

Perception of Health Care Workers on 'Health Care Associated Infections (HCAI) and Hand Hygiene' in a Tertiary Hospital in Visakhapatnam City

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Abstract: Background: Health Care Associated Infection (HCAI) are the most frequent adverse event in health care delivery worldwide. Poor knowledge and lack of basic infection control measures by the health care workers has been identified as one of the many causes. **This study was conducted with an objective to determine the perception and knowledge of health care worker on HCAI and hand hygiene. Methodology:** A cross sectional study carried out among staff nurses working in King George Hospital in Visakhapatnam city. A sample of 129 Staff nurses who have direct contact with patients on a daily basis were considered. Study tools include WHO questionnaire on Perception Survey and Hand Hygiene Knowledge Questionnaire for Health-Care Workers. **Results:** Eighty seven study participants felt that the frequency of HCAI infection is less than 50% among patients, 98(75.96%) were formally trained in hand hygiene. Only 14.72% were actually performing hand washing in all situations requiring hand hygiene. About 63.56% had knowledge about source of infection and 53.48 % on route of transmission. More than 70% could tell at least two of the five moments of hand hygiene. Among all patient safety issues hand hygiene was given priority by 72.8%. **Conclusion:** Health care worker perceived hand hygiene as an important and effective patient safety measure and also had good Knowledge on hand hygiene. Continuous reinforcement by heads of the departments and senior staff is needed. **Key Words:** Hand Hygiene, Health Care Associated Infections(HCAI). Health Care Worker (HCW).

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I. Introduction

Patient safety is a serious global Public health issue. Health care-associated infections (HCAI) or Infections acquired in health care settings are the most frequent adverse events in health-care delivery worldwide. Hundreds of millions of patients are affected each year, leading to significant mortality and financial losses for health systems(1). Health Care Associated Infection (HCAI), is defined as "An infection occurring in a patient during the process of care in a hospital or other health-care facility which was not present or incubating at the time of admission. This includes infections acquired in the hospital, but appearing after discharge, and also occupational infections among staff of the facility"(2). Of every 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire at least one health care-associated infection. The endemic burden of health care-associated infection is also significantly higher in low- and middle-income countries particularly in patients admitted to intensive care units resulting in prolonged illness, hospital stay, long term disability & unexpected high costs on patients & families which lead to a massive additional financial burden on health system. (1). At any given time, the prevalence of health care-associated infection varies between 5.7% and 19.1% in low- and middle-income countries(1). A systematic review on burden of HCAI reports that prevalence (pooled prevalence in high-quality studies) was 15.5 per 100 patients [95% CI 12.6–18.9] (3).

Healthcare workers' hands are the most common vehicle for the transmission of healthcare-associated pathogens from patient to patient and within the healthcare environment (4). While urinary tract infection is the most frequent health care-associated infection in high-income countries, surgical site infection is the leading infection in settings with limited resources, affecting up to one-third of operated patients; this is up to nine times higher than in developed countries. Prevention and control measures such as appropriate hand hygiene can reduce the frequency of HCAI by 50% (1).

Poor knowledge and lack of basic infection control measures by the health care worker has been identified as one of the many causes. Lack of knowledge of guidelines for hand hygiene, lack of recognition of hand hygiene opportunities during patient care, and lack of awareness of the risk of cross-transmission of pathogens are barriers to good hand hygiene practices. Among the various factors for non or poor adherence,

some of the self-reported factors include non-availability of soap, handwashing agents, sinks, insufficient time, lack of knowledge of guidelines and protocols, lack of role model from colleagues or superiors, encouragement etc (5). WHO has developed an evidence-based, user-centered concept, "My five moments for hand hygiene," for measuring, teaching, and reporting hand hygiene adherence. This concept is an integral part of the WHO's hand hygiene improvement strategy conceived to translate the WHO Guidelines on Hand Hygiene in Health Care into practice.(6) With this background this study was conducted to determine the perception and knowledge of health careworkers on 'health care associated infections and hand hygiene'.

II. Methodology

A hospital based, cross sectional study was conducted in the month of November 2015 in King George Hospital, a Government Tertiary care hospital in Visakhapatnam city. Study Population include Staff nurses working in the hospital. As per the WHO questionnaire, it can be applied to all health care providers, however for this study staff nurses were chosen as they are in direct contact with patients on a daily basis and therefore their knowledge and opinion on health care-associated infections and hand hygiene is of utmost importance. SampleSize: A total of 234 staff nurses are working in various departments and taking care of the patient safety. Participants were contacted during the day shifts between 9am to 4 pm with an intention of interviewing at least 50% of the staff nurses and also because this is the time when maximum contact with the patients is expected. All the staff nurses who were present/on duty at the time of survey and consented to participate were included. Thus the total number of staff nurses interviewed were 129. The participants were approached in the hospital itself and self administered questionnaire was given. Permission to conduct the study was taken from the Medical and Nursing Superintendents of the hospital. Study tools: Two questionnaires were used. 1) Standard WHO questionnaire on perception survey for health care workers. The questionnaire includes a set of 24 questions with the responses arranged in Likert scale ranging from very low priority/ important/ effective to very high priority/ important/ effective. For analysis purpose it was converted into a three point scale. The questions include perception of study population on various aspects of HCAI such as impact of a HCAI on patient outcome, effectiveness of hand hygiene in preventing HCAI, importance given to hand hygiene, health-care workers actually performing hand hygiene, importance given by HOD, colleague or patients etc. 2) Hand Hygiene Knowledge Questionnaire for Health-Care Workers (21 items) which includes questions on source of infection, route of transmission, usage of hand rub etc. Statistical Analysis was done using SPSS.

III. Results

A total of 129 staff nurses were interviewed. Table no 1 shows that 98 (75.96%) of the staff nurses were formally trained in hand hygiene whereas 70 (54.26%) were actually routinely using hand rub for hand hygiene. When asked about in what percentage of situations requiring hand hygiene do you actually perform hand hygiene, either by hand rubbing or handwashing (between 0 and 100%), only 14.72% responded that they actually perform hand washing in all situations requiring hand hygiene.

Table no. 2 shows that 67.4% of the staff nurse felt that the frequency of occurrence of HCAI infection is less than 50% among patients, 14.7% and 3.87% perceived the frequency of infection to be as high as between 50% – 75 % and >75% respectively. Surprisingly 13.95% did not know about HCAI. Regarding the impact of HCAI on the patients' clinical outcome, 11.6% of the study population on felt it has low impact, 55% of the staff nurses perceived that the impact of HCAI is high on the patients' outcome where as 33.3% felt it has very high impact on the patients. The table also shows the perception on effectiveness of hand hygiene on prevention of HCAI. Around 72 % and 16.8% perceived that hand hygiene practice is very effective or effective in preventing HCAI. Whereas 10.8% believed hand hygiene is less effective cross-transmission. About 72.8% felt that hand hygiene is an issue of high priority among all patient safety issues. 10.8% felt it is of least priority among all patient safety issues.

The importance given by various people eg Head of the department or colleagues or the patients themselves to hand hygiene by HCW is depicted in the table no 3. Around 43.4% of the study population felt that the heads of departments have given high importance to the hand hygiene practices performed by health care worker where as 52.7% felt they have given little importance. Similarly regarding the importance given by colleagues and patients themselves, 33.3% of the study population perceived that colleagues have given high importance. Also 13.5% of the participants felt that patients too give importance to hand hygiene.

As per Table 4, the study population perceived that certain actions would be very effective in improving hand hygiene practice such as support of leader or supervisors (89.92%) , availability of hand rub (81.42%), display of hand hygiene posters (80.62%), health care worker receives education on hand hygiene (87.83%) clear and simple instructions (75.96%).

The knowledge of the healthcare providers was assessed by using the hand hygiene knowledge questionnaire. Fig no1 Shows that 63.56% of participants said the main route of cross transmission is through the unclean hands of the health care providers where as 17.05% said it is sharing of objects while examining or

treatment. When asked about most frequent source of germs responsible for HCAI (Fig 2) 53.48% could tell that it is the germs on or within the patient which leads to infection, 26.35% said the hospital environment (surface) as the source.

Fig no 3 shows the knowledge on use of hand rub. When asked about minimal time needed for alcohol based handrub to kill the germs. Only 27.13% of the participants could tell the right answer as 20 sec. 70.54% said the minimum time for use of handrub is 1 min.

Knowledge regarding five moments of hand hygiene table no 5 shows that 73.6% of the participants could tell about the moment "before touching the patient" 71.3% could tell about the moment "before aseptic procedure". Only 13.3% of the participants could tell about all five moments.

IV. Discussion

In this study, about two third of the staff nurses felt that the average percentage of HCAI ie the frequency of occurrence of HCAI in hospitalized patients is less than 50%. Around 14 % of them were not aware about the HCAI among patients. In fact the rate of occurrence of HCAI is 10 per every 100 hospitalized patients. Most countries lack surveillance systems for health care-associated infections. Limited data, often of low quality, are available from low and middle-income countries. (1) Lack of availability of information on incidence of HCAI may be one of many factors for HCW not having awareness about HCAI.

Among the various determinants of HCAI specific to settings with limited resources, 'poor knowledge and poor application of basic infection control measures' have been identified as most common and important. Other determinants include inadequate environmental hygienic conditions and waste disposal, poor infrastructure, insufficient equipment, understaffing, overcrowding, lack of procedure, lack of knowledge of injection and blood transfusion safety, absence of institutional and national guidelines(1). In this study, majority (75.96%) were formally trained in hand hygiene. About sixty percent participants also had knowledge about source of infection and route of transmission and more than two third could tell at least two of the five moments of hand hygiene. Among all patient safety issues hand hygiene was given priority by 72.8% of them. However only 54.26 % were using alcoholbased hand rub routinely and only 14.72% were practicing hand washing in every required situation. This reflects huge gap in their knowledge and practice. The knowledge is not being translated into action. Other studies also have reported that although HCW have received formal training it is not put into practice(7,8, 9, 10). Nair S reported that practice of hand hygiene among nurses was better than medical students(11). Therefore it is understood that practice of hand hygiene would improve not by improving health care workers' knowledge on infection control measures alone but by continuous reinforcement. The same has been expressed by the study participants. Simple clear instructions and IEC materials in the form of posters should be displayed in all wards for better performance (table 4).

Regarding the impact of HCAI on the patients' clinical outcome, as per the WHO factsheet, health care-associated infections create additional suffering and cause high cost for patients and their families. Infections prolong hospital stays, create long-term disability, increase resistance to antimicrobials. In this study, 33.33% of the study population felt that impact of HCAI on patient outcome is high and 55% felt it is very high. Even regarding the role of hand hygiene in preventing HCAI majority felt it is effective or very effective (72.8% and 16.2%). Khaled et al too reported similar finding(12). Payghan et al (8) reported that 95% of respondents in their study felt that hand hygiene is effective for themselves as well as patients and colleagues. Most important mechanism of spread of these HCAI is via contaminated hands of the Health Care Workers (HCW), relatives or friends of patients & contaminated environmental surfaces. (13). Therefore hand hygiene practice by health care workers is of utmost importance while providing care to the patients and the same is well understood by the staff. Patient safety practices are to be followed both as individual and collective responsibility of the hospital or the department. In this study 43.4% of the staff nurses felt that their Heads of the department give importance to hand hygiene where as 33.33% felt that colleagues give importance to hand hygiene. Study by Birks et al and Zabeeri et al also revealed that 47.8% of the HCW in their study felt their Heads of department are giving importance where as 55.8% felt colleagues are giving importance. (7,14).

Patient safety practices are to be implemented strictly in every health care facility whether public or private sector, how big or small it may be. Many infection prevention and control measures, including appropriate hand hygiene and the correct application of basic precautions during invasive procedures, are simple and low-cost, but require staff accountability and behavioural change. The concept of "My five moments for hand hygiene" introduced by WHO aims to increase the sense of self-efficacy by giving HCWs clear advice on how to integrate hand hygiene in the complex task of care. (5) Hand hygiene can reduce the frequency of HCAI by 50% (1). In this study, participants have expressed their opinion on effectiveness of various interventions as shown in table no 4. Majority felt that senior officials, leaders play important role in promoting and supporting this practice in the facility. Eighty seven percent of them perceived that health education and training on hand hygiene would help improve practices. Availability of alcohol based hand rub at every point of care (specially in resource poor settings), IEC material being displayed, simple clear instructions displayed was also perceived as

important intervention. Similar findings have reported by other studies(7,8,12,14).Senior staff or other health care providers can be a role model by he or she performing hand hygiene regularly. Performance appraisal of the HC provider by the Heads of the departments may act as motivational factor.

V. Figures And Tables

Table 1: Shows the proportion of the study population who have received training in hand hygiene and are using Handrub routinely

| Study population who have | No (%) |
|--|-------------|
| 1) Received formal training in hand hygiene in the last three years | 98 (75.96%) |
| 2) Routinely using an alcohol-based hand rub for hand hygiene | 70 (54.26%) |
| 3) Actually perform hand hygiene in every situation requiring hand hygiene | 19 (14.72%) |

Table 2: Perception of staff nurses on various aspects of HCAI

| Q 14 Frequency of occurrence of HCAI among patients | Number (%) |
|--|------------|
| > 75% | 5(3.87%) |
| 50 - 75% | 19(14.72%) |
| < 50% | 87(67.44%) |
| Don't know | 18(13.95%) |
| Q 15 Impact of HCAI on patients clinical outcome | No % |
| Low | 15(11.6%) |
| High | 71(55.0%) |
| Very High | 43(33.33%) |
| Q 16 Effectiveness of hand hygiene in preventing HCAI | No % |
| Low | 14(10.8%) |
| High | 21(16.2%) |
| Very High | 94(72.8%) |
| Q 17 Importance of Hand Hygiene among all Patient Safety issues Perceived as | No % |
| Low Priority | 14(10.8%) |
| Moderate Priority | 21(16.2%) |
| High Priority | 94(72.8%) |

Table 3: Perception of study population on Importance given by various people to Optimal Hand Hygiene performed by HCW (Q 20,21,22)

| | No importance | Little importance | High importance |
|--------------------|---------------|-------------------|-----------------|
| Head of department | 3.9% | 52.7% | 43.4% |
| Colleagues | 16.2% | 50.3% | 33.33% |
| Patients | 32.5% | 53.4% | 13.5% |

Table no 4 : Perception of study population on effectiveness of various actions to improve Hand hygiene.

| Q 19 | How effective would the following actions be to improve hand hygiene permanently in your institution? | Very effective / Moderately effective (%) |
|------|---|---|
| 1 | Leaders and senior managers at your institution support and openly promote hand hygiene. | 89.92 |
| 2 | The health-care facility makes alcohol-based handrub always available at each point of care | 81.40 |
| 3 | Hand hygiene posters (are displayed at point of care as reminders | 80.62 |
| 4 | Each health-care worker receives education on hand hygiene. | 87.83 |
| 5 | Clear and simple instructions for hand hygiene are made visible for every health-care worker | 75.96 |
| 6 | Health-care workers regularly receive feedback on their hand hygiene performance | 76.74 |
| 7 | You always perform hand hygiene as recommended (being a good example for your colleagues). | 66.67 |

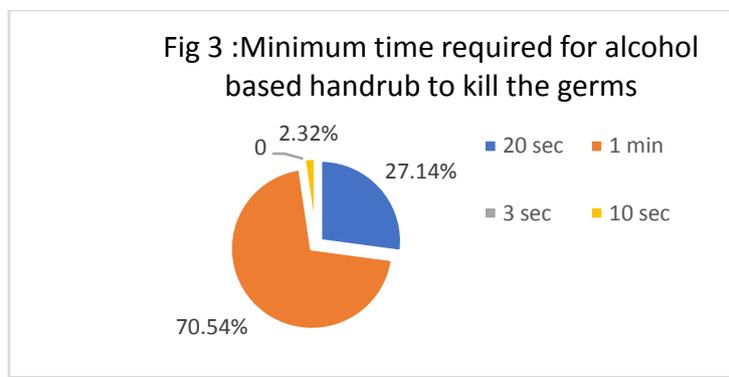
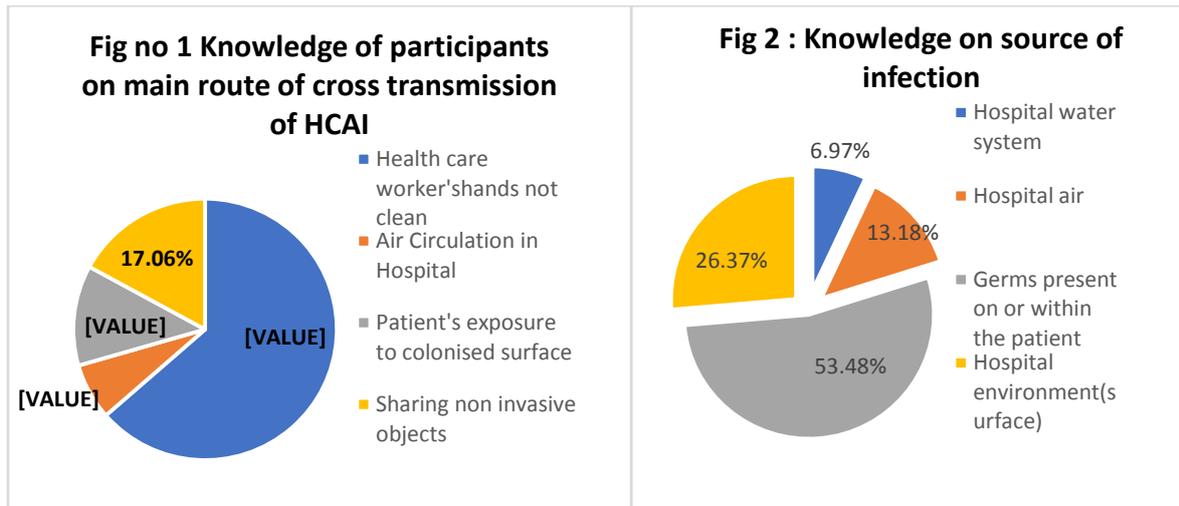


Table no 5: Study Population's knowledge on five moments of hand hygiene

| Knowledge on Five Moments | Percentage (%) |
|---|----------------|
| Moment 1: Before touching patient | 73.3 |
| Moment 2: Before clean/aseptic procedure | 71.3 |
| Moment 3: After body fluid exposure | 38.7 |
| Moment 4: After touching patient | 48.0 |
| Moment 5: After touching patients surrounding | 16.0 |
| All five moments | 13.3 |

VI. Conclusion

Health care worker perceived hand hygiene as an important and effective patient safety measure and also had good Knowledge on hand hygiene. Continuous reinforcement by heads of the departments and senior staff along with display of IEC and simple instructions at the action site is needed. Improvement of safety climate and hand hygiene practices by health care workers play a major role in patient safety and preventing hospital associated infections.

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