

Hand hygiene knowledge of primary health care workers in Abha city, South Western Saudi Arabia

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ABSTRACT

Purpose: The aim of this is to find out the hand hygiene (HH) knowledge among primary health care workers (PHCWs) in Abha health district, southwestern Saudi Arabia. **Methods:** Data were collected through an anonymous self-administered questionnaire. The questionnaire was based on a WHO "Knowledge Questionnaire for Health Care Workers." **Results:** The study included 478 PHCWs (239 males and 239 females). The sample included 186 physicians, 212 nurses, and 80 technicians. The highest proportion receiving formal training was nurses (82.1%). Females (77.4%) received significantly more training than males (70.3%). Only 59.2% (283) of the HCWs properly identified unclean hands of HCWs as the main route of the cross. Only 26.4% (126) of the HCWs properly identified germs already present on or within the patient as the most frequent source of pathogens in a health-care facility. Only 54.8% (262) of HCWs properly identified 20 s as the minimal time needed for alcohol-based hand rub to kill most germs on hands. **Conclusion:** The study revealed gaps in the knowledge regarding HH. To promote HH at primary health care setting, WHO bundle of multimodal strategies should be adopted including system change; training/education; evaluation and feedback; reminders in the workplace; and institutional safety climate.

Keywords: Hand hygiene, primary health care workers, Saudi Arabia

Introduction

Several terms were used to define infections acquired in the framework of health care settings. The name used before was nosocomial infections. It is now called health care-associated infection (HCAI). HCAI is defined as "an infection acquired by patients as a result of health procedures carried out and which can also affect the health of professionals during their practice."^[1] It can happen wherever health care is provided. Healthcare-associated infection (HAIs) continue as a significant

and increasing health crisis, causing increased morbidity and mortality. HAI represents a serious disease burden and has a significant economic effect on patients and healthcare systems throughout the world. HAIs are among the most common preventable medical complications among patients.^[2]

Yet good quality hand hygiene (HH), the easy task of cleaning hands at the correct time and in the appropriate way, can save lives. HH has been known to reduce HAIs. It was Dr. Oliver Wendell Holmes in Boston in 1843 and Dr. Ignaz-Semmelweis in Vienna in 1861, who encouraged hand washing to prevent the transmission of infectious disease.^[3] Both clinicians separately concluded that disease was transmitted from

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patient to patient by physicians and nurses on their hands and clothing. Semmelweis instituted a strict hand washing policy with antiseptic in his practice and by doing so, decreased mortality rates from 5%–30% to 1%–2% within 3 months period.^[4,5]

HH is an important health-care concern globally and is a single most cost-effective and practical measure to cut down the incidence of HCAI and the spread of antimicrobial resistance across all settings – from advanced health care systems to primary health care centers (PHCCs).^[6] In spite of being a very simple action, compliance with HH among health-care providers is low.^[7,8] To address this problem continuous efforts are being made to identify effective and sustainable strategies. An effective strategy is to ensure the proper education of the trainee health work team. Study the HH awareness of health students is important as the students being the healthcare providers of the future. Their pattern of training will reflect on their infection control practices.

The Aseer region is situated in the southwest of Saudi Arabia covering an area of more than 80,000 km². The region is divided into 11 governorates. Abha is the capital of Aseer. Primary health services in Abha health districts are delivered by a network of 42 PHCCs. The purpose of this study was to find out the basic HH knowledge among primary health care workers (PHCWs) in Abha health district. This will help in capacity building and running local continuing medical education programs to fill in the breaks of necessary knowledge in this respect.

Methods

Study design and target population

The cross-section survey was the selected study design. The study targeted HCWs in PHCCs in Abha health district.

Field activities

Data were collected during 2013–2014 by level 8 male and female 4th-year medical students and directly supervised by the Family and Community Medicine staff. The study was approved by the Ethical Committee of King Khalid University. Data were collected through an anonymous self-administered questionnaire. A covering letter was enclosed explaining the purpose of the study and asking for the written consent.

Study questionnaire

The questionnaire was based on the WHO “Knowledge Questionnaire for Health Care Workers.”^[9] The questionnaire collected data on HH knowledge including; HH training, the main route of cross-transmission of potentially harmful pathogens between patients in a health-care facility, the most frequent source of germs responsible for HCAIs, and hygiene actions preventing transmission of germs to the patient, and to the health-care worker, minimal time needed for alcohol-based hand rub to kill most germs on hands, and what should be avoided, as associated with a likelihood of colonization of hand with harmful pathogens.

Data analysis

Data were coded, validated, and analyzed using the SPSS software (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp). Frequency, percentage, arithmetic mean, median, and standard deviation were used to present the data. Chi-square test of significance was applied wherever necessary at the 5% level of significance.

Results

Description of the study sample

This study included 478 PHCWs (239 males and 239 females). Their age ranged from 18 to 57 years with an average of 31.1 ± 5.5 years and a median of 28 years. The sample included 186 physicians, 212 nurses, and 80 technicians.

Training in hand hygiene

Seventy-four percent (353) of PHCWs received formal training in HH. Table 1 shows that there were significant differences by profession and gender. The highest proportion receiving training was nurses (82.1%). Females (77.4%) received significantly more training than males (70.3%).

Knowledge about the main route of cross-transmission

Only 59.2% (283) of the PHCWs properly identified unclean hands of HCWs as the main route of cross-transmission of potentially harmful pathogens between patients in a health-care facility. Table 2 shows that there were significant differences by profession and history of training. Physicians significantly identified properly unclean hands more than nurses and technicians. Similarly, PHCWs receiving training in HH identified significantly unclean hands as the main route of cross-transmission compared to those lacking formal training.

Knowledge about the most frequent source of pathogens

Only 26.4% (126) of the PHCWs properly identified germs already present on or within the patient as the most frequent source of pathogens in a health-care facility. Table 3 shows no significant difference by profession or training in this respect.

Table 1: Proportion of primary health care nurses (212), physicians (186) and technicians (80) receiving formal hand hygiene training in Abha health district, Southwestern Saudi Arabia

Receiving formal training	n (%)	P
Training by profession		
Nurses	174 (82.1)	0.001*
Physicians	126 (67.7)	
Technicians	53 (66.3)	
Training by gender		
Males	168 (70.3)	0.048*
Females	185 (77.4)	

*Significant (P<0.05)

Knowledge about actions preventing transmission of pathogens to the patient, and to the healthcare worker

The majority of PHCWs properly identified HH before touching the patient and immediately before a clean/aseptic procedure (92.3% and 77.6%, respectively) as actions preventing transmission of pathogens to the patient. Table 4 shows significant differences in these items by profession. Technicians were the least group identifying these measures. No differences were found by receiving training.

Similarly, the majority of PHCWs properly identified HH after touching the patient, immediately after a risk of body fluid exposure and after exposure to the immediate surroundings of a patient (85.4%, 85.6%, and 77.4%, respectively) as actions preventing transmission of pathogens to the HCWs. Table 4

shows no significant differences in these items by profession or training.

The minimal time needed to kill most pathogens on hand

Only 54.8% (262) of PHCWs properly identified 20 s as the minimal time needed for alcohol-based hand rub to kill most germs on hands. No significant differences by profession or training were found.

What should be avoided to minimize colonization?

The majority of PHCWs properly identified wearing jewelry, damaged skin and artificial fingernails (81.0%, 88.3%, and 80.3%, respectively) as associated with a likelihood of colonization of hand with harmful germs. No significant differences by profession or training were found.

Table 2: Knowledge of primary health care nurses (212), physicians (186) and technicians (80) regarding the main routes of cross-transmission of potentially harmful germs between patients in healthcare facility

The main routes of cross-transmission	Profession				Receiving training		
	Nurses, n (%)	Physicians, n (%)	Technicians, n (%)	P	Yes, n (%)	No, n (%)	P
HCWs' hands when not clean	122 (57.5)	121 (65.1)	40 (50.0)	0.042*	230 (65.2)	53 (42.4)	0.001*
Air circulating in the hospital	14 (6.6)	25 (13.4)	11 (13.8)	0.048*	34 (9.6)	16 (12.8)	0.312
Patients' exposure to colonised surfaces	46 (21.7)	27 (14.5)	22 (27.5)	0.011*	62 (17.6)	33 (26.4)	0.037*
Sharing noninvasive objects (i.e., stethoscopes, pressure cuffs, etc.) between patients	30 (14.2)	13 (7.0)	7 (8.8)	0.057	27 (7.6)	23 (18.4)	0.002*

*Significant ($P < 0.05$). HCWs: Health care workers

Table 3: Knowledge of primary health care nurses (212), physicians (186) and technicians (80) regarding the most frequent source of the germs responsible for health care-associated infections

The most frequent source of health care associated infections	Profession				Receiving training		
	Nurses, n (%)	Physicians, n (%)	Technicians, n (%)	P	Yes, n (%)	No, n (%)	P
The hospital's water system	23 (10.8)	7 (3.8)	5 (6.3)	0.016*	29 (8.2)	6 (4.8)	0.144
The hospital air	17 (8.0)	23 (12.4)	12 (15.0)	0.151	32 (9.1)	20 (16)	0.044*
Germs already present on or within the patient	59 (27.8)	40 (21.5)	27 (33.8)	0.088	96 (27.2)	30 (24)	0.567
The hospital environment (surfaces)	113 (53.3)	116 (62.4)	36 (45.0)	0.023*	196 (55.5)	69 (55.2)	0.99

*Significant ($P < 0.05$)

Table 4: Knowledge of primary health care nurses (212), physicians (186) and technicians (80) regarding hand hygiene actions preventing transmission of germs to the patient and to the health care workers

Hand hygiene actions preventing transmission of germs	Profession				Receiving training		
	Nurses, n (%)	Physicians, n (%)	Technicians, n (%)	P	Yes, n (%)	No, n (%)	P
To patient							
Before touching a patient	197 (92.8)	177 (95.2)	67 (83.6)	0.005*	326 (92.4)	115 (92.0)	0.517
Immediately after a risk of body fluid exposure	179 (84.4)	148 (79.6)	69 (86.3)	0.269	295 (83.6)	101 (80.8)	0.282
Immediately before a clean/aseptic procedure	178 (84.0)	150 (80.6)	52 (65.0)	0.001*	277 (78.5)	94 (75.2)	0.263
After exposure to the immediate surroundings of a patient	173 (81.6)	134 (72.0)	61 (76.3)	0.076	278 (78.8)	90 (72.0)	0.079
To HCWs							
After touching a patient	188 (88.7)	150 (80.6)	70 (87.5)	0.065	299 (84.7)	109 (87.2)	0.794
Immediately after a risk of body fluid exposure	188 (88.7)	157 (84.4)	64 (80.0)	0.144	301 (85.3)	108 (86.4)	0.443
Immediately before a clean/aseptic procedure	172 (81.1)	135 (72.6)	63 (78.8)	0.120	291 (82.4)	95 (76.0)	0.077
After exposure to the immediate surroundings of a patient	181 (85.4)	147 (79.0)	58 (72.5)	0.034*	272 (77.1)	98 (78.4)	0.431

*Significant ($P < 0.05$). HCWs: Health care workers

Alcohol based hand rub and hand washing

The majority of PHCWs properly identified hand rubbing is more rapid for hand cleaning than hand washing and hand rubbing is more effective against germs than hand washing (81.4% and 85.0%, respectively). No significant differences by profession or training were found.

Discussion

HH is known as the most important measure for preventing the spread of HCAs at health care settings. Such standards mandate that to promote HH compliance, HH resources must be made readily available at critical locations, and behavior change must be supported through education, training, monitoring, feedback, and organizational support. Supporting research also indicates that to effectively interpose the transmission of HAI-causing pathogens, HH must be performed at the times and locations where transmission is most likely to occur.^[1]

Educating HCWs on effective HH techniques and compliance is highly important. Identifying HH knowledge will help in capacity building in this respect. Studies addressing HH among HCWs in Saudi Arabia addressed different settings including intensive care units,^[10] cardiac centers,^[11] university hospital,^[12] critical care units,^[13] and general hospitals.^[14,15] Studies regarding HH knowledge among PHCWs in Saudi Arabia are scarce and even lacking.

The present study revealed gaps in the knowledge of PHCWs regarding HH. The gaps were more evident among technicians followed by nurses and physicians. The study documented the effect of formal training on HH knowledge. The study revealed differences in rates of formal training by profession and gender.

Similar gaps in HH knowledge were discovered among HCWs during Hajj. The performance of nurses was better than physicians.^[16]

Several reports in Saudi Arabia reported the effectiveness of structured intervention program to increase HH compliance.^[10,17] A study in Saudi Arabia showed that lack of knowledge is a strong determinant of poor HH performance and education by itself is a key constituent of effective HH campaign.^[14]

Improving HH compliance of HCWs in primary health care centers can be achieved through behavioral approach.^[18] It was suggested that participatory decision making and efforts to reach consensus would help enhance staff compliance to newly introduced HH requirement.^[19] Thus, appreciating the motivations to adapt a particular behavior is an important step to design appropriate strategies and to set goals. These goals should be measurable and attainable. In many instances, these goals require a system change that would facilitate easy access to HH products, promote and facilitate skin care for HCWs and introduce regular monitoring and feedback of HH compliance.

Executive and middle management of any organization should also strive to engage HCWs into active participation for HH promotion.^[19]

To promote HH in health care setting, WHO suggested a bundle of multimodal strategies. The components are system change; training/education; evaluation and feedback; reminders in the workplace; and institutional safety climate. Changes in HH compliance after a multimodal intervention among health-care workers were successfully reported in the region.^[20]

Conclusion

The present study revealed gaps in HCWs knowledge regarding HH. It is recommended that primary health care administration in Abha health district should adopt WHO multimodal strategy to promote HH at primary health care settings. In addition, behavioral tactics such as accountability, motivation, and sanctions are needed to encourage HCWs to participate more in the program.

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Conflicts of interest

There are no conflicts of interest.

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