

Effectiveness of Educational Program on Nurses Performance regarding Emergency Crash Cart management in Governmental Cardiac Centers Khartoum State Sudan

Raga AbdElfatah Mohamed Ebrahim¹Dr. Suaad Ahmed Mohamed Saliheen²

Dr . Sara lavinia Brair³

^{1.} Al Neelain University, Ph.D student

^{2.} Assistant professor of medical nursing , faculty of nursing sciences , University of Khartoum

^{3.}Associate Professor, Community Medicine - Alneelain University

Abstract

The emergency crash cart is a portable trolley containing all equipment and drugs needed to treat a life-threatening situation. **Aim:** study effectiveness of Educational Program on Nurses Performance regarding Emergency Crash Cart management. **Design:** An interventional Hospital based study pre –post test design. **Setting:** Coronary Care Unit1, Coronary Care Unit 2and Intensive Care Unit at Ahmed Gasim Cardiac Center , Coronary Care Unit, Intensive Care Units, Intermediate Intensive Care Units at Shab Cardiac Center. Sample size included (135) nurse's as (72) nurse's from Ahmed Gasim Cardiac Center and (63) nurse's from Shab Cardiac Center. **Methods:** questioner composed of 25 items was utilized to assess nurse's Knowledge pre and post Educational Program. **Results:** There were statistically significant differences between nurse's knowledge (T) value reached (31.19), which is a statistically significant value at the level of significance.01, where the Sig value is (.00), before means (57.37%) and after means (100.25). the accept hypothesis, from the result is: ((Significant difference Nurse's knowledge it enhanced after the educational program are in favor the post-measurement)). **Conclusions** Educational program was improvement of nurse's performance regarding emergency Crash Cart management. **Recommendations:** All nurses must be will trained regarding emergency Crash Cart management.

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I. Introduction

The emergency crash cart is a portable trolley containing all equipment and drugs needed to treat a life-threatening situation.⁽¹⁾A way to keep unit-based crash carts properly stocked, arranged, and maintained is through crash cart maintenance.⁽²⁾The function of crash carts is to provide a mobile station within the hospital, The availability and proper operation of the resuscitation equipment are necessary for successful cardiopulmonary resuscitation. ⁽³⁾ Defects with missing or malfunctioning resuscitation equipment in resuscitation trolleys have been identified by the National Patient Safety Agency (NPSA) as threats to patient safety and causes of death among in-patients needing CPR. ⁽⁴⁾Basic protocols must be followed when setting up the trolley, including the locations and monitoring schedules that must be followed throughout the institution on a regular basis. The trolley should ideally have space for the storage of the necessary medications and medical supplies, both disposable and non-disposable. ⁽⁵⁾ Several international studies have demonstrated that quick access to resuscitation supplies is necessary for effective and safe CPR. ⁽⁶⁾ Research from settings with adequate resources indicates that there is a wide range of survival following CPR, with the best results being attained in specialized settings like the accident and emergency (A&E) department and coronary care unit. ⁽⁷⁾Maintaining the chain of survival for patients in need of emergency medical care requires adequate availability of resuscitation equipment, medications, and health care workers who are well-prepared and able to give timely care. ⁽⁸⁾ Structured emergency crash carts reduce confusion, save time, and give order in a potentially chaotic scenario. ⁽⁹⁾Although studies have emphasized how important it is to have the right tools, supplies, and medications on hand to successfully manage emergencies, along with staff members who are aware of where to find them and what they contain, it is discovered that the availability of essential tools varies from hospital to hospital. ⁽¹⁰⁾There is a focus on standardization since it improves the staff's familiarity with operating crash carts and lowers the likelihood of mistakes and misunderstanding during an emergency. ⁽¹¹⁾ Poor familiarity with the

equipment and a failure to recognize component failure or damaged devices result from operators' lack of daily checks and insufficient training⁽¹³⁾.

Problem statement

A number of occurrences involving missing or damaged equipment, including non-functioning defibrillators due to inadequate care and maintenance that delayed the start of CPR, were documented by the National Patient Safety Agency⁽¹⁴⁾. Poor familiarity with the equipment and an inability to recognize component failure or broken devices are the results of insufficient training and operators' failure to undertake daily checks⁽¹⁵⁾ For instance, in cardiac arrest situations, every minute's delay in resuscitation can lead to a drop in successful outcomes by 7%–10%. Thus, timely access to a defibrillator, resuscitation medications, supplies, and equipment should be fast and easy, and crash carts need to be carefully equipped, organized, and maintained.⁽¹⁶⁾

Justification

- The study's significance can help nurses who respond to calls for cardiopulmonary resuscitation to be properly prepared. As a result, this study can advise nurses to keep standardized equipment in the resuscitation trolley in order to avoid confusion regarding its use during emergency situations and to become familiar with the equipment and contents.
- On the other hand, this study can improve nurses' practice when it comes to drug errors and mix-ups, missing, damaged, contaminated, or expired supplies.
- The nursing management team may be able to remotely track and keep track of which hospital departments or units examined their crash carts thanks to this study.

Hypothesis

1. No Significant difference in the nurse's performance after the educational program.
2. Significant difference Nurse's performance enhanced after the educational program

Aims of the study

To Study effectiveness of Educational Program on Nurses Performance regarding Emergency Crash Cart management .

II. Materials And Methods

Study design

An interventional Hospital based study pre –post test design

Study setting: -

Study participants were nurses who work in Coronary Care Unit (CCU1), Intensive Care Unit (ICU), Coronary Care Unit2 (CCU2)Cardiac Center in Ahmed Gasim hospital. and Coronary Care Unit(CCU), Intensive Care Units(ICU), Intermediate Intensive Care Units (ICU)at the Shab Cardiac Center.

Inclusion criteria:

Nurses were included in the study by the following eligibility requirements Gender : Males and Females both, holders of a bachelor's degree in nursing, Working departments include the Intensive Care Unit, Coronary Care Unit (1)and Coronary Care Unit(2)Ahmed Gasim Cardiac Center. Intensive Care Unit, Intermediate Coronary Care Units, and Coronary Care Unit were employed by the Shab Cardiac Center.

Exclusion criteria:

Nurses who not attend the training program three nurses

Sample size :

total coverage sample 135 Nurses.

Variables: -

The study used two different kinds of variables.

dependent variables such as Gender, Age, and Qualification

Independent variables :Training program for Crash Cart

Development of data collection tool

The researcher created pre and post educational program questionnaire for nurses, which was developed by the researcher and reviewed by the supervisor. It included two parts. Part I: Data on the socio-demographic characteristics, including age, gender, educational background, and level of experience. work environment and have received prior training for crash cart management.

Part II: to evaluate nurses' knowledge of crash cart management, which consists of 25 items separated into three categories nurses knowledge about general information ten items such as "what is a crash cart," "why a crash cart is vital," and "how to utilize a crash cart," availability of the required quantity for the crash cart content, usage of infection control policy, checking the crash cart every day, knowing where it is, keeping it

locked, being familiar with the contents, Nurses were on a crash cart without the required standards or paperwork .The essential knowledge of medication management consists of seven items, including an emergency crash cart with a list of medications that are regularly checked and replaced based on their expiration dates, organized according to their actions, ordered chronologically, and filled with emergency medications that meet standards. Medication errors are reduced by organizing the medications in emergency crash carts. According to their action plan, finely Nurses' knowledge of managing Crash Cart material and articles consists of eight elements that can be arranged differently depending on the standard, with a check list for each drawer's contents. Daily equipment testing is recommended, and documentation for crash carts is updated whenever modifications are made .Having experience using Crash Cart equipment, nurses can certify that everything is in working order, drawers Labeling with content and restocked of crash cart.

The scoring system: a Likert scale scores were used five points Strongly agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly disagree (1)

The validity and reliability of the questionnaires

After the researcher conducted arbitration on tools and modified them based on the arbitrators' recommendations for modification, deletion and addition, conducted an exploratory study on it, which included (30) individuals from the study sample, in order to ensure the validity and reliability of its tools statistically, and the result of this was Reliability: Construction Validity (Internal Consistency)It means the correlation of each item of the questionnaire with the total score, and from this the correlations of all items are high to an acceptable degree, as all correlation coefficients were limited to (.255-.712) Also Cronbach's Alpha reliability:The stability value of Cronbach's alpha for the resolution was (.862), which is a high value and therefore acceptable, which indicates the stability of the resolution, and thus its validity for use in the current study. Finley B. Split-Half reliability test the researcher extracted the values of the stability of the split half of the questionnaire in two ways: Spearman-Brown method and Guttman method, where the values of the two methods, respectively: (.766 - .764), which are high values, and therefore acceptable, which indicates a high level of stability for all dimensions of the scale

Work plan:

According to the scheduling time table for the two cardiac centers, participants were split into Groups A and B for each cardiac center. Group A is made up of nurses who work the morning shift. They were split into two smaller groups, one for each cardiac center, and participated in an educational program that lasted one month for the four groups from 10:30 to 12:30 each day for five days. The nurses in Group B worked the afternoon and evening shifts, and they were separated into three groups according to their schedules at the cardiac centers. The six groups were then further divided into smaller groups, making a total of twenty groups Over the course of five days, classes were held from 3:30 to 6 p.m.

Three months were spent on the educational program for group B. The educational program began as a centralized training to enable participants to attend throughout working shifts. The head nurse from the two centers authorized the timetable schedule. A program booklet and audiovisual elements were used to teach the knowledge portion of the course; the length of the educational program was planned (a). The processes required for organizing, stocking, labeling, checking the availability of equipment and supplies, and reloading the emergency crash cart were trained. The participant was given the schedule and materials for the teaching program, and three months later the post-program evaluation got started using the same questionnaire

Ethical Approval

The IRB and Nursing Colleges at Al Neelain University provided their approval for this study. The second approval from the IRB for research division of the Khartoum State Ministry of Health (SMOH).additionally the study was approved from governmental hospitals Ahmed Gasim and Shab heart centers. The participant was given an explanation by the researcher of the study's goal and aim. The participants' voluntary agreement was obtained in writing, and they were free to opt out at any point without suffering any consequences. They were informed about the study and the expected advantages, which included improving their knowledge, skills, and attitude about emergency crash carts. There were also no known dangers associated with the trial. The participants were given code numbers rather than their names to ensure confidentiality. They stated that no one had accessed the data they had gathered.

III. Results

Table No. (1) Distribution Demographic data for the studied nurses (N=132).

Variable	Socio-demographic data	Number	%
Gender	Male	40	%30
	Female	92	%70
Age	20 - 30	46	%35
	31 - 40	72	%54
	41-50	14	%11
Qualification	Bachelor	117	%89
	Master	15	%11
Experience	1 -5Y	42	%32
	6-10Y	71	%54
	Y15-11	19	%14
Work place	Coronary Care Units	72	%55
	Intensive Care Unite	49	%37
	Inter media Intensive Care Unite	11	%8
have training before	Yes	44	%33
	No	88	%67

Table (1): Show that Most of nurses were female(70%) , hade aged between 23 to 40 years(54%) and about (89%) of them were Bachelor in nursing. regarding years of experience half of nurses (54%) were have experience 6-10 years. nurses disruption 55%were in coronary care units Most of Nurses (67%) hadn't received training before .

Table No. (2) shows the differences between nurse’s knowledge mean scores of the significance of the T-test pre and post test (n=132)

	Pre /Post	N	Mean	Std. Deviation	df	(T)	Sig. (2-tailed)	Inference
Nurse's performance	pre	132	57.37	10.99	131	-31.19	.000	Sig.
	post	132	100.25	11.52				

The above table shows , the differences between the means values are statistically significant, as the calculated (T) value reached (31.19), which is a statistically significant value at the level of significance.01, where the Sig value is (.00). Looking at the two measurements means, we note that the differences are in favor of the mean scores of the post-measurement versus the pre-measurement, this makes to accept the alternative hypothesis, then the result is: ((Significant difference Nurse's knowledge it enhanced after the educational program are in favor the post-measurement))

Table (3)shows the nurse’s knowledge result of (T) test in post educational program (n=132)

	N	Items	critierion Value	Mean	Std. Deviation	df	(T)	Sig. (2-tailed)	Inference
Post	132	(25)	75	100.25	11.52	13	25.18	.000	Sig.
						1			

The above table shows , the differences between the mean and the criterion value are statistically significant, as the calculated (T) value reached (25.18), which is a statistically significant value at the level of significance.01, where the Sig value is (.00). That mean differences are statistically significant, In favor of the mean versus the criterion value, then the result is a statistically significant increase in the degree of nurses' Knowledge in the post-measurement

Table (4) shows the nurse's knowledge result of (T) test inPre-educational program (n=132)test

N	Items	critrion Value	Mean	Std. Deviation	Df	(T)	Sig. (2-tailed)	Inference
Pre	132	(25)	75	57.37	131	-18.42	.00	Sig.

The above table shows , the differences between the mean and the critrion value are statistically significant, as the calculated (T) value reached (25.18), which is a statistically significant value at the level of significance.01, where the Sig value is (.00). That mean differences are statistically significant, In favor of the mean versus the critrion value, then the result is a statistically significant decrease in the degree of nurses' performance in the pre measurements.

IV. Discussion

The importance of these findings might be linked to the organization of a training course on emergency crash cart management, which aimed to raise the bar for patient care and establish safe practices for maintaining crash carts and levels of standardization. Knowledge of crash carts, equipment familiarity, equipment handling skills, defibrillator safety, and adequate documentation are among the important duties of nurses in intensive care. According to the current survey, the majority of nurses were female, the majority of them had bachelor's degrees in nursing, and half of them had experience ranging from six to ten years.

Percentage distribution of information on crash cart management among staff nurses before intervention revealed that, overall, staff nurses' knowledge was approximately %57.37. The pre-test nurses' knowledge had a low level of significance, according to the study's findings. This might be explained by the fact that nurses don't use self-learning resources or keep up with new information. Another fact is that nurses' workloads don't allow them to read and keep their knowledge current. This may be due to the fact that the majority of individuals with Bachelor's degrees in nursing and crash cart management did not have these topics covered as sparingly in their level. Another statistic is that 67% of the participants had never trained about crash cart management before. The findings of the study, which are corroborated by those of a related study carried out by Madhya Madhusudan Singh (2019). In the current study, it was found that after implementing an educational program, nurses' knowledge of crash cart management increased from a mean of 57.37 to 100.25. It runs counter to the conclusions of a study by Rawiaa Ibrahim (2017), who found that such teaching programs generally improved knowledge by 33%. Additionally, this outcome is consistent with (Paramesha&kumar, et al., 2016) who evaluates the impact of a self-instructional knowledge module on hospital emergency crash cart usage between 4th year B. Sc. nursing Students at specific Mysore nursing schools Pretest results showed that fourth-year B. Sc. nursing students had a low level of understanding. After completing the Self-instructional Module, the post-test result improved, this enhance the result of the present study he post-test knowledge score for nurses significantly increased to 100.25. The management of crash carts in a tertiary care teaching hospital was evaluated by resuscitation council UK and the national accrediting board of hospitals and health care providers among staff nurses, According to the study there is a lot of work to do and there isn't enough information about crash carts, therefore labeling has been neglected. And improper documentation resulting in decreased accountability and inefficient monitoring. (Pasha, T., Hossain, M.M. and Chowdhury, R) . The results of this study supported hypothesis (II), Significant difference, with regard to nurses' performance. Following educational program, the nurse's performance improved

V. Conclusion

According to the completed study, standardization in the crash carts may be fully adopted in terms of labeling and documentation protocols to promote visibility and staff accountability in order to manage situations in an efficient manner. Additionally, it demonstrated how difficult it was to bring about change in clinical practice when it came to the management of emergency equipment so that new procedures for checking and maintaining emergency equipment might be established.

VI. Recommendations

Following are some recommendations that are offered based on the findings of the present study: Ongoing training initiatives to keep nurses working in emergency rooms up to speed on their knowledge and abilities .To generalize the findings, the study may be replicated with a larger sample size and in a different hospital context. An intermittent assessment of critical care nurses' knowledge and skills regarding various nursing practices at the intensive care units. The system of inspecting, changing, and repairing the emergency trolleys' equipment might be made better by developing the Standard Operating Procedures in-service training.

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