Effectiveness of Educational Health Program on Nurses Knowledge toward Post-Operative Care for the Child undergoing Cardiac Surgery inPediatricCardiac Intensive CareUnit (PCICU) at Cardiac Centers and Hospitals in Baghdad City

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Abstract

Background:Congenital heart defects (CHD) are anatomic malformations that found at delivery and result due to abnormal cardiac function, and considered as the main cause of death in the first 12 months of life. Surgical Operation has been the gold standard treatment for congenital cardiac anomalies or malformations for decades, it has significantly reduced the morbidity and mortality of infants born with severe and complicated cardiac conditions, with development in the field of congenital cardiac surgery, various complex actions are done in children. These moves can be having numerous complications, nurse must be have an information and skills to provide best nursing care postoperatively to the children with congenital heart disorders and children undergoing cardiac surgery.

Methodology:The study was designed as quasi-experiment for study group and control group participants employed in cardiac intensive care unit of cardiac centers and hospitals in Baghdad city (Ibn Al-Nafees Hospital, Iraqi Center for Heart Disease, and Ibn Al-Bitarcenter for cardiac surgery), being tested in two periods pre-test, and post-test , The study group participants are tested prior implementing the educational program (the educational program lectures started from 4th -22th of March 2020, In the CICU departments) then after period they are tested post-test (2th - 14th April, 2020 in same CICU departments). The control group participants are provided with the same questionnaire to answer at same time intervals as in study group but without enrollment in educational program.

The results:The results of the study show that the effectiveness of educational program about nurses' knowledge regarding post-operative care for the child undergoing cardiac surgery.

Discussion:there is a highly significant difference in study group between pre and post-test in all main domains related to post-operative care for the child undergoing cardiac surgery.

Conclusion:Most of nurses in Cardiac intensive care units had knowledge deficit concerning post-operative care for the child undergoing cardiac surgery. There were no differences between the knowledge in both study and control groups in the pretest. There is an improvement in the knowledge of the nurses in study group after exposure to an educational program concerning post-operative care for the child undergoing cardiac surgery, there were no significant differences between pre and posttest of control group in all main domains except in the sixth domain concern postoperative care. The effectiveness of program show strong difference between the nurses' knowledge for both study and control groups during the post-test.

Keywords---effectiveness, educational program, nurses, knowledge, Postoperative, care

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1. Introduction

Children with cardiovascular disorders are classified into two main sets, congenital cardiac defects and acquired heart disorders 1, congenital cardiac defect happens when the heart, or blood vessels close the heart, doesn't growth normally before birth 2. It has occurred in 8 per 1000 childbirths; although most conditions are multifactorial some lesions are associated with chromosomal disorders, single gene defects, teratogens, or maternal metabolic disorder 3.

Congenital heart defects can be classified into three large pathophysiologic groups: left-to-right shunts, right-to-left shunts, and obstructive stenotic lesions, a cyanotic congenital defect consists of left-to-right shunts resulting in an elevation in pulmonary blood flow and obstructive lesions, which commonly have normal pulmonary blood flow , the most prevalent left-to-right shunts are ventricular septal defect (VSD), atrial septal defect (ASD), and patent ductus arteriosus (PDA). All three lesions have ordinary systemic oxygen saturations within the presence of immoderate 4,the highest occurrence of CHD at 9.3/1000 live births was in Asian countries, and the lowest prevalence of CHD was 1.9/1000 stay births in African nations 5.

In Middle East countries, the rate change widely, in Saudi Arabia the incidence ranged between 2.1 and 10.7 per 1000 6. While in Egypt the happening of congenital heart disease (CHD) is ranged from 7 to 8 children per 1000 existence birth 7. Postoperative cardiac and extra cardiac complications in pediatric cardiac surgical procedure had been inconsistently stated but contribute consequentially to mortality, hospital stay, cost, and quality of life post pediatric cardiac surgery, these complications associated with prolonged mechanical ventilation and pediatric cardiac intensive care unit and hospital stays, and increased mortality 8. Nurses need to have a sound information base about cardiovascularevents affecting children as a way to provide suitable assessment, intervention, guidance, and assist to the child and family, because the potentially massive and destructive effects that cardiovascular disorders can have on kids and their families, nurses want to be professional in assessment and interventions in this location and capable of provide support throughout the course of the disease and beyond 9.

Postoperative care begins from the point when the operating room team decides to move the patient to the cardiac intensive care unit ,this is a that is a very vital phase due to various troubles such as inadvertent change in rate of drug infusion, displacement of endotracheal tube, or hypothermia can additionally lead to deterioration of the patient status, the intensive care unit team should be aware in improvement of the hemodynamic condition of the patient, medications, and the type and setting of the ventilator support 10, the nurse performs an important role at a postoperative cardiac intensive care unit (CICU) in making sure the affected person gets whole and optimal care. In this setting, the nurse has to pay unique attention towards any type of real or potential trouble that can occur, the nurses, acting a complete assessment of patient's medical history, has perceived each patient's requirements and carries out the accurate and specific interventions 11, optimal management of the postoperative pediatric cardiac surgical patient needs a comprehensive understanding of patient anatomy, physiology, surgical repair or palliation, and clinical status 12.

The study aims to:

1. To determine the effect of health educational program on nurses knowledge toward post-operative care for the child undergoing cardiac surgery

2. To find out the relationship between nurses knowledge and their socio-demographic characteristic such as (gender, age, level of education and years of experiences).

2. Methodology

2.1 Ethical considerations of the study

All ethical considerations were obtained from the College of Nursing /University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

2.2 Design and setting of study

The study was designed as quasi-experiment for study group and control group participants employed in cardiac intensive care unit of cardiac centers and hospitals in Baghdad city (Ibn Al-Nafees Hospital, Iraqi Center for Heart Disease, and Ibn Al-Bitarcenter for cardiac surgery), which is a governmental Centers and hospitals specialized in heart disease and surgery, it are selected as a site for implementing an educational program to achieve the validation of nurses' knowledge about post-operative care for the child undergoing cardiac surgery .

2.3 Sampling and sample size:

A non-probability purposive sample chosen from nurses' who were working in a CICU department of cardiac centers and hospital in Baghdad city, The sample separated into two groups (25) nurses registered as a study group, and (25) nurses registered as the control group, the study   group participants were enrolled to an educational program, while the control group were not

2.4Instrument of study

The study instruments include two parts: Part one related to the general information of the nurses like Socio-demographic data included (age, gender, education level, mitral status, and years of experience in CICU). Part two contained of (40) items concerning with Nursing role in post-operative period. The items of the questionnaire format were designed as multiple choice questions, every question has four answers (A, B, C, and D), and there are one right answer and three wrong, the participant should be choose one only.

2.5 Statistical Analysis

The data were analyzed by using SPSS (Statistical Package for Social Sciences) version 24.0 application of the statistical analysis system. The subsequent statistical data analysis methods were used to analyze and assess the results of the study:

3. Resluts and discussion

(Table.1): The Distribution of the Study Samples (Study and Control) according to the Demographical Data.

Variable	Groups	Study group		Control group	
		F.	%	F.	%
Age Groups	21 – 30	9	36	16	64
	31 – 40	11	44	4	16
	41 – 50	5	20	4	16
	51 – 60 and more	0	0	1	4
	Total	25	100	25	100
	$\bar{x} \mp SD$	33.84 + 8.49		31.6 + 9.71	
Gender	Female	9	36	14	56
	Male	16	64	11	44
	Total	25	100	25	100
Marital Status	Single	9	36	12	48
	Married	16	64	13	52
	Total	25	100	25	100
Education level	Nursing School Graduate	6	24	7	28
	Nursing Institute Graduate	13	52	8	32
	Nursing College Graduate	6	24	10	40
	Higher Education	0	0	0	0

	Total	**25**	**100**	**25**	**100**
Years of Experience in ICU	**1 – 5**	**10**	**40**	**15**	**60**
	6 – 10	**10**	**40**	**5**	**20**
	11 – 15	**4**	**16**	**0**	**0**
	16 – 20 and more	**1**	**4**	**5**	**20**
	Total	**25**	**100**	**25**	**100**

Freq. = frequency, % = percentage, P=Value, = arithmetic Mean (x̄) and Standard Deviation (S.D.).

Table (1) showed that the majority of the study groups (44 percent) were within age group (31 – 40) years old; while, most of the control groups (64 percent) were within age group (21 – 30) years old. Moreover, most of the study group (64 percent) were male and (56 percent) of the control group were female. The majority of the study group (64 percent) and the control group (52 percent) were married. In addition, most of the study (52 percent) have nursing institute graduation, and (40 percent) of the control group were graduated from college of nursing with bachelor's degree in nursing. The highest percent in the study group (40 percent) and in control group (60 percent) have (1 – 5) years of experience in the ICU.

(Table.2) comparison significant of pre-test knowledge scores for the study and control group.

Main domain of knowledge	N	Pre-test Study group			Pre-test Control group			t	P- value	Sig.
		M.S	SD	df	M.S	SD	df			
Part one: Nurses knowledge toward cardiovascular disease	25	1.44	.58	24	1.4	.58	24	-.214	.83	N.S
Part two: Nurses knowledge toward Risk factors with signs and symptoms of cardiovascular disease	25	1.44	.58	24	1.4	.577	24	.225	.82	N.S
Part Three: Nurses knowledge toward diagnosis and classification of cardiovascular disease	25	1.24	.43	24	1.28	.458	24	-.296	.77	N.S
Part four : Nurses knowledge toward treatment of cardiovascular disease	25	1.76	.66	24	1.52	.77	24	1.036	.29	N.S
Part five: Nurses knowledge toward complication of cardiac surgery	25	1.04	.2	24	1.12	.33	24	-1.0	.32	N.S
Part Six: Nurses knowledge toward postoperative care for child undergoing cardiac surgery	25	1.88	.33	24	1.76	.43	24	-1.0	.32	N.S
Total	25	1.48	.51	24	1.44	.507	24	.23	.81	N.S

N= number, M.S= mean of score, SD= standard deviation, df= degree of freedom, t= t.test, NS=non-significant at P > 0.05

Table.2. showed that there were no significant differences between pretest score between both study and control groups in all main domains at (P.value> 0.05).

(Table.3) comparison significant of post -test knowledge scores for the study and control groups

Main domain of knowledge	N	Pre-test Study group			Pre-test Control group			t	P- value	Sig.
		M.S	SD	df	M.S	SD	df			
Part one: Nurses knowledge toward cardiovascular disease	25	2.56	.50	24	1.4	.5	24	7.77	.000	H.S
Part two: Nurses knowledge toward Risk factors with signs and symptoms of	25	2.16	.688	24	1.2	.4	24	6.08	.000	H.S

cardiovascular disease									
Part Three: Nurses knowledge toward diagnosis and classification of cardiovascular disease	25	2.04	.73	24	1.24	.43	24	4.38	.000	H.S
Part four : Nurses knowledge toward treatment of cardiovascular disease	25	2.36	.569	24	1.24	.43	24	9.33	.000	H.S
Part five: Nurses knowledge toward complication of cardiac surgery	25	2.2	.645	24	1.28	.45	24	6.05	.000	H.S
Part Six: Nurses knowledge toward postoperative care for child undergoing cardiac surgery	25	2.4	.5	24	1.48	.51	24	6.54	.000	H.S
Total	25	2.4	.5	24	1.32	.47	24	7.11	.000	H.S

N= number, M.S= mean of score, SD= standard deviation, df= degree of freedom, t= t.test, NS=non-significant at P > 0.05

Table.3. showed that there were significant differences between posttest score of both study and control group in all main domains at (P.value ≤ .05).

(Table.4) Comparison significant of pre and post - test knowledge scores for the Study and control groups.

score	group	N	M	SD	T	P.value	Sig.
Pretest knowledge	Study	25	1.48	.51	.238	.814	N.S
	Control	25	1.44	.507			
Posttest knowledge	Study	25	2.4	.5	7.111	.000	H.S
	Control	25	1.32	.47			

N= number, M = mean of score, SD= standard deviation, NS =non-significant at P>0.05, S= significant at P<0.05

Table.4 Showed that there was no statistically significant difference in nurses' knowledge in the pretest time between the study and the control groups (P.value = .814).

Table .4 Also showed that there was highly significant difference in nurses' knowledge in the posttest time between the study and the control groups (P.value = .000).

(Table.5): Correlation between Socio-demographic Variables and knowledge of the study group by

Socio-demographic variables		Study group (N=25)										
		pretest						posttest				
		Sum of squares	df	M.S	F	P value	Sig.	Sum of squares	df	M.S	F	P value	Sig.
Age	Between groups	.136	1	.136	.236	.632	N.S	.06	1	.06	.104	.75	N.S
	Within groups	13.22	23	.575				13.3	23	5.78			
	total	13.36	24					13.36	24				
gender	Between groups	.016	1	.016	.066	.8	N.S	.06	1	.06	.242	.62	N.S
	Within groups	5.744	23	.25				5.7	23	.24			
	total	5.76	24					5.76	24				
Marital Status	Between group	.279	1	.279	1.172	.29	N.S	.427	1	.427	1.84	.18	N.S
	Within groups	5.481	23	.238				5.33	23	.232			
	total	5.76	24					5.76	24				
Level of education	Between group	.16	1	.16	.311	.58	N.S	1.5	1	1.5	3.28	.08	N.S
	Within groups	11.84	23	.515				10.5	23	.457			

	total	12	24					12	24				
Years of experience in ICU	Between group	.136	1	.136	.181	.674	N.S	2.16	1	2.16	3.26	.031	S
	Within groups	17.22	23	.749				15.2	23	.66			
	total	17.36	24					17.36	24				

M.S= mean of score, df= degree of freedom, NS = non-significant at P>0.05, S=significant at P<0.05

Table (5) Showed there was a significant relationship between years of experience and nurses' knowledge in posttest at (P.value=.031)

4. Discussion

According to (Table 1) the result related to demographic data, the result of age group in the study group match with the results of Thomas (2013) 13, who found in his study that most of nurses at age (20-30) years. These findings Agree with the control group and disagree with the finding of study group. Regarding to the nurses' gender, at the study group most of nurses are males. While at the control group most of them are females, this agrees with Thomas study in his finding of the control group and in-consisted with the finding of study group. Also this result is in agreement with another study by Kreem, & Hamza, (2019) 14 they found that most of nurses were males. Regarding to the marital status of nurses in the both groups are married, the finding of Kreem, & Hamza, (2019) in same line of our study finding. They found that most of nurses were married.

Regarding to the educational level of the nurses, at the study group most of nurses are nursing institute graduate. While at the control group, most of them are nursing college graduate. This result is in agreement with a study implemented by Mahil (2005) 15. Who found that half of the nurses had institute nursing graduate also agreement with Thomas in his study who found that majority of the nurses had diploma degree in nursing , Present study is supported by Salah Eldien, Tantawi, and Eltahan, (2017) 7 founds that most of nurses had diploma nursing degree; this result consisted with the present study finding. Regarding to the years of experience of nurses at the ICU, Most of nurses at the study group have (1-5) and (6-10) years, and at the control group, nurses have (1-5) years of experience at the ICU. Mahil (2005) found that most of nurses had (1-6) years of experience in intensive therapy unit.

Also Thomas (2013) found that majority of the nurses had (1-5) years of experience as staff nurse in post-operative cardiac units. ,Kreem, & Hamza, (2019) found that most of nurses had (1-5) years of experience. Regarding to the nurses' knowledge at the two periods (pretest and posttest) at the study group in (Table.2) showed that there were no significant differences between pretest score between both study and control groups in all study main domains, Mahil, (2005) found that (58%) of nurses had poor level of knowledge.

regarding the post-operative nursing care of the children with congenital heart disease , Salah Eldien, Tantawi, &Eltahan, (2017) in their studies found that 61.3% of the studied nurses had unsatisfied total knowledge score toward care for children undergoing open heart surgery. AlsoKreem, & Hamza, (2019) found that nurses in the control group had low level of knowledge regarding post-operative care at the pretest and post-test. These findings supported the result of the control group level of knowledge at pretest and post-test. Regarding to the significant comparison between the nurses' knowledge of the study group and control group at the pretest period at the (Table.3) There are no significant differences between the nurses' knowledge at the 6 domains, The researcher seen that the mean score of assessment nurses level of knowledge at pretest for control group and study group are in same level in the all domains. There for no significant statistical difference present between the 2 tests. Regarding to the significant comparison of the overall nurses' level of knowledge at pretest and post-test of the two groups (study and control) in

(Table.4) There is no significant difference between the pretest of the control group and study group of the overall nurses' level of knowledge and there is significant difference between the post-test of the control group and study group of the overall nurses' level of knowledge.

The researcher point of view that this finding related to the overall mean score of nurses' knowledge in the pretest of the control group and study group in same line. While, there is a wide range between the mean score of the post-test of the control group and study group. This finding occur due to the educational program has enhance the nurses level of knowledge related cardiovascular disease in the post test of the study group and the control group not took the training sessions of the program therefore still in the same level of knowledge. Regarding to the correlation between the overall nurses' level of knowledge at the pretest and post-test in

the study group and their demographic characteristics in (Table.5) the study showed there are no significant relationship between the nurses'knowledge at the pretest and their demographic characteristics (age, gender, marital status, level of education and years of experience), this result is in agreement with a study of Thomas (2013) who found that there is no significant statistical relationship between nurses' level of knowledge and their sociodemographic data, while There is significant relationship between the nurses' knowledge at the post-test and their years of experience in ICU.

5. Recommendations:

From conclusion and study efforts the researcher recommends the following:

1. Educational program about post-operative care for the child undergoing cardiac surgery must be conducted for all nursing staff in cardiac intensive care unit.

2. The need for print and distribute care guidelines with an ongoing educational program to increase and refresh nurses' knowledge about post-operative care in the specific areas for using as a reference

3. further studies should be conducted to measure practice of nurses toward post-operative car in Cardiac intensive care unit

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