

Perceptions and attitudes of inpatients toward infection control measures in Erbil public hospitals

Received: 02/08/2022

Accepted: 29/09/2022

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Abstract

Background and objective: Infection control refers to the measures taken in hospitals and other healthcare facilities to limit and control infections. The primary purpose of infection control is to reduce infection rates. Inpatients must have a perception and attitude about healthcare-associated infections. The aim of this study was to determine the perceptions and attitudes of inpatients and their related factors regarding infection control measures in Erbil public hospitals.

Methods: This cross-sectional study was carried out in Erbil public hospitals from September 1st, 2021, to September 1st, 2022). It included 400 patients admitted for different reasons in Rizgary Teaching Hospital, Erbil Teaching Hospital, and Maternity Teaching Hospital. Data were collected during the period (December 15th, 2021) to (March 29th, 2022). Data was gathered through a direct interview using the questionnaire format.

Results: The highest percentage of inpatients were females (67.8%), and 60.3% had sufficient income. A high number of inpatients (43.5%) were admitted to the Rizgary teaching hospital. More than half (52.5%) of the inpatients believed they would get an infection if admitted to the hospital. Concerning being aware of healthcare-associated infections, only 16.0% of inpatients were aware of healthcare-associated infections. Most (83.0%) of the inpatients thought that hand washing reduced the chance of infection.

Conclusion: The present study indicated that the perceptions and attitudes of inpatients regarding infection control issues in hospitals are low; accordingly, more efforts are needed to empower patients about infection control measures in hospitals.

Keywords: Infection; Nosocomial infection; Perception; Attitude; Hygiene.

Introduction

Infection is the invasion of a host organism's bodily tissues by disease-causing organisms, their multiplication, and the reaction of host tissues to these organisms and the toxins they produce. Microorganisms such as viruses, bacteria, and larger organisms like parasites and fungi are what cause infections.¹

Transmission of the infectious agent occurs from the reservoir through a portal of exit to a susceptible host. This may lead to an infection and the development of a disease. Transmission of pathogens could be via contact by air (airborne), carried on common vehicles (e.g., water, food), or

by a vector (vector-borne).² Infections are usually caused by different microorganisms like bacteria, viruses, parasites, and fungi.³ Any disease that patients under medical care contract is known as a nosocomial infection (NI). It is an infection acquired by patients during their hospital stay. Recently, a new term, "healthcare-associated infections," was used for the type of infections caused by a prolonged hospital stay, and it accounts for a major risk factor for serious health issues leading to death.⁴ Nosocomial infections account for 7% in developed countries and 10% in developing countries.⁵ Healthcare-associated infections (HAIs) appear 48

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hours or more after hospitalization or within 30 days after having received health care.⁶ When these infections occur during hospital stays, they may lead to long-term patient hospitalization, mortality, disability, and a negative economic consequence. Moreover, these infections more commonly include central line-associated bloodstream infections, catheter-associated urinary tract infections, surgical site infections, and ventilator-associated pneumonia.⁵

Inpatients must have a good perception and attitude about healthcare-associated infections because this will help them in the prevention of healthcare-associated infections.² The aim of infection control in hospitals is to prevent the spread of infection to inpatients, healthcare workers, and visitors. The components of an infection program include the clinical environment,⁷ decontamination of patient care items, and isolation measures, which are the two most crucial ideas to grasp when it comes to infection control.⁸ Also, education and training of health care workers, protection of health care workers, antibiotic usage, management of blood and body fluid exposure, handling of blood and blood products, and hospital waste management are ways of controlling the infection.⁹ Finally, the infection can be controlled from patients to patients, hospital staff to patients, and patients to hospital staff via standard procedures.¹⁰

Accordingly, this study was conducted with the aim of determining the perceptions and attitudes of inpatients and their associated factors regarding infection control measures in Erbil public hospitals.

Methods

This cross-sectional study was carried out from September 2021 through July 2022. This study included 400 inpatients because we chose a confidence level of 95%, a population size of 2000000, and a margin of error of 5%. The inpatients were admitted for different reasons at Rizgary Teaching Hospital, Erbil Teaching Hospital, and Maternity Teaching Hospital.

The researcher was responsible for creating the questionnaire. Our questionnaire was reviewed by eight experts, and the reliability of the questionnaire was 0.90. The first section focused on the socio-demographic characteristics of the patients, including age, gender, marital status, residency, family income, education level, occupation, time of admission, and type of ward.

The second section of the inpatients' perceptions regarding infection control questionnaire included: inpatient thinking about getting an infection when admitted; inpatient awareness of healthcare-associated infection; inpatient perceptions regarding hand hygiene and hand washing; inpatient perceptions regarding wearing the PPE by the nurse and doctors before touching them; and inpatient perceptions regarding waste management and using the bin for waste. The third section, the inpatients' attitudes regarding infection control questionnaire, included how inpatients usually wash or clean their hands, cover their mouths when sneezing and coughing, ideas about cleaning wards by workers, inpatients' ideas about factors that cause nosocomial infection, and inpatients ideas about safe disposal of biomedical waste management and their risk of transmitting infectious diseases. The fourth section, Overall, describes how you rate the infection control measures in the hospital, including washing hands by the HCWs before touching patients, using PPE by HCWs, especially gloves and masks, clean instruments and supplies, inpatient room cleanliness, and the overall hospital environment. After doing a pilot study, those who participated in the pilot were excluded from the study. This study included all the admitted patients to the hospitals, excluding children and tired patients.

After having the nature and aim of the study described to them, all of the participants were informed of the voluntary nature of participation as well as the anonymity and confidentiality of any

information supplied. Using a specially created questionnaire, the researcher conducted a direct patient interview to gather data. After the collection of all the responses, the data were entered into the Statistical Package for Social Science (SPSS, version 23), and then the data was coded and analyzed using tables and figures. The Chi-square and Fischer's exact tests were used to find an association between different variables, and statistical significance was set at $P < 0.05$. The study was approved by the Department of Community Medicine at the College of Medicine at Hawler Medical University.

Results

In this cross-sectional study, 400 inpatients

were enrolled. 51.2% of the inpatients were less than ≤ 40 years old, and the rest (48.8%) were more than >40 years old, with a mean \pm SD of 42.5800 ± 16.59313 years. Regarding the gender of the inpatients, 67.8% were females compared to 32.3% males, with a female-to-male ratio of 2.1:1. The majority (85.8%) of the inpatients married in compression to singles (14.2%). In terms of monthly family income, 60.3% had sufficient income, while 34.3% had less than sufficient income, and only 5.5% had more than sufficient income. More details of the sociodemographic characteristics of the inpatients are shown in Table 1.

Table 1 Sociodemographic characteristics of the inpatients (N= 400).

Variables	Frequency	Percentage (%)
Age groups		
<u>≤ 40 years</u>	205	(51.2)
>40 years	195	(48.8)
Gender		
Male	129	(32.3)
Female	271	(67.8)
Marital state		
Single	57	(14.2)
Married	343	(85.8)
Monthly family income		
Insufficient	137	(34.3)
Sufficient	241	(60.3)
More than sufficient	22	(5.5)
Residency		
Urban	322	(80.5)
Rural	78	(19.5)
Educational status		
Illiterate	106	(26.5)
Read and write/Primary	124	(31.0)
Intermediate stage	71	17.8)
Secondary school	47	(11.8)
Graduates	52	(13.0)

In terms of occupation, 57.3% of the patients were housewives, 18.8% of them were public sector employees, and 24% were private-sector employees, (Figure 1). Regarding the proportion of inpatients admitted to the hospitals, less than half of

the inpatients (43.5%) were admitted to the Rizgary teaching hospital, 29.0%, and 27.5% were admitted to the Erbil teaching and maternity teaching hospitals, respectively (Figure 2).

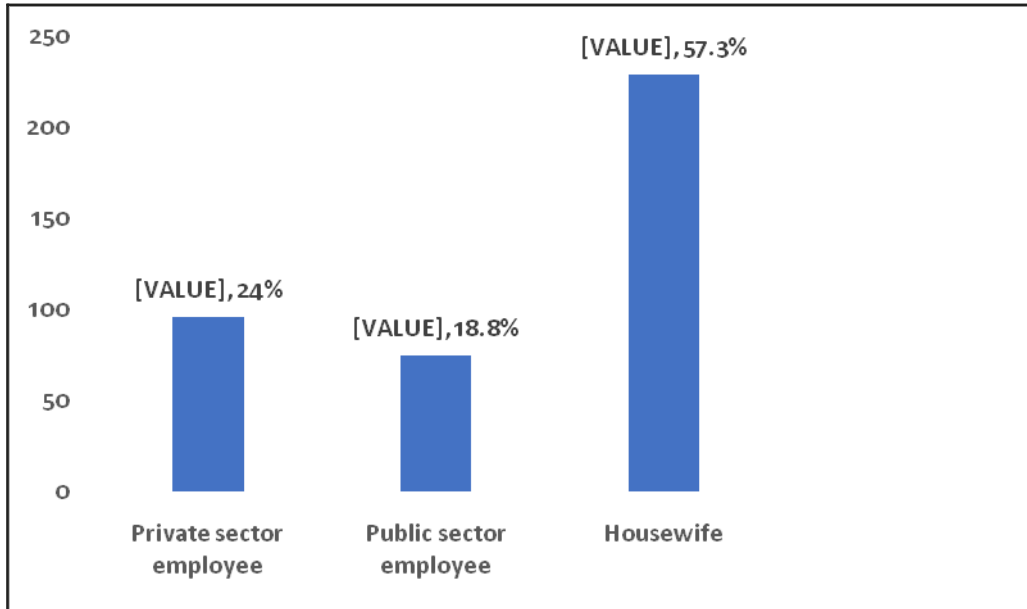


Figure 1 The occupation of the inpatients.

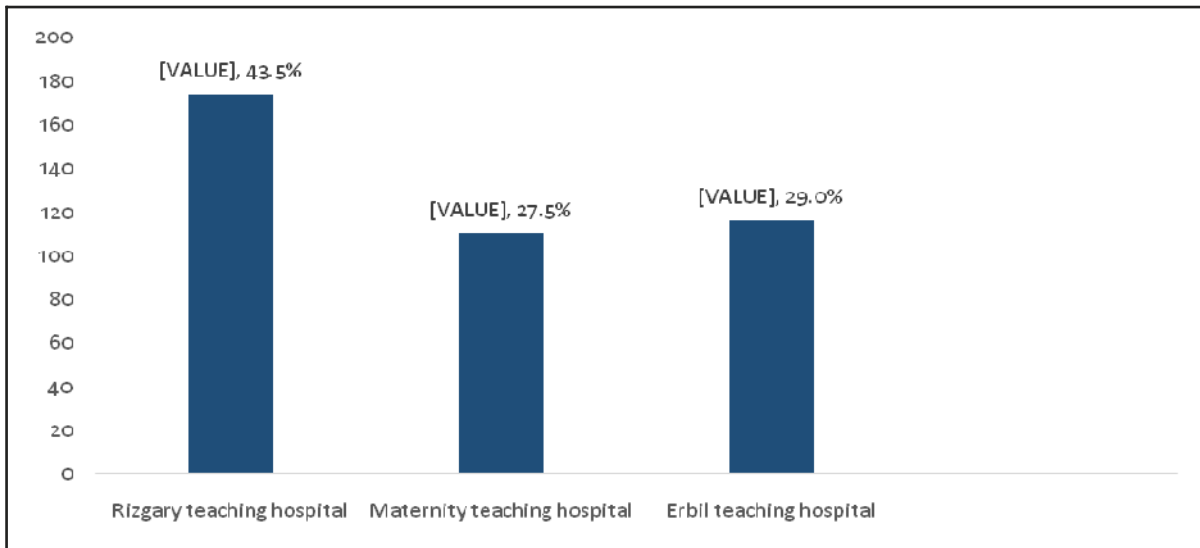


Figure 2 Distribution of the inpatients by the hospitals.

Regarding the inpatients' perceptions towards infection control, more than half (52.5%) believed they would get an infection if admitted to the hospital, while less than half (47.5%) believed they would not get an infection if admitted to the hospital. Concerning being aware of healthcare-associated infections, only 16.0% of inpatients were aware of healthcare-associated infections, while the

others were not (Table 2). Concerning reasons for hospital admission, 37.3% of the inpatients were admitted because of multiple reasons: 13.8% because of delivery, 10% because of cardiovascular and other circulatory problems, 18.5% because of renal problems, 8.5% because of cancer, and 12% of them admitted because of different infections (Figure 3).

Table 2 Perceptions of the inpatients (N=400) toward infection control.

Variables	Frequency	Percentage (%)
Do inpatients think you may get infections when admit to the hospital?		
Yes	210	(52.5)
No	190	(47.5)
Do inpatients aware of healthcare-associated infection?		
Yes	64	(16.0)
No	336	(84.0)

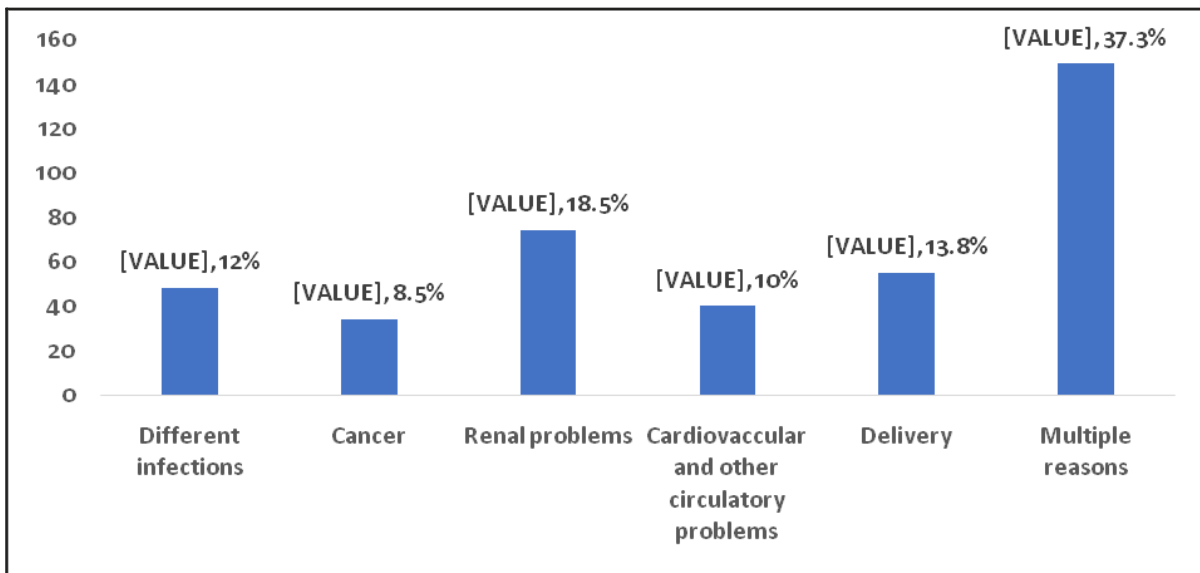


Figure 3 The reasons behind inpatient admission.

Regarding the inpatients' ideas about whether the toilets in hospitals are clean, 49.8% of the inpatients said the toilets in hospitals are clean, and 37.8% said the toilets in hospitals are not clean (Figure 4). Concerning inpatients' rooms, 59.8 said it was very good, 29.8 said it was good, and 10.5 said it was bad. About hospital environments, more than half (63.5%) said it was very good, 28.0% status that it

was good and only 8.5% status that it was bad (Table 3).

Association of education level to the perception of the inpatients:

There was a statistically significant association between inpatients' education level and their perceptions, and their awareness of healthcare-associated infections ($P = 0.001$), (Table 4).

Table 3 Inpatients' (N=400) overall evaluation of the infection control measures in the hospitals.

Variables	Frequency	Percentage (%)
Inpatients room cleanliness		
Very good	239	(59.8)
Good	119	(29.8)
Bad	42	(10.5)
The overall hospital environment		
Very good	254	(63.5)
Good	112	(28.0)
Bad	34	(8.5)

Table 4 Association of the education level of the inpatients to their awareness of healthcare-associated infections.

Variables	Do inpatients aware of healthcare-associated infection?			P-value
	Yes No. (%)	No No. (%)	Total** No. (%)	
Education level of inpatients				
Illiterate	4 (3.8)	102 (96.2)	106 (26.5)	0.001***
Read and write/ Primary stage	10 (8.1)	114 (91.9)	124 (31.0)	
Intermediate stage	14 (19.7)	57 (80.3)	71 (17.8)	
Secondary school	14 (29.8)	33 (70.2)	47 (11.8)	
Graduates *	22 (42.3)	30 (57.7)	52 (13.0)	
Total	64 (16.0)	336 (84.0)	400 (100.0)	

*:Including graduates from the institute, college and postgraduates. **:Column percentage. ***: Chi-Square Test

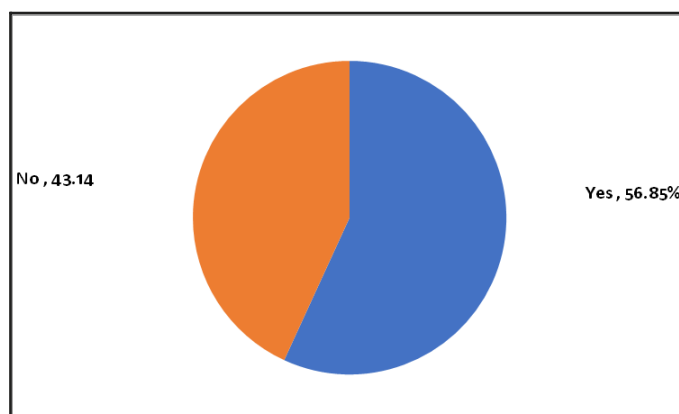


Figure 4 The inpatients thinking about the cleanliness of the toilets.

Association between the educational level of the inpatients to the perception of inpatients:

There was a significant statistical association ($P = 0.035$) between the educational level of the inpatients to their perception regarding hand hygiene/ hand washing that could reduce the chance of getting an infection (Table 5).

Association of education level to the attitude of the inpatients:

There was a statistically significant association between inpatients' education level and the use of hand cleaners for washing their hands and covering their mouths when coughing and sneezing ($P = 0.009, 0.028$, respectively) (Table 6).

Discussion

In this study, around two-thirds of the inpatients were female. In a cross-sectional study in Eastern Ethiopia, a total of 394 medically reported patients for nosocomial infection were included in this study. More than half of the study participants were female (56.6%). The higher number of female inpatients could be due to the fact that women are less energetic than men in some activities, and they could be more vulnerable to certain medical conditions that necessitate hospital admission. However, in the ICUs of Alzahra Hospital,

Isfahan-Iran 65.6% were males.¹² In another study on COVID-19 patients, performed on 1240 patients in the ICUs of IKCH, 58.9% of the participants were males.¹³ In these two results, the higher number of inpatients were males because males tend to have higher all-cause admission rates as well as higher rates of admission for the most acute and life-threatening diseases.

In this study, the results showed that just 13.0% of inpatients were graduates of colleges. A descriptive cross-sectional survey was conducted to evaluate the Nigerian patients' perceptions of infection control measures in the Periodontal Clinic of the University of Benin teaching hospitals, Nigeria. The majority (80.5%) of the respondents were at the tertiary level, and the rest (14.3%) were at the secondary level; 3.7% were in primary; 1.5% were informal; and no one was at the graduate level.¹⁴ Due to higher self-reported health and lower rates of illness, death, and disability, people with higher levels of education have better health, which explains why the percentage of college inpatients was low. Low educational attainment is thereby linked to self-reported bad health, a shorter life expectancy, and a worse chance of survival when unwell.

Table 5 Association between the educational level of the inpatients to their perception regarding hand hygiene/ hand washing.

Variables	Hand hygiene/ hand washing can reduce the chance of getting an infection?			P-value
	Yes No. (%)	No No. (%)	Total No. (%)	
Educational Status				
Illiterate	82 (77.4)	24 (22.6)	106 (26.5)	0.035*
Read and write/primary	99 (79.8)	25 (20.2)	124 (31.0)	
Intermediate stage	60 (84.5)	11 (15.5)	71(17.75)	
Secondary school	41 (87.2)	6 (12.8)	47 (11.75)	
Graduates	50 (96.2)	2 (3.8)	52 (13.0)	
Total	332 (83.0)	68 (17.0)	400 (100.0)	

*: Chi-Square Test

Table 6 Association of education level to the attitude of the inpatients.

Variables	Education level of inpatients					Total No. (%)	P- value
	illiterate No. (%)	Read and write/ Primary stage No. (%)	Intermediate stage No. (%)	Secondary school No. (%)	Graduates No. (%)		
How do you usually wash or clean your hands?							
Wash with running water	2 (1.9)	4 (3.2)	4 (5.6)	0 (0.0)	0 (0.0)	10 (2.5)	0.009*
Wash with running water and bar soap	55 (51.9)	54 (43.5)	27 (38.0)	18 (38.3)	14 (26.9)	168 (42.0)	
Wash with running water and hand washing liquid	18 (17.0)	22 (17.7)	9 (12.7)	5 (10.6)	3 (5.8)	57 (14.25)	
Clean with skin disinfectant	10 (9.4)	22 (17.7)	12 (16.9)	11 (23.4)	10 (19.2)	65 (16.25)	
Wash with bar soap and hand washing liquid	10 (9.4)	10 (8.1)	5 (7.0)	4 (8.5)	8 (15.4)	37 (9.25)	
Wash with bar soap, hand washing liquid, and clean with skin disinfectant	3 (2.8)	1 (0.8)	5 (7.0)	5 (10.6)	7 (13.5)	21 (5.25)	
Wash with bar soap and clean with skin disinfectant	5 (4.7)	7 (5.6)	6 (8.5)	1 (2.1)	4 (7.7)	23 (5.75)	
Wash with hand washing liquid and clean with skin disinfectant	3 (2.8)	4 (3.2)	3 (4.2)	3 (6.4)	6 (11.5)	19 (4.75)	
When you sneeze and cough in the ward, do you cover your mouth and nose?							
Never	25 (23.6)	27 (21.8)	13 (18.3)	11 (23.4)	8 (15.4)	84 (21.0)	0.028
Sometimes	47 (44.3)	76 (61.3)	37 (52.1)	23 (48.9)	21 (40.4)	204 (51.0)	
Every time	34 (32.1)	21 (16.9)	21 (29.6)	13 (27.7)	23 (44.2)	112 (28.0)	
Total	106 (26.5)	124 (31.0)	71 (17.75)	47 (11.75)	52 (13.0)	400 (100.0)	

We found that more than half (52.5%) believed they would get an infection if admitted to the hospital. In a study in the central regional hospital in Ghana, 44.8% of inpatients said they had come to the hospital with a particular illness but felt they had gotten another illness or infection after leaving the hospital.¹⁵

The percentages were high, and the participants believed they would become infected if admitted to the hospital. Patients do not have more awareness of how to avoid infection and always feel that if they visit a hospital, they may get the infection.

In the present study, concerning healthcare-associated infections, only 16.0% of inpatients were aware of healthcare-associated infections. In a study involving 65 inpatients from various surgery departments about their knowledge and thoughts about nosocomial infection, only 26%.

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In the present study, concerning healthcare-associated infections, only 16.0% of inpatients were aware of healthcare-associated infections. In a study involving 65 inpatients from various surgery departments about their knowledge and thoughts about nosocomial infections, only 26% were able to describe nosocomial infections as infections acquired in hospitals.¹⁶ This similarity could be due to the low educational level of the inpatients and the lack of patient awareness programs when they are admitted to hospitals.

However, in a pilot study about patients' perceptions of hospital-acquired infections in Australian hospitals, they reported having enough information (70.6%) and understanding (80.4%) about HAIs.¹⁷ This difference could be due to better patient education and better infection control practices.

In this study, only 12% of inpatients were admitted because of different infections, and others were admitted for multiple reasons. In a study that was carried out in eight university hospitals in Shiraz, Iran, the prevalence of nosocomial infections was 9.4%.¹⁸ The percentage of nosocomial infections is low in our community because of underreporting and a lack of systems of data reporting and analysis.

In a cross-sectional study in Erbil governorate, a minority of patients were satisfied with hand washing or wearing gloves by doctors (18.2%) and nurses (19.2%).¹⁹ This difference could be due to better patient awareness, especially after the COVID-19 outbreak, and the implementation of better infection control principles at different health levels.

The results of the current study showed that in clean rooms, more than half (59.8%) of inpatients said it was very good, 29.8% said it was good, and 10.5% said it was bad. In another study in Erbil, regarding the cleanliness of the wards and rooms of inpatients, 78.1% of patients were satisfied and 21.9% were not satisfied.¹⁹ This similarity could be due to the better application of infection control measures, especially after the COVID-19 pandemic, since hospitals do more work for cleaning and decontamination.

This study showed that around two-thirds of inpatients (63.5%) stated that the rate of infection control measures about the overall environment in the hospitals was very good; 28.0% said that it was good, and only 8.5% said that it was very bad. In a study in a regional hospital in Ghana, 53.3% of patients considered the hospital clean.¹⁵ The results are similar, and in both of those, the percentage of clean rooms was high. This could be due to the involvement of cleaning companies in Kurdistan's hospitals, housekeeping, or other governmental offices working hard to clean the hospital environment.

In our study, there was a statistically significant association between inpatients' education level and their perceptions of

their awareness of healthcare-associated infections in hospitals. Also, in a study in India, participants' educational level was significantly associated with their level of knowledge about dental infection.²⁰

Conclusion

The present study indicated that the perceptions and attitudes of inpatients regarding infection control issues in hospitals are low. A low proportion of inpatients were aware of healthcare-associated infections and medical waste management. There was a significant statistical association between the educational level of the inpatients and their perceptions regarding hand hygiene, awareness of healthcare-associated infections, and using bins for waste.

Funding

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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