

Effectiveness of an Educational Program on Nurses Practice Concerning Adult Cardio-Pulmonary Resuscitation in Talafar General Hospital

اثر فاعلية برنامج تعليم التمريض على ممارسات الممرضات والممرضين إزاء الإنعاش القلبي الرئوي للبالغين في مستشفى تلعفر العام

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الخلاصة:

هدف الدراسة تقويم فعالية اثر البرنامج التمريضي التثقيفي على ممارسات الممرضات والممرضين إزاء الإنعاش القلبي الرئوي للبالغين في مستشفى تلعفر العام

المنهجية : أجريت الدراسة التجريبية في مستشفى تلعفر العام للفترة من الأول من كانون الأول 2012 إلى الأول من شباط 2014- وتم بناء البرنامج والأداة من قبل الباحث لغرض انجاز الدراسة تم اختيار عينة عشوائية تتكون من (80) ممرض وممرضة وقسمت العينة إلى مجموعتين، المجموعة التجريبية المنفذ عليها البرنامج التعليمي وتكونت من (40) ممرض وممرضة ومجموعة ضابطة تكونت من (40) ممرض وممرضة لم تتلقى البرنامج ولقياس تأثير البرنامج التعليمي على ممارسات الممرضات والممرضين استعمل الباحث استمارة تقويم الممارسات المتعلقة بالإنعاش القلبي الرئوي المتضمنة (37) فقرة وتم تحديد ثبات اداة القياس من خلال الاختبار وإعادة الاختبار و حددت مصداقية الاداة من خلال عرضها على مجموعة من الخبراء، وتم استخدام (الإحصاء الوصفي) التكرارات والنسب المئوية، الوزن المرجح والوسط الحسابي والانحراف المعياري (والإحصاء الاستدلالي) الكفاية النسبية اختبار فيشر اختبار مربع كاي، اختبار ليفين وذلك لإيجاد الاختلافات بين المجموعة التجريبية والمجموعة الضابطة

النتائج أشارت نتائج الدراسة بوجود فروقات ذات دلالة معنوية عالية لمجموعة الدراسة بين الاختبار القبلي والاختبار البعدي في الجوانب الرئيسية التي لها علاقة بفقرات الممارسات التمريضية

الاستنتاج: استنتجت الدراسة بان هناك تأثير ايجابي للبرنامج التثقيفي المنفذ على اداء على ممارسات الممرضات والممرضين إزاء الإنعاش القلبي الرئوي للبالغين في مستشفى تلعفر العام

التوصيات : عمل برامج تثقيفية مركزة وشاملة لدعم مهارات على ممارسات الممرضات والممرضين بخصوص الإنعاش القلبي الرئوي للبالغين

Abstract:

Objective: To evaluate the effectiveness of an educational program on nurses practices concerning Adult Cardio-Pulmonary Resuscitation in Talafar general hospital

Methodology: An experimental study was carried out at Talafar general hospital between the 1st October to 1st February 2014. The program and instruments were constructed by the researcher for the purpose of the study. Random sample comprised of (80) nurses was divided into two groups, experimental group consisted of (40) nurses exposed to the nursing educational program and control group consisted of (40) nurses were not exposed to the program. The measurement of effectiveness of nursing educational program through the practice checklist includes (37) items concerning Cardio-Pulmonary Resuscitation. Reliability of instrument was determined through the use of test and retest and the instrument validity was determined through a panel of experts. The analysis of the data was used descriptive statistics (frequencies, percentages, weighted and the arithmetic mean and standard deviation) and statistical inferential (sufficiently relative test, Fisher test, chi square and Levin test) In order to find the differences between the experimental group and the control group

Results: The study findings indicated that there were highly significant differences between pre and post tests in the experimental group in overall main domains related to nurses' practice

Conclusion: The study concluded that the effectiveness of educational program regarding nurses' practice concerning the adult cardio-pulmonary resuscitation is a positive and clear

Recommendation: An intensive comprehensive wide population based education program was conducted to support nurse's practice toward adult cardio-pulmonary resuscitation

Keywords: nursing; education; program; practice; Adult Cardio-Pulmonary Resuscitation

INTRODUCTION

Cardiac arrest takes place in a wide variety of settings, from the unanticipated event in the out-of-hospital setting to anticipated arrests in the intensive care unit. Outcome from cardiac arrest is a function of many factors including the willingness of family or bystanders to perform cardiopulmonary resuscitation (CPR), the ability of rescuers to integrate knowledge and psychomotor skills, the quality of performance delivered by individual rescuers and teams, and, finally, the efficiency and effectiveness of post-cardiac arrest care ^{1}. Secondly, the advances in medical technology, more invasive interventions, an increase in the proportion of population reaching old age, a higher prevalence of chronic disease in this age group, more emergency ward admissions have increased the demand for CPR. Moreover, these patients have conditions that are more serious and are exposed to more medical errors and complications, which lead to a 3% - 16% complication of therapeutic procedures and 5-8% death rate ^{2}. According to another study, the formal training of nursing students and practicing nurses in CPR is important for the following two reasons: nurses (and physicians) must be able to perform CPR on all types of patients in any situation, and they must assume a greater role in passing this knowledge on to other healthcare workers and laypersons. CPR cannot be learned just by reading or listening to theoretical concepts; practice is essential. For ethical reasons, this should be carried out on mannequins because, in the event of sudden death, CPR must be performed by the most experienced people available^{3}. The objective of our study is to evaluate the effectiveness of an educational program on nurses practices concerning Adult Cardio-Pulmonary Resuscitation in Talafar general hospital

METHODOLOGY

An experimental study was carried out at Talafar general hospital between the 1st October to 1st February 2014. A random sample comprised of (80) nurses was divided into two groups, experimental group consisted of (40) nurses exposed to the nursing educational program and control group consisted of (40) nurses were not exposed to the program. The selection of present sample based on special criteria which include; (1) Nurses who were working at the Talafar General Hospital (2) Nurses who agreed to participate in the study (3) Nurses that had at least one year of experience or more (4) Nurses who worked both the morning and night shift. (5) Nurses who worked in the medical and surgical units (CCU, Medical Ward, Emergency units (Surgical Ward, Operating Room, Obstetrical and Gynecological Wards).

The educational program consisted of eight sessions and was carried over four-week period in medical and surgical department. The study instrument was observation check list of nurses' practice developed by the researcher for the purpose of this study. It was consisted of two parts: Self administered questionnaire sheet related to demographic characteristics of the nurses. And Practice check list to assess the nurses practices with respect to procedures of Cardio-Pulmonary Resuscitation. The researcher observed and checked for correct or not correct performance. A practices checklist for nurses was given to them prior to performing on a manikin during either the morning or the afternoon shift. The practices checklist for nurses was composed of 37 items divided into six parts: **Part one:** 5 items nurses' practices related to placing in the recovery position. **Part two:** 8 items relating to the stages of Cardio-Pulmonary Resuscitation. **Part three:** 6 items about the nurses' practices related to techniques of artificial ventilation. **Part four:** Nurses' practices related to techniques of pressure. It was consisted of 6 items. **Part five:** Nurses' practices related to searching on pressure site. It was consisted of 2 items. **Part six:** Nurses' practices related to how to use the DC shock device. It was composed of 10 items. These items were rated according to the liker scale (always (3); sometimes (2)

and never (1)) the levels of scale which were scored as a total of three episodes of events were observed for each respondent .Practices as mean of data collection (3) or (2).Correct practices out of (3) episodes were rated as sometimes and uncorrected practices were rated as never. Observational checklist was used for pre education and post education immediately. The control group were given observational checklist of nurses' practice at the same time that be given to the study group. Scores of the response were categorized according to the following very good $\leq 80\%$; and good 60- 80.The same practices test were used for baseline and 1-months follow up test.

Statistical Analysis

The data of present study was analyzed through the application of two statistical approaches. A descriptive statistical approach that includes frequency, percentage, $\bar{x} \pm S.D.$ =Arithmetic Mean (\bar{x}) and Std. Dev. (S.D.), and an Inferential statistical approach that includes Chi-Square test, t. test, Fisher Exact Probability test (F.E.P.T.), Levine's test and ANOVA. Results were determined as highly significant at ($P<0.01$)significant at ($P<0.05$) and non-significant at ($P>0.05$).

RESULTS:

Table (1): Distribution of the Study Samples (Study and Control) According to Demographic Data

Var.	Groups	Study			Control		
		Freq.	%	Cum. %	Freq.	%	Cum. %
Age Groups	< 25	27	2.5	2.5	13	0.0	0
	25 – 29	12	65	67.5	13	32.5	32.5
	30 – 34	1	30	97.5	8	32.5	65.0
	35 – 44	0	2.5	100	6	35.0	100
Mean \pm SD		23.62 \pm 2.86			27.30 \pm 6.31		
Gender	Male	24	60	60	23	57.5	57.5
	Female	16	40	100	17	42.5	100
Work Place	CCU	8	20.0	20.0	8	20.0	20
	Medical	8	20.0	40.0	10	25.0	45
	Emergency	5	12.5	52.5	8	20.0	65
	Surgical	6	15.0	67.5	5	12.5	77.5
	Operations	5	12.5	80.0	6	15.0	92.5
	OB and GYN	8	20.0	100	3	7.50	100
Nursing Education al Levels	College	9	22.5	22.5	12	30.0	30.0
	Institute	27	67.5	90.0	17	42.5	72.5
	School	4	10.0	100	11	27.5	100.0

Freq=frequency, % = percentages, cum= cumulative percent ;HS: Highly Significant . at $P<0.01$; NS: Non Significant . at $P>0.05$,FEPT : Fisher Exact Probability Test; χ^2 : Chi – Square test , OB and GYN = Obstetrics and Gynecology ; \bar{x} .=Arithmetic Mean ; SD=Standard Deviation; P=P-value, t. test= Student (t-test) ; CCU: coronary care unit.

Table -1-displays the frequency counts for selected variables. As stated above, the two educational groups (control versus study) were equal in size. Ages of the nurses ranged from <25 to 44 years ($M = 23.62$, $SD = 2.86$). There were somewhat more male nurses (60%) than female nurses (40%) in the study group and (57.5%).male and (42.5%) in the control

group. Most common workplaces were CCU (20%) in the study group and the same percentage in the control group. The most common educational attainment was from an institute (67.5%) in the study group and (72.5%) in the control group.

Table (2): Distribution of Study and Control Groups According to Expert years & Kind of Training Nursing Staff

Var.	Groups	Study			Control			C.S. (*) P-value
		Freq.	%	Cum %	Freq.	%	Cum. %	
Expert years	1 - 2	16	40.0	40.0	8	20.0	20.0	$\chi^2 = 5.752$ P=0.331 NS
	2 - 4	12	30.0	70.0	18	45.0	65.0	
	4 - 6	6	15.0	85.0	4	10.0	75.0	
	6 - 8	2	5.0	90.0	5	12.5	87.5	
	8 - 10	2	5.0	95.0	3	7.5	95.0	
	10-12	2	5.0	100	2	5.0	100	
Location of Expertise	Expert yrs. In CCU	8	50	50	8	44.4	44.4	FEPT P=0.508
	Medical ward	8	50	100	10	55.6	100	NS
Location of Expertise	Emergency Dep.	5	45.5	45.5	8	61.5	61.5	FEPT P=0.363
	Surgical ward	6	54.5	100	5	38.5	100	NS
Location of Expertise	Operations	5	38.5	38.5	6	66.7	66.7	FEPT P=0.193
	OB and GYN	8	61.5	100	3	33.3	100	NS
Training in CCU	None	40	100	100	37	92.5	92.5	FEPT P=0.120
	Yes	0	0.0	100	3	7.5	100	NS
Training in FON	None	37	92.5	92.5	30	75	75	FEPT P=0.033
	Yes	3	7.5	100	10	25	100	S

Freq=Frequency, % = percentages, cum= cumulative percent, (*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Significant . at P>0.05, FON (Fundamental of Nursing) ; CCU (Cardiac Care Unit), FEPT : Fisher Exact Probability Test; χ^2 : Chi – Square test.

Table -2-shows that the Years of experience ranged from (10-12) years (5%) in the study group and the same percentage in the control group. The most common locations of expertise were medical (50%) in the study group and (55.6%) in the control group. Most nurses reported not having training in cardiac care (0%) in the study group and (7.5%) in the control group.

No significant differences were found between the groups for the expert year specialty and whether they received training in cardiac care.

Table -3- Comparison of Pre-test Nurses Practices Between Study and Control groups

Score	Group	<i>n</i>	M	SD	η	t	P
Pretest Recovery Practice	Control	40	40.50	23.75	.67	8.02	.001
	Study	40	5.00	14.85			
Pretest CPR Practice	Control	40	43.75	22.11	.66	7.83	.001
	Study	40	7.19	19.59			
Pretest Artificial Ventilation Practice	Control	40	47.50	20.52	.71	8.78	.001
	Study	40	7.08	20.63			
Pretest Compression Practice	Control	40	45.42	17.29	.75	10.17	.001
	Study	40	6.67	16.79			
Pretest Focal Point Search Practice	Control	40	46.25	44.42	.52	5.40	.001
	Study	40	5.00	18.95			
Pretest DC Device Practice	Control	40	39.25	20.05	.66	7.83	.001
	Study	40	5.00	19.08			
Pretest Practice	Control	40	43.78	19.43	.73	9.46	.001
	Study	40	5.99	16.16			

n=number ,m= mean, SD=standard deviation, , η = Eta coefficient which is the Pearson correlation between educational group and the score , t=t test ,P=P value .

Inspection of Table -3-found all 7 pretest practice scores (pre test Recovery Practice; pre test CPR Practice; pre test Artificial Ventilation Practice; pre test Compression Practice; pre test Focal Point Search Practice; pre test DC Device Practice and pre test Practice)to be significantly higher for control group nurses.

Table -4- Comparison of Post Test Nurses Practices Between Study and Control groups

Score	Group	n	m	SD	η	t	P
Posttest Recovery Practice	Control	40	39.50	23.31	.87	15.36	.001
	Study	40	98.00	6.08			
Posttest CPR Practice	Control	40	44.69	21.16	.88	16.05	.001
	Study	40	99.06	3.33			
Posttest Artificial Ventilation Practice	Control	40	48.33	21.94	.86	14.67	.001
	Study	40	99.58	2.64			
Posttest Compression Practice	Control	40	47.50	17.92	.89	17.55	.001
	Study	40	98.75	4.45			
Posttest Focal Point Search Practice	Control	40	46.25	44.42	.65	7.65	.001
	Study	40	100.00	0.00			
Posttest DC Device Practice	Control	40	38.50	20.45	.91	18.89	.001
	Study	40	99.75	1.58			
Posttest Practice	Control	40	44.13	18.79	.82	12.48	.001
	Study	40	99.19	1.90			

n=number ,m= mean, SD=standard deviation, η = Eta coefficient which is the Pearson correlation between educational group and the score, t=t test ,P=P value.

Table-4- found all 7 posttest practice scores(post test Recovery Practice; post test CPR Practice; pre test Artificial Ventilation Practice; post test Compression Practice; post test Focal Point Search Practice; post test DC Device Practice and post test Practice)were significantly higher for the study group nurses

Table-5- ANCOVA Prediction Model for Posttest Practice Based on Pretest Practice, Demographic Variables and Educational Group (n = 80)

Variable	B	SE	B	P
Intercept	-0.60	0.09		.001
Pretest Practice	0.55	0.06	.46	.001
Age	0.00	0.00	.05	.20
Sex ^a	0.00	0.02	.00	.95
Education level	-0.01	0.02	-.03	.40
Number of years of experience	0.00	0.01	.00	.96
Location of Expertise	-0.02	0.02	-.03	.44
Group ^c	0.77	0.03	1.26	.001

*B=standard parameter estimate with intercept ,SE=standard error,**B=standard parameter estimate;Sex: 1 = Male

2 = Female.^b Location: 1 = Acute care units 2 = Wards.;^c Group: 1 = Control 2 = Experimental.

Inspection of Table -5- for the dependent variable posttest practice found the overall ANCOVA model to be significant ($p = .001$) for studygroup nurses but unrelated to any of the five demographic variables

Table -6-Comparision Between Study and Control Groups Related to Pre and Post Tests

Score	Group	N	M	SD
Pre-test Practice				
	Control	40	43.78	19.43
	Study	40	5.99	16.16
Post-test Practice				
	Control	40	44.13	18.79
	Study	40	99.19	1.90

N= Number;M=Mean; SD=Stander deviation

Practice scores for the control group remained essentially the same from pretest to posttest while for the Study group, the practice scores tripled from pretest ($M = 5.99$ to posttest ($M = 99.19$).

DISCUSSION

The results of the literature review in connection to the frameworks used to guide this project: the retention of CPR training programs on nurses and effectiveness of these programs. For the most part, our findings are consistent with the results found in our review of literature although in some instances our findings seemed to contradict these results.

This study used a randomized clinical trial design to test the efficacy of an educational and skill building training program in Cardiopulmonary Resuscitation (CPR). The sample consists of 80 nurses who were randomly allocated to either a control Group ($n=40$) or study group ($n=40$). The average age of the nurses was $23.62 (2.86\pm)$ years in the study group and the average age of the nurses was $27.30 (6.31\pm)$ years in the control group ranged from less than 25 to 44 years. The most frequently cited nursing expertise was in medical and CCU units. It is of note that only (0%) claimed to have any training in cardiac care and only (7.5%) in fundamentals of nursing. in the experimental group and (7.5%) claimed to have any training in cardiac care and only (25%) in fundamentals of nursing. in the control group This rather low proportion of nurses, who had received any training in cardiac care and presumably in CPR training—as was done in this study—underscores the novelty and urgency of the situation and requires greater efforts to provide CPR education and training for nurses. On the other hand, another possible explanation for these results could be attributed to the type of internships in which these nurses had participated. Those who achieved better results after the training program might have succeeded in doing so because of prior experiences with CPR. In this case, another study might want to look into a comparison between nurses who had received internships in CPR units and those who hadn't received internships in these units. Judging from table -3- The educational level of nurses was significantly different between the groups ($P=0.05$, Cramer's $V=0.27\%$). Nurses in the control group tended to be more likely to have received training in fundamentals than nurses assigned to the experimental group. In addition, control group nurses were statistically significantly older ($P=0.001$) than the study group nurses. Taken together, these findings suggest that randomization provided an acceptable level

of equality in demographic and work related factors between groups. It appears, however, that pretest data for practice was not equalized; therefore, changes from pretest to post test could be problematic. A review initial between group comparisons (Table -3-) reveals all 7 pretest practice scores (pre test Recovery Practice; pre test CPR Practice; pre test Artificial Ventilation Practice; pre test Compression Practice; pre test Focal Point Search Practice; pre test DC Device Practice and pre test Practice) to be significantly higher for control group nurses. However, (Table -4-) revealed all 7 posttest practice scores (post test Recovery Practice; post test CPR Practice; pre test Artificial Ventilation Practice; post test Compression Practice; post test Focal Point Search Practice; post test DC Device Practice and post test Practice) were significantly higher for the study group. Thus, conclusions about the primary study findings must be viewed with caution and ideally be replicated and confirmed with a larger sample. Assuming, that there are no biases and confounding or data transport problems, this study nevertheless has numerous strengths. The study group demonstrated statistically significantly higher posttest scores on all 7-practice scores, thus rejecting the null hypothesis, and demonstrating that nurses in the study group achieved considerable benefit from 16 hours of education and 16 hours of skill training in CPR. In conclusion, this study demonstrates that the CPR educational and practice intervention was highly effective. Our study is consistent with the majority of studies on effectiveness of CPR training programs as it provides strong evidence to support the critical role of CPR training in ensuring that nursing students progress to the point of becoming competent and confident responders in the event of a cardiac related emergency. Furthermore, a need for regular updating has been identified^{4}. By the same token, the results found in the this study suggest that repetition may be more important than the number of days since last trained for skill and knowledge retention, and methods of “refreshing” skills should be examined. While skills deteriorate rapidly, changing frequency of certification is not necessarily the best way to increase retention of skill and knowledge.^{5,9,10} As such, this research supports the importance of CPR refresher courses on a regular basis.^{6,7,8,} In fact, and in light of other studies conducted on the effectiveness of CPR training programs on nurses, this study suggests that in order to carry out carry out CPR skills effectively, regardless of the training programs used, clinical nurses should undergo retraining every three months.

CONCLUSION:

Nurses working in the hospital having minimum level of experience at cardiopulmonary resuscitation and need specific educational program and training session. The study reveals that the majority of nurses had unsatisfactory practice toward cardiopulmonary resuscitation before implementation of the educational program and after applying the education program, there were improvement.

RECOMMENDATION:

1. Education in CPR training, similar to that offered to the experimental group of this study, needs to be need to be provided as part of nursing education in all nursing school programs.
2. Hospitals need to incorporate “State of the Art” CPR training as part of their orientation of new nursing staff orientation; such training must be repeated at regular intervals to maintain the knowledge and practice skills. Nurses working in CCU’s, Emergency Departments, and Intensive Care Units most become the highest priority as patients on such units have the greatest chance of being in need of this type of emergency care.

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