

Hand hygiene, perceptions amongst health-care workers in Najran hospitals and primary health-care centers: a cross sectional study

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Abstract

This study evaluated the perceptions of healthcare professionals in Najran hospitals, Kingdom of Saudi Arabia, towards hand hygiene according to the World Health Organization (WHO) validated questionnaire. A total of 405 questionnaires were evaluated. The study participants had sufficient knowledge about the hand hygiene practices, in particular the importance of alcohol-based scrubbing in decreasing health-care associated infections. The health-care workers needed a better understanding about the infection prevention data in their particular institutions.

Key Words: Health-care workers; health-care associated infections

Introduction

Health-Care Associated Infections (HCAI) affect millions of patients worldwide annually, according to the World Health Organisation (WHO) (WHO, 2014). According to the WHO, HCAI are infections that are acquired by patients during the process of receiving medical care which were not present or being incubated at the time of being admitted (WHO | The burden of health care-associated infection worldwide, n.d.). They occur to more than 5% of hospitalised patients which mounts to hundreds of millions of patients worldwide causing significant complications with increased mortality and morbidity (Allegranzi et al., 2011).

According to the Center for Disease Control and Prevention, more than 1.7 million HCAI and 99,000 health-care-associated infection-correlated deaths occurred in 2002 in hospitals (Klevens et al., 2007). The above studies showed that HCAI are also associated with a significant financial burden on health care institutions and systems especially in low and middle income countries. Recent published data have suggested that consistent and efficient applications of WHO recommendations in regards infections prevention and control policies have reduced 70% of HCAI. The cost savings of these measures are estimated to be between \$25-\$31 billion dollars per year in the United States (Berríos-Torres et al., 2017).

Hand hygiene is globally recognised as one of the key elements in the control and reduction of HCAI (Hosseinalhashemi et al., 2015). In fact, hand hygiene low compliance among health-care workers has been associated with contamination and cross infection in healthcare facilities and was linked with mortality of patients (Kingston, O'Connell, & Dunne, 2017). This is of great importance especially with the emergence of Middle East respiratory syndrome (MERS) cases in the Kingdom of Saudi Arabia (KSA) (Raj, Osterhaus, Fouchier, & Haagmans, 2014) and the newly emerging Coronavirus. While hand hygiene education policies and documents have been published by the WHO for health-care workers (Allegranzi et al., 2013), little is known about the compliance towards hand hygiene and hand hygiene policies in the Kingdom of Saudi Arabia. Such information is of great importance to guide policymakers to generate specific healthcare policies to reduce HCAI. Our study aimed to assess healthcare professionals' perceptions about HCAI and hand hygiene.

Methods:

Study Design

This cross-sectional study was conducted in seven public hospitals and three primary health care centers (King Khaled Hospital (KKH), Najran General Hospital (NGH), Maternity and Children Hospital MCH, Shrorah General Hospital (SGH), Ydamah General Hospital (YGH), Thar General Hospital (TGH), Habona General Hospital (HGH), Bader Al Ganoob General Hospital (BAGH), Khobash General Hospital (KGH) and Psychiatric Hospital (PH), in the Najran province, Kingdom of Saudi Arabia. A convenience sampling was used to administer a validated questionnaire developed by the WHO during the period October-November 2019 (WHO, 2014) (Appendix A). The Ministry of Health, Kingdom of Saudi Arabia, granted the institutional approval to administer the health-care workers' questionnaire (IRP Log Number 2019-020E).

Sampling, questionnaire design and data collection

Any health-care worker was eligible to participate in this study and included medical doctors, nurses, auxiliary nurses, medical students, nurse students, midwives, and technicians. According to the latest Annual Statistical Book published by the Ministry of Health (1438 H, 2017) there are 9 hospitals and 69 primary healthcare centers that encompass 5758 and 1487 health-care workers respectively (<https://www.moh.gov.sa/en/Ministry/Statistics/book/Documents/ANNUAL-STATISTICAL-BOOK-1438H.pdf>). In order to achieve international representative standard of a sample size based on published literature (Hosseinalhashemi et al., 2015), a minimum of 365 participants were needed to achieve confidence interval of 5% and a confidence level of 95%.

The survey comprised of two sections: demographics and hand hygiene practices among healthcare professionals with a total of 24 questions, with 'yes or no', multiple choices, 7-point Likert scale, and percentage answers. The percentage answers with responses 0-25%, 26-50%, 51-75%, and 76-100%, were categorized as poor, moderate, high and very high respectively.

The survey was administered by trained staff along with information sheets that were visiting the recruited sites and the data were entered by interviewers into a predesigned spreadsheet. Anonymity was maintained by creating a key identifier generated at random, as first letter of the hospital/primary healthcare center followed by number for each survey.

Statistical analysis

Descriptive statistics was used to analyse the frequency, mean, standard deviation responses on the variables of interest using the R statistical software (R version 3.6, Copyright© 2019 The R Foundation for Statistical Computing). Chi-squared test of independence was used to assess health care inter-discipline differences. A p-value less than 0.05 will be considered statistically significant.

Results

A total of 405 healthcare professionals participated in this survey of which the majority were males (82%). 59% of the respondents were medical doctors, followed by nurses and medical students, 17% and 14% respectively. Respondents were 20-72 years old with 78% were of a young age between 30-40 years old. Most of the participants were from the surgical department (69%), followed by outpatients' clinics (10%) and emergency departments (9%) (Table 1).

Almost all the respondents have received a formal training for hand hygiene in the last three years (98%), and routinely use an alcohol-based hand rub for hand hygiene (98%). More than 60% of the respondents did not have a specific answer of what percentage of hospitalised patients will develop health-care associated infections. However, 75% considered that the impact of HCAI will be low and 2% very low on the patient's clinical outcome. Most of the respondents agreed that the effectiveness of hand hygiene in preventing HCAI is high (82%) with 16% considering it very high. Among all patient safety issues, priority of hand hygiene at the institutions ranged between high (74%) and very high priority (21%) with 5% considering it as moderate priority. On average, more than 50% of the participants did not have a specific answer if the health-care workers in their department actually perform hand hygiene, either by hand rubbing or handwashing in situations requiring hand hygiene to do, with 40% ranged between high and very high. However, 96% of the participants responded that they do perform hand hygiene in the required situations.

Perceptions of the health-care workers towards hand hygiene were largely positive and the responses to how effective would be some actions to improve hand hygiene permanently varied, with answers of several questions ranging between 5-7 (positive response) on Likert scale (Table 2). The majority agreed that health-care facilities make alcohol-based hand rub always available (87%) at each point of care with support from leaders and senior managers who openly promote hand hygiene (84%). Also, participants saw hand hygiene posters displayed at point of care as reminders would be highly effective (77%). Fewer agreed that performance of hand hygiene was as recommended (62%), and (63%) agreed that clear and simple instructions for hand hygiene visible for every health-care worker would be effective in improving hand hygiene among health-care workers.

Table 1: Demographic data of study participants

Demographics Position	Department						Total
	Surgery	Outpatient clinic	ER	Internal medicine	Mixed medical/ surgical	Obstetrics/ Paediatrics and other	
Medical doctor		2 (4.9)	2 (5.9)	3 (17.6)	17 (89.5)	1 (8.3)	238 (58.8)
Medical student	54 (19.1)	1 (2.4)	4 (11.8)	1 (5.9)	0 (0.0)	0 (0.0)	60 (14.8)
Nurse	10 (3.5)	22 (53.7)	19 (55.9)	7 (41.2)	1 (5.3)	8 (66.7)	67 (16.5)
Midwife	2 (0.7)	2 (4.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (1.0)
Auxiliary nurse	1 (0.4)	3 (7.3)	1 (2.9)	2 (11.8)	0 (0.0)	0 (0.0)	7 (1.7)
Nurse student	1 (0.4)	1 (2.4)	2 (5.9)	0 (0.0)	0 (0.0)	1 (8.3)	5 (1.2)
Technician	1 (0.4)	6 (14.6)	6 (17.6)	1 (5.9)	0 (0.0)	1 (8.3)	15 (3.7)
Other	0 (0.0)	2 (4.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Resident	0 (0.0)	1 (2.4)	0 (0.0)	3 (17.6)	1 (5.3)	0 (0.0)	5 (1.2)
Unknown	0 (0.0)	1 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)	1 (8.3)	2 (0.5)
Total	282 (69.6)	41 (10.1)	34 (8.4)	17 (4.2)	19 (4.7)	12 (3.0)	405 (100)

Data are presented n (%)
ER: emergency department

Table 2: Questions answered by the health-care workers ranked on a 7-point Likert scale

Questions	Not Important				Very Important		
	1	2	3	4	5	6	7
Leaders and senior managers promote hand hygiene	1 (0.2)	2 (0.5)	13 (3.2)	48 (11.9)	175 (43.2)	109 (26.9)	57 (14.1)
Hcf makes alcohol-based hand rub available at each point of care.	0 (0.0)	4 (1.0)	13 (3.2)	34 (8.4)	68 (16.8)	161 (39.8)	124 (30.6)
Hand hygiene posters are displayed at point of care as reminders.	17 (4.2)	31 (7.7)	21 (5.2)	25 (6.2)	65 (16)	50 (12.3)	196 (48.4)
Each hcw receives education on hand hygiene.	22 (5.4)	37 (9.1)	74 (18.3)	95 (23.5)	71 (17.5)	61 (15.1)	45 (11.1)
Clear and simple instructions visible for every hcw	28 (6.9)	29 (7.2)	44 (10.9)	52 (12.8)	89 (22)	43 (10.6)	120 (29.6)
Hcw regularly receive feedback on their hand hygiene performance.	59 (14.6)	46 (11.4)	66 (16.3)	40 (9.9)	86 (21.2)	45 (11.1)	63 (15.6)
You always perform hand hygiene as recommended	42 (10.4)	23 (5.7)	50 (12.3)	33 (8.1)	91 (22.5)	64 (15.8)	102 (25.2)
Patients are invited to remind hcw to perform hand hygiene.	51 (12.6)	46 (11.4)	54 (13.3)	45 (11.1)	93 (23)	42 (10.4)	74 (18.3)
Department head follow up that you perform optimal hand hygiene	50 (12.3)	48 (11.9)	38 (9.4)	46 (11.4)	77 (19)	42 (10.4)	103 (25.4)
Colleagues attach to the fact that you perform optimal hand hygiene	54 (13.3)	45 (11.1)	71 (17.5)	53 (13.1)	68 (16.8)	48 (11.9)	66 (16.3)
Patients attach to the fact that you perform optimal hand hygiene	40 (9.9)	36 (8.9)	52 (12.8)	52 (12.8)	79 (19.5)	59 (14.6)	86 (21.2)
Effort required by you to perform hand hygiene when caring for patients	49 (12.1)	30 (7.4)	64 (15.8)	63 (15.6)	73 (18)	44 (10.9)	82 (20.2)

Data are presented n (%)

Hcf: health care facility; hcw: health-care worker

1 is the least import or effective while is the 7 is the most important or effective

Patients reminding health-care workers to perform hand hygiene, each health-care worker receives education on hand hygiene, and regularly receiving feedback on their hand hygiene performance were considered the least effective in improving permanently hand hygiene the hospitals. Finally, almost half of the participants agreed that performing optimal hand hygiene was not a high priority by the head of the department, colleagues, patients and by the health-care workers themselves.

Discussion

The WHO guidelines about hand hygiene are designed to decrease and prevent health-care associated infections. This study provided a valuable insight about the hand hygiene implementations and perceptions among health-care workers in Kingdom of Saudi Arabia. Most of the study participants have undergone a formal training and for hand hygiene and regularly used alcohol-based hand rub.

The reduction in nosocomial transmission introduction of an alcohol-based handrub have well been established (Gordin, Schultz, Huber, & Gill, 2005). The behaviour of the health-care workers towards hand hygiene in general was positive, which is similar to what is previously reported in literature (Hosseinalhashemi et al., 2015; Kingston et al., 2017; Lohiniva et al., 2015). The study participants have a great knowledge how effective hand hygiene in reducing and preventing health-care associated infections, however, 75% considered the impact HCAI as low on the patients' health. interestingly, more than 60% did not have a specific answer of the percentage or range of HCAI in their institutions. This might be due to the fact that most of the study participants were of a young age with majority (78%) between 30-40 years of age and did not have enough reading of what is expected in their institution. This highlights the important role of the infection control departments of these institutions to publish these data, particular nosocomial transmission of antimicrobial resistant bacteria, to the health-care workers and make sure that they are knowledgeable through continuous program development.

Attitudes and perceptions of the health-care workers towards hand hygiene were also assessed which did not differ significantly ($P>0.05$) between the departments and the professions. Most of medical doctors and students work in the surgical departments, while the nurses were presented from different departments, which may have biased the obtained results. The importance of key factors that influences the hand hygiene varied between different questions. There was a great importance of the role of leaders and supervisors to promote hand hygiene and health-care facilities by visualizing the importance of hand hygiene (Kingston et al., 2017). However, the participants didn't feel that their supervisors and the health care facility were not pedantic in ensuring an optimal hand hygiene practice. This is similar to what was described for students in a study by Kingston et al. (2017). This can be overcome by increasing the self-efficacy among health-care workers through continuous program developments education.

Conclusion

In conclusion, this study presented an important set of data about the compliance of the health-care workers in the Kingdom of Saudi Arabia towards hand hygiene. The responses were positive, however a better understanding of the risk factors associated with not performing optimal hand hygiene scrubbing is needed.

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Appendix A

Perception Survey for Health-Care Workers

ID:** **Date:**

Facility: **City/Country:**

Gender: Female Male

Age: years

Profession*:** Nurse Auxiliary nurse Midwife Medical doctor
 Resident

Technician Therapist Nurse student Medical student
 Other

Department (please select the department which best represents yours):

Internal medicine medical/surgical Surgery Intensive care unit Mixed

Emergency unit term/rehabilitation Obstetrics Paediatrics Long-

Outpatient clinic Other

Did you receive formal training in hand hygiene in the last three years?
Yes No

Do you routinely use an alcohol-based handrub for hand hygiene?
Yes No

In your opinion, what is the average percentage of hospitalised patients who will develop a health care-associated infection (between 0 and 100%)?

% I don't know

In general, what is the impact of a health care-associated infection on a patient's clinical outcome?

Very low Low High Very high

What is the effectiveness of hand hygiene in preventing health care-associated infection?

Very low Low High Very high

Among all patient safety issues, how important is hand hygiene at your institution?

Low priority Moderate priority High priority Very high priority

On average, in what percentage of situations requiring hand hygiene do health-care workers in your hospital actually perform hand hygiene, either by handrubbing or handwashing (between 0 and 100%)?

% I don't know

In your opinion, how effective would the following actions be to improve hand hygiene permanently in your institution?

Please tick one “” on the scale according to your opinion.

a. Leaders and senior managers at your institution support and openly promote hand hygiene.

Not effective ------------------ Very effective

b. The health-care facility makes alcohol-based handrub always available at each point of care.

Not effective --------------- Very effective

c. Hand hygiene posters are displayed at point of care as reminders.

Not effective --------------- Very effective

d. Each health-care worker receives education on hand hygiene.

Not effective --------------- Very effective

e. Clear and simple instructions for hand hygiene are made visible for every health-care worker.

Not effective --------------- Very effective

f. Health-care workers regularly receive feedback on their hand hygiene performance.

Not effective --------------- Very effective

g. You always perform hand hygiene as recommended (being a good example for your colleagues).

Not effective ------------------ Very effective

h. Patients are invited to remind health-care workers to perform hand hygiene.

Not effective ------------------ Very effective

What importance does the head of your department attach to the fact that you perform optimal hand hygiene?

No importance ------------------ Very high importance

What importance do your colleagues attach to the fact that you perform optimal hand hygiene?

No importance ------------------ Very high importance

What importance do patients attach to the fact that you perform optimal hand hygiene?

No importance ------------------ Very high importance

How do you consider the effort required by you to perform good hand hygiene when caring for patients?

No effort ------------------ A big effort

On average, in what percentage of situations requiring hand hygiene do you actually perform hand hygiene, either by handrubbing or handwashing (between 0 and 100%)?

%