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NURSE'S KNOWLEDGE AND ATTITUDE TOWARD INFECTION CONTROL PRACTICES AND PREVENTION MEASURES IN THE GOVERNMENTAL HOSPITALS, NAJRAN CITY, SAUDI ARABIA

ELSADIG ELTAHER HAMED
Faculty of Nursing, Najran University, Saudi Arabia. Email: sadigtaheer33@gmail.com

MOHAMMED ABDULLA AL ALHARETH
Faculty of Nursing, Najran University, Saudi Arabia. Email: mohammedalyami0911@gmail.com

HAMMAD ALI FADLALMOLA*
RN, MSc, PhD. Associate professor, Nursing college, Department of Community health nursing, Taibah University, Saudi Arabia. *Corresponding Author Email: hazzminno345@gmail.com, hafadlelmola@taibahu.edu.sa, ORCID: https://orcid.org/0000-0002-5065-9626

SADEQ A. ALWESABI
Faculty of Nursing, Najran University, Saudi Arabia. Email: salwsaby@yahoo.com

Abstract

Introduction: To avoid the spread of communicable diseases, infection control and preventive measures are essential in all health care settings. Every health care professional, especially nurses, plays an important role in reducing the risk of health care-associated infections. Our goal is to examine the knowledge and attitudes regarding infection control and prevention measures. **Methods:** A descriptive study was carried out on a convenience sample at King Khalid Hospital and New Najran General Hospital in Najran city, using a self-administered questionnaire to examine the knowledge and attitude of nurses regarding infection control and prevention measures. **Results:** According to the study, 76.7% of the individuals had good knowledge, while 23.3% had poor knowledge. The majority of participants (78.8%) had a positive attitude toward infection control and prevention measures, whereas 21.2% had a negative attitude. There were statistically significant variations based on total years of experience, gender, education level, and the occurrence of needle stick during years of employment. However, due to the years of experience in the surgical wards, there were statistically significant variances. **Conclusion:** More training programs and seminars should be held to raise awareness and improve attitudes toward infection control practices and preventative measures.

Keywords: nurse's knowledge, nurse's attitude, infection control, prevention measures, governmental hospitals, Najran, Saudi Arabia

INTRODUCTION

Infections acquired in health care are most common in the delivery of health care around the world. Every year, hundreds of millions of patients worldwide are affected by nosocomial infection, resulting in enormous mortality and financial losses for healthcare systems. 1, 2. Infection is defined as the entrance and proliferation of microorganisms that are not ordinarily present in the body, such as bacteria, viruses, and parasites[1].

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According to the World Health Organization (WHO), the prevalence of healthcare-acquired infection in developed countries is 7.6% while in developing countries it is about 10% [2].

The Centers for Disease Control and Prevention (CDC) recommended using standard precautions by both health care workers and patients. Many studies conclude that the adherence to standard precaution measures is fundamental to control health-associated infections among healthcare workers, as well as patients [3-5].

Nurses spend more time with patients on the ward than any other member of the health team, so they play an important role in infection control and prevention. Educating patients may decrease their risk of becoming infected or may decrease the complications of infection [6, 7]. Using appropriate prevention measures, observing prudent hand hygiene and ensuring aseptic care of intravenous catheters and other invasive equipment also help reduce infections[8].

Studies have reported that failure to comply with standard precautions for infection control was associated with lack of knowledge in this area, negative attitudes, and lack of support from both institutions and patients[9, 10].

Recently, the obvious growing in health care-associated infections (HAIs) is considered one of the most significant challenges faced by health care system around the world. The health care-associated infections (HAIs), previously known as “nosocomial” or “hospital infections”, refer to infections that occur 48 hours after admission to the hospital[9].

According to WHO’s report the prevalence of HAIs is15% worldwide; 6% in Europe and 5.7% to 19.1% in developing and East Mediterranean countries [11].

To reduce HIA while taking care of the patient, the health care worker should follow best practices and comply with infection prevention and control guidelines. Nurses spend more time with patients compared to other health care providers and make up the largest percentage of hospital staff, and this puts them at risk of developing HIA [12].

Hospital-acquired infections add to the functional disability and emotional stress of the patient and, in some cases, lead to deteriorating conditions that reduce quality of life. Nosocomial infections are also one of the leading causes of death.

The following essential elements must be included in any integrated, monitored program for the prevention of nosocomial infections: limiting the spread of pathogens between patients receiving direct patient care through proper hand washing and glove use, appropriate aseptic technique, isolation strategies, sterilization and disinfection practices, and laundry management of infection risks [13].

Despite the importance of this subject, relevant studies are quite scarce in the Najran region, Saudi Arabia; this study aims to assess the knowledge and attitude of nurses towards infection control practices and prevention measures.

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METHODS

Study design

A descriptive cross-sectional study was conducted to assess the knowledge and attitude of nurses towards infection control practices and prevention measures.

Study Setting

This study was carried out in the surgical departments of King Khalid Hospital and New Najran General Hospital, Najran City, Saudi Arabia. Najran is one of thirteen regions in the Kingdom of Saudi Arabia, located in the southwest of the Kingdom, and its population exceeds half a million, according to the statistics of 2018. It has two government hospitals, New Najran General Hospital and King Khalid Hospital.

Study population

The study was carried out in the surgical departments of King Khalid Hospital and New Najran General Hospital if the nurses agreed to participate in the study after explaining the purpose of the research and the questionnaire orally.

Study sample

A total of 45 nurses from the surgical department were assigned to participate in the study.

Data Collection Tools

A self-administered questionnaire was used to collect the data of this study. The questionnaire consisted of three parts, to collect the data required to achieve the goals of the research, and in general it contained: the first part measures the nurse's demographic data, the second part measures the nurse's knowledge toward infection control practices and prevention measures, and the third part measure the nurses' attitudes Nurse's toward infection control practices & prevention measures.

Data Analysis

Data coding, entry, and analysis were managed using the Statistical Package for Social Sciences (SPSS, v.25). Descriptive statistics were calculated, and the appropriate tests of significance were applied accordingly. Statistically significant differences were considered if the P-values are less than 0.05.

RESULTS

As shown in (table1), the demographic characteristics according to the gender of the participants show that most of the nurses n=31(68.9%) were men, while less than one third n=14 (31.1%) of them were women. More than half of the nurses n=25(55.6%) had a bachelor's degree, and less than a third n=12(26.7) had a diploma degree, while of them n=5(11.1%) had a master's degree, and only of them n=3 (6.7%) had a doctorate degree.

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Based on total years of experience, the results show that more than half of the nurses n=25(55.6%) had (1-3) years of experience and of them n=12(26.7%) had (4-5) years of experience, while only of them n=8(17.8%) had more than (5) years of experience.

According to the years of experience in surgical wards, the results show that less half of the nurses n=22(48.9%) had (1-3) years of experience in the surgical wards, and more than a of them third n=18(40 %) had (4-5) years of experience in the surgical wards, while only of them n=5(11.1%) had more than (5) years of experience in the surgical wards.

Table (2) showed that more than half of the participants n = 25 (55.6%) correctly answered the components of infection control measures. More than half of the participants n=26(57.8%) answered that respirators, protective clothing, and facemasks are equipment needed for infection control. Most of the participants n = 28 (62.2%) believed that nosocomial infection can be transmitted by contact, droplets, and mucous membrane. Approximately two thirds n = 32 (71.1%) correctly answered that hospital-acquired infections can be prevented by hand hygiene, personal protective equipment, and safe use and disposal of sharps.

More than two-thirds n = 33 (73.3%) answered that the term standard precautions mean the minimum infection prevention practices that apply to all patient care. The majority of the participants n=40(88.9%) answered that cheap prices are not a recommendation for PPE. Most of the participants n=39 (86.7%) correctly replied that aseptic technique refers to using practices and procedures to prevent contamination from pathogens.

Great number of participants n=36(80%) thought that ‘Infection control policy and procedures” is not considered an important measure to be performed to reduce the risk of nosocomial infection. The majority of the participants n=41(91.1%) thought correctly that the term

Infection Control refers to the policies and procedures used to minimize the risk of spreading infections. Most of the participants n=43(95.6%) thought that the recommended standard precautions include hand hygiene, use of personal protective equipment, respiratory hygiene/cough etiquette, sharps safety and safe injection practices. Most of the participants n=38(84.4%) replied that the Personal Protective Equipment for Standard Precautions include gloves, gowns, face masks, eye protection, patient safety and hand hygiene. A large number n=36(80%) answered correctly that the cycle of infection did not include natural immunity.

More than two thirds n = 33 (73.3%) correctly thought that exposure to occupational hazard exposure should be reported at as soon as they occur. More than half of the participants n=29(64.4%) thought that staphylococcus aureus is a bacteria that can often be found as a part of the normal flora of the skin or groin and can also cause postoperative infections. About n=28(62.2%) thought that the order should PPE be taken off is: gloves, eyewear, gown, mask. Most of the participants n=38(84.4) replied that disinfection is a process -in addition to cleaning-when an item comes into contact with mucous membranes.

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Most of the participants n=39(86.7%) replied that factors influencing the development of nosocomial infections include the microbial agent, patient susceptibility, environmental factors, and bacterial resistance. Most participants n=37(82.2%) knows to prevent the spread of infection by wearing a mask, even if you are fully vaccinated, indoors-and outdoors during highly congested activities like concerts, get fully vaccinated as soon as possible, and cleaning your hands often, either with soap and water for 20 seconds or with a hand sanitizer that contains at least 60% alcohol.

Table (3) showed that more than half of the participants n=30(66.7%) thought that it was not necessary to wash their hands if they used gloves. Most of the participants n=32(71.1%) disagreed that blood-borne pathogens may be transmitted through intact as well as non-intact skin. Most of the participants n= 33(73.5%) thought that they preferred to attend in-service training/workshop related to infection prevention and control regularly. More than two thirds of the participants n=39(86.7%) thought that the workload does not affect the ability to apply infection prevention guidelines.

Most of the participants thought that they were responsible for complying with the hospital acquired infection guidelines. Most of the participants n=41(91.1%) agreed that contact precautions require the use of a gown, gloves, and mask. The majority of the participants agreed to follow the unit procedural guidelines of the unit. Most of the participants n=38(84.4%) disagreed that needles should be bent or broken before being discarded. Most n=36(80%) of the participants disagreed that protective or reverse isolation is a method of caring for patients with communicable diseases.

More than two thirds n=33(73.3%) agreed that to remove contaminated gloves, put the gloved fingers of one hand inside the cuff of the glove on the opposite hand to remove the first glove. More than half of the participants n=29(64.4%) agreed to wash hands before and after direct contact with the patients. More than half of the participants n=28(62.2%) disagreed that gloves can be washed between patients if gloves have not been contaminated.

Most of the participants n=38 (84.4%) disagreed that before entering a negative air flow room (mask isolation) it is no need to check the Iso-Tek monitor outside of the door. Most of them n=39(86.7%) agreed that bags containing soiled linen must be tied before being dropped into the laundry room in order to prevent spillage. More than two thirds of them n=37(82.2%) agreed that staff shall avoid contamination of their exposed skin or clothing during removal of Personal Protection Equipment (PPE).

Table (4) shows that there is statistically no significant correlation (p-value>0.05) between the demographic characteristics (hospital name, total years of experience, sex, level of education, received vaccine of hepatitis B and occurrence of needle stick during the years of work), but there is a statistically significant correlation (p-value**<**0.001) between the experience in surgical wards and the level of knowledge and attitude of infection control and prevention measures in favor of the ≥7years of experience. Also, there is a statistically significant correlation (p-value**<**0.001) between the training courses related of infection control and the level of knowledge and attitude infection control and

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prevention measures in favor of those who received training courses related of infection control.

DISCUSSION

Nosocomial infection (NI), or hospital-acquired infection or Health-care-associated infection (HCAI) refers to infection that is acquired during the process of care and not manifested at the time of admission to a hospital or other health-care facility [14].

Health care professionals are constantly exposed to microorganisms. Many of which can cause serious or even lethal infections. Nurses in particular are often exposed to various infections during the course of carrying out their nursing activities. Therefore, nurses should have solid knowledge and strict adherence to infection control practice.

The results of this study reflected high knowledge and attitude towards control practices and prevention measures among nurses in surgical wards at New Najran General Hospital. The results showed that of the nurses (76.7%) had good knowledge, while only of them (23.3%) had poor knowledge towards infection control practices and prevention measures.

These results are also in line with the findings of Radzak, Alasmari, and Alhawsawi, study conducted during the Hajj season at Tertiary Care Hospital in the City of Makkah, which showed that (80.5%) of the nurses had good knowledge at the local level [15].

Globally the results of this study in the line of many studies that showed nurses had a good knowledge and attitude towards control and prevention measures [11, 15-17].

In contrast, the results of this study are better than the results of the Ahmad Ayed study[18], which revealed that approximately half of the sample studied (53.9%) had fair knowledge level (>80%) in the Palestinian government hospital. The results conducted by Rahiman, F. et al.[17] also showed inconsistent poor knowledge (47.4%) among nurses regarding infection control practices and prevention measures.

The results showed also that about two thirds n = 32 (71.1%) correctly answered that hospital acquired infections can be prevented by hand hygiene, which is higher than the results of the study conducted by Alhraiwil, N. et al. [19], which revealed that the average hand hygiene knowledge score was 65.5% among the participants.

The results also showed that of the nurses (78.8%) had a positive attitude towards infection control practices and prevention measures, which is higher than the attitude rate revealed by the Radzak, Alasmari and Alhawsawi study conducted during the Hajj Season at Tertiary Care Hospital in the city of Makkah, which showed that (80.5%) of the nurses had good knowledge. The Alasmari and Alhawsawi study showed that of the nurses (72.3%) had a positive attitude towards infection control practices and prevention measures [15].

This study shows a clear indication that practices in infection control are viewed positively by nurses, thus its implementation is most likely be observed by the nurses themselves.

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This result is line with Saudi study conducted by Ghabrah, T.M., et al. [20], which showed that nurses have a positive attitude toward infection control practices. In addition, this study agrees with a recent systematic review conducted by Nasiri et al in the United States where they found that most of the studied reported a very high level of attitude among nurses. However, other study showed inconsistent result with this result which revealed poor attitude among nursing students [11].

This study also revealed that there were no statistically significant differences (p-value**>**0.05) between demographic characteristics (hospital name, total years of experience, sex, level of education, and occurrence of needle stick during years of work).

These results are consistent with the results of the study conducted by Radzak, Alasmari and Alhawsawi during Hajj Season at Tertiary Care Hospital in City of Makkah which revealed that there were no statistically significant differences between the respondents' demographic profile like gender, educational attainment, length of service, and seminars attended and the nurses' knowledge, Attitude on infection control practices [15].

However, the results of this study revealed that there was a statistically significant correlation (p-value**<**0.001) between surgical ward experience and the level of knowledge and attitude infection control and prevention measures in favor of the ≥7years of experience, which agrees with the results of the study conducted by Desta et al. in Ethiopia, which revealed that (75.1%) of the nurses had good knowledge[21]; Gulilat, K. and Tiruneh, G. in Bahirdar city[22], which showed that (69.9%) had good knowledge and Mukwato, Ngoma, and MJ.Maimbolwa in Zambia, which revealed that the hospital experience had statistically significant correlation with knowledge and attitude towards infection control practices and prevention measures [23].

Also, the results of this study showed statistically significant differences (p-value**<**0.001) between the training courses related of infection control and the level of knowledge and attitude infection control and prevention measures in favor of those who received training courses related of infection control. The nurses who had previous training courses had better knowledge and more positive attitude than those who didn't receive training coursed. This result didn't agree with the results of Fashafesh et al. which revealed that there were now statistically significant differences due to the training courses[18].

CONCLUSIONS

However, the prevention of infection is a major concern of all health workers and health policy makers. Nursing is crucial to the success of any preventive program aimed at reducing the incidence of infections in our health care facilities. Nurses, therefore, must possess adequate knowledge and demonstrate practices towards achieving the goal of prevention of infections.

Conflict of interest

The authors have no conflict of interest to declare

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Ethical Considerations

A letter for the hospitals administration permission to conduct this research was obtained from the ethical committee. Oral permission was obtained prior to participating in this study. The goals and method of this study were explained to the participants.

The purpose of the study was written in the instructions of the questionnaire.

Authors contributions

EEH was the study leader and the design planner. HAF conducted the analysis. EEH, MAA, HAF, and SAA were responsible for the editing, peer reviewing, and supervision. All authors participate actively in all paper process.

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Table 1: Demographic characteristics of respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	31	68.9	68.9	68.9
	Female	14	31.1	31.1	100
	Total	45	100	100	
Level of education					
		Frequency	Percent	Valid Percent	Cumulative Percent
	diploma degree	12	26.7	26.7	26.7
	bachelor's degree	25	55.6	55.6	82.2
	master's degree	5	11.1	11.1	93.3
	doctorate degree	3	6.7	6.7	100
	Total	45	100	100	
Years of experience in surgical wards					
		Frequency	Percent	Valid Percent	Cumulative Percent
	1-3 years	22	48.9	48.9	48.9
	4-5 years	18	40	40	88.9
	more than 5 years	5	11.1	11.1	100
	Total	45	100	100	
Total years of experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
	1-3 years	25	55.6	55.6	55.6
	4-5 years	12	26.7	26.7	82.2
	more than 5 years	8	17.8	17.8	100
	Total	45	100	100	

Table 2: Knowledge toward infection control practices and prevention measures

N	**Statement**	**Good Knowledge**		**Poor Knowledge**	
		N	**%**	**N**	**%**
1.	Which of the following is considered a component of infection control measures?	25	55.6	20	44.4
2.	Which of the following equipment are needed for infection control?	26	57.8	19	42.2
3	Nosocomial infection can be transmitted by which of the following	28	62.2	17	37.8
4.	Hospital-acquired infections can be prevented by which of the following action?	32	71.1	13	28.9
5.	The term Standard Precautions mean?	33	73.3	12	26.7
6.	The recommendations for PPE are the following except:	40	88.9	5	11.1

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7.	Aseptic technique refers to?	39	86.7	6	13.3
8.	The important measures must be performed to reduce the risk of Nosocomial infection considered all of the following except.	36	80	9	20
9.	The term Infection Control refers to.	41	91.1	4	8.9
10	The recommended Standard Precautions practices include all the following except?	43	95.6	2	4.4
11	PPE for Standard Precautions include all of the following except?	38	84.4	7	15.6
12	Cycle of Infection include all of the following except?	36	80	9	20
	Total	76.7%		23.3%	

Table 3: Attitudes among nurses towards infection control practices and preventive measure

Items	Responses					
	agree		Don't know		disagree	
	N	%	N	%	N	%
1. I have to wash my hands even if I used gloves	7	15.7	8	17.8	30	66.7
2.Policies and procedures for infection control should be adhered to at all times	6	13.3	7	15.6	32	71.1
3.I should attend in-service training/workshop related to infection prevention and control regularly	33	73.4	6	13.3	6	13.3
4.The workload does not affect my ability to apply infection prevention guidelines	39	86.7	3	6.7	3	6.7
5.It is my responsibility to comply with the hospital-acquired infection guidelines	36	80	5	11.1	4	8.9
6.I believe that following the prevention guidelines will reduce rates of hospital-acquired infection	41	91.1	3	6.7	1	2.2
7.I have to follow the procedural guidelines of the unit	43	95.6	1	2.2	1	2.2
8.I recap needles after use and before disposal.	4		3	6.7	38	84.4
9.I isolate patients with communicable diseases in separate rooms to prevent cross contamination.	4	8.9	5	11.1	36	80
10.I wear personal protective equipment when handling linen.	33	73.3	6	13.3	6	13.3
11. wash hands before and after direct contact with the patients.	29	64.4	10	22.2	6	13.3
12. I follow aseptic techniques strictly.	10	22.2	7	15.6	28	62.2
Total	78.8%		21.2%			

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Table 4: Correlation between the demographical characteristics and level of knowledge and attitude toward infection control and prevention measures

Demographic Characteristics	N	Min.	Max.	Mean	SD	P-value
1-Hospital Name						
King Khalid Hospital	25	10.17	80.40	48.1245	13.24123	p=0.427
New Najran General Hospital	9	10.45	90.30	51.2547	12.24573	p=0.514
Najran University Hospital	11	13.41	81.25	58.4512	14.34253	p= 0.640
2-Sex						
Male	31	12.50	84.50	51.8645	15.85463	p=0.410
Female	14	15.75	81.75	53.3756	14.34253	p=0.333
3-Total Years of Experience						
1–3 years	25	12.36	85.15	54.2314	14.22321	p=0.472
4–6 years	12	14.27	81.60	49.1423	15.54712	p=0.435
≥7years	8	13.00	82.10	50.3246	14.02315	p=0.472
4- Level of education						
Diploma degree	12	11.20	85.54	52.6145	14.23687	p=0.425
Bachelor's degree	25	12.65	86.34	55.5416	15.23687	p=0.534
Master's degree	5	10.35	83.45	57.1425	14.65723	p=0.743
Doctorate degree	3	12.40	80.42	56.1163	14.24050	p=0.637
5- Experience in surgical wards						
1–3 years	22	84	12.50	84.50	51.8645	15.85463
4–6 years	18	66	15.75	81.75	53.3756	14.34253
≥7years	5	58	13.41	81.25	58.4512	0.001
6-Training courses related of infection control						
Yes	35	16	14.75	60.40	49.66	0.001
No	10	26	13.35	80.20	51.65	13.87546
7-Received vaccine of hepatitis B						
Yes	29	11.54	80.42	53.4511	14.34253	p=115
No	11	11.54	80.42	53.4511	14.34253	p=115
8-Occurrence of needle stick during the years of work						
Once	27	11.22	83.50	52.8645	15.54663	p=354
1-3 times	12	14.75	80.75	52.3756	14.76542	p=324
> 3 times	6	12.75	81.40	54.6435	13.88613	p =215