Effectiveness of an Education Program on Nursing Staffs' Knowledge about Infection Control Measures at Intensive Care Unit in Al-Diwaniya Teaching Hospital

فاعلية البرنامج التعليمي في معارف الملاك التمريضي حول مقاييس السيطرة على العدوى في وحدة العناية المركزة في مستشفى الديوانية التعليمي

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المستخلص

الاهداف: تحديد فاعلية البرنامج التعليمي في معارف الملاك التمريضي حول مقاييس السيطرة على العدوى في وحدة العناية المركزة في مستشفى الديوانية التعليمي.

منهجية البحث: تم استخدام تصميم قبل التجريبي (تصميم مجموعة واحدة، الاختبار القبلي، والاختبار البعدي). إجريت هذه الدراسة في مستشفى الديوانية التعليمي للفترة (من 20 شباط إلى 5 اذار 2020)، لمعرفة فاعلية البرنامج التعليمي في معارف الملاك التمريضي حول مقاييس السيطرة على العدوى في وحدة العناية المركزة، تم اختيار عينة غير احتمالية (هادفة) تكونت من (25 ممرض/ ة) يعملون في وحدة العناية المركزة.

تم بناء استبيان كأداة لجمع البيانات وتكونت من جزئين:

الجزء الأول: الخصائص الديموغرافية للملاك التمريضي (العمر، الجنس، مستوى التعليم، سنوات الخبرة في التمريض، سنوات الخبرة في العناية المركزة، المشاركة في دورات تدريبة تتعلق بمقاييس السيطرة على العدوى، والحالة الزوجية).

الجزء الثاني: تقويم معارف الملاك التمريضي حول مقاييس السيطرة على العدوى في وحدة العناية المركزة وتكون من (39) سؤال متعدد الخيارات.

تم التحقق من مصداقية الاستبانة والبرنامج التعليمي من خلال عرضها على (11) خبير. اجريت للعينة اختبار قبلي، برنامج تعليمي، اختبار بعدي، وتم استخدام الاحصاء الوصفي والاستدلالي لتحليل نتائج الدراسة باستخدام الحقيبة الاحصائية الإصدار 25 وبرنامج ميكروسوفت اكسل (2010).

النتائج: تظهر النتائج أن جميع استجابات عينة الدراسة في الاختبار القبلي كانت معرفة متوسطة، بمتوسط إحصائي للدرجات (1.342). بخلاف الاختبار البعدي، يظهر أن (100٪) من عينة الدراسة لديها معرفة عالية بمتوسط الدرجات (1.879). كما أظهرت النتائج فروق ذات دلالة إحصائية بين الاختبار القبلي والاختبار البعدي لعينة الدراسة بعد مشاركتها في البرنامج التعليمي بقيمة (P-value= 0.001). خلص الباحث إلى أن البرنامج التعليمي كان فعالا في تعزيز معرفة طاقم التمريض حول تدابير مكافحة العدوى في وحدة العناية المركزة.

التوصيات: أوصت الدراسة بضرورة تفعيل دور التعليم الطبي المستمر بشكل صحيح من اجل اعطاء دورات حول مقاييس السيطرة على العدوى لكل مقدمي الرعاية الصحية، وايضا العمل بالبرنامج الوطني لمكافحة العدوى في المؤسسات الصحية العراقية لسنة ٢٠٠٩.

الكلمات المفتاحية: البرنامج التعليمي، معارف الملاك التمريضي، مقاييس السيطرة على العدوى، وحدة العناية المركزة

Abstract

Objectives: To determine the effectiveness of the educational program on nursing staff knowledge about infection control measures at the Intensive Care Unit in Al-Diwaniya Teaching Hospital.

Methodology: A pre-experimental design (one group design: pre-test and post-test) was used. This study was conducted in Al-Diwaniya Teaching Hospital for the period from (20th February to 5th March, 2020) on a non-probability (purposive) sample consisting of (25 nurses) working in ICU. A questionnaire was built as a data collection tool and consisted of two parts:

First part: The demographic characteristics of the nursing staff (age, gender, level of education, years of experience in nursing, years of experience in ICU, participation in training courses related to infection control measures, and marital status).

Second part: Evaluation of the nursing staff knowledge about infection control measures in ICU, which consist of (39) multiple-choice questions. The validity of the questionnaire and the educational program were verified by presenting it to (11) experts. The sample has received a pre-test, educational program, and post-test. Descriptive and inferential statistics were used to analyze the results of the study using the Statistical Package of Social Sciences (SPSS) version 25 and Microsoft Excel (2010).

Results: The study finding shows, that all the study sample responses at the pre-test were fair knowledge with a statistical mean of scores (1.342). Other than the post-test, shows (100%) of the study sample has high knowledge at the mean of scores (1.879). Also, the results revealed a highly significant difference between the pre-test and post-test of the study sample after participated in the educational program at the p-value (0.0001). The researcher concluded that the educational program was effective in the enhancement of nursing staff knowledge about infection control measures in ICU.

Recommendations: The study recommended the necessity of activating the role of continuing medical education correctly in order to give courses about infection control measures for all health care workers, as well as activate the national infection control program in Iraqi health facilities (2009).

Keywords: Educational program, Nursing staffs' Knowledge, Infection control measures, Intensive Care Unit (ICU).

Introduction:

Infection control and prevention are the cornerstones in preventing and reducing microorganisms that cause harm to patients, health care workers (HCWs), and society in general. It is a scientific way and a practical resolution based on pathology, epidemiology, and the reinforcement of health systems. Infection control takes a unique position in the global health system because it cares about patient safety, prevents complications, and reduces the costs of health systems for countries (1).

Infection control measures are basic infection control and prevention strategies that apply to everyone, regardless of their potential or actual infectious condition. These strategies include "hand hygiene; use of

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First part: The demographic characteristics of the nursing staff (age, gender, level of education, years of experience in nursing, years of experience in ICU, participation in training courses related to infection control measures, and marital status). Second part: Evaluation of the nursing staff knowledge about infection control measures in ICU, which consist of (39) multiple-choice questions. The validity of the questionnaire and the educational program were verified by presenting it to (11) experts. The sample has received a pre-test,

personal protective equipment (PPE) (e.g., gloves, gowns, facemasks); respiratory hygiene and cough etiquette; safe injection practices, and safe handling of potentially contaminated equipment or surfaces; medical waste management; cleaning, disinfection, and sterilization of patient care equipment". These measures are the first-line way to prevent infection in health care facilities and are applied as a major strategy for reducing the spread of infections. Infection control measures reduce the danger of transfer of pathogens from one individual or place to another, even in high-risk conditions, and maintain objects and areas as free as possible from contagious agents(2).

Methodology:

educational program, and post-test. Descriptive and inferential statistics were used to analyze the results of the study using the Statistical Package of Social Sciences (SPSS) version 25 and Microsoft Excel (2010).

Ethical considerations

The Institutional Review Board (IRB) in college of nursing /university of Baghdad reviewed contents of program and questionnaire before conducting a study. Informed consent was taken orally before participating in the study. After that information regarding study title and objectives had been given. Two official requests were submitted through the College of Nursing / University of Baghdad to medical city directorate/ Ministry of Health (MOH) to take approval for data collection from Iraqi center for cardiac disease and Al-Karkh health directorate/ Ministry of Health (MOH) to take approval for data collection

from Ibn-Albetar specialist center for cardiac   surgery in Baghdad city.

Results:

Table (1): Distribution of the Sample (25) Nurse According to the Demographic Characteristics:

Demographic data	Rating and intervals	Frequency	Percent
Age / years	<= 24	7	28
	25- 29	12	48
	30- 34	1	4
	35- 39	3	12
	40+	2	8
	Total	25	100
Years of experience	1-3	15	60
	4- 6	3	12
	7- 9	2	8
	10- 12	2	8
	13+	3	12
	Total	25	100
Years of experience in ICU	<= 3	15	60
	4- 6	4	16
	7- 9	4	16
	10- 12	2	8
	Total	25	100
Training sessions	Yes	0	0
	No	25	100
Marital status	Married	12	48
	Single	13	52
	Total	25	100

Table (1) displays the demographic data of the study sample. The study results show that the dominant age group of nursing staff is (48%) at age group (25-29) years old. Regarding years of experience, the table shows that (60%) of the nurses have (1-3) years of experience in nursing. In regards to years of experience in ICU, the results show that the majority of nurses (60%) have (less than or equal 3) years of experience in ICU. Additionally, all the study samples (100%) don't have training sessions about infection control measures. Regarding marital status, the study results show that (52%) of the sample are married.
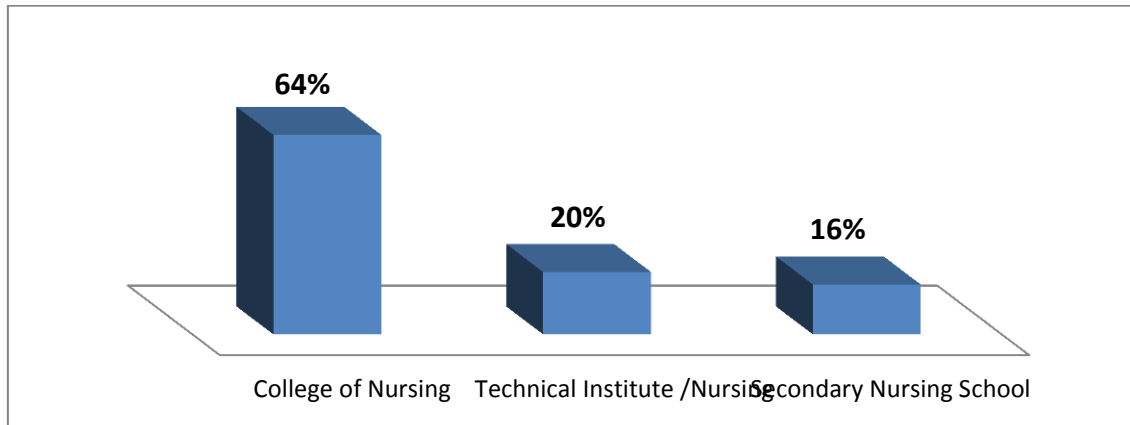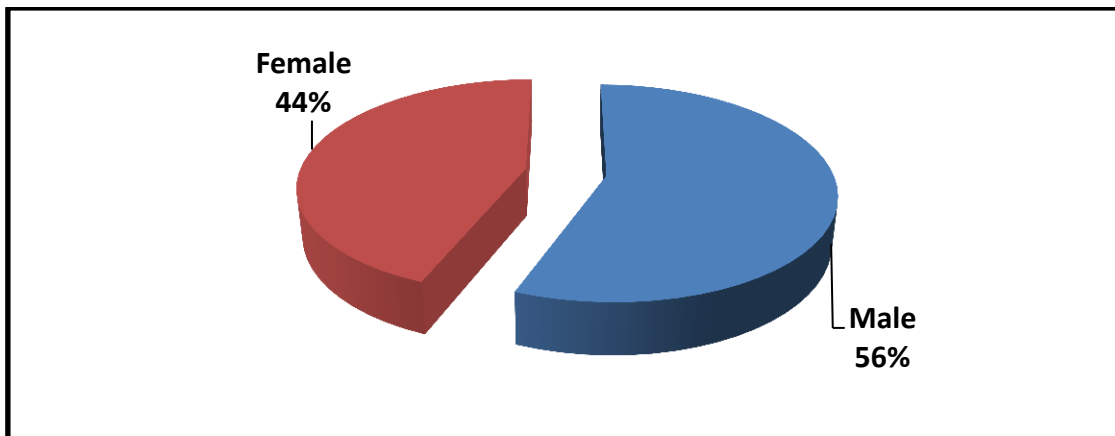
Figure (1) Educational Levels of the Study Sample

Figure (2) Distribution of the Study Sample by their Gender

Table (2): Overall Evaluation of Nurses' Knowledge Regarding Infection Control Measures at the Pre-Test and Post-Test Trials

Measures	Levels	Frequency	Percent	Overall mean	Overall evaluation
Pre-test	Low	13	52	1.342	Fair
	Fair	12	48		
	High	0	0		
Post-test	Low	0	0	1.879	Good
	Fair	0	0		
	High	25	100		

Low (mean of scores 1-1.33), fair (1.34-1.67), high (1.68 and more), cut off point (0.33)

Table (2) shows, all the study sample responses at the pre-test are fair knowledge with a statistical mean of scores (**1.342**). Other than the post-test, the table represents the (100%) of the study sample have high knowledge at the mean of scores (**1.879**)**.**

Table (3): Mean Difference (Paired Sample T-Test) between the Overall Evaluation of Nurses' Knowledge at the Pre-Test and Post-Test Trials

Periods	Mean	N	Std. Deviation	t-value	d.f.	p-value
Pre-test	1.3426	25	0.0736	29.018	24	0.0001 HS
Post-test	1.879	25	0.04653			

N: number, DF: degree of freedom, HS: highly significant

The results of table (3) show a highly significant difference between the pre-test and post-test of the study sample after participated in the educational program at p-value (0.001).

Table (4): Analysis of Variance (ANOVA) of the Overall Nurses' Knowledge According to Some Demographic Data

Studied variables		Mean	Std. Deviation	F	p-value
Age / years	<= 24	1.901	0.04	2.161	.111 NS
	25 – 29	1.876	0.042		
	30 – 34	1.769	0		
	35 – 39	1.88	0.053		
	40+	1.871	0.036		
	Total	1.879	0.046		
Educational levels	Secondary nursing school	1.878	0.038	0.22	.804 NS
	Technical institute / nursing	1.866	0.071		
	College of nursing	1.883	0.041		
	Total	1.879	0.046		
Years of experience	1-3	1.887	0.045	0.861	.504 NS
	4 – 6	1.888	0.029		
	7 – 9	1.846	0		
	10 – 12	1.833	0.09		
	13+	1.880	0.053		
	Total	1.879	0.046		
Years of experience in ICU	1-3	1.887	0.045	3.322	.039 S
	4 – 6	1.897	0.029		
	7 – 9	1.820	0.036		
	10 – 12	1.897	0		
	Total	1.879	0.046		

NS: not significant, S: Significant

Table (4) shows that there is a significant association between nurses' knowledge in post-test and years of experience in ICU at p-value (0.039). But the other results indicate that there is no association between nursing staffs' knowledge and the other demographic data at p-value more than (0.05).

Discussion:

Part-I: Discussion of the Nursing Staffs' Demographic Characteristics of the Study Sample, as Shown in Table (1) and Figure (1 and 2):

Concerning nursing staffs' age, the result of the study uncovers that the highest percentage of participants (48%) between (25-29) years old. These findings supported by a study conducted in Ethiopia, which found that (52%) of participants at age group (24-30) years [3].

Regarding years of experience in nursing and experience in ICU, the study found that more than half of the nursing staff (60%) have (1-3) years in nursing jobs. These results supported by a study done at ICUs in Selected Egyptian Cancer Hospitals which found that most of the nursing staff had less than five years of experience with a percentage of (55.6 %). Also, the study results are consistent with another study, which revealed that (43.3%) of nurses had (1-5) years of experience in ICU [4, 5].

With respect to the training sessions about infection control measures, the study findings indicate that all of the nursing staff have no training courses in this field. This totally agreed with the study carried out in Iraq, it founds that (100%) of the ICU nursing staff did not take training sessions about infection control measures [6].

As per marital status, the study shows that (52%) of the participants are single. This finding comes along with a study conducted in Egypt, which found that (53.2%) of the sample is single [4].

With respect to the level of education, the study appeared that (64%) of the participants graduated from the college of nursing. This result supported by a study accomplished in Nigeria, which found that most nurses (66.2%) are graduated from the college of nursing [7].

Regarding nursing staffs' gender, the study findings demonstrated that (56%) of the participants were males. These results are confirmed through a study done in North East Ethiopia, they found that most participants (53.8%) were males [8].

Part-II: Discussion of the Evaluation of Nursing Staffs' Knowledge Regarding Infection Control Measures at the Pre-Test and Post-Test Trials, as Shown in Tables (2 and 3):

The study findings manifested that the nursing staffs' knowledge regarding infection control measures in the pre-test was fair, in the post-test trials, nursing staffs' knowledge has been improved after the application of the educational program as shown in tables (2) and figure (3).

These findings agree with a study done in Iraq, which indicates that improved knowledge following the application of the educational program in the study sample [9].

The study result also finds that there was a highly statistically significant difference at p-value (0.0001) between the participants' overall responses in two periods

of measurements (pre-test and post-test). This finding reflects that there was an improvement in the nursing staffs' knowledge at the post-test compared with pre-test scores as shown in table (3). This result is along with studies performed, they revealed that a highly significant difference at p-value (0.0001) in the knowledge of nursing staff between "pre-test and post-test" [10, 11].

Part-III: Discussion the Association of the Overall Nursing Staffs' Knowledge and Some Demographic Data as Shown in Table (4):

Concerning the association between nursing staffs' age and their knowledge about infection control measures, the study showed that not a statistically significant difference between nursing staffs' knowledge in post-test and their age at p-value (0.111). This finding indicates that the educational program was effective for all age groups.

Regarding the educational level, the result of the study shows no significant difference between the educational level and nursing staffs' knowledge in post-test at p-value (0.804), this result is due to that more than half of the participants (64%) were in the same level of education (college of nursing).

Concerning years of experience, the findings showed that no statistically significant at (p-value=0.504), this result indicates that the knowledge of nursing staff about infection control is not affected with years of experience, perhaps this result is due to that most of the nursing staff in ICU (60%) are newly employed and have not received courses or programs about infection control measures.

These results are consistent with the studies conducted in Kenya and India, they found there is no statistical association among age, educational level, and years of experience with nursing staffs' knowledge regarding infection control measures (p>0.05) [12, 13].

Regarding the association between nursing staffs' knowledge and years of experience in ICU, our study found a statistically significant association at (p-value=0.039), this finding indicates an association between knowledge of the nursing staff and years of experience in ICU because the ICU requires a special policy of work and procedures according to the critical nature of the patients who enter it and some of these procedures are known by the nursing staff as routine practices.

This result supported by a research accomplished in India, who found that a statistically significant association between years of experience in ICU and knowledge of the nursing staff [14].

Recommendations:

The study recommended the necessity of activating the role of continuing medical education correctly in order to give courses about infection control measures for all HCWs, as well as work in the national infection control program in Iraqi health facilities (2009).

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