

Effect of Structured Teaching Programme on Knowledge Regarding Crash Cart System among Staff Nurses

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Abstract: *Emergency Nursing is a nursing specialty in which nurse's care for patients in the emergency or critical phase of their illness or injury. A crash cart enables healthcare providers to manage medical emergencies easily and confidently. This study was conducted to assess the effect of structured teaching programme on knowledge regarding crash cart system among staff nurses. The objectives of the study were to assess the level of knowledge of staff nurses regarding crash cart system, assess the effectiveness of structured teaching programme on crash cart system and to find the association between level of knowledge and selected demographic variables. The conceptual frame work used for the study was based on Modified King's Goal attainment theory. Pre- experimental one group pretest - post test design was used. The researcher selected thirty samples from medical wards of St. Thomas Hospital, Chethipuzha, by non probability purposive sampling technique. The tool consists of structured questionnaire on socio demographic data and crash cart system. Pre test followed by a structured teaching programme on crash cart system was done. Post test was done after two weeks of intervention using the same questionnaire. The data were analyzed using descriptive and inferential statistics. There was a significant increase in knowledge level of staff nurses ($t=2.17$) after the intervention. So the structured teaching programme on crash cart system had effectiveness in imparting knowledge. Study findings also revealed that the total years of experience and age of subjects has significant association with knowledge level, which is significant at $p<0.05$.*

Keywords: mCrash cart system; Structured Teaching Programme; Knowledge; Staff Nurses

1. Introduction

An emergency is a situation that poses an immediate risk to health, life, property or environment. Most emergencies require an urgent intervention to prevent a worsening of the situation, although in some situations mitigations may not be possible and agencies may be able to offer palliative care for the aftermath.

A crash cart enables healthcare providers to manage medical emergencies easily and confidently. Crash cart is a specially designed trolley, used for transporting and dispensing medicines and equipments at the emergency site for participating in life saving measures.

Cardio respiratory arrest and the need for cardiopulmonary resuscitation can occur anywhere, both in the out-of-hospital and in-hospital settings. Therefore, all healthcare centers (hospitals, primary care facilities, out-of-hospital emergency services) must be prepared to initiate life support procedures in children and to treat other life-threatening emergencies. To achieve this objective, adequate material including a full crash cart or resuscitation trolley is essential and must be available in all healthcare centers. Specific items contained in the trolley can vary according to the characteristics of the facility and the most probable type of resuscitation needed (for example, neonatal resuscitation). At least one resuscitation trolley must be available in primary care centers, pediatric intensive care units, emergency departments, out-of hospital emergency services, and pediatric wards. The trolley must be located in an easily accessible site and must contain only indispensable material. It is essential to include instruments in several sizes, covering children of all ages, as well as enough spare instruments and medications that could be required during resuscitation. The material must be checked periodically and

all the staff (physicians, nurses, and auxiliary personnel) must be familiar with the trolley's contents and the location of all material and drugs¹.

According to a new study four times people die from preventable medical errors, as many as 4,40,000 a year. One in 10 patients is harmed while receiving hospital care. At least 50% of the medical equipments in developing countries are unusable or only partly usable. Often the equipment is not used due to lack of skills or commodities. As a result, diagnostic procedures or treatments cannot be performed.

It is important for every material management employee to be trained to know the purpose, benefits and operations of the exchange cart system. This information can be shared in a simple, short in service or during department orientation. It is vital to the success of the system. To summarize one expert's views on this training. "No system will work without people. The people must be trained to believe in the system, to understand the system, and to work within the system. Certainly the policies and procedures must be there to provide the guidelines for day-to-day operations. Certainly there should be some quantitative analysis in order to evaluate the daily results. However, the people will make most systems work or fail²."

In past years, there have been various issues with efficiency and organization of the "Crash Carts". The two main issues prior to its reinvention and revamping, were that (1) the materials on the cart were not easily found, and (2) there were no clear instructions on how to use critical items on the crash cart. There were also issues with over-stuffing of items, and the excessive shifting of various items when the cart was on the move, or even when the drawers of the cart were opened and shut. The investigator had come across many incidents in her experience in nursing profession

where many nurses were not having knowledge regarding crash carts, one patient could not survive because of unavailability of emergency equipment during the time of resuscitation. That prompted the researcher to do some studies related to this topic in order to upgrade the standards of nursing care.

2. Objectives of the study

- Assess the level of knowledge of staff nurses regarding crash cart system.
- Assess the effectiveness of structured teaching programme on level of knowledge regarding crash cart system.
- Find the association between level of knowledge and selected demographic variables

3. Review of literature

In this present study the review of literature is organized under the following sections:

- Literature related to general information on crash cart system and its relevance
- Literature related to knowledge of staff nurses on crash cart system
- Literature related to effect of structured teaching programme

A study conducted to use the (A) Airway, (B) Breathing and, (C) Circulation structured approach to the assessment of a sick child to provide an overview of the equipment used in resuscitation attempts involving children. It emphasizes that a working knowledge of the resuscitation equipment used in emergency situations is fundamental to the process of checking and preparing it. The article is aimed at students and newly qualified nurses, but may be also useful as revision for more experienced nurses³.

A study conducted to assess the usability testing and human factors engineering (HFE) principles to create efficient code cart medication drawer modifications to improve code blue medical emergency medication management. A total of 26 health care professionals (13 pharmacists and 13 nurses) were asked to locate items within a code cart medication drawer during two independent simulated code scenarios alternately using either a baseline medication drawer (control; Drawer 1) or a prototype medication drawer (prototype; Drawer 2), which was developed using HFE principles and usability testing. Overall medication retrieval time, wasteful actions, and survey responses were recorded. The results showed that the Drawer 2 had significantly faster trial completion times ($p = .005$) and fewer wasteful actions ($p < .001$) compared to Drawer 1. Participant survey results rated Drawer 2 (prototype) significantly higher (more favorable) for medication drawer visibility ($p < .001$), usability ($p = .011$), and organization ($p < .001$) compared to Drawer I (baseline). The findings demonstrate that HFE and usability applied to code cart design are effective, are customizable, and can affect patient safety by saving valuable time and reducing wasted motions (including errors) during code situations⁴.

A study conducted to explain the shortcomings of the existing bedside emergency resuscitation carts, which interfere with the rapid, efficient care of the hospitalized patient in a catastrophic episode. A systems study was made of the performance criteria of such a cart under conditions which require its use. The primary result of the study was a new design for a bedside emergency resuscitation cart and a suggested list of emergency medications and equipment, every item of which is visible and available without opening drawers to search for it. It is suggested that such a cart, fully equipped, be kept on every nursing station and in every specialcare department of a hospital⁵.

A study was conducted among intensive care unit nurses on the knowledge of the Crash cart trolley. The investigator administered 31 multiple choices question to 168 intensive care unit nurses from 15 institutions. The mean score was 57%. Although 90% of intensive care unit nurses correctly identify the equipments and not measured it, only 61% were able to measure it correctly. The results of the study indicated that formal training, frequency and exposure to the Crash cart trolley and professional certification in critical care correlated with better score on the questionnaire⁶.

Crash cart trolley with its basic emergency medications is often utilized to guide therapeutic interventions, especially in critically ill patients. Critical care nurses practicing in various critical care specialties were invited to participate in a study on knowledge of crash cart trolley. The participants were asked to complete an 18-itemed questionnaire and total scores ranged from 11.1% to 61.1%. The response rate was 17.4% ($n = 68$). The study concluded that there is lack of knowledge related to essential Crash cart trolley with basic emergency medications⁷.

A quasi experimental study was performed among the critical care staff nurse working with critically ill patient, in Benha University, Cairo, Egypt to assess the impact of a designed teaching protocol about advanced cardiac life support. The programme was divided into 23 sessions, it was given an average of 3 days per week for eight month pre- and post test implementation evaluation. The results of the study shows that the knowledge score and practice level increased after the implementation of the programme and also there is a positive correlation between knowledge score and practice of study subjects⁸.

4. Methods / Approach

A quantitative research approach is adopted for this study. A pre experimental one group pre testpost test design was used to conduct the study on the month of February 2015 using structured knowledge questionnaire and a structured teaching programme among thirty staff nurses from St.Thomas Hospital, Chethipuzha. Samples are selected by purposive sampling method. The data collection was done by two sessions. In the first session basic socio demographic data was collected and knowledge was assessed by structured questionnaire. The structured questionnaire includes the questions related to the questions concerning the definition, purpose, location, arrangement maintenance of crash cart and post emergency actions. Each question has one right answer and three wrong answers. A structured

questionnaire is prepared to assess the demographic data of staff nurses which includes age, sex, gender, educational qualification, additional qualification, years of experience, area of maximum experience and experience in working with crash cart.

In the next session structured teaching programme was provided to the thirty staff nurses with the help of power point, which took about twenty minutes. The post test was done after two weeks, using the same knowledge questionnaire which took about twenty minutes for each sample.

Data was analysed by using statistical package for social sciences (SPSS) version 20 statistical package. Frequency and percentage distribution were computed for analyzing demographic variables. Paired t test was used to compare the pre and post test knowledge score regarding crash cart $t = \frac{d}{\sqrt{n-1}Sd}$. Chi-square was used to associate the selected demographic variables with knowledge.

5. Results

Thirty staff nurses were included in the study. Among the study participants, 60% of the staff nurses belonged to the age group of 30 years or less and 40% were above 30 years and majority of the staff nurses (90%) who took part in the study were females. The study shows that 70% of staff nurses were having diploma in general nursing. It reveals that 26.7% of staff nurses had 10-15 years of experience and the rest had 1-9 years of experience. 3.3% had Emergency department experience and 80% of staff nurses had experience in medical and surgical wards.

The study shows that in pretest knowledge assessment 43.3% of study subjects had good knowledge on crash cart system, 20% had average knowledge and 36.7% of staff nurses had poor knowledge about crash cart system. These findings reveal the need for an educational intervention to improve the knowledge regarding crash cart system.

Data shows that mean post test knowledge (24.20) is higher than that of pretest knowledge (21.30). The obtained t value is 2.17 is highly significant ($p < 0.001$) and it can be concluded that post knowledge scores are significantly greater than pre test knowledge scores of staff nurses on crash cart system and the research hypothesis is accepted.

The study reveals that age of the subjects and total years of experience had significant association with the knowledge levels of staff nurses regarding crash cart system.

6. Discussion

The present study focused on the effectiveness of structured teaching programme on knowledge regarding crash cart system among staff nurses working in a private hospital, Chethipuzha. The main aim of the study is to assess the knowledge regarding crash cart among staff nurses. The main study was conducted among the staff nurses working in St. Thomas Hospital Chethipuzha. The data was collected using structured questionnaire and practice checklist prepared by the investigator. The data thus collected were

analyzed using appropriate statistical tests with the help of Statistical Package for Social Science (SPSS). Frequency and percentage distribution was computed for analyzing demographic variables. Paired t test was used to compare the pre and post test knowledge score regarding crash cart. Chi-square was used to associate the selected demographic variables with knowledge. The result of this study revealed that the structured teaching programme has improved the knowledge regarding crash cart among staff nurses.

The present study was conducted on 30 staff nurses from St. Thomas Hospital Chethipuzha. Baseline demographic data and knowledge regarding crash cart was assessed by structured questionnaire. Structured teaching programme was given in the form of a group education programme consisting of group teaching using power points and charts. After seven days post test knowledge was assessed.

The present study concluded that, 43.3% of study subjects have good knowledge on crash cart system, 20% have average knowledge and 36.7% of staff nurses had poor knowledge about crash cart system.

The study revealed that the structured teaching programme on crash cart system imparted knowledge in staff nurses. Paired 't' test was used to analyze the effect of structured teaching programme on knowledge regarding crash cart system among staff nurses. The obtained value is 2.17, which is significant ($p < 0.00$).

In this study Chi-square test is used to find the association between the level of knowledge and the selected demographic variables. The p value obtained for total years of experience and age of the subjects are 0.02 and 0.01 respectively, which is less than 0.05. The study revealed that there was significant association between the total years of experience & age of the subjects with knowledge of staff nurses regarding the crash cart system.

7. Conclusion

This study showed that structured teaching programme on crash cart system impart knowledge among staff nurses. Mean post test knowledge (24.20) is higher than that of pretest knowledge (21.30). The obtained t value (2.17) is significant ($p < 0.000$) and it can be concluded that post knowledge scores are significantly greater than pre test knowledge scores of staff nurses on crash cart system. The study also revealed that age of the subjects and total years of experience had significant association with the knowledge levels of staff nurses regarding crash cart system

8. Future Scope

- A similar study can be conducted by adopting true experimental research approach.
- A study can be conducted to find the effectiveness of various teaching strategies on crash cart system. (Example- video, computer-assisted teaching programme.)
- A comparative study can be conducted on knowledge and practice regarding crash cart system at general hospital and super specialty hospitals.

- A similar study can be conducted among nursing students.
- Conduct educational programme to highlight the significance of utilizing the effective crash cart management system.
- Similar study can be replicated on a large sample.
- Nurse educator can train and encourage the student to utilise crash cart system.
- Similar study can be done among all staff nurses from all departments

Table 1: Pre test knowledge level of staff nurses regarding crash cart system

Knowledge	Frequency	%
Good	13	43.3
Average	6	20.0
Poor	11	36.7

9. Limitations

- The purposive sampling used in this study may not allow for transferability of data.
- Randomization of sample could not be done because of unavailability of staff due to three shift duty.
- Study period was only four weeks.

Table 2: Mean, standard deviation and level of significance of pre and post- test knowledge of staff nurses before and after intervention

	Mean	Std. Deviation	t	Significance
Pre -test score	21.30	5.30	2.17	0.000
Post test score	24.20	5.10		

Table shows that mean post test knowledge (24.20) is higher than that of pretest knowledge (21.30). The obtained t value is 2.17 is highly significant (p<0.001)

Table 3: Association between level of knowledge and selected demographic variable

Sl. No.	Demographic variable	χ^2	df	level of significance (p value)
1	Age	9.1	2	0.01**
2	Gender	5.75	2	0.06
3	Marital status	7.9	4	0.09
4	Professional qualification	5.4	4	0.25
5	Additional qualification	2.2	2	0.34
6	Total years of experience	11.8	4	0.02**
7	Area of experience	5.5	4	0.24
8	Experience with crash cart	1.5	2	0.47

** Significant at 0.05

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