

Effectiveness of an Educational Program on Nurses Knowledge Concerning Cardiopulmonary Resuscitation at Imam Hussein Medical City in Holy Kerbala'a Governorate

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Abstract: Objective(s): The present study aims to determine the effectiveness of an educational program of cardiopulmonary resuscitation on nurses' knowledge at Imam Hussein Medical City in holy kerbala'a governorate. **Methodology:** A quantitative approach using quasi-experimental design (two-group pre-test-post-test design) has been conducted in this study to determine the effectiveness of an educational program on nurses knowledge concerning cardiopulmonary resuscitation with application of pre and post- test approach for the study group and control group to evaluate their knowledge during the period of 10st of January, 2017 till 25th of May, 2017. The present study is carried out at Imam Hussein Medical City in Holy Kerbala'a Governorate. Non-probability (purposive) sample of (70) nurses were selected. They are selected from (421) nurses who are working at medical and surgical department at the medical city. A self-report instrument is constructed for the purpose of the study. It is consisted of two parts; the first is the demographic data which is consisted of (6) items and the second is divided to five parts, nurses' knowledge concerning cardiovascular system anatomy and cardiac electrical activity (5) items, nurses knowledge concerning respiratory system anatomy (6) items, nurses knowledge about cardiopulmonary resuscitation (19) items, nurses knowledge related to D.C shock using (2) items and nurses knowledge about drugs used during cardiopulmonary resuscitation (2) items. Validity and reliability of the instrument is determined through pilot study. Data collection is initiated during the period from 19th of February to 30th of August, 2017 in order to assess the effectiveness of an educational program of cardiopulmonary resuscitation on nurses' knowledge. Data are analyzed through the use of SPSS (Statistical package for Social Sciences) version 20.0 application statistical analysis system and excel application. Descriptive and inferential statistical data analysis approaches are employed. **Results:** Results of data analysis depicted that participants are severely affected by the educational program of CPR. **Conclusion:** The study concludes that the educational program concerning cardiopulmonary resuscitation was effective for the study group, where the mean of the pretest responses was 17.03, while for the posttest answers was 33.63 and p-value = 0.001.

Key words: Effectiveness, Educational Program, Knowledge, Cardiopulmonary Resuscitation

I. Introduction

Cardiopulmonary resuscitation (CPR) is a serious & vital process that is needed for persons who have sudden cardiac arrests. It is a mixture of rescue breaths and chest massage which is done to the victims who are suspected to have cardiac crisis ⁽¹⁾. The term cardio-pulmonary resuscitation in this study as 'CPR' is pointing to the attempts of instituting and keeping airway patency via supporting breathing and circulation without using of equipments other than the protective shield. It includes a primary assessment of the patient and then number of steps that implicate cardiac massage, airway maintenance and rescue breaths. Cardiopulmonary resuscitation is one of the procedures that could be done with no evident order from the doctor. As majority of incidences of heart attack showing both sudden and unexpected, immediate activities are necessary ⁽²⁾. About 90% of heart attack victims die before getting the hospital, but statistics proved that if more people knew how to perform cardiopulmonary resuscitation, more victims could be saved. Direct cardiopulmonary resuscitation can replicate a victim's chance of survival. Approximately 100,000 people suffer from a lethal cardiac arrest in Germany annually which is about ten times more than deaths resulting from road traffic accidents. New means and techniques for cardiopulmonary resuscitation had been developed to improve the competency of chest compressions during cardiopulmonary resuscitation ⁽³⁾. After a cardio-pulmonary stopping had appeared, a patient loses his/her unconsciousness because of inappropriate cerebral blood flow and no pulse can be checked. A little after a cardiac arrest, respiratory failure occurs. One of the consequences of cardiac arrest is that oxygen cannot be distributed well to tissues. This could result in subsequent metabolic and respiratory acidosis. The Heart, Brain and other tissue damages will arise within 4-6 minutes if a successful tries to resuscitate the patient who had delivered within that short time of clinical opportunity ⁽⁴⁾. The significant fact is

that nurses were seriously more likely to refuse CPR efforts. Nurses are generally the first responders to an in-hospital heart crises and direct basic life support while waiting for the advanced cardiac life support. In a study done by Dwyer and associates, the behaviors of nurses members affect the speed and level of participation in real emergency situations regarding cardiopulmonary resuscitation ⁽⁵⁾. Cardiopulmonary resuscitation (CPR) is an important lifesaving skill taught to hospital staff throughout the world. There is a marked and rising demand for cardiopulmonary resuscitation training from the professional healthcare groups and from the public. These training programs involve considerable operational and opportunity costs and must be repeated annually for mandatory recertification⁽⁶⁾. Since a short period of about 45 years in the rising of hospital practices, cardiopulmonary resuscitation has been raised from its original historical position as a new method process to its modern status as a clinically international procedure. As an outcome, all hospital-based health care qualifiers are expected to be proficient and rehabilitated in the implementation of this vital procedure ⁽⁷⁾. Modern achieved studies reported that about **1,000,000** people die of cardiac ceasing every year in the United States and Europe; almost one every **30** second with approximately **200,000** treated cardiac arrests among United States hospitalized patients annually. Cardiopulmonary resuscitation will be implemented to some of them by Emergency Medical Services (EMS). Unluckily only **1 in 5** adults survives in hospital cardiac arrest ⁽⁸⁾.

II. Methods

A quantitative approach using quasi-experimental design (two-group pre-test-post-test design) has been conducted in this study to determine the effectiveness of an educational program on nurses knowledge concerning cardiopulmonary resuscitation with application of pre and post- test approach for the study group and control group to evaluate their knowledge during the period of 23st of March, 2017 till 25th of May, 2017. The present study is carried out at Imam Hussein Medical City in Holy Kerbala'a Governorate. Non-probability (purposive) sample of (70) nurses were selected. They are selected from (500) nurses who are working at medical and surgical department at the medical city. A self-report instrument is constructed for the purpose of the study. It is consisted of two parts; the first is the demographic data which is consisted of (6) items and the second is divided to five parts, nurses' knowledge concerning cardiovascular system anatomy and cardiac electrical activity (5) items, nurses knowledge concerning respiratory system anatomy (6) items, nurses knowledge about cardiopulmonary resuscitation (19) items, nurses knowledge related to D.C shock using (2) items and nurses knowledge about drugs used during cardiopulmonary resuscitation (2) items. Validity and reliability of the instrument is determined through pilot study. Data collection is initiated during the period from 26th of June to 21th of August, 2017 in order to assess the effectiveness of an educational program of cardiopulmonary resuscitation on nurses' knowledge. Data are analyzed through the use of SPSS (Statistical package for Social Sciences) version 20.0 application statistical analysis system and excel application. Descriptive and inferential statistical data analysis approaches are employed.

III. Results

Table (1):Distribution of the Nurses According to their Socio-demographic Characteristics

No.	Characteristics	Study group		Control group		
		F	%	F	%	
1	Age:	18 – 24 years	15	50	10	33.3
		25 – 34 years	7	23.3	10	33.3
		35 – 44 years	4	13	5	16.7
		45 – 54 years	3	10	4	13.3
		55 ≤ years	1	3.3	1	3.3
		Total	30	100	30	100
2	Gender:	Male	8	26.7	13	43.3
		Female	22	73.3	17	56.7
		Total	30	100	30	100
3	Level of nursing education:	Higher	2	6.7	0	0
		College	3	10	1	3.3
		Institute	11	36.7	9	30
		Preparatory school	12	40	20	66.7
		school	2	6.7	0	0
		Total	30	100	30	100
4	Years of experience:	1 – 5 years	18	60	12	40
		6 – 10 years	5	16.7	9	30
		11 – 15 years	2	6.7	6	20
		16 ≤ years	5	16.7	3	10
		Total	30	100	30	100
5	Participation in CPR course:	Yes	17	65.7	13	43.3
		No	13	43.3	17	56.7

		Total	30	100	30	100
6	Number of Training course inside country:	None	13	43.3	17	56.7
		1 – 3	12	40	12	40
		4 – 6	3	10	1	3.3
		7 – 10	2	6.7	0	0
		Total	30	100	30	100
7	Number of Training course outside country:	None	29	96.7	30	100
		1 – 3	1	3.3	0	0
		4 – 6	0	0	0	0
		7 – 10	0	0	0	0
		Total	30	100	30	100

Table (1) demonstrates that the analysis of socio-demographic characteristics in this table for the nurses shows that half of the study group nurses are with age of (18-24) years old (50%) and the age group for nurses in the control group is ranging equally between groups of (18-24) and (25-34) years old (33.3%). The nurses' gender indicates that the female is the dominant gender among the current study, in which 73.3% of nurses in the study group and 56.7% in the control group are female nurses. The highest percentage related to the educational levels is seen to be the nursing preparatory school that are 40% in the study group and 66.7% in the control groups who are graduated from the nursing preparatory school, and about third of them are graduated from medical institute as nurses (study group= 36.7%, control group= 30%). The number of years of experiences is 1-5 years among nurses. We found 60% of the nurses in the study group and 40% in the control group show a five years and less in their experience. Regarding participation in the training courses of CPR, more than half of the nurses in the study group are participated in such courses (65.7%), while 56.7% have not participated in the control group. For those nurses who are participated in the training courses, twelve nurses of both study and control groups are participated in 1-3 courses inside country (40%), while only one nurse have participated in courses outside country (3.3%).

Table (2):Overall Assessment of Nurses' Knowledge towards Cardiopulmonary Resuscitation for Study and Control Group

Levels of Knowledge	Study Group (N= 30)							
	Pre-test				Post-test			
	F	%	M.S	SD	F	%	M.S	SD
Poor	2	6.7	2.00	0.371	0	0	3.00	0.000
Fair	26	86.7			0	0		
Good	2	6.7			30	100		
Total	30	100			30	100		

Control Group (N= 30)								
Levels of Knowledge	Pre-test				Post-test			
	F	%	M.S	SD	F	%	M.S	SD
Poor	4	13.3	1.93	0.450	4	13.3	1.90	0.403
Fair	24	80			25	83.3		
Good	2	6.7			1	3.3		
Total	30	100			30	100		

Table (2) reveals that the overall assessment of nurses' knowledge in this table reveals that nurses in the study group showing a fair knowledge towards cardiopulmonary resuscitation during the pre-test period (86.7%), and their knowledge is increased to a good level during the post-test period (100%) after receiving an educational program, while the control group show a fair level of knowledge regarding cardiopulmonary resuscitation for both periods of pre-test and post-test (80% and 83.3%).

Table (3):Effectiveness of an Educational Program on Nurses' Knowledge toward Cardiopulmonary Resuscitation for Study and Control Groups

Nurses' Knowledge	Study Group (N=30)					Control Group (N=30)				
	M.	t	df	p-value	Sig.	M.	t	df	p-value	Sig.
Pre-test	17.03	22.358	29	0.001	H.S	15.33	16.438	29	0.149	N.S

Post-test	33.63				15.31			
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F= Frequencies, %= Percentages

Table (3) presents the t-test analysis for measuring an effectiveness of the program; the table indicates that the educational program is highly effective on nurses' knowledge evidenced by high significant difference (p-value= 0.001) among nurses in the study group, in which there is a significant difference between the means of nurses' knowledge during the pre-test and post-test periods, while the means of nurses' knowledge in the control group have no significant difference during the pre-test and post-test (p-value= 0.149).

IV. Discussion

Table 1: Analyses of the Nurses' demographical characteristics confirm the equivalency in both study and control group and there are some differences between them. These results of the study are accepted in the non-equivalent (pre and post-test) quasi experimental design of the study. with respect to their age group, table (4-1) shows that a half of the study group nurses are with age range **18-24 years** old (50%) and the age group for nurses in the control group is ranging equally between groups of **(18-24)** and **(25-34)** years old (33.3%). In a study was conducted in 2014 reported that the age group who were less than 25 years old made the majority of nurses and more than other groups⁽⁹⁾. Relative to gender group, the present study reveals that the nurses' gender indicates that the female is the dominant gender among the current study, in which **73.3%** of nurses in the study group and **56.7%** in the control group are females. In support to this study, a study was done in 2009 revealed that females were more than males⁽¹⁰⁾. Concerning the educational level, the study concluded that the highest percentage related to educational levels of the nursing preparatory school that are **40%** in the study group and **66.7%** in the control groups are graduated from the nursing preparatory school too, and about third of them are graduated from medical institute as nurses (study group= **36.7%**, control group= **30%**). This comes along with a study was conducted in 2015 that reported that the level of secondary school in nursing made the highest score in his study⁽¹¹⁾. Related to nurses' years of experience, our findings have revealed that the number of years of experiences is **1-5** years where **60%** of the nurses in the study group and **40%** in the control group are show having a five years and less in their experience. This study agreed with a study done in 2006 in Ireland, which mentioned the employment 5 years and less construct the majority of nurses more than other levels of occupation years⁽¹²⁾. This result indicates that (≤ 5) years are predominant among the nursing staff. Regarding participation in the training courses of CPR, more than half of the nurses in the study group are participated in such courses (**65.7%**), while (**56.7%**) have not participated in the control group. For those nurses who are participated in the training courses, twelve nurses from both study and control groups are participated in **1-3** courses inside country (**40%**), while only one nurse have participated in courses outside country (**3.3%**). Our findings agree with a study done in 2011 which stated that **52%** have attended resuscitation training program and **48%** of them have not attended the programme⁽¹³⁾. **Table 2:** reveals that nurses in the study group show a fair knowledge towards cardiopulmonary resuscitation during the pre-test period (86.7%) and their knowledge is increased to a good level during the post-test period (100%) after receiving an educational program. The control group show a fair level of knowledge regarding cardiopulmonary resuscitation for both periods of pre-test and post-test (80% and 83.3%). Our study has revealed that knowledge and pretest scores were lower for the study group (M.S = 2.00), while for posttest knowledge study group scores were higher (M.S = 3.00). our findings come along with a study made in 2011 that confirmed the knowledge of Nurses toward cardiopulmonary resuscitation is improved after the application of their resuscitation program training⁽¹⁴⁾.

Table 3: presents the t-test analysis for measuring an effectiveness of the program. The table indicates that the educational program is highly effective on nurses' knowledge evidenced by high significant difference (**p-value= 0.001**) among nurses in the study group, in which there is significant difference between the means of nurses' knowledge during the pre-test and post-test periods, while the means of nurses' knowledge in the control group have no significant difference during the pre-test and post-test (**p-value= 0.149**). According to these numbers and ratios, the researcher confirmed that the educational program was designed and conducted to be an effective education device by which nurses in the study group can improve their knowledge base. This study reveals that the majority of nurses have had unsatisfactory knowledge toward cardiopulmonary resuscitation before execution of the educational program and after applying the program, their responses and knowledge have been improved. (Niskanen, et al., 2009 & Pearn, 2000) support the importance of CPR educational training courses updating on a regular basis. This study suggests that in order to carry out CPR skills effectively, regardless of training program used, clinical nurses should be undergo retraining every 6 months. A study was done in 2009 support the importance of CPR educational training courses updating on a regular basis. This study suggests that in order to carry out CPR skills effectively, regardless of training program used, clinical nurses should be undergo retraining every 6 months⁽¹⁵⁾.

V. Conclusions

Based on the interpretation and discussion of the study findings, the study can conclude that female nurses are more than male, nurses' age group (18-20) years is more than other age group, most of nurses have

preparatory school graduate, high percent of the nurses have 1-5 years of experience in nursing.. More than half of the nurses have CPR participation, while the other half has not been participated in CPR training sessions.. The educational program concerning cardiopulmonary resuscitation was effective for the study group, where the mean of the pretest responses was 17.03, while for the posttest answers was 33.63 and p-value = 0.001. The mean of the pretest scores of the control group was 15.33, and the posttest was 15.31, p-value = 0.149.. There was a significant relationship between nurses' knowledge and the sample's demographic characteristics (gender, level of education, and participation in CPR Courses), while there was no correlation found between the nurses' knowledge and characteristics (age & years of employment). Our study recommended to encouraging nurses to improve their own knowledge and performance through increasing their participation in CPR training courses (at least every 6 months). The study also recommended to encouraging nurses to improve their own knowledge and performance through increasing their participation in CPR training courses (at least every 6 months), Encouraging conduction of the CPR educational courses with cooperation with Nursing Continuing Education Unit in Imam Hussein Medical City for all Nurses staffs work in this health foundation to supply and update them with the newest information & algorithms related to this subject.

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