

KNOWLEDGE AND PRACTICES OF HEALTHCARE WORKERS TOWARDS INFECTION PREVENTION AND CONTROL

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ABSTRACT

Background: Healthcare professionals are the foundation of the healthcare system, and a proficient and physically fit staff is crucial during a health emergency. Healthcare professionals face an elevated risk of being exposed to and spreading healthcare-associated illnesses. Therefore, it is imperative for individuals to have a strong understanding and implementation of infection prevention and control measures in order to safeguard not just their own well-being, but also that of their coworkers, families, and the broader community. **Methodology:** This is a cross sectional study that included 200 participants and was conducted in Baghdad/Iraq. A questionnaire based interview was employed as the data collection method that consisted of distinctive parts evaluating each of knowledge and practice. **Results:** Among the study participants, 151 (75.5%) had good knowledge, and 105 (52.5%) had good practice. Being a medical doctor was significantly associated with higher awareness than other healthcare professions. **Conclusion:** According to the results of the current study, healthcare workers (HCWs) demonstrated adequate knowledge but only average practice of infection prevention and control measures. Infection prevention and control (IPC) training shown to be the most significant determinant of both knowledge and practice quality, as all healthcare workers who underwent IPC training demonstrated excellent knowledge and practices.

INTRODUCTION

Healthcare-associated infections (HAIs) are illnesses that are acquired in hospitals but are not present or developing at the time of a patient's admission. According to the World Health Organization (WHO), there are currently 1.4 million individuals worldwide who are experiencing the repercussions of Healthcare-Associated Infections (HAIs). Approximately 10% of hospitalised patients experience the adverse effects of Healthcare-Associated Infections (HAIs), according to estimates.^[1] Healthcare personnel have an elevated risk of acquiring and transmitting infectious illnesses, therefore jeopardizing their own well-being, the safety of their families, and the health of their patients. Inadequate infection prevention methods may have disastrous implications, resulting in epidemics in hospitals and communities and jeopardizing the entire efficacy of healthcare systems. Healthcare-associated infections may lead to a diminished quality of life and perhaps shorten the lifespan of the affected individual. Additionally, these illnesses might result in significant financial burdens

over time.^[2] The probability of acquiring healthcare-associated infections after a needlestick injury from a syringe contaminated by an infected patient was 0.3% for HIV, 3% for hepatitis C, and 6-30% for hepatitis B. Each year, about 3 million healthcare workers (HCWs) out of a worldwide total of 35 million are exposed to bloodborne pathogens (BBPs) by percutaneous methods. Out of these occurrences, 2 million are associated with HBV, 0.9 million with HCV, and 0.17 million with HIV.^[3]

HAIs are mostly caused by the contact and transfer of contaminated hand and medical equipment by healthcare workers (HCWs) who fail to adhere to hospital hygiene protocols. For instance, following the assessment or treatment of one patient, healthcare workers occasionally come into contact with another patient without adequately cleansing their hands.^[4] A prior investigation indicated that healthcare workers' adherence to hand hygiene standards is not ideal, with a compliance rate of around 30%. Fifteen Approximately 42% of COVID-19

infections in healthcare workers (HCWs) can be attributed to the improper utilization of personal protective equipment (PPE), including masks and gloves.^[5]

METHODS

This is a cross sectional study that included 200 participants and was conducted at health institutes of Al-Karkh Health Directorate/ Baghdad/ Iraq during the period 11/2/2024 to 13/6/2024. All healthcare workers were included in the study. A questionnaire based interview was employed as the data collection method. The questionnaire consisted of the following parts

1. Basic sociodemographic characteristics (age, gender, marital status, residence, and occupation).
2. The second part consisted of a total of 16 questions divided into two sections that collected information about general knowledge (8 questions), and practice (8 questions). Each correct answer was assigned a score of 1, whereas an incorrect answer was given a score of zero. Regarding rating, a total knowledge score of 4-8 was considered as good knowledge and practice, while a score of 0-3 was considered as poor knowledge and practice.

Statistical analysis

Analysis was conducted using statistical package for social sciences (SPSS version 26). Categorical variable were tested using Fischer’s exact test. Continuous variables were compared using independent sample t-test. A P value of less than or equal to 0.05 was assigned as a criterion for declaring statistical significance.

RESULTS

The age distribution of the studied sample ranged from 25-56 years old with a mean 47.3 ±10.2 SD. Regarding gender; the studied sample showed slight female predominance, as the female to male ratio was 1.7: 1. Regarding marital status, the majority (71%) were married. Concerning profession, 69 (34.5%) participants were medical doctors, 82 (41%) were nurses, and 49 (24.5%) were dentists. As for work experience; 71 (35.5%) had < 5 year work experience while 129 (64.5%) had >5 year experience. Only 70 (35.0%) received IPC training; as illustrated in table (1).

Table 1: Basic demographic and job characteristics of the studied sample.

Variable	Frequency	Percentage
Age		
25-35 years	51	25.5
36-45 years	69	34.5
>45 years	80	40.0
Gender		
Male	74	37.0
Female	126	63.0
Marital status		
Single	58	29.0
Married	142	71.0
Profession		
Medical doctor	69	34.5
Nurse	82	41.0
Dentist	49	24.5
Work experience		
<5 years	71	35.5
>5 years	129	64.5
Received IPC training		
Yes	70	35.0
No	130	65.0

Participant responses to the knowledge section are illustrated in table (2).

Table 2: Participant responses to the knowledge section.

Knowledge section	Frequency	Percentage
Ensure that all personal protective equipment (PPE) is taken off prior to exiting the patient's surroundings.		
Yes	140	70.0
No	60	30.0
Alcohol is used following the removal of gloves.		
Yes	185	92.5
No	15	7.5

Properly separating clinical and non-clinical waste is crucial in order to prevent the transmission of infections.		
Yes	149	74.5
No	51	25.5
Personal Protective Equipment (PPE) such as surgical masks and gowns can provide protection for the nose and mouth in situations when there is a high probability of blood and body fluids being splashed or sprayed.		
Yes	157	78.5
No	43	21.5
Hand hygiene following interaction with the patient's surroundings is a fundamental component of routine precautions.		
Yes	149	74.5
No	51	25.5
Prior to and following the handling of potentially infectious objects, hands should be thoroughly cleansed using soap and water, regardless of whether gloves are being worn.		
Yes	162	81.0
No	38	19.0
Telephones and doorknobs within the ward can serve as potential sources of infections.		
Yes	159	79.5
No	41	20.5
Patients who are coughing should wear a mask in order to prevent the spread of infectious respiratory secretions to other people.		
Yes	155	77.5
No	45	22.5

Participant responses to the practice section are illustrated in table (3).

Table 3: Participant responses to the practice section.

Practice questions	Frequency	Percentage
Do you cleanse your hands using soap and water after collecting a sample?		
Yes	117	58.5
No	83	41.5
Do you consistently dispose of sharp objects in a secure container?		
Yes	130	65.0
No	70	35.0
Do you consistently wear goggles to safeguard your eyes during procedures that produce a mist of blood or bodily fluids?		
Yes	125	62.5
No	75	37.5
Do you consistently adhere to proper gowning protocols for each procedure?		
Yes	129	64.5
No	71	35.5
Do you apply dressings to wounds and cuts on the skin prior to commencing work?		
Yes	118	59.0
No	82	41.0
Do you refrain from consuming food or beverages in your designated workspace?		
Yes	138	69.0
No	62	31.0
Have you received immunization for prevalent contagious illnesses?		
Yes	118	59.0
No	82	41.0
Is there a way to distinguish between infected and non-infectious waste?		
Yes	118	59.0
No	82	41.0

Regarding response rating; 151 (75.5%) participants had good knowledge while 49 (24.5%) had poor knowledge. Concerning practice, 105 (52.5%) showed good practice

while 95 (47.5%) had poor practice; as illustrated in figure (1).

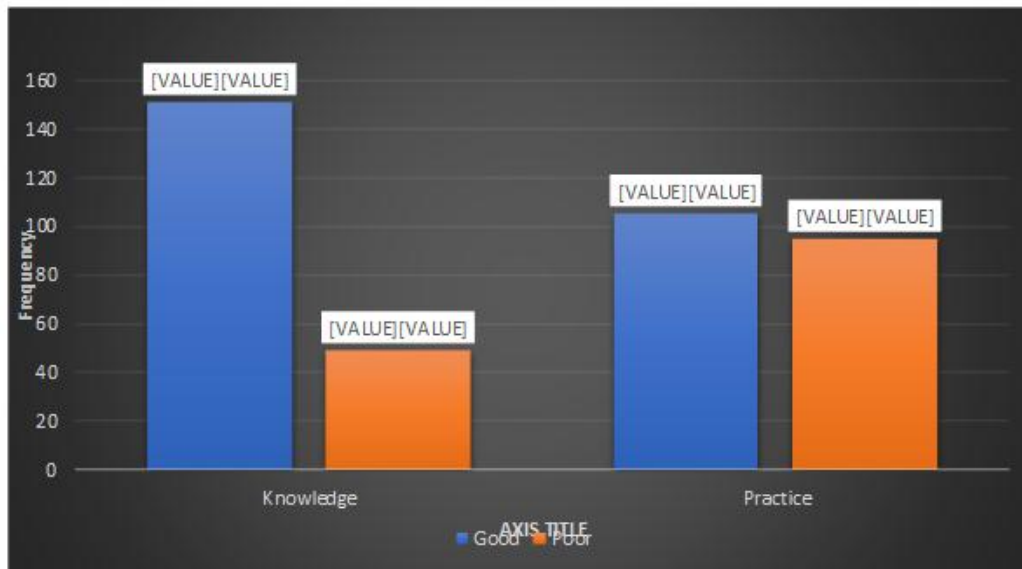


Figure 1: Rating of questionnaire sections.

Relationship between overall knowledge rating and basic characteristics

A statistically significant association was detected between overall knowledge rating and each of profession and receiving IPC training; as shown in table (4).

Table 4: Relationship between overall knowledge rating and basic characteristics.

Variable	Knowledge rating		P value
	Good	Poor	
Age			
25-35 years	38 74.5%	13 25.5%	0.378
36-45 years	56 81.2%	13 18.8%	
>45 years	57 71.3%	23 28.7%	
Gender			
Male	56 75.7%	18 24.3%	1.000
Female	95 75.4%	31 24.6%	
Marital status			
Single	23 39.7%	35 60.3%	0.164
Married	72 50.7%	70 49.3%	
Profession			
Physician	68 98.6%	1 1.4%	<0.001
Nurse	38 46.3%	44 53.7%	
Dentist	45 91.8%	4 8.2%	
Work experience			
<5 years	54 76.1%	17 23.9%	1.000
>5 years	97 75.2%	32 24.8%	

Received IPC training			
Yes	70	0	<0.001
	100.0%	0.0%	
No	81	49	
	62.3%	37.7%	

Relationship between overall practice rating and basic characteristics

A statistically significant association was detected between overall practice rating and each of profession and receiving IPC training; as shown in table (5).

Table 5: Relationship between overall practice rating and basic characteristics.

Variable	Practice rating		P value	
	Good	Poor		
Age				
25-35 years	23	28	0.292	
	45.1%	54.9%		
36-45 years	35	34		
	50.7%	49.3%		
>45 years	47	33		
	58.8%	41.3%		
Gender				
Male	47	27	0.019	
	63.5%	36.5%		
Female	58	68		
	46.0%	54.0%		
Marital status				
Single	21	37		0.005
	36.2%	63.8%		
Married	84	58		
	59.2%	40.8%		
Profession				
Physician	50	19	<0.001	
	72.5%	27.5%		
Nurse	31	51		
	37.8%	62.2%		
Dentist	24	25		
	49.0%	51.0%		
Work experience				
<5 years	31	40	0.076	
	43.7%	56.3%		
>5 years	74	55		
	57.4%	42.6%		
Received IPC training				
Yes	70	0		<0.001
	100.0%	0.0%		
No	81	49		
	62.3%	37.7%		

DISCUSSION

It has always been crucial to avoid HAIs by effectively using IPC principles. In order for healthcare workers to successfully avoid HAIs, it is essential that they have a solid grasp of pathogenic transmission, IPC procedures, and that they adhere to and use the relevant information and practice about IPC.

The current research demonstrated that around 75% of healthcare professionals have a high level of knowledge pertaining to infection control. An important knowledge gap was identified: 30% of individuals believed that it was unnecessary to remove all personal protective equipment upon leaving the patient. The research done by Radarishkan et al. revealed that 89.5% of HCWs had a significant degree of expertise. More precisely, 97.4%

of the participants concurred that it is crucial to wash hands after being in touch with the patient's surroundings as a fundamental aspect of standard precaution. Similarly, 81.6% of the participants expressed their approval for using an alcohol-based hand massager after removing gloves, while 97.4% agreed that hands should be washed with soap and water both before and after touching infectious things, regardless of whether gloves are used.^[6]

Our study also found that medical doctors possessed much higher knowledge compared to nurses. These findings align with the research conducted by Khatrawi *et al.*, which similarly shown that medical practitioners had the highest knowledge scores.^[7] The study by (Binsaleh *et al.*) in Saudi Arabia who found that general physicians scored better in terms of wearing protective measures than technicians, nurses, pharmacists, and other healthcare workers.^[8] This can be linked to the fact that doctors receive more comprehensive education that delves deeper into the study of infectious diseases.

Unfortunately, our study showed that only half of HCWs adhered to good practice. This is in concordance with Assefa *et al.*'s study in Northeast Ethiopia, who reported that 55% HCWs were found to have safe infection prevention procedures.^[9]

Furthermore, the study demonstrated that being female and married were correlated with exhibiting good practice. This can be attributed to the fact that married women are cautious in order to prevent the transmission of infectious diseases to their offspring.

Contrary to expectations, our study revealed that work experience did not predict either knowledge or practice. This finding contradicts other research, such as the one conducted by Khatrawi *et al.*, which found that HCWs with more years of experience are three times more inclined to participate in infection control activities compared to those with less experience.^[7]

The most important finding in the present study is that all HCWs who received IPC training achieved good knowledge and practices. Unfortunately, only 35% received IPC training. While in the study by (Abri *et al.*), 70.3% stated to have received proper training at least once.^[10] This discovery indicates a deficiency in the Iraqi healthcare system, which, if rectified, could result in improved infection control outcomes. According to the World Health Organization (WHO), education and training on infection prevention and control (IPC) procedures are essential for monitoring readiness and response during a pandemic. Training of this nature should be compulsory for all healthcare workers, irrespective of their position, function, or level. This should encompass comprehensive training for new employees and ongoing education opportunities for current staff.

CONCLUSION

According to the results of the current study, healthcare workers (HCWs) demonstrated adequate knowledge but only average practice of infection prevention and control measures. IPC training shown to be the most significant determinant of both knowledge and practice quality, as all healthcare workers who underwent IPC training demonstrated excellent knowledge and practices.

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