

RESEARCH ARTICLE

Assessment of Nurses' Knowledge Attitude and Practice regarding Infection Controls in Intensive Care Unit at Hospitals in Kirkuk City-Iraq

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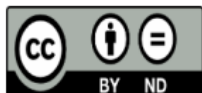
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ABSTRACT

Infection control are the cornerstone of infection prevention and control programs, especially healthcare-associated infection (HCAI), because of their importance in reducing mortality and morbidity for patients, protecting health care workers, reducing the financial burden for both the patient and health care facilities, as well as reducing the period of hospitalization of patients. The study's objective is to assess the nurse's knowledge, Attitude and practice regarding Infection Controls in Intensive Care Unit. A Quantitative(descriptive and observational) design are used in the current study, A nonprobability (convenient) sample of 68 nurses were participated from Intensive Care units, at Azadi Teaching , Kirkuk General and Maternity, Pediatric and Gynecology Hospital in Kirkuk city. The present study shows that Most of the participants were 25-29 years old, male, single, bachelors' science of nursing degree, 1-2 years of experience in intensive care unit and not received any training course about infection control. The nurses had good levels of knowledge about infection control (95%), attitude (78.57%) and practice (66.67%). There were a significant differences between mean of nurses' knowledge about infection control and years of experience ($p=0.013$) and between nurses practice and who exposed to infection while working ($p=0.027$). But no significant differences were found between nurse's attitude and all other socio-demographic variables. Continuing education, training and providing scientific booklet and publication about the infection control in intensive care unit are also recommended.

Keywords: Nurses, Knowledge, Attitude, Practice, Infection control



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Received: 17 June 2022, Accepted: 31 August 2022, Available online: on 28 January 2023

INTRODUCTION

Infection control and prevention are essential in preventing and decreasing germs that cause harm to patients, health care workers (HCWs), and society world in general. It's a scientific approach and a practical solution based on pathology, epidemiology, and health-system reinforcement. Infection control occupies a unique place in the global health system because it promotes patient safety, prevents complications, and reduces country health-care costs. (World Health Organization [WHO], 2020a).

Infection control measures are the base of infection control and prevention strategies, and they apply to everyone, regardless of their potential or actual infectious condition. Hand hygiene, personal protective equipment (PPE) (e.g., gloves, gowns, and face masks), respiratory hygiene and cough etiquette, safe injection procedures, medical waste management, and cleaning, disinfection, and sterilization of patient care equipment are among these strategies. These measures are the first line way to prevent infection in health-care facilities, and they are used as a primary method for limiting infection spread. Infection control procedures limit the risk of pathogen transmission from one individual or area to another, even in high-risk conditions, and keep things and places as free of infectious agents as possible. (National Health & Medical Research Council [NHMRC], 2019).

Healthcare-associated infections cause many of problems for patients, including increased complications, prolonged hospital stays, death, and increased financial costs for both patients and the health-care system. As a result, HCWs should have a more knowledgeable about HCAs and develop infection control strategies, which will help to reduce and prevent many of these problems. (Coffin & Zaoutis, 2008).

Nosocomial infections are a significant challenge for health-care systems, especially for people with serious diseases and weak immune systems, because therapeutic contexts, especially those that rely on interventions, increase complications, deaths, and long stays in intensive care units (ICUs), as well as financial costs. Preventing and controlling HCAs in ICUs is essential for reducing cost, improving patient outcomes, and protecting all health care staff. (Malaysian Society of Anesthesiologists, 2015).

Hospital Acquired Infections (HAIs) are one of the most difficult challenges globally. HAIs are considered the most common harmful events during provide health care services. Globally Millions of peoples are influenced by NIs every year, which lead to increase death-rate,

morbidity, length hospital stay, and financial costs for patients and health care systems (Varshney et al., 2014).

Due to their critical health condition or status associated with impaired immunity; length of hospital stay; frequent invasive procedures that penetrate the body's defenses mechanism and monitoring procedures; frequent use of antibiotics, which leads to multidrug-resistant pathogens; and risks of aseptic mistakes, patients admitted to ICUs are the most vulnerable to HCAs. All of these factors raise the risk of HCAs. (Mahfouz et al., 2013)

METHOD

A quantitative (descriptive and observational) design was carried out in the present study which was conducted from 7 February to 25 August 2022. The study was carried out on the nursing staff at the intensive care unit /Azadi Teaching, Kirkuk General and Maternity, Pediatric and Gynecology Hospital.in Kirkuk City. A non-probability (purposive) sampling technique was utilized to collect data from (68) nurses working in intensive care unit in Kirkuk city Hospitals. They were selected according to the following criteria which included both gender, Nurses who agree to participate in the study, Nurses who participate in the pilot study and nurses who work morning shifts and night shifts. And the exclusion criteria of the study included: Nurses who refuse to participate in the study, and Nurse's experience is less than one year, Nurses who were not in position to give information due sickness or in leave at the time of interviews.. The study instrument was constructed depending on achievement of the objectives of the study, different tools were formulated. We developed our KAP questions on infection control based on the guidelines of the CDC (2020) and WHO (2020b). It is a questionnaire format for the research purpose and composed of five parts and these parts are:

Part one: Socio-demographic data of nurses

Part two: Assessment of nurses' knowledge regarding infection control.

Part three: Assessment of nurses' attitude regarding infection control

Part four: Assessment of nurses' practice regarding infection control

The data summarized and analyzed through using application statistical package for social science (SPSS) version 22 and the following procedures used in Data Analysis: Descriptive and inferential statistical Data Analysis.

RESULTS

Part one: Distribution of Socio-demographic characteristics of the nurses:

Table (1) shows More than half of the nurses were male (55.9%) while the female nurses percentage were (44.1%) of these sample and Age Group that most of studied respondent were focused at the second and first age group (i.e. 20_29) years, since they accounted 55(80.88%) by mean of high significant different at $P < 0.01$ among different age group, with regard to educational level, the College of Nursing Graduate high percentage and constitute 67(98.5%) respectively. About married subjects are accounted 39(57.4%), and single marital status were formed the leftover 29(42.6%) with no significant different at $P > 0.05$ According to experience in intensive care unit the more than half (64.7%) of the sample had experience between (1- 2) years and second rank represent (14.7%) of the sample were (3-4). Also the result shows Exposed to infection while working that half of the sample respondent were answer positively 34(50%). Finally, the result appear Less than half of sample 28(41.2%) were attending training course on infection control while 40(58.8%) of the samples were not attending.

Part two: Nurses' level of knowledge regarding infection control items

Table (2) shows data about nurses' Knowledge related to infection control at intensive care unit. The most of nurses' Knowledge accounted 19(95.0%) items were high mean scores.

Part three: Nurses' level of Attitudes regarding infection control items.

Table (3) shows data about nurses' Attitudes related to infection control at intensive care unit. Results observed responses of high evaluated generally assigned, and they are accounted 11(78.57%) items, while leftover items were an assigned at moderate evaluation are 2(14.29%), and low evaluation 1(7.14%).

Part three: Nurses' practice regarding infection control items.

Table (4) shows result of nurses' practice regarding infection control. Results that observed responses of high evaluated generally assigned, and they are accounted 7(46.69%) items, while leftover items were an assigned at low evaluation are 5(33.35%), and moderate evaluation 3(20%)

Part four: Relationships of nurses "Knowledge, Attitude and Practices" and their (SDCv.) and some related variables

Table (5) Results shows that significant levels in contrast of Nurse's Knowledge or Attitudes, observing that weak relationships are accounted, except between Knowledge "Work Experience per Years in intensive care unit and knowledge .", since significant relationship are accounted at $P < 0.05$. With respect to "Practices" observing that weak relationships due to the non-significant level except between "Exposed to infection while working, and Hospitals", since significant relationships were accounted at $P < 0.05$.

Table 1. Distribution of Socio-demographic characteristics of the nurses with comparisons significant.

SDCv. and some related variables	Classes	No	%	C.S. (*) P-value
Gender	Male	38	55.9	P=0.396 (NS)
	Female	30	44.1	
Age Groups	20 _ 24	17	25	$\chi^2 = 39.647$ P=0.000 (HS)
	25 _ 29	38	55.9	
	30 _ 34	9	13.2	
	35 _ 39	4	5.9	
	Mean \pm SD	26.69 \pm 3.25		
Educational level	Bachelor of Nursing Science	67	98.5	P=0.000 (HS)
	Higher Degree of Nursing Science	1	1.5	
Marital Status	Single	29	42.6	P=0.275 (NS)

	Married	39	57.4	
Work Experience Years in intensive care unit	1 _ 2	44	64.7	$\chi^2 = 57.529$ P=0.000 (HS)
	3 _ 4	10	14.7	
	5 _ 6	7	10.3	
	> 7	7	10.3	
	Mean \pm SD	2.69 \pm 2.84		
Exposed to infection while working	No	34	50	P=1.000 (NS)
	Yes	34	50	
Received training course on infection control	No	40	58.8	P=0.182 (NS)
	Yes	28	41.2	

⁽¹⁾ HS: Highly Sig. at P<0.01; Testing based on One-Sample Chi-Square test, and Binomial test.

Table 2. Nurses' knowledge regarding infection control items.

Knowledge Items	Resp.	No.	%	MS	SD	RS%	Eva.
1. Infection control measures are used for the care of all patients regardless of their diagnosis and perceived infection status. (Yes)	No	11	16.2	0.84	0.37	84	H
	Yes	57	83.8				
2. Isolation precaution is one of the elements in infection control measures. (Yes)	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
3. Washing hands after contact with the patient's environment is one of the elements in infection control measures. (Yes)	No	3	4.4	0.96	0.21	96	H
	Yes	65	95.6				
4. Alcohol-based rubs are used after removing gloves. (Yes)	No	6	8.8	0.91	0.29	91	H
	Yes	62	91.2				
5. Performing hand hygiene is required before and after patient care (Yes)	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
6. Hands should be washed with soap and water before and after handling potentially infectious materials irrespective of wearing gloves. (Yes)	No	9	13.2	0.87	0.34	87	H
	Yes	59	86.8				
7. Personal protective equipment (PPE) is important in infection control because it acts as a barrier between infectious materials such as viral and bacterial contaminants and your skin, mouth, nose, or eyes (mucous membranes). (Yes)	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
8. Gloves must be worn every time during handling potentially infectious materials. (Yes)	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
9. Gloves must be changed during patient care if you move hands from 'contaminated body site' to 'clean body site'. (Yes)	No	2	2.9	0.97	0.17	97	H

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	Yes	66	97.1				
10. Surgical masks can protect the nose and mouth when procedures and activities are likely to generate splashes or sprays of blood and body fluids. (Yes)	No	3	4.4	0.96	0.21	96	H
	Yes	65	95.6				
11. The purpose of using a gown or apron is to protect clothes from splashes or sprays of blood and body fluids. (Yes)	No	3	4.4	0.96	0.21	96	H
	Yes	65	95.6				
12. Removed all personal protective equipment (PPE) before leaving the patient's environment. (Yes)	No	16	23.5	0.76	0.43	76	H
	Yes	52	76.5				
13. Stationary, telephones kept in wards, and doorknobs can be sources of infections. (Yes)	No	6	8.8	0.91	0.29	91	H
	Yes	62	91.2				
14. All linen from an infectious patient should be thrown in a red linen bag even when it is free from visible blood or body fluids. (Yes)	No	8	11.8	0.88	0.32	88	H
	Yes	60	88.2				
15. Segregation of clinical and non-clinical waste is important for preventing the spread of infection. (Yes)	No	4	5.9	0.94	0.24	94	H
	Yes	64	94.1				
16. Ampoules injection that has been used must be disposed of in the clinical waste bin. (Yes)	No	14	20.6	0.79	0.41	79	H
	Yes	54	79.4				
17. Recapping of needles, in general, is not appropriate. (Yes)	No	30	44.1	0.56	0.50	56	M
	Yes	38	55.9				
18. If you puncture hand with sharp instruments, you must report to the concerned authorities. (Yes)	No	13	19.1	0.81	0.4	81	H
	Yes	55	80.9				
19. Puncture-proof containers should be used for disposal of sharps objects. (Yes)	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
20. Mask must be placed on coughing patients to prevent potential dissemination of infectious respiratory secretions from the patient to others. (Yes)	No	10	14.7	0.85	0.36	85	H
	Yes	58	85.3				

Ev. : Evaluation (0.00 – 33.33) Low (L); (33.34 – 66.66) Moderate (M); (66.67– 100) High (H).

Table 2. Nurses' Attitude regarding Infection control items

Attitudes' Items	Resp.	No.	%	MS	SD	RS%	Eva.
1. Infection control measures is not easy to follow. (Disagree)	Disagree	22	32.4	0.32	0.47	32	L
	No opinion	6	8.8				
	Agree	40	58.8				
2. Infection control measures prevent the spread of infections from patients to Health Care Workers (HCWs) and vice versa. (Agree)	Disagree	8	11.8	0.81	0.4	81	H
	No opinion	5	7.4				
	Agree	55	80.9				
3. Infectious diseases can be treated hence PPE are not required. (Disagree)	Disagree	52	76.5	0.76	0.43	76	H
	No opinion	4	5.9				
	Agree	12	17.6				
4. Prefers to perform hand hygiene before and after any intervention with patients. (Agree)	Disagree	3	4.4	0.96	0.21	96	H
	No opinion	0	0.00				
	Agree	65	95.6				
5. Personal protective equipment (PPE) can be used during emergencies. (Agree)	Disagree	9	13.2	0.74	0.44	74	H
	No opinion	9	13.2				
	Agree	50	73.5				
6. Changing gloves is not necessary during procedures even if heavily contaminated. (Disagree)	Disagree	59	86.8	0.87	0.34	87	H
	No opinion	2	2.9				
	Agree	7	10.3				
7. It is difficult to work wearing PPE. (Disagree)	Disagree	39	57.4	0.57	0.5	57	M
	No opinion	11	16.2				
	Agree	18	26.5				
8. Healthcare providers should ensure the availability of adequate protective barriers.(Agree)	Disagree	6	8.8	0.84	0.37	84	H
	No opinion	5	7.4				
	Agree	57	83.8				
9. Health Care Workers should not use PPE because it may harm patients psychologically. (Disagree)	Disagree	46	67.6	0.68	0.47	68	H
	No opinion	11	16.2				
	Agree	11	16.2				
10. Stationeries, telephones, and doorknobs are not sources of infections. (Disagree)	Disagree	56	82.4	0.82	0.38	82	H
	No opinion	4	5.9				
	Agree	8	11.8				
11. Segregation of clinical and non-clinical waste is useful to prevent transmission of infections from one to another. (Agree)	Disagree	7	10.3	0.84	0.37	84	H
	No opinion	4	5.9				
	Agree	57	83.8				
12. Adequate disinfection of medical equipment should be ensured by all HCWs. (Agree)	Disagree	4	5.9	0.87	0.34	87	H
	No opinion	5	7.4				
	Agree	59	86.8				
13. Transmission of infectious organisms can be reduced by adhering to Infection control measures. (Agree)	Disagree	4	5.9	0.84	0.37	84	H
	No opinion	7	10.3				
	Agree	57	83.8				
14. It is not logical to assume all patients contagious unless their	Disagree	35	51.5	0.51	0.5	51	M

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infection has been confirmed. (Disagree)	No opinion	6	8.8				
	Agree	27	39.7				

Ev. : Evaluation (0.00 – 33.33) Low (L); (33.34 – 66.66) Moderate (M); (66.67– 100) High (H).

Table 4. Nurses' practices regarding infection control items

Practices' Items	Resp.	No.	%	MS	SD	RS%	Eva.
1. Performs hand hygiene when they come in contact with patients.	No	63	92.6	0.07	0.26	7	L
	Yes	5	7.4				
2. Performs hand hygiene after taking off gloves.	No	52	76.5	0.24	0.43	24	L
	Yes	16	23.5				
3. Washes hands immediately after contacting any blood, body fluid, secretion, excretion, or dirty substances.	No	14	20.6	0.79	0.41	79	H
	Yes	54	79.4				
4. Wears gloves when drawing blood samples.	No	9	13.2	0.87	0.34	87	H
	Yes	59	86.8				
5. Wears gloves when disposing of stool or urine.	No	0	0.00	1.00	0.00	100	H
	Yes	68	100				
6. Wears gloves when handling impaired patient skin.	No	42	61.8	0.38	0.49	38	M
	Yes	26	38.2				
7. Wears gloves when handling the patient's mucosa.	No	0	0.00	1.00	0.00	100	H
	Yes	68	100				
8. Wears gloves when handling saliva or sputum culture.	No	0	0.00	1.00	0.00	100	H
	Yes	68	100				
9. Wears gloves when performing parenteral injections of medications.	No	29	42.6	0.57	0.50	57	M
	Yes	39	57.4				
10. Wears gloves when dressing wounds.	No	1	1.5	0.99	0.12	99	H
	Yes	67	98.5				
11. Wears gloves when they come in contact with blood.	No	12	17.6	0.82	0.38	82	H
	Yes	56	82.4				
12. Wears mask when performing operations/procedures that might induce the spraying of blood, body fluid, secretions, or excretions.	No	54	79.4	0.21	0.41	21	L
	Yes	14	20.6				
13. Wears a protective eye patch or goggle when performing operations/procedures that might induce spraying of blood, body fluid, secretions, or excretions.	No	68	100	0.00	0.00	0.00	L
	Yes	0	0.00				
14. Wears protective suits or gown when performing operations/procedures that might induce spraying of blood, body fluid, secretions, or excretions.	No	55	80.9	0.19	0.40	19	L
	Yes	13	19.1				
15. Dispose of needles, blades, or any other single use sharp objects in a sharp disposal container	No	24	35.3	0.65	0.48	65	M

after use.	Yes	44	64.7				
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Ev. : Evaluation (0.00 – 33.33) Low (L); (33.34 – 66.66) Moderate (M); (66.67– 100) High (H).

Table 5. Relationships of nurses "Knowledge, Attitude and Practices" and their (SDCv.) and some related variables

Socio-demographical Characteristics and some related variables	Knowledge		Attitudes		Practices		Overall Evaluation	
	C.C.	Sig.	C.C.	Sig.	C.C.	Sig.	C.C.	Sig.
Gender	0.081	0.502 NS	0.118	0.329 NS	0.012	0.919 NS	0.059	0.625 NS
Age Groups	0.296	0.089 NS	0.050	0.982 NS	0.165	0.594 NS	0.153	0.650 NS
Level of Education	0.144	0.229 NS	0.121	0.314 NS	0.140	0.243 NS	0.121	0.314 NS
Marital Status	0.116	0.333 NS	0.147	0.220 NS	0.098	0.418 NS	0.030	0.806 NS
Work Experience Yrs in intensive care unit.	0.371	0.013 S	0.162	0.609 NS	0.148	0.677 NS	0.250	0.209 NS
Exposed to infection while working	0.119	0.324 NS	0.059	0.628 NS	0.259	0.027 S	0.117	0.332 NS
Received training course on infection control	0.029	0.814 NS	0.060	0.622 NS	0.123	0.305 NS	0.000	1.000 NS
Hospitals	0.276	0.061 NS	0.093	0.741 NS	0.343	0.011 S	0.279	0.057 NS

([†]) NS: Non-Sig. at P>0.05; S: Sig. at P<0.05; Testing is based on a Contingency Coefficient test.

DISCUSSION

Table (1) Shows analysis of the Socio-Demographical Characteristics Variables (SDCv.) of samples .The results shows in the age group, highest percentage of nurse’s age ranged between (25-29) years old. This finding supported by (Desta et al., 2018), who found in their study that (52%) of participants at age group (24-30) years old. Related to the gender male account more than half of the sample, this result is confirmed through a study done by (Alemayehu et al., 2016), who found that most participants (53.8%) were males. The researcher confirms the reason to the situation of hard work in ICU in our country lead to increase male than female. Also the results shows an educational level of studied subjects shows that most of them has graduate bachelor or more degrees, and they are accounted 67(98.5%). This result is confirmed by (Ghorbani et al., 2016), they found that (60%) of participants were graduated from the college of nursing. More than half of nurses had (1-2) years of experience in intensive care unit, followed by (3-4) years, these results agree with the study done by (Badawy, 2014), that shown the mean of years of experience was (1-5) in ICU. The majority of nurses who not received any training course about infection control reported more than half 40(58.8%) of the sample.

Table (2) This table shows a Results of assess the nurses knowledge that observed responses of

high evaluated generally obtained, and they are accounted 19(95.0%) items.This rate is still higher than the rate reported by studies conducted in a hospital in Northern Cyprus (Abuduxike et al., 2021), among nursing students in Jordon (49.64%) (Darawad et al., 2012).

Table (3) This table shows according to answers of respondents in Attitude items the Results that observed responses of high evaluated generally assigned, and they are accounted 11(78.57%) items, while leftover items were a assigned at moderate evaluation are 2(14.29%), and low evaluation 1(7.14%). which is considerably higher compared with studies conducted in Iran (Sarani et al., 2015) and Jordon (Darawad et al., 2012),

Table (4) This table shows the recent study on nurse practice, Results that observed responses of high evaluated generally assigned, and they are accounted 7(46.67%) items, while leftover items were a assigned at low evaluation are 5(33.35%), and moderate evaluation 3(20%).

This rate is higher compared with the findings from studies conducted in Northern Cyprus (30.9%) (Abuduxike et al., 2021), but lower than the rate reported among nurses in Ethiopia (60.2%) (Asmr et al., 2019).These differences in the level of practice of infection control in different countries may be due to the differences in education, training, organizational culture, policies, the presence of infection control guidelines and monitoring of its implementation.

Table (5) This table shows years of experience in intensive care unit had effect on the knowledge of the participants relating infection control, which disagree by another study conducted in UK reported that current medical students demonstrated better knowledge of needle stick injuries than the previous cohort (Elliott et al., 2015).

A statistically not association were found between nurses attitudes regarding infection control and their socio-demographic variables .That agreement with studies conducted in Federal Republic of Nigeria (Ogoina et al., 2015), also the eastern province of the KSA (Elsherbeny et al., 2018).

Finally, the results show significant association were found between nurses practice with exposed to infection while working. This findings disagree with a study conducted by Al-Ahmari et al., who reported that good level of practice was significantly associated with training in infection control and years of experience (2021).

CONCLUSIONS

The study sample revealed that the Most of the participants were 25-29 years old, male, single, bachelor science of nursing degree, 1-2 years of experience and not received any training course about infection control.

Also,Most of the nurses had good level of knowledge and they had a good attitude and had moderate practices regarding infection control.

There were a significant differences was found between nurses' knowledge about infection control and years of experience in intensive care unit field.

According to the study that statistically no significant association between nurse's attitude and their socio-demographic variables. Regarding nurses practice and socio-demographic there were statistically significant association between practice regarding infection control and who exposed to infection while working.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

An administrative agreement was obtained from the head of the clinical nursing department. The study was approved by the College of Nursing and the College of the Medicine/ University of Sulaimani. Oral consent was gained from the nurses after explaining the purpose and objectives of the study and ensuring the confidentiality of the information.

FUNDING

This research did not receive any grant from

funding agencies in the public, commercial, or non-profit sectors.

AUTHOR'S CONTRIBUTIONS

Study concept; Writing the original draft; Data collection; Data analysis and reviewing the final edition by all authors.

DISCLOSURE STATEMENT:

The authors report no conflict of interest

ACKNOWLEDGEMENTS

We thank the anonymous referees for their useful suggestions.

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