

ORIGINAL PAPER

Assessing Healthcare Associated Infections and Hand Hygiene Perceptions amongst Healthcare Professionals

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Abstract

Health care associated infection is associated with increase morbidity, mortality, prolonged hospital stay, increased health care costs, and antibiotic resistance in both acute and long term care facilities. Hand hygiene, such as hand washing and hand rub, has been the cornerstone of infection prevention and control measures in reducing HCAs. The aim of the study is to assess the perception towards hand hygiene amongst healthcare professionals such as doctors and nurses in the Ministry of Interior Security hospital, Saudi Arabia. A descriptive survey using a modified World Health Organization (revised 2009) questionnaire was used to gather data. A total of 87 respondents participated in the study. Results showed that respondents (27.6%) are aware that health care associated infection has an impact on patient outcome ($X^2= 46.5$; $p < 0.05$), hospitalized patient will likely develop HCAs ($X^2= 50.4$; $p < 0.05$), and hand hygiene remains to be the single and most effective method against HCAs ($X^2= 52.2$; $p < 0.05$). Respondents reported a high self-efficacy ($X^2= 127.3$; $p < 0.05$) in performing hand hygiene. Organizational factors such as staff engagement, commitment of the department heads and leadership are perceived to be significant in promoting hand hygiene practices. Strategies such as provision of access to hand hygiene facilities, guidelines, education and training, positive role modeling are effective. In conclusion, the findings suggest that health care workers have a high level of awareness about health care associated infections and the importance of hand hygiene. Furthermore, assessment of knowledge thru self-report is not enough to determine compliance of hand hygiene practices. Observational studies are recommended.

Keywords: Health Care Associated Infection, Hand Hygiene, Nurses, Survey, Questionnaire.

Introduction

World Health Organization (2009) defines "Healthcare Associated Infections (HCAs), also referred to as "nosocomial" or "hospital" infection, as an infection occurring in a patient during the process of care in a hospital or other healthcare facility which was not present or incubating at the time of admission." HCAs is associated with increase morbidity, mortality, prolonged hospital stay, increased health care costs, and antibiotic resistance in both acute and long term care facilities (Shah, and Singhal, 2013). Hand hygiene, such as hand washing and hand rub, has been the

cornerstone of infection prevention and control measures in reducing HCAs (Center for Disease Control, 2010). Despite the numerous guidelines published, compliance remain to be a challenge to achieve and sustain. Studies of Halwani, Tashkani, and Basuny (2010) in ten Intensive Care Units in Saudi Arabia about the incidence of HCAI's detected 851 HCAs among 5,523 patients admitted and stayed for 53,025 days with a mean length of stay of 9 days. The incidence rate for HCAI was 16 per 1000 patients' days. Al-Tawfiq, Abed, Al-Yami, and Birrer (2012) conducted a descriptive time series study using multimodal

interventions from October 2006 to December 2011 set in a 350-bed community hospital in Saudi Arabia. The rate of health care-associated methicillin-resistant *Staphylococcus aureus* per 1,000 patient-days decreased from 0.42 in 2006 to 0.08 in 2011. Ventilator-associated infection rates decreased from 6.12 to 0.78, central line-associated bloodstream infections rates decreased from 8.23 to 4.8, and catheter-associated urinary tract infection rates decreased from 7.08 to 3.5. Allegranzi et al. (2013) conducted a global implementation of WHO's multimodal strategy for improvement of hand hygiene using a quasi-experimental study in five countries including Saudi Arabia. These prior studies show that implementation of WHO's hand-hygiene strategy is feasible and sustainable across a range of settings in different countries and leads to significant compliance and knowledge improvement in healthcare workers, supporting recommendation for use worldwide. Whereas these WHO multi-modal strategy and previous studies indicate that this is effective in reducing HAIs and increasing hand hygiene compliance. The researchers as part of the Infection Control and Prevention Committee in the hospital would like to support the WHO hand hygiene campaign by conducting the study using the WHO approved tool kit. The WHO tool kit offer a series of assessment and intervention framework to identify problems and strategies to improve hand hygiene practices in the hospital. Our study is in the initial phase of establishing the baseline data for the knowledge of healthcare workers about health care associated infections and hand hygiene.

Purpose, aims and objectives

The purpose of this study is to support the WHO hand hygiene campaign against healthcare associated infections. It aims to assess the perception towards hand hygiene amongst healthcare professionals in the hospital. Specifically, it seeks to identify perceptions on health care-associated infections and hand hygiene.

Methodology

Design and Research setting

A descriptive study using a standardized survey questionnaire of the World Health Organization

(WHO) was performed. Descriptive survey design aims to observe, describe, analyze and document aspects of situation as it naturally occurs (Polit and Beck, 2004). In this situation, the perceptions about healthcare associated infection and hand hygiene were the focus of the study. The study was conducted at the Ministry of Interior Security Hospitals, Jeddah Kingdom of Saudi Arabia and was completed last July 2013.

Participants and sampling

A purposive sampling was done to meet the inclusion and exclusion criteria. The participants consisted of various healthcare professional working in the hospital. The participants included in the study were healthcare professional i.e. medical doctors, nurses and others who have a direct contact to patients at least on a daily basis, understands English and willing to participate in the survey. Participants who did not meet the inclusion criteria were excluded. There were a total of 102 healthcare professionals eligible and was invited to participate in the study. However, there were only 87 participants who completed and returned the survey questionnaire.

Data collection and analysis

The study utilized the "Perception Survey for Health-Care Workers" questionnaire which was formulated and recommended by the World Health Organization (WHO) in their campaign for patient safety. It is a self-administered 21-item questionnaire used to measure perception with regards to healthcare associated infection and hand hygiene. This questionnaire has been reliable and validated by World Health Organization (WHO). It is easy to administer and takes about 10 minutes to fill-out. The questionnaire was slightly modified by the researchers to remove irrelevant items and to ensure that items reflect the context where the research is conducted. Moreover, some terms were simplified to make it clear. The first eight question asked about demographic characteristics. There were three items that pertains to perceptions about healthcare associated infection and ten items related to perceptions about hand hygiene practices. Possible answers to question were varied ranging from a yes or no response, one to seven rating and using a four point Likert scale. Information package, consent and the 21-item

questionnaire were altogether distributed to the identified eligible participants. SPSS statistical software version 17 was used for statistical analysis of the collected data. Descriptive statistics and inferential non-parametric Chi-squared (X^2) test was used. For statistical tests, P-values less than 0.05 were considered to be statistically significant.

Ethical considerations

Ethical considerations were addressed by seeking the ethical approval from the Infection Control and Prevention Committee of the hospital. Research permit was sought from the hospital director. Participation in the study is completely voluntary. Information package and informed consent was provided.

Results

There were a total of 87 healthcare professionals who participated. Nurses (64.4%) accounts for the majority of the participants, followed by physician (20.7%) and other healthcare professional (14.9%) such as psychologist, technicians, therapists and dietician. Males (94.3%) were the predominant respondent in the study as compared with the female (5.7%) participants. The mean age was 32.3 ± 8.3 years.

Perceptions about Healthcare Associated Infection

Participants were asked to identify the percentage of the hospitalized patients who will develop healthcare associated infections. The responses obtained were varied and widely distributed from 0-100%. However, 27.6% of the respondents believed that there is about 0 – 10% chances that hospitalized patients will develop healthcare associated infections. On the other hand, there were 19.5% respondents who claimed that they don't have the knowledge of the occurrence of healthcare associated infection in the hospital. The difference among the respondent's perceptions about the percentage of hospitalized patients developing healthcare associated infections was significant ($X^2= 50.4$; $p < 0.05$). On the other hand, there was a significant difference in the perception

of impact of health care-associated infection on a patient's clinical outcome ($X^2= 46.5$; $p < 0.05$). Most of the participants believed that there is a high (54%) and very high (21.8%) impact of healthcare associated infections in patient's clinical outcome.

Lastly, Table 1 shows that there was a significant difference ($X^2= 52.2$; $p < 0.05$) in the respondents perceptions about the effectiveness of hand hygiene as measures to prevent healthcare associated infections. Majority (99%) of the respondents knew and agreed that hand hygiene is the single and most effective against healthcare associated infections.

Perceptions about Hand Hygiene

Three quarters of the participants had undertaken a formal training in hand hygiene in the last two years. When asked about the routine use of alcohol based hand rub when performing hand hygiene, 97.7% of the respondents agreed to prefer the hand rub method. Among all patient safety issues, there was a significant difference ($X^2= 42.3$; $p < 0.05$) about the respondents perception as to the importance of hand hygiene at the institution. Respondents believed that hand hygiene has a high (43.7%) and very high (55.2%) priority in their affiliated hospital. When asked about the percentage of situations requiring hand hygiene and the actual performance of hand hygiene either by hand rubbing or hand washing among healthcare workers in the hospital, the response varied between 0 to 100%. Around 67.7 % of the respondents believed that the actual performance of hand hygiene is between 70-100% which was significant ($X^2= 78.2$; $p < 0.05$). Managers' support and promotion of hand hygiene (34.5%), alcohol-based hand rub availability at each point of care (60.9%), displays of hand hygiene posters (57.5%), education on hand hygiene (40.2%), visible clear and simple instructions for hand hygiene (52.9%), positive role modeling (51.8%) and patient reminding healthcare workers to perform hand hygiene (26.4%) were found significant interventions to promote and improve hand hygiene practices in the hospital as shown in Table 2.

Table 1. Impact of healthcare associated infections on patient’s clinical outcome and effectiveness of hand hygiene as preventive measures.

RESPONDENT’S OPINION	VERY LOW	LOW	HIGH	VERY HIGH	X² (p-value)
Impact of HCAI on patient’s clinical outcome	3 (3.4%)	18 (20.7%)	47 (54%)	19 (21.8%)	46.5 (0.000)
Effectiveness of Hand Hygiene in preventing HCAIs	1 (1.1%)	0 (0%)	30 (34.5%)	56 (64.4%)	52.2 (0.000)

*HCAIs means Healthcare associated Infections

Table 2. Effectiveness of various strategies to improve hand hygiene practices.

ACTIONS	1 Not Effective	2	3	4	5	6	7 Very Effective	X² (p-value)
Managers support and promote HH	0 (0.0%)	0 (0.0%)	3 (3.4%)	14 (16.1%)	17 (19.5%)	23 (26.4%)	30 (34.5%)	23.5 (0.000)
Handrub always available	0 (0.0%)	0 (0.0%)	1 (1.1%)	2 (2.3%)	9 (10.3%)	22 (25.3%)	53 (60.9%)	107.2 (0.000)
Posters displayed	0 (0.0%)	0 (0.0%)	1 (1.1%)	3 (3.4%)	8 (9.2%)	25 (28.7%)	50 (57.5%)	96.9 (0.000)
Receive education on hand hygiene	1 (1.1%)	2 (2.3%)	1 (1.1%)	6 (6.9%)	11 (12.6%)	31 (35.6%)	35 (40.2%)	102.0 (0.000)
Clear and simple instructions visible	0 (0.0%)	0 (0.0%)	1 (1.1%)	2 (2.3%)	11 (12.6%)	27 (31.0%)	46 (52.9%)	83.7 (0.000)
Feedback regularly provided	0 (0.0%)	4 (4.6%)	3 (3.4%)	13 (14.9%)	27 (31.0%)	23 (26.4%)	17 (19.5%)	33.1 (0.000)
Good example for role modeling	0 (0.0%)	0 (0.0%)	1 (1.1%)	1 (1.1%)	16 (18.4%)	24 (27.6%)	45 (51.7%)	77.3 (0.000)
Patient remind staff	0 (0.0%)	8 (9.2%)	5 (5.7%)	17 (19.5%)	12 (13.8%)	22 (25.3%)	23 (26.4%)	18.9 (0.002)

Interestingly, there was a significant difference in the respondent's (31%) perception that regular feedback on hand hygiene performance was not as effective as compared with the above mentioned strategies. Moreover, the respondents perceived that the head of the department ($X^2= 58.6$; $p < 0.05$), colleagues ($X^2= 63$; $p < 0.05$) and patients ($X^2= 64.5$; $p < 0.05$) placed a very high importance in adhering to optimal hand hygiene performance during the care process. These perceptions were found to be significant. At a personal level, respondents were asked to reflect about their effort to perform good hand hygiene when caring for patients. Almost half of the respondents considered that it was a big effort on their part to perform hand hygiene in caring for patients. Furthermore, when asked about their own performance of hand hygiene requiring situation, around 80% of the respondents answered that between 80 -100% of the required situation they perform optimal hand hygiene and the result was significant ($X^2= 127.3$; $p < 0.05$).

Discussion

The study investigated the perception towards hand hygiene among healthcare professionals in the hospital. The results showed that health care professionals have a very high level of knowledge about health care-associated infections and the role of hand hygiene. First, the study showed that respondents have a very high perception that health care associated infections have a significant impact in patient outcome. The result showed that majority of the respondents believed that there is a 0-10% chances that hospitalized patients will develop healthcare associated infections. The result was congruent to the WHO Report in 2011 on the burden of endemic healthcare associated infections worldwide. According to the report seven out of 100 hospitalized patients in developed countries and ten out of 100 hospitalized patients in developing countries will develop at least one healthcare-associated infection. In a similar study conducted by Burnett (2009), clinical ward nurses demonstrates good perceptions about health care associated infections and positive attitudes toward hand hygiene. However, a secondary finding in the study showed that these high level of awareness was not found to be independently associated with positive behavior. This mean that being

knowledgeable does not necessarily translates to high level of compliance. On the other hand, Most of the participants believed that there was a high (54%) and very high (21.8%) impact of healthcare associated infections in patient's clinical outcome and hand hygiene (99%) remains the single and most effective against healthcare associated infections. Previous studies of Tai et al. (2009) showed that 70% of the nurses and 49% of the physicians perceived that over 15% of patients would suffer from healthcare-associated infections. A total of 79% of the nurses and 68% of the physicians believed that more than 5% of patients would die as a result of healthcare-associated infection. A total of 60% of the nurses and 46% of the physicians acknowledged that over 75% of healthcare-associated infections could be prevented by optimal hand hygiene practices.

Second, the results of our study not only confirm with the previous but also showed that majority of the health care professional (99%) had a very high degree of awareness about the effectiveness of hand hygiene against health care associated infection. This awareness can be attributed to formal training attended previously by the respondents. Nteli et al. (2012) reported that educational activities were important factor to improve health-care workers hand hygiene practices. In contrast, De Wandel et al. (2010) argued that neither having good theoretical knowledge of hand hygiene guidelines nor social influence or moral perceptions does not influence hand hygiene practices. Self-efficacy is a determinant factor for compliance with hand hygiene. When asked about self-efficacy, half of the respondents considered that it was a big effort on their part to perform hand hygiene in caring for patients and around 80% of the respondents answered that between 80 -100% of the required situation they perform optimal hand hygiene. Previous study reported that nurses reporting a poor self-efficacy or a poor attitude toward time-related barriers appear to be less compliant (De Wandel et al. 2010). Speaking about factors and determinants, Tai et al. (2009) found that perceived behavioral control and subjective norms were the most important factors associated with the nurses and physicians' self-reported hand hygiene performance. Apart from knowledge and self-

efficacy, Sinkowitz-Cochran et al. (2012) added that staff engagement, overwhelmed/stress-chaos, and hospital leadership (Min, 2013) were three organizational factors found to be significantly associated with individual health care personnel knowledge, attitudes, and self-reported hand hygiene practices. The result confirmed with the previous study, managers' support and promotion of hand hygiene, alcohol-based hand rub availability at each point of care, displays of hand hygiene posters, education on hand hygiene, visible clear and simple instructions for hand hygiene, positive role modeling, and patient reminding healthcare workers to perform hand hygiene were found significant interventions to promote and improve hand hygiene practices in the hospital. Furthermore, respondent believed that hand hygiene is a very high priority among the head department, colleague and patient in the institution. Interestingly, the study results reported that regular feedback was not an effective measure to encourage respondents to comply with hand hygiene practices. The result was unexpected since literatures have well documented the effectiveness of regular feedback in increasing the effectiveness of regular feedback in increasing the hand hygiene compliance such as the study of Pessoa-Silva et al. (2007) and Min (2013) who reported that performance feedback is effective in sustaining compliance improvement and is independently associated with infection risk reduction. The researcher speculated that the low perception about feedback can be attributed to the different cultural perception about feedback, since the hospital employs employee from a multicultural background and another factor could be the manner of delivering the feedback may play an important role. Min (2013) suggested that education and role modeling at both the individual and organizational levels might be beneficial in improving hand hygiene compliance. Al-Tawfiq, Abed, Al-Yami, and Birrer (2012) suggested that a multimodal approach using different strategies and intervention such as the WHO hand hygiene campaign (Allegranzi et al., 2013) promotes an institution-wide increase and sustained improvement in the rates of compliance. Lastly, most respondent preferred alcohol based hand rub as the method of hand hygiene primarily because of the same reasons reported by the literatures such as: it requires less time, acts faster,

more accessible than sinks, effective in reducing the number of microorganism, and skin issues were less common (Center for Disease Control, 2010).

In general, the study contributes to support the WHO hand hygiene campaign against healthcare associated infections. The findings suggest that health care workers have a high level of awareness about health care associated infections and the importance of hand hygiene. Furthermore, assessment of knowledge thru self-report is not enough to determine compliance of hand hygiene practices. Observational studies are recommended.

This is a small-scale project whose findings are difficult to be generalized because the researcher's respondents came from a single location, the use of a relatively small sample is a limitation of this research. Furthermore, reliance on self-reporting restricts the objectivity of the data. A study employing observation may provide a more reliable data in measuring compliance.

Conclusion

In conclusion, the respondents have a high level of knowledge about health care associated infections and hand hygiene. Respondents were aware that health care associated infection has an impact on patient outcome, hospitalized patient will likely develop HCAs, and hand hygiene remains to be the single and most effective method against HCAs. Respondents reported a high self-efficacy in performing hand hygiene. Organizational factors such as staff engagement, commitment of the department heads, and leadership were perceived to be significant in promoting hand hygiene practices. Strategies such as provision of access to hand hygiene facilities, guidelines, education and training, positive role modeling were effective. There was a low perception about the effectiveness of regular feedback. Furthermore, observational studies are recommended to objectively measure hand hygiene compliance.

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