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ASSESSMENT OF HAND HYGIENE COMPLIANCE AMONG HEALTH CARE WORKERS IN A TERTIARY CARE HOSPITAL IN PERI-URBAN REGION OF NORTHERN INDIA

Microbiology

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ABSTRACT

Hand hygiene is regarded as one of the simplest and the most effective method to reduces the risk of cross-transmission of infection in healthcare facilities. Thus, regular monitoring of hand hygiene compliance (HHC) among healthcare workers (HCWs) and providing them with feedback regarding their performance are integral components of a successful hand hygiene promotion program. The present study was undertaken to assess the HHC among HCWs. The study was carried out at a tertiary care hospital in Haryana, India during September and November 2020. Hand hygiene practices of the study participants i.e., HCWs from different departments were directly observed during regular care activities. Data collection was carried out on an observation form based on the WHO practical guide. Out of 471 HCWs, 25.7% (n= 121), 31.8% (n= 150) and 42.5% (n= 200) were doctors, nurses and other HCWs respectively. A total of 1715 opportunities for hand hygiene were observed during the study period in 30 observation sessions. The overall prevalence of HHC was observed as 1162 (67.8%), simple hand washing in 251 (21.6%) of the total opportunities while alcohol hand rub was practiced in 911 (78.4%) of the total occasions. Nurses had the higher compliance rate (73%, 428/586) compared to doctors (68.7%, 277/403) and other HCWs (62.9%, 457/726). Regular monitoring of hand hygiene practices and continuous training and performance feedback to the HCWs will help in prevention of transmission of infections in healthcare settings.

KEYWORDS

Hand hygiene, Healthcare workers, Hand hygiene compliance, Hand hygiene practices

INTRODUCTION

Healthcare-associated infections (HAIs) are a major cause of increasing morbidity and mortality resulting in increased health care costs among hospitalized patients worldwide. A high prevalence of 19% of HAIs poses a serious challenge for health care providers in developing countries.[1] About 50% of such HAIs are transmitted through the hands of health care workers (HCWs).[2] To combat this increasing rate of HAIs, which is further complicated by infections due to multi-drug resistant (MDR) pathogens, health care providers are reverting back to simple hand hygiene as basic infection preventive measures.[3] Decrease in prevalence of HAIs means lesser amount of antibiotics required to treat them, thus decreasing the rate of antimicrobial resistance (AMR). Hand hygiene is usually practiced by cleansing hands with soap and water or using alcoholic hand rub to remove transient colonizing pathogenic microorganisms from the hands.[4] It is now regarded as one of the simplest and the most effective method of infection control, with documented scientific evidence that hand hygiene compliance alone reduces the risk of cross-transmission of infection in healthcare facilities.

The World Health Organization (WHO) global campaign of "Save Lives: Clean Your Hands" programme[1,2] promotes "My 5 Moments for Hand Hygiene" which includes performing hand hygiene before and after touching a patient, before clean/aseptic procedures, after body fluid exposure/risk, and after touching patient surroundings. Currently, 189 countries have pledged their commitment to implementing hand hygiene as part of the WHO global campaign.[5] The 5th of May, every year is designated by WHO as the World Hand Hygiene Day.[2,3] Despite a high awareness of the importance of hand hygiene in preventing infections, access to hand hygiene facilities, like hand sanitizers, as well as soap and water is often inadequate in many communities and health care facilities, with developing countries being the worst affected. According to surveys by WHO and UNICEF an estimated 3 billion people worldwide still lack hand hygiene facilities at home and two out of every five health care facilities do not have hand hygiene at points of care.[6]

Even though hand hygiene is an easy and simple concept that should become routine behaviour among HCWs, it is difficult to implement, and data from studies show low levels of compliance worldwide.[3] Adherence to HH recommendations among HCWs remains suboptimal, with compliance rates varying from 5% to 89%, with an average of 38.7% as reported in published studies.[7] Regular monitoring of hand hygiene compliance (HHC) among HCWs and providing them with feedback regarding their performance are integral components of a successful hand hygiene promotion program. But in India very few studies have been conducted to address the issue of hand hygiene compliance. Thus, the main aim of the study was to assess the HHC among different HCWs in our setup.

METHODS

The study was carried out at SGT Hospital, a 750- bedded tertiary care hospital in Haryana, India during September and November 2020. The HCWs who agreed to complete the questionnaire (based on WHO Hand Hygiene Knowledge Questionnaire)[8] and be observed during regular care activities were included as study participants. Physicians, nurses and other HCWs surveyed in the present study were from the following departments: Emergencies, general surgery, intensive care, general medicine, gynaecology, Paediatrics, Neonatal intensive care, Dialysis, ENT, respiratory. The method used was direct observation, based on the recording of hygienic action performed against opportunities available for practicing hand hygiene, for health care personnel using the five indications described by the WHO hand hygiene practical guide (before touching a patient, before an aseptic procedure, after a risk of exposure to a biological fluid, after touching a patient, and after touching a patient's environment).[2]

Data collection was carried out on an observation form based on the WHO practical guide [9]. Direct observation was conducted in sessions of varying duration (60 to 120 minutes) over the study period, for each study participant. The sessions were scheduled in the services during the morning period or during the most frequent care periods. In the study, a minimum of 400 opportunities was set for all five indications, in accordance with the WHO observation tools.[10] To determine the factors associated with non-adherence, a questionnaire based on the one used by WHO program was used.[8] The questionnaire was divided into two parts: the first part identified departments, occupational category, and experience, the second part included questions related to factors associated with non-adherence with hand hygiene such as hand hygiene training, availability of hygiene products, workload, skin irritation problem. The questionnaire was administered to HCWs after a hand hygiene indication, once an individual was under observation. The HCWs were observed whether they had washed hands with soap

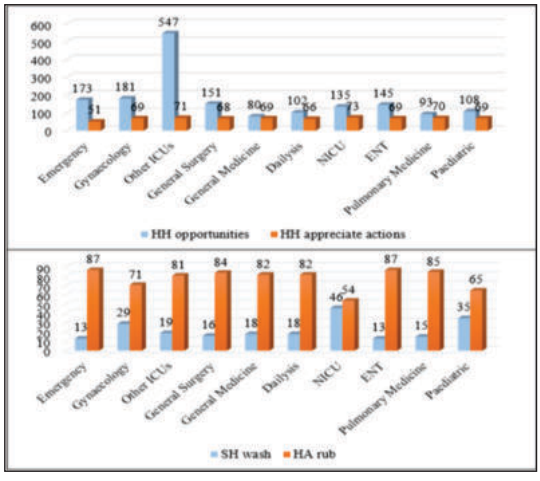
and water or used alcohol hand rub for an indication. The data were entered in MS excel and analysed and the relationship between the different factors and the achievement of a hygiene action was evaluated by the Chi-square test.

RESULTS

A total of 471 HCWs comprising of 25.7% (n= 121) doctors, 31.8% (n= 150) nurses and 42.5% (n= 200) other HCWs were involved in the study. Among the HCWs, a total of 1715 opportunities for hand hygiene were observed during the study period in 30 observation sessions. The overall prevalence of HHC was observed as 1162 (67.8%), simple hand washing in 251 (21.6%) of the 1162 opportunities while alcohol hand rub was practiced in 911 (78.4%) of 1162 occasions.

Out of the 10 different departments assessed for HHC, maximum hand hygiene opportunities were observed in ICUs, i.e., 31.9% (n= 547), followed by gynaecology 10.6% (n= 181) and emergency unit 10.1% (n= 173) (Figure 1). There was extensive difference in the department-wise proportion of hand hygiene appropriate actions which ranged between 51-73%, maximum recorded from NICU (73%, 99/135) followed by other ICUs (71%, 386/547) and pulmonary medicine (70%, 65/93) and the lowest adherence was recorded in the emergency unit (51%). There was significant difference in the proportion of hand hygiene compliance among the different categories of HCWs (P<0.001). Nurses had the higher compliance rate (73%, 428/586) compared to doctors (68.7%, 277/403) and other HCWs (62.9%, 457/726).

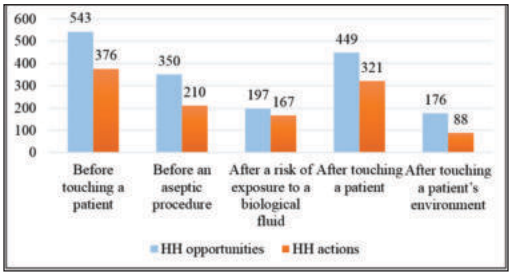
Fig- 1. Department-wise compliance with hand hygiene recommendations in SGT Hospital



Note: HH opportunities= Hand hygiene opportunities; HH appropriate actions= Hand hygiene appreciate actions; SH wash= Simple hand wash; HA rub= Use of alcohol hand rub

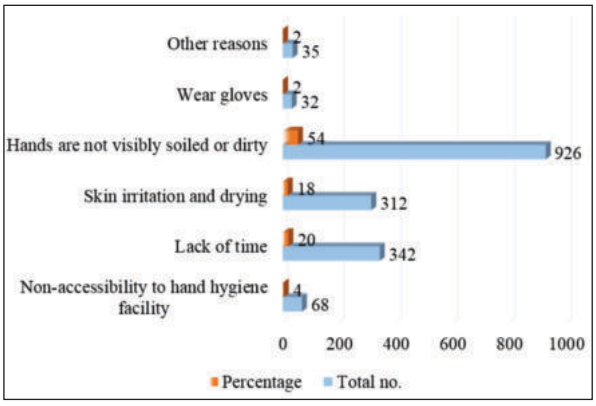
The hand hygiene opportunities were observed in five different indications described by the WHO hand hygiene practical guide. The highest adherence rate i.e., 85% (167/197) was found in the indication "after a risk of exposure to a biological fluid" and the lowest adherence rate i.e., 50% (88/176) was observed for the indication "after touching a patient's environment" (Figure 2). In maximum of occasions i.e., 926 (54%) during assessment of the reasons for not following appropriate actions when there were hand hygiene opportunities, study participants had responded that their hands were not visibly soiled or dirty. While wearing of gloves was the least reason given by the study participants for not following hand hygiene appropriate actions (Figure 3).

Figure 2. Adherence with hand hygiene recommendations according to hand hygiene (HH) indications



Note: HH opportunities= Hand hygiene opportunities; HH actions= Hand hygiene appreciate actions

Figure 3. Proportion of various reasons for non-compliance of hand hygiene



DISCUSSION

Hand hygiene is among the most efficient methods of infection control programs, but compliance is generally poor. There is no standard for measuring adherence to HH. WHO guidelines recommend the use of direct observation for monitoring HHC. It provides qualitative and quantitative information about why and when failures occur. Adherence to hand hygiene recommendations is the most important means to prevent and control the spread of HAIs. The overall prevalence of hand hygiene compliance as per WHO Guidelines was observed in 67.8% cases. Chavali *et al* reported overall compliance of 78% in their study, while overall hand hygiene practice score was 69.0% as reported by Gulilat *et al.*[11,12] Most health care settings report unacceptably low adherence to recommended HH practices.[13-15] Adherence to handwashing compliance among HCWs is estimated to vary between 5% to 81%.[13] Similar to many studies in the literature, compliance with hand hygiene among nurses is better than doctors.[16,17] Among the HCWs observed for hand hygiene in our study, nursing staff had an overall compliance of 73.4 % while doctors showed 68.7% compliance to recommended HH norms. Goel et al reported 77.8% compliance for nurses.[16] A study conducted in Southwest Ethiopia showed that 68.8% had adequate practice and 82.97% were knowledgeable about hand washing.[17] Highest compliance to hand hygiene norms was noted among HCWs in NICU (73.3%) and ICU (70%) while least compliance was observed in the Emergency department (50.86%). This is similar to other studies. Mustapha *et al.* reported highest adherence with hand hygiene practices was found in intensive care department (36%) and dental department (63.6%).[18]

In our study, among the 5 moments of hand hygiene recommended by WHO, HHC was observed mostly after risk of exposure to a biological fluid (84.77%) or after touching a patient (71.5%) followed by 69.24% compliance before touching a patient and 60% compliance before any aseptic procedures. Low compliance before aseptic procedures compared to before touching a patient may be due to the fact that most nurses clubbed moment 1 and 2 together and would not additionally perform hand hygiene before suctioning or doing any other clean procedure. Moreover, wearing gloves may instil a sense of protective measure, which replaced hand hygiene protocols. Least hand hygiene compliance was observed after touching a patient's surroundings (50%). A study conducted in Health Institutions of Bahir Dar City Administration showed that 82.5% of health professionals had hand hygiene practice after completing the procedure they perform and about 50.8% wash their hand before the procedure.[12] Chavali *et al.* reported compliance of 93% and 91% after body fluid exposure risk and patient contact compared to 39% compliance after aseptic procedures.[11] The high value of adherence after contact with the patient or his biological fluid and very low before contact indicates that staff promotes protective practices over hygiene practices. It seems necessary to first evaluate the staff's knowledge of hospital hygiene to determine the objectives of the training. Then, provide periodic training on hygiene indications and infectious risk and distinguish between the concepts of personal protection to prevent occupational accidents and hygiene to avoid patient contamination.

Although emerging technology continues to expand the available choices, widely recognized hand hygiene compliance systems

currently include direct observation, electronic or automated systems, and systems based upon advanced technologies.[19] None of these methods are ideal as each system has their own merits and de-merits, as discussed in WHO Guidelines on Hand Hygiene in Health Care.[20] Direct observation is currently considered the gold standard in hand hygiene compliance technology.[19,21] It involves in-person evaluation of hand hygiene habits of HCW within the healthcare environment by highly trained personnel.[20,21] It also allows for real-time feedback and evaluation of all five of WHO's five moments for hand hygiene, and allows observation of which hand hygiene products are used, the thoroughness of cleansing, the tools and technique used for drying, and the use of gloves.[20] Thus the present study was done to evaluate the presence of adhesion to the different aspects of hand hygiene among nurses and allied HCWs.

The technique of evaluating HHC by direct observations have its limitations; it is a time consuming and manpower intensive method, which is not suitable for continuous monitoring. The information provided does not include all hand hygiene opportunities. Moreover, awareness of being observed may affect the behaviour of HCWs (Hawthorne effect).[11,20,22] More importantly, its validity is greatly limited by the Hawthorne effect, or altered behaviour of HCWs in response to being observed; one study found that Healthcare workers performed eight hand hygiene events per hour when not under observation compared with 21 hand hygiene events per hour during observation, while a similar study found that hand hygiene event rates were approximately threefold higher in hallways within eyesight of an auditor compared with when no auditor was visible and the increase occurred after the auditors' arrival;[23,24] the authors of the second study added that the results called into question the accuracy of publicly reported hospital hand hygiene compliance rates.[16,19] WHO Guidelines on Hand Hygiene in Health Care points out the potential bias which may affect the evaluation of HH compliance by direct observation.[20]

Studies have suggested that these difficulties may be limited by engaging a single trained observer which was implemented in this study.[22] However, there could be opportunities that were missed during our assessment of HHC among HCWs. Measures were taken so that none of the staff involved in the study were aware of being observed and assessed as data was collected during his/her regular duty rotation. None of the staff was given performance feedback during the study period. The questionnaire was filled before the study period started as part of regular feedback on training.

The secondary objective of this study was to determine the factors associated with nonadherence with hand hygiene recommendations, to contribute to the development of programs for their improvement. Several factors have been associated with non-compliance to HH which include lack of knowledge, lack of persuasion, increased work load, lack of time forgetfulness, non-availability of products, and skin irritation or dryness to available hand hygiene products.[25] The most common reason for not following hand hygiene in the present study was absence of visibly soiled or dirty hands. This highlights the importance of information, education materials, regular communication and other reminders in ensuring adherence to hand hygiene guidelines. Reminders in the workplace are a key component of the WHO multimodal hand hygiene improvement strategy.[26]

A periodical check of knowledge of HCWs would be advisable in order to fill any gaps, improve training, reduce HAIs and increase prevention measures compliance.[27] Knowledge and training of steps and moments hand hygiene, access to adequate soap, water and towels at strategically important areas for performing hand hygiene, availability of alcohol-based hand rub at point of patient care, regular and periodic re-training of HCWs, presence of posters on importance and correct techniques of hand hygiene at work areas, reminders in the workplace, periodic monitoring of hand hygiene practices and performance feedback significantly increase hand hygiene compliance of health care providers.[28]

CONCLUSIONS

In developing world like India, direct observation which is evidence based, field-tested and has a user-centred approach in a wide range of settings, remains a widely used, easily reproducible method for monitoring compliance where technology to monitor adherence may not be available. Continuous training, performance feedback and verbal reminders helps sustain adherence to hand hygiene.

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