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RESEARCH ARTICLE

HAND HYGIENE PRACTICES AMONG HEALTH CARE WORKERS WORKING IN TERTIARY CARE HOSPITAL, NEW DELHI

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ABSTRACT

Hand hygiene plays a very significant role in preventing health care associated infection (HCAI). Several outbreaks of HCAI are linked with contaminated hands of health care workers. Normal human skin harbours various bacteria which are both commensals as well as pathogenic. Through hand washing one can get rid of the microbial contamination as well as dirt and organic material present in hands.1 Though water is considered to be the universal solvent, it cannot remove the hydrophobic substances. Therefore, thorough hand washing with soaps or detergent and water is advised because soap or detergent dissolve hydrophobic substance such as fats and oils and facilitate their subsequent removal from hand.2 Careful hand drying after hand wash also plays a critical role in determining the amount of bacterial transfer associated with touch contact after hand washing.2Drying of hands is recommended using clean towel or air drier can also be used. Reusing and sharing of towels should be avoided as there is a risk of cross contamination.3 Alcohol based hand rubs was introduced to make hand hygiene more convenient as washing hands with soap and water is not feasible every time especially in emergency sections of the hospital. The antimicrobial property of alcohol results from their ability to denature proteins. Adverse reaction related to use of alcohol-based hand rub for hand hygiene include dryness of skin, allergic contact dermatitis, contact urticaria syndrome.4 Although several studies have demonstrated the importance of hand hygiene in the prevention of HCAI, adherence to hand hygiene guidelines remains uniformly low amongst health care workers. However, education plays a critical role and represents one of the cornerstones for improvement of hand hygiene practices. In literature also it has been well illustrated that education plays a vital role in improving compliance of hand hygiene among health care workers. A successful educational program should be multifaceted as well as multidisciplinary to improve the knowledge of hand hygiene among health care workers.1,3 The present WHO guidelines are accompanied by educational material to convey the key recommendations and support training activities. Apart from educational programs, refresher sessions should also be organised frequently to update knowledge of hand hygiene among health care workers. Furthermore, every 15th October of each year is celebrated as Global Handwashing Day to remind us the significance of hand washing. On 5th May 2019 WHO has organised the annual global hand hygiene campaign.2 This study aimed to observe the hand hygiene compliance pattern amongst health care workers in a tertiary care hospital in North India, with an intention to generate an information that would provide the basis for health educational interventions and technical training of health workers that would significantly improve health worker's compliance with hospital infection prevention standards.

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INTRODUCTION

Hand hygiene plays a very significant role in preventing health care associated infection (HCAI).Several outbreaks of HCAI are linked with contaminated hands of health care workers.

Normal human skin harbours various bacteria which are both commensals as well as pathogenic. Through hand washing one can get rid of the microbial contamination as well as dirt and organic material present in hands (CDC guidelines on hand hygiene).

Though water is considered to be the universal solvent, it cannot remove the hydrophobic substances. Therefore, thorough hand washing with soaps or detergent and water is advised because soap or detergent dissolve hydrophobic substance such as fats and oils and facilitate their subsequent removal from hand (WHO guidelines on hand hygiene). Careful hand drying after hand wash also plays a critical role in determining the amount of bacterial transfer associated with touch contact after hand washing.[2]Drying of hands is recommended using clean towel or air drier can also be used. Reusing and sharing of towels should be avoided as there is a risk of cross contamination (Shobowale, 2017). Alcohol based hand rubs was introduced to make hand hygiene more convenient as washing hands with soap and water is not feasible every time especially in emergency sections of the hospital. The antimicrobial property of alcohol results from their ability to denature proteins. Adverse reaction related to use of alcohol-based hand rub for hand hygiene include dryness of skin, allergic contact dermatitis, contact urticaria syndrome (Pittet, 2013). Although several studies have demonstrated the importance of hand hygiene in the prevention of HCAI, adherence to hand hygiene guidelines remains uniformly low amongst health care workers. However, education plays a critical role and represents one of the cornerstones for improvement of hand hygiene practices.In literature also it has been well illustrated that education plays a vital role in improving compliance of hand hygiene among health care workers. A successful educational program should be multifaceted as well as multidisciplinary to improve the knowledge of hand hygiene among health care workers (CDC guidelines on hand hygiene, Shobowale, 2017). The present WHO guidelines are accompanied by educational material to convey the key recommendations and support training activities. Apart from educational programs, refresher sessions should also be organised frequently to update knowledge of hand hygiene among health care workers. Furthermore, every 15th October of each year is celebrated as Global Hand washing Day to remind us the significance of hand washing. On 5th May 2019 WHO has organised the annual global hand hygiene campaign (WHO guidelines on hand hygiene). This study aimed to observe the hand hygiene compliance pattern amongst health care workers in a tertiary care hospital in North India, with an intention to generate an information that would provide the basis for health educational interventions and technical training of health workers that would significantly improve health worker's compliance with hospital infection prevention standards.

MATERIALS AND METHODS

Study period: A cross sectional study was conducted ata tertiary care hospital in New Delhi over a period of 07 months(from November 2018 till May 2019). Health care workers such as doctors, nurse, other health care workers (HCW) posted in different facilities of the hospital were observed for hand hygiene compliance.

Study Design: Infection control nurse (ICN) covertly observed the number of opportunities for hand hygiene and number of occasions for which health care worker compiled with appropriate action. Adherence to the standard protocol was evaluated. Each event of alcohol-based hand rub or hand wash with soap and water was considered as hand hygiene opportunity. Hand hygiene compliance was expressed in percentage, according to the formula given by WHO[2]

Compliance rate = Number of times hand hygiene performed/ Number of hand hygiene opportunities × 100

Comparison of hand hygiene compliance pattern was done between months November 2018 to January 2019 and March 2019 to May 2019. November 2018 to January 2019 was pre-training period and month March 2019 to May 2019 was post-training period on hand hygiene. In the month of February 2019 training program was conducted with an aim to improve the knowledge of hand hygiene amongst HCW which in turn improve the compliance of HH amongst them. The onsite training sessions continued intermittently during the post training period as well. In this educational program pre-test was conducted on 114 participant HCWs followed by training session on hand hygiene and finally post-test was conducted on the same 114 participant HCWs. Pre-test and post-test questionnaire consisted of five points about hand hygiene. The questions were same in pre-test and post-test so as to analyse the improvement in their knowledge about hand hygiene. These questions were designed in such a manner that reflects perceptions and behaviour related to hand hygiene compliance. Knowledge was assessed by five questions which consists of multiple-choice questions. A score of one is given to each correct response and zero score was given to incorrect answer. The study aimed to assess the knowledge and practice of hand hygiene among health care workers in order to set a plan for improving the implementation of infection control guidelines.

Statistical analysis: Later data the statistical analysis was carried out using SPSS software version 17.0. Data was presented as percentages and proportions. Chi-square test was applied (if needed) when two or more set of variables were compared. The critical value of 'p' indicating the probability of significant difference was taken as <0.05.

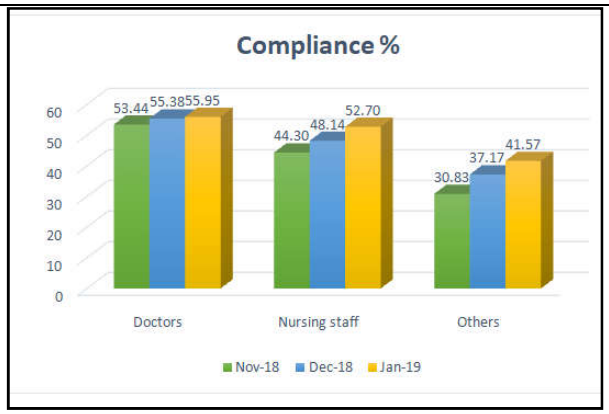
RESULTS

In the current study hand hygiene compliance was observed covertly by ICN from the month of November 2018 to January 2019 which was considered as pretraining period. As displayed in graph 1 hand hygiene compliance was mentioned as percentages and calculated in terms of HH episodes out of the number of opportunities. The percentage of hand hygiene (HH) compliance was relatively high for doctors as compared to other HCWs. HH compliance in November 2018 among doctors was 31/58(53.44%), in nurses was 35/79(44.3%) and in other HCW was 37/120(30.83%).

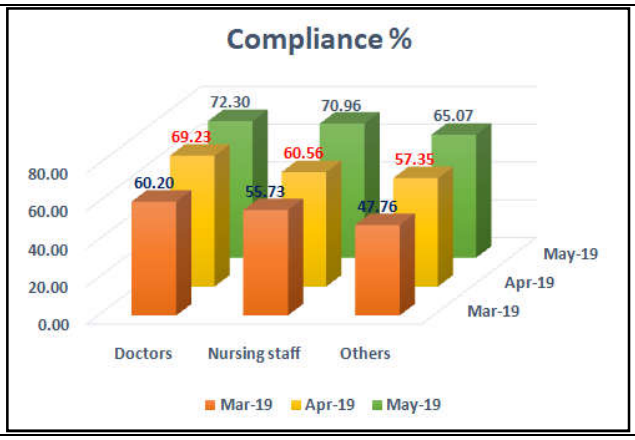
HH compliance in December 2018 among doctors was 36/65 (55.38%), in nurses was 26/54(48.19%)& in other HCW was29/78(37.17%). HH compliance in January 2019 among doctors was 47/84(55.95%), in nurses was 39/74(52.7%) and in other HCW it was 37/89(41.57%).Overall the hand hygiene compliance was poor in the pre-test period. In the month of February 2019 educational programme was arranged on hand hygiene for HCW with an aim to improve their knowledge on HH. In this program pre-test was conducted which was followed by training session on HH and finally post-test was conducted. Refresher sessions were also organised from time to time to keep the HCW updated with the knowledge of HH.

Table 1. Percentage of right answers in Pre-test and Post-test on the participants (N=114)

Questions	Test sessions	No. of right answers	% of right answers	P Value
Can alcohol-based hand rub may be used instead of soap and water when hands are not visibly soiled.	Pre	54	47.36	
	Post	89	78.07	
Is drying of hands is necessary before performing another task	Pre	36	31.57	
	Post	83	72.80	
Should hand hygiene must be performed each time gloves are removed	Pre	69	60.52	
	Post	86	60.52	
Is there is need to perform hand hygiene after using a tissue for coughing or sneezing.	Pre	48	42.10	
	Post	102	89.47	
Use of artificial nails by healthcare workers poses risk to residents or not	Pre	78	68.42	
	Post	97	85.08	



Graph 1. Hand hygiene compliance in percentage in different health care workers from November to January 2019



Graph 2. Hand hygiene compliance in percentage in different health care workers from March to May 2019

After giving the training sessions HH compliance was again observed by the ICN covertly for the following three consecutive months i.e. from March 2019 to May 2019 which was considered as post-training period. It was observed that compliance with HH has been gradually increased over this period among HCW and it was still higher amongst doctors as depicted in graph 2. HH compliance in March2019 among doctors was 41/68(60.29%), in nurses was 34/61(55.73%) and in other HCW was 32/67(47.76%). HH compliance in April 2019 among doctors was 45/65 (69.23%), in nurses was 43/71(60.56%) & in other HCW was39/68(57.35%). HH compliance in May 2019 among doctors was 47/65(72.30%), in nurses was 44/62(70.96%) and in other HCW it was 41/63(65.07%). Overall the hand hygiene compliance had improved in the post-test period. In February 2019 educational program was arranged for all HCW, in this program pre-test was conducted followed by training program and finally post-test was taken. Pre-test and post-test consisted of same five questions. Questions were kept same so as to analyse the impact of training program on their knowledge. There was a significant rise in the percentage positive answer by the participants in the post test period as compared to the pre- test period. However, there was no change in the percentage positive answer to a question regarding the performance of HH after removal of gloves (60.52% in both pre and post-test period).

DISCUSSION

Compliance to hand hygiene practices generally remains low amongst HCWs as shown in various studies.[2] Various factors that contribute to noncompliance are insufficient knowledge and lack of awareness about importance of hand hygiene, lack of time due to work load, casual attitude of HCWs, limited number of sinks, soaps or alcohol-based hand rub available in the health care set ups (Shobowale, 2017; Ravichandran, 2019). In the present study it was concluded that HH compliance was low in HCW, root cause analysis showed that the most common factor contributing to low compliance for HH was lack of awareness of the importance of HH. The percentage of hand hygiene (HH) compliance was relatively high for doctors as compared to other HCW. Sarfaraz et al. (2015) have also concluded that among HCW better HH compliance was found in doctors followed by nurses. In our study, all the categories of healthcare personnel had optimal overall knowledge on hand hygiene. Although knowledge of doctors on various aspects of hand washing was better than staff nurses, paramedical staff and class IV workers. Similar findings were reported by study conducted by Harsha et al. (2015) in Mangalore city, India and Shukla et al. (2018) in Lucknow, India. To increase the awareness of HH compliance among HCW intensive training program was arranged in the month of February. This programme included pre-test followed by training session on HH. At the end post-test was conducted which has same questions as that of pre-test so as to assess the improvement of their knowledge on hand hygiene. After analysing the results of pre-test, it was concluded that majority of HCW were unaware of the fact that drying of hands after performing HH plays a very crucial role in preventing transmission of hospital acquired infections. Question regarding when to perform HH was also poorly answered by many HCW. Most of them were also unaware of the fact that alcohol-based hand rub can be used as a substitute to soap and water when hands are not visibly soiled. After conducting a successful training session on HH, assessment of post-test showed a significant improvement in the knowledge of HH in HCW (Siddarth Sai, 2015; Aliyu, 2018; Alsofiani, 2015).

After conducting the training session, refresher sessions at regular intervals were also organised by Hospital infection team of our hospital, and ICN once again observed the HCW covertly for next three months i.e. March 2019 to May 2019 in order to see whether there is any improvement in HH compliance among HCW. After calculating the compliance for three months it was concluded that there is increase in the compliance of HH. Strengthening a positive work culture attitude toward hand hygiene and reinforcing the idea that each staff can influence group behaviour may also improve adherence among HCW. Multipronged approaches which combine education with written material, reminders and continued feedback of performance can have an important effect on handwashing compliance and rates of HAI (CDC guidelines on hand hygiene; WHO guidelines on hand hygiene; Alsofiani, 2015; Harsha Kumar, 2013; Alfred, 2013; Maharjan, 2013).

CONCLUSION

Through this study it is concluded that overall compliance rate is low in HCW because they considered hand hygiene as "burdensome". Various hurdles in practicing hand hygiene are dryness and irritation caused by hand washing, sink to bed ratio is less, inadequate availability of alcohol-based hand rub, insufficient time to perform hand hygiene, inadequate knowledge about hand hygiene etc. All these hurdles can be overcome by a good education and motivation programs. Soaps or alcohol-based hand rub with added humectants can be a good option to avoid dryness and irritation of skin. Sink to bed ratio should not be low and appropriate numbers of alcohol-based hand rubs should be available.

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