

Effectiveness of an Educational program on Nurses' Knowledge Regarding Care of Central Venous Catheter in AL-Nasiriyah cardiac center

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Abstract

A quasi experimental study design (study and control group) carried out through the period of 2020-2021 to assess effectiveness of an educational program on nurses' knowledge regarding care of central venous catheter. The study carried out in in Al-Nasiriyah cardiac center in Al-Nasiriyah city, Iraq, sixty nurses (30 nurses in study group and 30 nurses in control group) in intensive care unit (ICU) and surgical ward were chosen by using of non-probability (purposive sample). The data were collected through three periods (pretest, posttest1 after one week of the implementation of educational program and posttest2 after two week of the implementation of educational program). The instrument reliable by using of coefficient reliability and valid by the panel of experts. The data analyzed by use of descriptive and inferential statistical data analysis. The study findings indicated that the nurses sample at age (≤ 25) years, most of participants were female, graduated from college of nursing for study group and nursing institute for control group, they had (1-5) years of experience in nursing and cardiac center, and they did not participants in training courses. nurses had low level of knowledge at pretest in both group more than three quarters of the participants in the study group 23(76.7%), and vast majority in control group 28(93.3%), with mean (0.29), and (0.26) respectively, at posttest1 mean score is (0.84) for study group and (0.26) in control group, at posttest2 the mean score of knowledge for study group was (0.85), while mean score of knowledge in control group was (0.29). The study concluded that the educational program has an effectiveness in improve the nurses' knowledge regarding care of central venous catheter. The study recommended conducting research related to central venous catheter care in oncology and dialysis centers, and Providing an Arabic booklet on central venous catheter care to motivate nurses to develop and refine their knowledge.

Keywords: nurses' Knowledge, care of central venous catheter.

1. Introduction

Central venous catheters (CVCs) are catheters which are positioned in a broad vein and may be inserting in the veins of the neck (the internal jugular vein), the chest (the subclavian vein), the groin (the

femoral vein) or the veins of the arms (Basilic, brachial, and cephalic veins). It is also referred to as a central venous line, central line or central venous access device (CVADs) (Ahmad, khan, & Beg, 2016; Gowhar, Manzoor, Jabeen, 2018; McKean, Ross, Dressler, Brotman, & Ginsburg, 2012).

CVCs are instruments that are implanted into the body via a vein to allow fluids, blood products, drugs, and other treatments to be delivered to the bloodstream. CVCs may be placed into the subclavian or jugular vein (implanted ports, and tunneled catheters) or into one of the upper extremity's peripheral veins, it is referred as (peripherally inserted central catheter (PICC)) (Ho, & Spry, 2017).

For several weeks, months, even years, some kinds of CVCs can remain. Furthermore, as long as the patient receives medication and so patients do not need to be tingling with a needle each time, which can effective to relive patients ' pain (Pesonen, 2017 as a cited in ElsadeqKhadrawi, 2019). Central line-associated blood stream infections (CLABSI) are most common hospital acquired infections with record mortality of (12-25%) the use of antibiotics and a strict aseptic procedure will minimize the rate of infection considerably (John, 2016).

Inadequate nursing awareness of routine CVCs treatment and maintenance is lead to poor patient outcomes, such as increased complications rates (e.g. CLABSI and occlusions), increased morbidity and mortality, and prolonged hospital stay (Paquet, Boucher, Valenti, & Lindsay, 2017).

After the catheter is implanted, the nurse is responsible for CVCs care. Proper care provided by the nurse also effects on the rate of development of infections and other catheter-related complications (Aydoğdu, & Akgün, 2020). Educational programs are the key pillar of prevention CVCs Complications, and a foundation for raising awareness among healthcare workers (HCWs) (Abdo, Ramadan, Tosson, & Al-Fadhil, 2020).

2. Methodology

2.1. Design of the Study:

The study design is a quasi-experimental (study and control group), that study carried out from the period of September 2020 to April , 2021 on nurses at ICU and surgical wards in AL-nasiriyah cardiac center, to evaluate the effectiveness of an educational program on their knowledge regarding central venous catheters care.

2.2. Ethical Considerations

Ethical approval was obtained from ethical committee of research in the Faculty of Nursing/University of Baghdad regarding confidentiality and anonymity of the participants. Also the nurses were fully acquainted of the current study and its aims and then a voluntary verbal consent was obtained in order to participate in the study.

2.3. Setting of the Study:

The study was carried out at ICU and surgical wards in AL-nasiriyah cardiac center.

2.4. Sample of the Study

The researchers sample includes (60) nurses, (30) nurses in study group and (30) nurses in control group in ICU and surgical wards. They are selected by using non probability sampling (purposive sample).

2.5.1. Demographic Data

This part consists of (6) items which include: nurses (sex, age, level of education, years of experience in nursing, years of experience in Al- Nasiriyah cardiac center, participated in training courses).

2.5.2. Questionnaire related nurses Knowledge regarding care of central venous catheter

This part is related to the questions that assess of the nurses knowledge for pre and post program. It is consisted of self-administered questionnaire and it is include three domain; first domain (nurses knowledge regarding central venous catheter. It was composed of (6) items), second domain (nurses knowledge regarding types of central venous catheter. It was composed of (6) items), and third domain (nurses knowledge regarding central venous catheter care. It was composed of (15) items) constructed for the purpose of an educational program.

2.6. Rating and Scoring of the Study Instrument:

The knowledge questionnaire have been scored and rated on two levels correct answer and incorrect answer, (1) points for correct answer and (0) point for incorrect answer which assessed by cutoff point (0.33) due to scores (1 and 0) respectively. Scores of responses are categorized according to the following level of nurses' knowledge: (0 - 0.33) = deficit level of knowledge, (0.34 - 0.67) = moderate level of knowledge and (0.68 – 1.00) = good level of knowledge.

2.7. Data Collection Methods:

The process of gathering information was conducted from 21st December 2020 to March 1st 2021. The study and the objectives were explained to the study sample by the researchers, the nurses' verbal consent has been taken. The researchers gathered the general information about nurses participated in the study, and conducted the pretest about nurses' knowledge regarding central venous catheter care.

2.8. Statistical Data Analysis:

The statistical analysis of the data of the study is done by using Microsoft office excel 2010 and SPSS package ver. 23. The following statistical data analysis approaches were used in order to analyze data and assess the results of the study. The researchers used descriptive and inferential statistical data analysis to obtain results.

3. Discussion of the Results

Part (1): Discussion of the distribution of the nurses by their demographic characteristics

The findings in the **table (1)** indicated that the age of nurses whom participate in the study (≤ 25) years in both study and control group. These findings will show the study samples of educational maturity, as well as their ability to acquire knowledge and change their behavior in terms of submitting up-to-date information. Shrestha, (2013) in their study (Impact of educational interventions on nurses' knowledge

regarding care of patient with central venous line) which reported that the majority of study group sample (72.5%) of nurses are at age group (≤ 25) years.

Sakshi et al., (2019) in their study (Effectiveness of education program regarding central venous catheter (CVC) care bundle in terms of knowledge and practice of nursing personnel) found that (63%) of study sample at age (21-30) years old.

Throughout the duration of the current study data analysis show, the finding present that 24(80%) in study group and 16(53.3%) in control group were females. Kumari, et al., (2016) in their study (A study of pre-and post-test knowledge score of nurses on care of patient with central venous access devices in selected oncology hospital of Bangalore) found that 40(80%) were females

Regarding to the nurses level of education the finding of the previous study indicated that 16(53.3%) in study group were graduated from college of nursing while control group 15(50%) were nursing institute. deshमुख and shinde, (2012) who reported that the majority of sample were (56.67%) are nursing institution. While Ahmed, et al., (2019) who indicated that the highest percentage of nurses (54%) were graduated from college of nursing.

The present study related to years of experience in nursing shows the findings of present study were in study group were 23(76.7) and control group were 24(80%) have (1-5) years of experience in nursing. Shrestha, (2013) who indicated that the majority of study sample (85.5%) have (0-5) years of experience in nursing.

In related to the years of experience in Al- nasiriyah cardiac center, the results of the present study were 23(76.7%) in study group, 28(80%) in control group have (1-5) years of working in ICU and surgical wards. Ahmed, et al., (2019) which revealed that the highest percent (72%) of study sample have (1-5) years of experience in ICU. In relation to participation in training courses, the current study showed that 19(63.3%) in the study group and 26(86.7%) had no participation in training courses. Ahmed, et al., (2019) who presented (48%) of nurses had no participation in training courses.

Part (2): Distribution of nurses' knowledge about central venous catheter care for the study and control groups at pre, post-1, and post-2 tests

Table (2) show that mean score of knowledge for study and control group were ($M=0.29$, $M=0.26$) respectively. According to this results nurses have deficit level of knowledge in pretest for both groups. This results agree with study done by (Ahmed et al., 2019) who mentioned that more than one half (54%) of nurses have fair level of knowledge. While mean score of posttest knowledge in study group increase after implemented of program ($M=0.84$). this is reflect the effectiveness of educational program on nurses' knowledge in study group at posttest. This results agree with study done by Pushpakala and ravinath, (2014) who indicate that the mean score of knowledge was ($X=9.80$) after one week of self-instructional module on central venous catheter care. In posttest2 mean score of knowledge for study group was ($X=0.85$). This results agree with study done by El-Sol and Badawy, (2017) who indicate that mean score of knowledge in pretest of

study group was ($X=5.09$), after two week of implemented program the post test was ($X=9.16$). This is reflect the effectiveness of educational program on nurses' knowledge in study group at posttests

Part (3): discussion the relationship between nurses knowledge and their demographic characteristics

The findings in **table (3)** revealed there is no significant statistical difference between nurses knowledge at posttest and their demographic characteristics (age, gender, level of education, years of experience in nursing, years of experience in AL- nasiriyah cardiac center). This is agree with study done by (deshmukh & shinde,2012), which show there was no significant association of age and gender of staff nurses with knowledge regarding central venous access device care. Aydoğdu and Akgün, (2020) study, which mentioned that there was no significant association between nurses knowledge and their level of education. Banks, et al., (2010) study show that there is no significant association between nurses' knowledge and their work setting.

4. Conclusion

The nurses' knowledge in the study group increase after the educational program was implemented, but there was not any difference in the control group. And The findings showed that the educational program was effective regarding nurses knowledge toward central venous catheter care in study group.

5. Recommendations

The study recommended the necessity of activating conducting research related to central venous catheter care in oncology and dialysis centers, and Providing an Arabic booklet on central venous catheter care to motivate nurses to develop and refine their knowledge.

Table (1) Distribution of the nurses by their demographic characteristics

Variables	Characteristics (n=60)	Study Group		Control Group		C.S. P-value
		Freq.	%	Freq.	%	
Age (years)	≤ 25	15	50.0	14	46.7	t-test p=0.742 NS
	26-30	12	40.0	12	40.0	
	31-35	2	6.7	3	10.0	
	36-40	1	3.3	1	3.3	
Gender	Male	6	20.0	14	46.7	FEPT P=0.567 NS
	Female	24	80.0	16	53.3	
Level of Education	Secondary Nursing	3	10.0	3	10.0	t-test P=0.580 NS
	Nursing institute	11	36.7	15	50.0	
	College of Nursing	16	53.3	12	40.0	
Years of Experience in Nursing	1-5 years	23	76.7	24	80.0	t-test p=0.585 NS
	6-10 years	4	13.3	5	16.7	
	11-15 years	2	6.7	0	0.0	
	≥ 16 years	1	3.3	1	3.3	
Years of	1-5 years	23	76.7	28	93.3	t-test

Experience in the Cardiac Center	6-10 years	5	16.7	2	6.7	p=0.153 NS
	11-15 years	2	6.7	0	0.0	
Training courses	No	19	63.3	26	86.7	FEPT P=0.569
	Yes	11	36.7	4	13.3	
Total		30	100.0	30	100.0	NS

n=sample size, Freq.=Frequency, %=Percentages, C.S. : Comparison Significant, $\bar{x} \pm Std.$ =Arithmetic Mean and Std. Dev.=Standard deviation, P=P-value, FEPT=Fisher Exact Probability Test N.S.= Non-Significant, $\leq$ = less than or Equal

Table (2): Distribution of nurses' knowledge regarding central venous catheter care for the study and control groups at pre, pre-1, and post-2 tests

Test Period	Levels of Evaluation	Pre-Test		Post-1 Test		Post-2 Test	
		Freq.	%	Freq.	%	Freq.	%
Study Group	Deficit (0 - 0.33) : 1	23	76.7	0	0.0	0	0.0
	Moderate (0.34 – 0.67) : 2	7	23.3	0	0.0	0	0.0
	Good (0.68 – 1.00) : 3	0	0.0	30	100.0	30	100.0
	Total	30	100.0	30	100.0	30	100.0
		0.29 $\pm$ 0.088		0.84 $\pm$ 0.046		0.85 $\pm$ 0.049	
Control Group	Deficit (0 - 0.33) : 1	28	93.3	28	93.3	24	80.0
	Moderate (0.34 – 0.67) : 2	2	6.7	2	6.7	6	20.0
	Good (0.68 – 1.00) : 3	0	0.0	0	0.0	0	0.0
	Total	30	100.0	30	100.0	30	100.0
	$\bar{x} \pm Std. Dev.$	0.26 $\pm$ 0.064		0.26 $\pm$ 0.064		0.29 $\pm$ 0.064	

F= Frequencies; %= Percentages; Arithmetic Mean ($\bar{x}$) and Std. Dev.= Standard. Deviation; Levels of Evaluation = Deficit (0 - 0.33) : 1; Moderate (0.34 – 0.67) : 2; Good (0.68 – 1.00) : 3

Table (3) relationship between nurses' Knowledge at posttest and demographic characteristics

variable	Period	ANOVA		
		F	d.f	Sig.(p)
Age (years)	Pretest	0.975	26	0.420
	Posttest1	0.920	26	0.445
	Posttest2	1.197	26	0.331
Gender	Pretest	1.537	28	0.410
	Posttest1	0.455	28	0.126
	Posttest2	3.327	28	0.128
Level of Education	Pretest	1.060	27	0.361
	Posttest1	0.147	27	0.864
	Posttest2	0.210	27	0.812
Years of Experience in Nursing	Pretest	1.118	26	0.360
	Posttest1	0.958	26	0.427
	Posttest2	1.346	26	0.281
Years of Experience in the Cardiac Center	Pretest	1.238	27	0.306
	Posttest1	1.328	27	0.282
	Posttest2	1.658	26	0.209

ANOVA: Analysis of variance; F = F-test, d.f = degree of freedom, P = probability value; NS: Non-Significant at (P > 0.05); S: Significant at (P < 0.05); HS: High Significant at (P < 0.01).

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