



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 10, Issue, 06, pp.9716-9719, June, 2019

RESEARCH ARTICLE

EFFECT OF AN IN SERVICE TRAINING PROGRAM FOR INTENSIVE CARE NURSING STAFF IN THEIR KNOWLEDGE - KHARTOUM STATE 2014-2017

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ARTICLE INFO

Article History:

Received 17th March, 2019
Received in revised form
26th April, 2019
Accepted 20th May, 2019
Published online 28th June, 2019

Key words:

Training program, Knowledge, Nurses, Intensive Care Unit.

ABSTRACT

Background: Cardiopulmonary resuscitation is the emergency procedure used to salvage victims of cardiac and respiratory arrest. It should be carried out with great urgency to avoid permanent brain damage or even death that would result if the victim stays from 4 to 6 minutes without oxygen. **The aim of study:** To assess the effectiveness of structured teaching program on the knowledge of cardio pulmonary resuscitation among the nursing staff in the Khartoum Teaching, Ahmed Gasim, Omdurman Teaching, and the Khartoum North Teaching hospitals. **Methods:** A quasi experimental design pretest/posttest for the same group. The study was conducted in the intensive care units in Khartoum hospitals. The study sample consisted of 100 nurses. Data was collected by a questionnaire and an observational checklist. The intervention program was in a form of lectures guidelines book. Data were analyzed using Statistical Packages for Social Sciences (SPSS). **Results:** the study showed the knowledge grades before implementation of the program were, poor in 42%; good in 22% and very good in 36% of the participants. Whereas after implementation of the program knowledge grades became, 3% poor; 16% good and 81% very good, (p value 0.001). **Conclusion:** The study concluded that educational program had a significant impact related to the improvement of the nurses's knowledge and practice post application of the program.

Citation: Ashraf Abdelrhman Elbashir, 2019. "Effect of an in service training program for intensive care nursing staff in their knowledge - khartoum state 2014-2017", *Asian Journal of Science and Technology*, 09, (06), 9716-9719.

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INTRODUCTION

Cardio pulmonary resuscitation (CPR) is a combination of mouth to mouth rescue breathing and chest compressions. It helps to keep blood and oxygen circulating to the heart and brain of a person whose heart has stopped beating. The term CPR is used to describe all aspects of basic life support, the initial establishment and/or maintenance of airway, breathing, circulation, defibrillation and related emergency care (Chew, 2011). Cardiopulmonary resuscitation is the emergency procedure used to salvage victims of cardiac and respiratory arrest. It should be carried out with great urgency to avoid permanent brain damage or even death that would result if the victim stays from 4 to 6 minutes without oxygen (Dwood, 2017). According to the World Health Organization (WHO) in 2008, 17 million people (48% of all deaths) died due to cardiovascular diseases, and mainly because of cardiac arrest (Dal, 2013). It has been documented that 33% to 40% of cardiac arrests in developed countries occur in the hospital setting, and of the arrests that occur in the hospital setting more than 60% are first recognized by nurses (WHO, 2009).

Therefore, in order to ensure patient survival, nurses who are often the first responders in resuscitation should be adequately prepared to provide effective advanced cardiac life support (ACLS) (Bennett, 1999). Nurses must improve their skill with training and repeated practice. For this reason, nurses must learn this skill, especially in their first aid lectures during nursing education. This training must be repeated, as studies have shown that the current level of CPR knowledge and skills is insufficient, and that there is a significant decrease in knowledge and skill retention of skills after a while. The training must be repeated after a specific period of time. If the skills are not used frequently, they can be forgotten over a short amount of time. CPR skills need to be maintained and practiced regularly. Repeating the CPR training will prevent the loss of knowledge and skills (Hamilton, 2005).

MATERIALS AND METHODS

The methods begin by presenting the research design, followed by setting and duration of the study, sample, sample size, data collection technique and tools, phases of the study, validity and reliability of instruments and ethical consideration.

Study design: A Quasi-experimental study: pretest and posttest for the same group.

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Study setting: four hospitals were (Khartoum Teaching Hospital, Ahmed Gasim Hospital, Omdurman Teaching Hospital and Khartoum North Teaching Hospital) chosen for this study, Khartoum state, Sudan.

Sample: Nursing staff providing the patients nursing services in the intensive care unit in Khartoum Teaching hospital, Ahmed Gasim Hospital, Omdurman Teaching Hospital and the Khartoum North Teaching Hospital.

Sample size: The recommended sample size given by the total coverage of nurses. So the total numbers of participants were 100.

Data collection technique and tools: Two tools were used to collect the needed data to achieve the aim of the study, they were: a self-administered questionnaire for this assessment of knowledge.

Data analysis: The collected data as pretest and posttest organized, categorized, tabulated using mean and standard deviation. The statistical package for social sciences (SPSS version 20) was used for analysis.

Phases of the study

Pre intervention phase: Baseline survey was conducted.

Intervention phase: Started from (July-October, 2016), the education was given through Lectures, videos, group discussion, booklets and seminars. The contents of the program were assigned to, include basic knowledge regarding nursing care of CPR.

Post Intervention Monitoring: Posttest was done twice early post interventions and later after three months' post interventions. She was using the same tools to compare between pre and post intervention program which were conducted to evaluate the effect of the program on respondents.

Ethical Consideration: An official letter was taken from the National Al Ribat University to hospitals administrators for permission to carry out the study. Participants provided verbal consent to participate they have also been assured of confidentiality and of freedom to withdraw without conditions.

RESULTS

Total numbers of respondents were 100. The results of the present study are shown in figures and tables respectively:

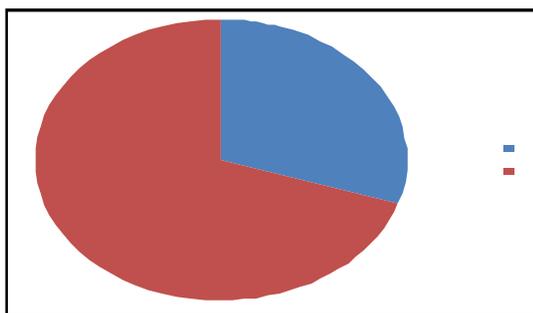


Figure 1. Comparison of overall total knowledge between pre and early after implementation of educational program

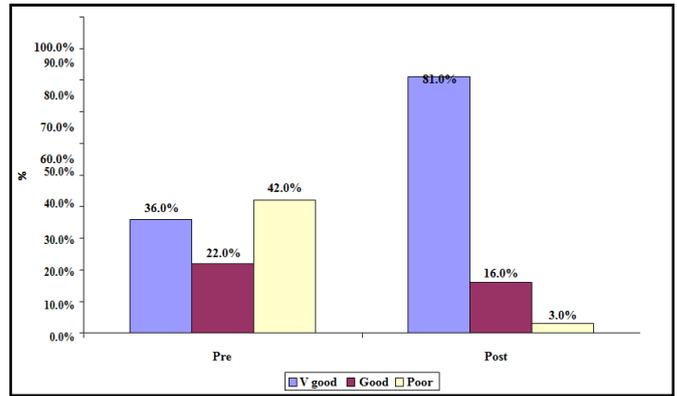


Figure 2. Comparison of grades overall total knowledge between pre and early after implementation of educational program

Table 1. Grades scores of the participating nurses knowledge late after implementation of the educational program (n=100)

Score grades	Frequency	Percent
Poor	18	18%
Good	10	10%
Very good	72	72%
Total	100	100%

DISCUSSION

In this study 100 nurses were selected to participate in the program. At baseline average level of knowledge about CPR of the participants was found to be very low (37%) due to their younger age and recent duration of graduation. This percentage increased to 86% at posttest (Figure 1) with slight decrease at late post program test to 72% (Table 16). The baseline —poor grade (42%) at increased posttest by 81% as very good (Figure 2), then the —very good grade of knowledge slightly declined to (72%) (table1). This study is similar to study conducted at Botswana in 2014 assessing the cardiopulmonary resuscitation knowledge and skills (Rajeswaran, 2014). The meaning of the overall knowledge score of 0.63 increased to 0.86 indicating significant differences (p < 0.05) in the level of knowledge of the participants regarding all items of CPR after the carrying out of the program; this in turn demonstrated that the program had good outcome on the studied nurses. Nevertheless, the slight decrease in the overall knowledge of the participants (86% to 72%) observed at the late post program test was not significant (p > 0.05) (Tables 2-4). This finding could be explained by the fact that at an early implementation program the information given to the participants were still fresh and at the late post program test the participants may be engaged in other activities that contribute to this slight decrease in their knowledge regarding the dimensions of CPR. Many of the previous studies proved the effectiveness of conduction of educational programs to provide the nurses with knowledge about many of the medical issues related to critical cases and chronic disease that in turn increased their competence and abilities to know more and more about the cases under their nursing supervision. An Egyptian study (Chaudoir, 2013) by revealed that the mean knowledge scores of nurses are increased immediately after implementation of the program with a significant statistical difference. This increased level slightly decreased post three months of program application. Another study from Basra (Neuendorf, 2016) proved that

Table (2) Knowledge score of the participants regarding procedures, responsibility and position in airways of the patients at late post implementation of the educational program compared with pre implementation program (n=100)

Statements	Pre		Followup		SE	C/I95%		t	DF	P
	Correct n(%)	Correct n(%)	Correct n(%)	Mean±SD		Lower	Upper			
Method to open airway	32(32.0)	32(32.0)	73(73.0)	0.73±0.44	0.07	0.01	0.23	1.28	198	0.073
The immediate responsibility of the nurse after identifying cardiac arrest	36(36.0)	36(36.0)	76(76.0)	0.76±0.43	0.08	0.03	0.23	1.89	198	0.065
Position of nose while providing mouth to mouth ventilation	39(39.0)	39(39.0)	77(77.0)	0.77±0.39	0.05	0.05	0.25	3.0	198	0.013

Table 3. Knowledge score of the participants regarding monitoring and process of breathing of patients of cardiac arrest at late post implementation of the educational program Compared with pre implementation program (n=100)

Statements	Pre		Followup		SE	C/I95%		t	DF	P
	Correct n(%)	Correct n(%)	Correct n(%)	Mean±SD		Lower	Upper			
Observations by the nurse while Providing mouth to mouth ventilation	46(46.0)	46(46.0)	71(71.0)	0.71±0.42	0.19	0.08	0.30	3.48	198	0.011
The rate of breathing given for a minute during passive ventilation	48(48.0)	48(48.0)	72(90.0)	0.72±0.44	0.18	0.07	0.29	3.32	198	0.021
Content of rescuer's exhaled air	42(42.0)	42(42.0)	68(83.0)	0.68±0.49	0.15	0.03	0.27	2.49	198	0.014
The rate of artificial ventilation to prevent stomach inflations	32(32.0)	32(32.0)	66(89.0)	0.66±0.41	0.23	0.12	0.34	4.03	198	0.011
The indication for pause between breaths	36(36.0)	36(36.0)	74(86.0)	0.74±0.39	0.12	0.01	0.23	2.13	198	0.034

Table 4. Knowledge score of the participants regarding monitoring of the circulation of the patients of cardiac arrest at late post implementation of the educational program compared with pre implementation program (n=100)

Statements	Pre		Followup		SE	C/I 95%		t	DF	P
	Correct n(%)	Mean±SD	Correct n(%)	Mean±SD		Lower	Upper			
The correct location for placement of hands for chest compression	51(51.0)	0.51±0.50	70(70.0)	0.70±0.48	0.17	0.06	0.28	2.98	198	0.013
The correct position to be maintained for giving prompt chest compression	50(50.0)	0.50±0.50	73(73.0)	0.73±0.45	0.19	0.09	0.29	3.63	198	0.012
The correct site of fingers during Performance of external chest compressions	50(50.0)	0.50±0.50	73(73.0)	0.73±0.45	0.19	0.09	0.29	3.63	198	0.023
The pressure applied while performing external chest compression	42(42.0)	0.42±0.50	76(76.0)	0.76±0.40	0.19	0.09	0.29	3.94	198	0.010
The recommended external chest compression for a minute	40(40.0)	0.40±0.48	59(59.0)	0.59±0.50	0.17	0.04	0.30	2.60	198	0.020
The length to which the sternum must be compressed downward during external chest compression in adults	41(41.0)	0.46±0.49	60(60.0)	0.60±0.49	0.23	0.11	0.35	3.71	198	0.014
The ratio of chest compression and passive ventilation for 1 rescuer technique	47(47.0)	0.47±0.50	60(60.0)	0.60±0.49	0.23	0.11	0.35	3.71	198	0.023
The means to perform external chest compression in CPR stimulates or improve of circulation	50(50.0)	0.50±0.50	73(73.0)	0.73±0.42	0.1	-0.02	0.22	1.71	198	0.089
The amount of blood ejected from the heart by external chest compression in CPR	49(49.0)	0.49±0.50	71(71.0)	0.71±0.49	0.16	0.05	0.27	2.82	198	0.015

application of teaching program significantly increased the nurses' knowledge about issues of cardiac arrest. However, a study in Bahrain (Barnes, 2012) showed that the cognitive knowledge was not adequately retained. Fifty-eight per cent of respondents perceived recalling CPR information as easy or extremely easy. The last study unlike our study where the program only improved the knowledge of minor proportion of the studies nurse. Being at the heart of the health care delivery is an enormous challenge for nursing, but it is also a golden opportunity to save the life of the patient. A high level of knowledge of CPR is expected from all participants to save the lives of the unfortunate victims of cardiac arrest.

Conclusion

According to the study findings the researcher concluded that: An early evaluating post training program test revealed a

significant improvement of both knowledge of the participating nurses. A late (three months) post program assessment to assess the retention of the already gained knowledge a little drop in their level.

Acknowledgements

We thank the administration and staff of the four hospitals, Khartoum Teaching Hospital, Ahmed Gasim Hospital, Omdurman Teaching Hospital and the Khartoum North Teaching Hospital for their enthusiastic support and cooperation throughout this study.

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