments. Our study showed that 52% of the NSI occurred in those working in surgical department and 48% in those working in non surgical departments, which are similar to the study mentioned above. [16] Most of the NSI occur during recapping of the needle (53.33%) which is similar to the study conducted by Nsubuga FM, Jaakkola MS in Mulago ,Uganda[17] and by Iram Manzoor et al. [18] But there was no association between recapping and NSI. The reason may be that the cause of NSI may be multifactorial. Other factors include the process while giving injection, taking syringe from others etc, contribute to a greater extent. But these results are in contrast to the study conducted by Zafar A et al [19] at Aga Khan Hospital, Pakistan which stated that 52.8% (i.e., more than half of the injuries) occurred while drawing the blood samples.

CONCLUSION: Our study concluded that knowledge of HCWs about hand hygiene was satisfactory. This study also provides an idea about the perception of HCWs about hand hygiene and Factors associated with it and how hand hygiene can be improved in the institution. It lays a foundation for further work in promoting the importance of infection control especially in the institution they work. Incident of needle stick injuries was more among the nursing staff and especially during emergency. This indicates that there is need to improve handling of sharps and needles. The guidelines should be followed strictly.

RECCOMENDATIONS: A periodic and ongoing reorientation program regarding Universal Precautions which includes hand hygiene, handling of the sharps and other protective measures is essential for preventing the hospital acquired infections. Mentors play an important role especially for nursing staff and interns, so mentors should practice hand hygiene regularly. There should be qualifying exams for students of both nursing and medical before sending them to clinical duties. Further investigation into the factors associated with hindrance is needed for promoting hand hygiene. Infection control committee of Hospital should take initiative to improve hand hygiene and provide necessary support.

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Table 1: Association between Knowledge of Hand Hygiene and certain variables

Knowledge of hand hygiene	Experience*			Discipline**		Received formal education on Hand Hygiene***	
	<3 yrs	3 – 6 yrs	>6 yrs	Non Surgical	Surgical	Yes	No
Adequate n (%)	72 (92)	63 (82)	23 (53)	113 (92)	59 (79)	55 (23)	26 (68)
Very Good n (%)	06 (08)	14 (18)	20 (47)	10 (8)	16 (21)	182 (77)	12 (32)
Total n (%)	**78 (100)**	**77 (100)**	**43 (100)**	**143 (100)**	**75 (100)**	**237 (100)**	**38 (100)**

* Experience and knowledge of hand hygiene $\chi 2 = 33.44$, *d.f* =2 *p* value <0.05

** Discipline and knowledge of hand hygiene $\chi 2 = 7.12$, *d.f* =1 *p* value <0.05

*** Formal education and knowledge of hand hygiene $\chi 2 = 32.22$, *d.f* =1 *p* value <0.05

Table 2: Association between Knowledge of duration of Hand rub and profession

Knowledge of duration of Hand rub	Profession		
	Doctors	Nurses	Interns
Yes n (%)	40 (73)	80 (56)	46 (60)
No n (%)	15 (27)	63 (44)	31 (40)
Total n (%)	**55 (100)**	**143 (100)**	**77 (100)**

$\chi 2 = 4.69$, *d.f* =2 *p* value >0.05

Table 3: Perception of importance of Hand Hygiene among HCWs

How effective is Hand Hygiene	Not effective n(%)	Hardly effective n(%)	Don't know n (%)	Effective n (%)	Very effective n (%)
To Self	0 (0)	6 (2)	8 (3)	68 (25)	193 (70)
To Hospital Administration	3 (1)	3 (1)	11 (4)	41 (15)	217 (79)
To Other Hospital Staff	3 (1)	3 (1)	6 (2)	62 (23)	201 (73)
To patient	0 (0)	8 (3)	8 (3)	42 (15)	217 (79)

Table 4: Effectiveness of measures to improve hand hygiene as perceived by HCWs

How effective would be the following	Not Effective n(%)	Hardly Effective n(%)	Don't know n(%)	Effective n(%)	Very effective n(%)
Acceptable soap product available	14 (5)	11 (4)	19 (7)	52 (19)	179 (65)
Hand rubs easily available	3 (1)	7 (3)	6 (2)	88 (32)	171 (62)
Hand hygiene posters displayed	13 (5)	47 (17)	11 (4)	77 (28)	127 (46)
Regular hand hygiene education	11 (4)	11 (4)	11 (4)	91 (33)	151 (55)

Table 5: Distribution of respondents as per cause of NSI

Cause of NSI	Doctors n(%)	Nurses n(%)	Interns n(%)
Uncapping	0 (0)	11 (8)	8 (11)
Giving injection	16 (29)	20 (14)	25 (32)
Recapping	22 (40)	97 (68)	40 (52)
Using needle cutter	3 (6)	6 (4)	0 (0)
Handling syringe	14 (25)	9 (6)	4 (5)

$\chi 2 = 25.10$, d.f=1 p value <0.05