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Knowledge of nurses toward infection control measures at Al-Hillah Teaching Hospitals

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Abstract---Infection is a significant issue in operating rooms. Many studies have shown that nurses are severely exposed to various risks, including needlestick and sharps injuries, which occur at a high rate in the operating room due to inexperience, cross-infection, and labour overload. Nurses need additional care to ensure efficient adherence to universal precautions. The study was conducted to assess nurses' knowledge of infection control measures and determine the relationship with their demographic characteristics. A descriptive cross-sectional study was conducted among (200) nurses in operating rooms at AL-Hilla teaching hospitals, divided as follows: 107 from AL-Hilla teaching hospital, 104 from AL-Imam AL-Sadiq teaching hospital, and 41 from Babil Educational Hospital for obstetric and pediatrics hospital, the study was conducted during 15 th October 2021 to 15 to May 2022. Samples were selected through (a purposive) nonprobability sampling approach. Data were collected during the use of a questionnaire and self-report technique. A questionnaire comprises two parts: the first part includes demographical characteristics. other section includes knowledge of nurses of infection control measures(ICM), composed of 45 items; questionnaire reliability was determined through a pilot study and then submitted to an expert committee composed of 30 experts. An inferential statistical approach and A descriptive were used to examine the data. The results show that (44.5%) did not receive training sessions. (60.5%) of nurses had moderate knowledge regarding(ICMs) and a correlation between nurses' knowledge and attitudes about infection control measures and some sociodemographic variables. The researcher recommended that the continuous medical education unit continue to provide instructional courses on infection control measures in all hospital departments, particularly for operating room staff.

Keywords---knowledge, teaching hospitals, nurses, infection control.

Introduction

A hospital-acquired illness (HAI) or "nosocomial infection" is an infection acquired after 48 to 72 hours of a patient's hospitalization., three days after a patient leaves the hospital, and 30 days after surgery, where the infectious agents are incubated during this period. It is regarded as the most significant global problem confronting healthcare systems; globally, the estimation of patients affected by HCAs is hundreds of millions in developed and developing countries. In some general hospitals in Australia, about one of each 74 hospitalized patients are affected by HCAs. The total number of patients who had HAIs in 2011–2012 was about 3.2 million. In the US, about 100000 of these patients die annually. In Europe is (6%) (Nasiri et al., 2019; Sahiledengle et. al.,2020).

Healthcare-associated infection is a significant public health issue that affects countries all over the globe, including Iraq. It is dangerous and may even be fatal. The longer patients are in the hospital, the greater the difficulties and losses on the patient and his family and the healthcare system's impact. To protect themselves, their families, and their patients against infectious illnesses, health care workers need to use all of the available strategies. So it is possible to restrict the spread of infection (Kerity & Naji, 2017; Shitemo, 2020).

Nevertheless, nurses are the most professionals exposed to occupational hazards, including hepatitis B and C, AIDs (HIV) and tuberculosis, needle sticks and sharp objects, splashes, and non-intact skin. The prevalence of occupational hazards among nurses is highest than in others; the risks of infected blood are about (0.1–0.3%) for 47.4%) HIV, (2%) for HCV, and (6-60)% for HBV; these hazards occur to nurses during their work on patients due to patients hospitalization for long periods and contact with blood, fluids of the body, tissue membranes and non-intact skin (Donati et al., 2019; Yazie et al., 2019).

In addition, nurses' hands play a crucial role in transmitting infection during patient care. Improving nurses' knowledge and positive attitudes about infection control procedures will enhance their performances, functions, and the health and safety of patients and the community (Kalantarzadeh, 2014). Nurses' responsibilities throughout operating surgery include providing the safety of the patient, performing the scrub role, performing hand hygiene, setting up the sterile equipment, tables, and sterile field, preparing sutures, ligatures, and special equipment and circulating activities, and protecting themselves from stick injury as use of preventive measures and wearing double gloves may also help protect the surgical team from the viral transmission. Gloves should be changed immediately after any accidental puncture and post-exposure prophylaxis (Susan, Holly, & Dallred, 2017).

Methodology

The Research Design

"A descriptive" cross-sectional research was done on a collection of nurses.

Study sample

A non-probability (purposive) sample of (200) nurses was chosen depending on some criteria to assess their knowledge of infection control measures

Places of the research conducted

The study was conducted in Operating rooms at Al-Hilla Teaching Hospitals, used as a rich field to collect data; these operating rooms were distributed in three hospitals (Operating Room in Babylon teaching Hospital for Maternity and Children, Al-Imam Al-Sadeq Teaching Hospital Operating Unit, and Operating Room in Al- Hilla Surgical Teaching Hospital).

Study instrument

the instrument has been constructed from several previous studies and publications to meet the aims of the present research, and it includes two parts as follows:

Part I: This part is constituted from (7) elements that include demographical data of the nurses (age, gender, educational level, years of experience, years of experience in operating rooms, training courses related to infection control, and marital status).

Part II: Assessment of Nurse's Knowledge toward Infection Control Measures in operating rooms. This part consists of (45) questions as an MCQ questionnaire. All knowledge questionnaire items have been classified into two categories of an answer, "correct and incorrect," this part is divided into six domains that include:

1. General Nurses' knowledge related to hospital-acquired infections (HAIs) and their prevention (12) questions.
2. Nurses' Knowledge related to hand hygiene (5) questions.
3. Nurses' Knowledge related to Personal Protective Equipment (PPE) (6) questions.
4. Nurses' Knowledge related to safe handling of equipment and instruments (8) questions.
5. Nurses' Knowledge related to sterilization and disinfection (8) questions.
6. Nurses' Knowledge related to waste management (6) questions.

Questionnaire reliability

The reliability of the study instruments means making sure that the answer will be almost the same if it is repeatedly applied to the same people at different times. The same people the second time, after confirming the apparent validity of the study tool, the researcher applied it to a random exploratory sample of 20 nurses

composed of 10% of the original sample where the members of this sample were later excluded from the original sample on which the final study was conducted.

Method of data collection

After receiving authorization from the institution, the nurses filled out the data collection form to collect the data. The researcher obtains each nurse's verbal and written consent to participate in this study. The time required to answer the instrument's questions with each participant is around (30-35) minutes. The information was gathered between the dates (March 11 and May 9, 2022).

Methods of Statistics Data Analysis

In order to statistically analyze the data collected from the study sample to arrive at the results, the researcher used the SPSS version (25) and Microsoft Excel (2016) program to analyze this data and deal with it statistically, to find the relationships between the variables, and obtain the final results of the research based on a set of statistical tests.

Results

The finding shows participants' age, the mean age is 27 (± 4.18), and the age 25-30 years old were recorded as the highest percentage ($n=107$; 53.5%). Regarding gender, more than half of the studied sample were female nurses ($n=114$; 57%) compared with those who were male. Nurses exhibited married ($n=116$; 58%) marital status-related findings compared with still single patients. Respected to the education level, the bachelor' nurses composed the highest percentage ($n=112$; 56%). Years of experience associated findings, the nurses had <5 years of experience in the nursing profession and their current workplace ($n=104$; 52%) and ($n=173$; 86.5%), respectively. In terms of training courses, it is obvious from the findings that the nurses no attend training sessions ($n=89$; 44.5%).

Table (1): Descriptive Statistic of Socio-Demographic Variables (SDVs)

SDVs	Classification	Freq.	%
Age/years ($M \pm SD = 27.79 \pm 4.18$)	21-25 years	60	30.0
	26-30 years	107	53.5
	31-35 years	11	5.5
	≥ 35 years	22	11.0
	Total	200	100.0
Gender	Male	86	43.0
	Female	114	57.0
	Total	200	100.0
Marital status	Single	84	42.0
	Married	116	58.0
	Total	200	100.0
Education level	School nursing	23	11.5
	Diploma nursing	65	32.5
	Bachelors	112	56.0

	Total	200	100.0
Years experience	<5 years	104	52.0
	5-10 years	73	36.5
	>10 years	23	11.5
	Total	200	100.0
Experience in current workplace	<5 years	173	86.5
	5-10 years	27	13.5
	Total	200	100.0
	No	89	44.5
Number of training courses	1-2 sessions	81	40.5
	>2 sessions	30	15.0
	Total	200	100.0
	Total	200	100.0

According to a total mean of the score and standard deviation. Findings demonstrated that (60.5%) of nurses expressed a fair level of knowledge toward infection control measures at an average equal to $9.77(\pm 2.19)$.

Table(2) Overall Nurses' Knowledge related to Infection Control Measures

Nurses Knowledge	Freq.	%	$M \pm SD$
Poor ($M=45-60$)	79	39.5	61.82 ± 5.03
Fair ($M=61-75$)	121	60.5	
Good ($M=76-90$)	0	0.0	
Total	200	100.0	

M: Mean score, SD=Standard Deviation

Table (3): Statistical Differences in Nurses' Knowledge with regards to their Age($n=200$)

Age	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.078	3	.026	2.106	.101
	Within Groups	2.411	196	.012		
	Total	2.488	199			

d.f: Degree of freedom, F: F-statistic

Findings demonstrated no significant differences in nurses' knowledge ($p=0.101$) toward infection control measures concerning their age groups.

Table (4): Statistical Differences in Nurses' Knowledge with regards to their Gender ($n=200$)

Variables	Gender	Mean	SD	t-value	d.f	$p \leq 0.05$
Knowledge	Male	1.41	.123	4.261	198	.001
	Female	1.34	.093			

Findings demonstrated significant differences in nurses' knowledge and gender ($t=4.261$; $p=0.001$). It is observed that the male nurses significantly associated with improved knowledge of infection control measures

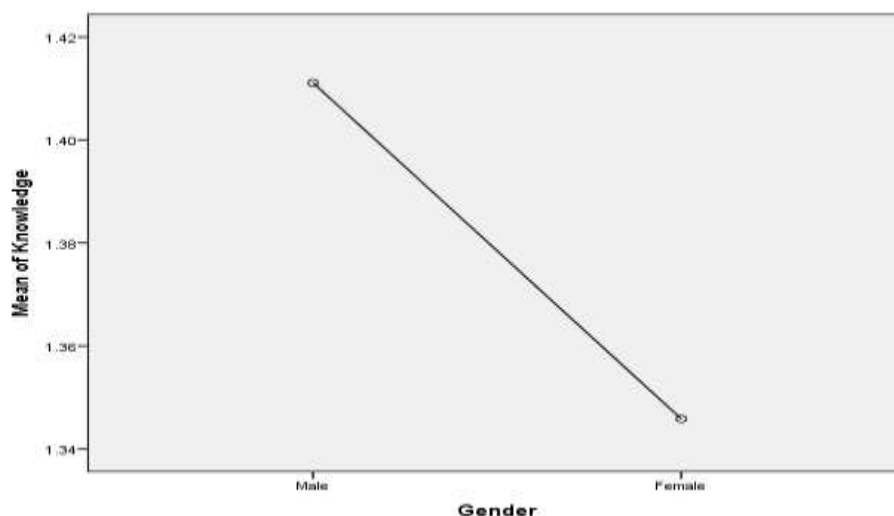


Figure 1: Distribution of Nurses' Knowledge according to Gender

Table(5): Statistical Differences in Nurses' Knowledge with regards to their Marital Status ($n=200$)

Marital Status	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.002	1	.002	.122	.727
	Within Groups	2.487	198	.013		
	Total	2.488	199			

Findings demonstrated no significant differences in nurses' knowledge ($p=0.727$) regarding their marital status infection control measures.

Table (6): Statistical Differences in Nurses' Knowledge concerning their Education Level ($n=200$)

Education Level	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.161	2	.080	6.802	.001
	Within Groups	2.328	197	.012		
	Total	2.488	199			

Findings demonstrated that there were significant differences in nurses' knowledge ($p=0.001$) toward infection control measures concerning their education level.

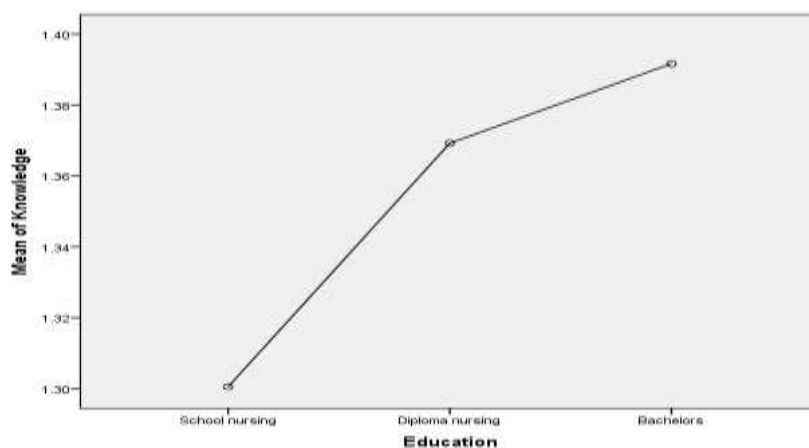


Figure 2: Distribution of Nurses' Knowledge according to Education level

Table (7): Statistical Differences in Nurses' Knowledge regarding their Years of Experience ($n=200$).

Years of Experience	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.499	2	.250	24.720	.001
	Within Groups	1.989	197	.010		
	Total	2.488	199			

Findings demonstrated significant differences in nurses' knowledge ($p=0.001$); toward infection control measures about their years of experience. The differences in favor of those who had >10 years of experience are associated with higher mean scores of knowledge.

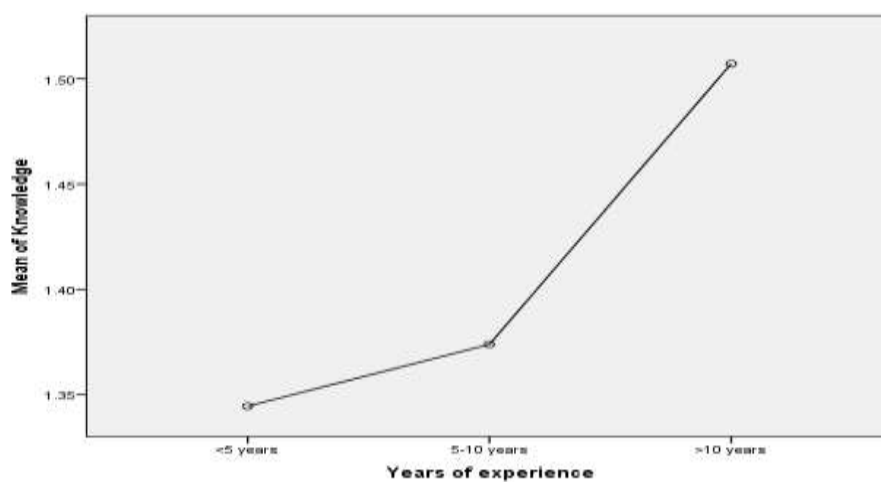


Figure 3: Distribution of Nurses' Knowledge according to Years of Experience

Table (8): Statistical Differences in Nurses' Knowledge concerning their Experience in Current Workplace ($n=200$)

Current Experience	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.007	1	.007	.592	.443
	Within Groups	2.481	198	.013		
	Total	2.488	199			

Findings demonstrated no significant differences in nurses' knowledge ($p=0.443$) toward infection control measures concerning their experience in the current workplace.

Table (9): Statistical Differences in Nurses' Knowledge and Attitudes with regards to their Number of Training Courses ($n=200$)

No. training	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Knowledge	Between Groups	.859	2	.430	51.953	.001
	Within Groups	1.629	197	.008		
	Total	2.488	199			

Findings demonstrated significant differences in nurses' knowledge ($p=0.001$); toward infection control measures about their number of training courses. We see the nurses who attended more than two training sessions significantly increased their knowledge of infection control measures.

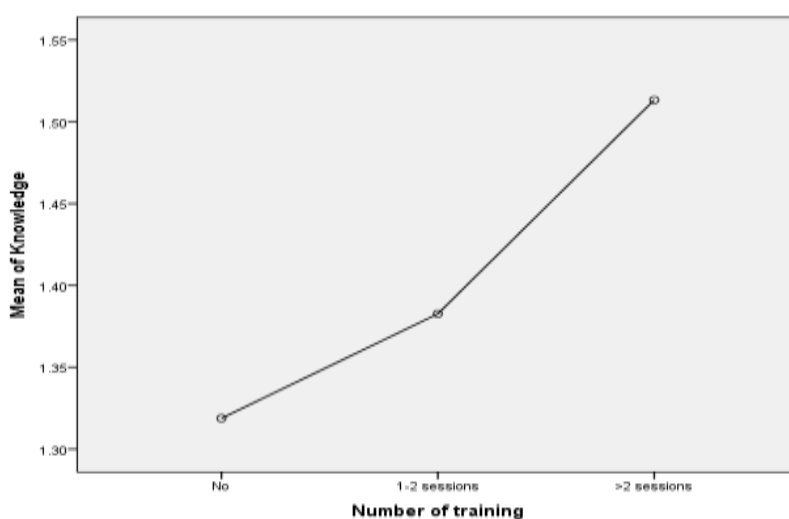


Figure 4: Distribution of Nurses' Knowledge according to Number of Training Courses

Discussion

The Findings demonstrated that more than half (60.5%) of nurses expressed a fair knowledge of "infection control measures" at average equal to $9.77(\pm 2.19)$, and

(39.5%) of them had failed knowledge. The research suggested that participants did not acquire appropriate information because of varying educational levels, short infection control and prevention training sessions for newly assigned nurses, and non-continuous training courses for trainee nurses.

The findings of a study in Baghdad agree with our findings study; due to the country's wartime predicament and the absence of accessible medical equipment and training courses, a deficiency of Knowledge arose. (Al-Jubouri, 2014). on the opposite side, a study done by (Rochwani & Sharma, 2019) was undertaken at India among one hundred nurses. It assesses knowledge of nurses' toward standard precautions, and the findings contradicted those of a present study; it discovered that the majority of the sample's overall knowledge rating was satisfactory. These study results because the study participants had long years of work experience and training opportunities.

According to the above studies, the level of knowledge depends on the availability of medical supplies to work with them and the establishment of training courses on an ongoing basis that maintains the knowledge factor among nurses. The study's current findings demonstrated no significant differences in overall nurses' knowledge related to the measure of infection control and some of their Socio-Demographic Variables at $p > 0.05$, for instance, (Age, years of experience in operating rooms, and marital status). In contrast, the other Socio-Demographic Variables (Gender, education level, years of experience, and training courses) had significant differences with overall nurses' knowledge related to infection control measures.

The present study results observed that the male nurses are significantly associated with improved knowledge toward infection control measures. also, the Findings demonstrated significant differences in nurses' knowledge ($p = 0.001$) concerning their education level. as well as The differences favour those with > 10 years of experience are associated with higher mean knowledge scores (Fig. 4-6). Furthermore, the findings see that nurses who attended more than two training sessions significantly increased their knowledge of infection control measures.

The current study's findings concurred with those of a study (Ayad, 2015) conducted in Palestinian hospitals, which concluded that there was no correlation between nurses' overall knowledge of infection control measures and demographic information (age and years of experience), except for the training course, which contradicted the current finding. In addition, the other demographic variables (gender and educational attainment) were connected with the nurses' knowledge (p -value 0.05). In addition, a research done by (Datta et al., 2018) contradicted this conclusion by demonstrating a significant association between the age of nurses and their knowledge of safe injection methods.

Similar to the present research, Sessa et al. (2011) found a strong correlation between Italian nurses' knowledge of disinfection techniques and their degree of education. Also, our results agree with a study conducted in AL-Amara city that deals with the impact of knowledge on infection control. The findings show that nurses' knowledge is significantly associated with education and the number of training courses p -value < 0.05 ; the quality and quantity of knowledge and skills

that health care workers acquire are positively influenced by education. When nurses increase their level of education, their knowledge also increases (AL-Hraishawi & Naji, 2015). The knowledge of infection prevention in hospitals in Punjab/India has been significantly associated with participants' educational qualifications (Mohandass et al., 2021).

Conclusion and Recommendation

Most of the study sample were females who had experience in the operating rooms for 1-5 years and received training courses. The present study revealed that more than half of the study samples (60.5%) have fair knowledge toward infection control measures. There are significant differences in overall nurses' knowledge related to infection control measures and some of the socio-demographic variables such as gender, education level, years of experience, and training courses. However, Age, marital status, and years of experience in operating rooms were statistically not significant

A study suggested activating the continuous medical education unit's work correctly to teach all hospital departments educational courses related to infection control measures, especially for operating room staff. Also, Establish a special infection control department at AL-Hilla teaching hospitals, which will undertake the continuous monitoring of the implementation of all modern infection control measures.,the researcher recommended Conducting future research programs to improve the nursing staff's knowledge and practices regarding infection control measures in all hospital departments, especially operating rooms.

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