Effectiveness Of Information Booklet On Knowledge Regarding Crash Cart Among Staff Nurses Serving In Tertiary Care Hospital Of Maharashtra State.

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Abstract:
Background: A crash cart or code cart (crash trolley) or "max cart" is a set of trays/drawers/shelves on wheels used in hospitals for transportation and dispensing of emergency medication/equipment at site of medical/surgical emergency for life support protocols to potentially save someone's life. Objectives: Primary objective:To assess the effectiveness of information booklet on knowledge on crash cart among staff nurses. Secondary objectives: 1. To assess the knowledge on crash cart among staff nurses in tertiary care hospital. 2. To find out the effectiveness of information booklet on knowledge regarding crash cart among staff nurses in tertiary care hospital.3. To find out the association between the post-test knowledge score and selected demographic variables of staff nurses in tertiary care hospital. Methods: Pre-experimental method. Sample size: 80 staff nurses serving in selected tertiary care hospital of Maharashtra state. Material:Information Booklet on knowledge regarding crash cart. Results: The study finding reveals that the majority of staff nurses were found average knowledge Before intervention, had mean knowledge score of 15.78 ± 3.25 is average and After intervention, had mean knowledge score is excellent and very good 26.35 ± 1.53. Effectiveness of information Booklet on crash cart among staff nurses The Student's paired' t' test shows significant difference (31.56) at 0.05% level significance Hence it is concluded that The post-test knowledge scores on crash cart has shown highly significant difference in "t" value (t=31.56, p<0.05) among staff nurses serving in tertiary care hospital. Therefore, the information booklet on crash cart was effective among staff nurses.

Keywords: effectiveness, information booklet, knowledge, crash cart, staff nurses.

BACKGROUND:

A crash cart or code cart (crash trolley) or "max cart" is a set of trays/drawers/shelves on wheels used in hospitals for transportation and dispensing of emergency medication/equipment at site of medical/surgical emergency for life support protocols to potentially save someone's life. The cart carries instruments for cardiopulmonary resuscitation and other medical supplies while also functioning as a support litter for the patient[1].

Theemergencynursetypicallyworkswithpatientswhoarenotyetdiagnosed, may have new problems not previously perceived, is not yet accustomed to institutional environment, is still struggling to deal with a new reality of illness or injury, who may have an element of uncertainty to their problem. The emergency nurse is at "the front line" of the hospitals contact with the community[2]. Emergency nursing is a specialty within the field of professional nursing focusing on the care of patients with medical emergencies, that is, those who require prompt medical attention to avoid long-term disability or death? Emergency nurses are most frequently employed in hospitals emergency departments (EDS), although they may also work in urgent care centers, sports arenas, and on medical transport aircraft and groundambulances[3].

The emergency nurse may need to assess and provide guidance for patients who call for advice or who have not yet arrived in the emergency department. The emergency nurse must also be sensitive and skilled in discerning the patient's educational needs to understand and care for the problem and be a successful and supportive teacher under less-than-ideal conditions[4].

MATERIAL & METHOD:

Setting of the study: The study was conducted in Tertiary care hospital of Maharashtra state, minimum bed strength of each hospital would be 50 and above.

Research Design: Pre-experimental one group pre-test post-test research design

Population: staff nurses

Sample: The staff nurses serving in tertiary care hospital of Maharashtra state.

Sample size: 80

Sampling technique: Convenient sampling technique.

Inclusion Criteria:

- Staff nurses give consent to participate in the study
- Staff nurses available at the time of data collection
- Staff nurses with 1 year of experience

Exclusion criteria:

- Those staff nurses who undergone similar type of training programs
- Those who are not registered to state nursing council

MATERIAL:

Tools used for data collection

1. Self-Administered Questionnaire
2. Information Booklet

Description of tools

1. Self-Administered Questionnaire

The SAQ in the form of Multiple-Choice Questions (MCQ) was used to assess the knowledge of staff nurses with regard to crash cart. The SAQ contain Part A and Part B.

The Part A is related demographic variable and Part B is related to MCQ on crash cart. This tool was handed over to the staff nurses to complete the part A and part B with instruction.

Part A: It is related to seeking information on demographic variable of staff nurses working in Tertiary care hospital of Maharashtra state.

Part B: It is related MCQ on knowledge items of crash cart which is used to assess the knowledge of staff nurses. This MCQ has a total of 30 questions related to general information of crash cart, contents and articles in crash cart and maintenance and arrangement of crash cart. Accordingly, the knowledge items were divided of general information of crash cart, content and articles of crash cart and maintenance/ arrangement of crash cart.

The SAQ consist of 30 questions with a total score of 30. Each question/ item had four options and the score for each right answer was 1 mark and for wrong answer 0 mark was awarded.
2. Information Booklet
This information booklet is a self-learning material on crash cart for staff nurses working in tertiary care hospital. It contains systematically organized series of self-learning contents on crash cart including general information of crash cart, content and articles of crash cart, maintenance/arrangement of crash cart and self-assessment. This self-learning material was handed over to the staff nurses soon after the pretest with necessary instructions.
The pilot study was conducted on 8 staff nurses. The findings of pilot study have shown the feasibility of major study in terms of time, money, samples and data collection procedure.

METHOD OF DATA COLLECTION:
The study proposal was approved by the Institutional Ethics Committee of the University. The researcher visited the selected tertiary care hospital in advance and obtained the necessary permission from the concerned authorities. Investigator introduced herself to the staff nurses, and explained the purpose of the study so as to ensure co-operation during data collection. The participant was collected in the teaching room available in hospital and structured administered questionnaire was administered. As the sample of study was 80 staff nurses, it requires 3 days for collection of pre-test data and intervention. Data were collected approximately from 20-25 participants every day. Once the questionnaire was completed, researcher collected it back. The staff nurses required 30 minutes to complete the structured administered questionnaire.
After the pre-test information booklet was given to staff nurses on knowledge regarding crash cart. On 7th day of the pre-test, the post test was administered in the same manner using same questionnaire. As the staff nurses included in the study was on different shift duty, the investigator approached the staff nurses in all 3 shifts according to the convenience and availability of the staff nurses for conducting the post test. The collection of data was completed within the stipulated time. After the data gathering process the researcher thanked all the study samples as well as the authorities for their co-operation.

DATA ANALYSIS: The data was decided to be analysed, using descriptive and inferential statistics on the basis of objectives of the study.

RESULTS:
It is observed from table 1 that, the percentage wise distribution of staff nurses according to their age reveals that, majority (80 %) were in the age group of 21-30 years whereas the staff nurses with more than 50 years and below were around 4%. However, 13.8% of staff nurses belonged to the age group of (31-40) years of age.The percentage wise distribution of staff nurses according to their gender depicts that majority (88.8%) of staff nurses were females.The percentage wise distribution of staff nurses according their qualification reveals that, the majority (72.5%) of the staff nurses were qualified with GNM whereas 11.3% of staff nurses were qualified with P.B. BSc Nursing. However, the staff nurses with B. B. Sc were 16.3%.The percentage wise distribution of staff nurses according to their work experience depicts that majority (76.3%) of staff nurses had0-5yrs of experience whereas 3.8% of staff nurses had work experience more than 16 years. However, the staff nurses with 6-10 years and 11-15 years had work experience (5% and 15% respectively).Percentage wise distribution of staff nurses according to their source of information reveals that majority (66.3%) had information regarding crash cart from their working area whereas only 5% of staff nurses had information from journals. However, 7.5% and 21.3% had information from mass media and books respectively.

Table 1.1: Percentage wise distribution of staff nurses according to their demographic characteristics.

n=80

Demographic Variables	No. of staff nurses	Percentage(%)
Age(yrs)		
21-30 yrs	64	80.0
31-40 yrs	11	13.8
41-50 yrs	3	3.8
≥51 yrs	2	2.5
Gender		
Male	9	11.3
Female	71	88.8
Education		
GNM	58	72.5
BBSc Nursing	13	16.3
PBBSc Nursing	9	11.3
GNM/BBSc/PBBSc with certified course	0	0
MSc and above qualifications	0	0
Working Experience(yrs)		
0-5 yrs	61	76.3
6-10 yrs	12	15.0
11-15 yrs	4	5.0
≥16 yrs	3	3.8
Source of information		
Mass Media	6	7.5
Journals	4	5.0
Working Area	53	66.3
Books	17	21.3

Table – 1.2: percentage distribution of knowledge on crash cart among staff nurses before intervention

n=80

Sr. No	Level of Knowledge	Frequency	Percentage
1	Poor	1	20.0 %
2	Average	9	36.2%
3	Good	53	51.2%
4	Very Good	16	66.4%
5	Excellent	1	83.3%
Overall		80	52.6%

Percentage distribution of knowledge on crash cart among staff nurses before intervention revealed that overall mean percentage of knowledge among staff nurses was 52.6%.

Table 1.3: Mean, Standard deviation of knowledge on crash cart among staff nurses before intervention

n=80

Sr. No	Level of Knowledge	Number of staff nurses	Mean	SD
1	Poor	1	6.00	-
2	Average	9	10.88	1.45
3	Good	53	15.37	1.55
4	Very Good	16	19.93	0.92
5	Excellent	1	25.00	-
Overall		80	15.78	3.25

Before intervention, the mean of knowledge score on crash cart among staff nurses is found to be 15.78±3.25.

Table –1.4: percentage distribution of knowledge on crash cart among staff nurses after intervention

n=80

Sr.No	Level of knowledge	Pretest		Posttest		Difference in Percentage
		Frequency	%	Frequency	%	
1	Poor	1	1.2%	-	-	+1.2%
2	Average	9	11.2%	-	-	+11.2%
3	Good	53	66.2%	-	-	+66.2%
4	Very Good	16	20%	2	2.5%	+ 17.5%
5	Excellent	1	1.2%	78	97.5%	+ 96.3%
Overall		**80**	**52.6%**	**80**	**87.8%**	**+35.2%**

Percentage wise distribution of knowledge on crash cart among staff nurses after intervention revealed that, the percentage of knowledge among staff nurses has increased up to 87.8% from 52.6% after administration of information booklet.

Table –1.5: Mean, Standard deviation of knowledge on crash cart among staff nurses after intervention

n=80

	Area of knowledge	Pretest		Posttest		Difference in mean & mean percentage	
		Mean ±SD	Mean %	Mean±SD	Mean %	Mean± SD	Mean%
	Poor	6.00± 0.00	20.0 0%	-	-	6±0	+20. 0%

Average	10.88 ±1.45	36.2%	-	-	10.88± 1.45	+36.2%
Good	15.37 ±1.55	51.2%	-	-	15.37± 1.55	+51.2%
Very Good	19.93 ±0.92	66.4%	21.00±0.00	70.0%	1.07±0.92	+3.5%
Excellent	25.00 ±0.00	83.3%	26.48±1.28	88.2%	1.48±1.28	+4.9%
Overall	15.78 ±3.25	52.6%	26.35±1.53	87.8%	10.57± 1.72	+35.2%

After intervention, mean knowledge score of staff nurses increased to 26.35±1.53from 15.78±3.25. Further, it is observed that the mean percentage of knowledge among staff nurses increased from 52.6%to 87.8%. There was about 35.2% improvement in knowledge among staff nurses after administration of information booklet.

Table NO.1.6: overall effect of information booklet on crash cart among staff nurses according to level of knowledge

$n=80$

Overall	Mean	Standard deviation	Mean difference	t - value	P- value
Pre test	15.78	3.25	10.56 ±2.99	31.56	0.0001 S, p<0.05
Post test	26.35	1.53			

*Df-1.98   p value<0.0001   ***highly significant*

This table shows the comparison of pretest and post-test knowledge scores of staff nurses working in tertiary care hospital of Maharashtra State. Mean, standard deviation and mean difference values are compared and with Student's paired 't' test applied at 5% level of significance, overall 't' value was found to be 31.56 whereas the corresponding p value was 0.0001which is statistically highly significant. Hence, it is interpreted that the information booklet was effective in improving the knowledge of staff nurses regarding crash cart and the Research Hypothesis H1 is accepted.

Table No.1.7: Association between post-test knowledge score on crash cart and Age in year

$n=80$

Age (yrs)	No. of staff nurses	Mean posttest knowledge score	F-value	p-value
21-30 yrs	64%	26.34±1.47	0.07	0.97

31-40 yrs	11%	26.36±2.06		NS,
41-50 yrs	3%	26.66±1.52		p>0.05
≥51 yrs	2%	26±1.41		

Df-3,76   p value>0.05   NS- Not significant

Table No.1.8: Association between post-test knowledge score on crash cart and gender
n=80

Gender	No. of staff nurses	Mean posttest knowledge score	F-value	p-value
Male	9%	25.44±2.92		0.060
Female	71%	26.46±1.25	1.91	NS, p>0.05

Df-78   p value>0.05   NS- Not significant

Table No.1.9: Association between post-test knowledge score on crash cart and Qualification

n=80

Education	No. of staff nurses	Mean posttest knowledge score	F-value	p-value
GNM	58%	26.31±1.62		
BBSc Nursing	13%	26.23±1.48		
PBBSc Nursing	9%	26.77±0.97		0.67
GNM/BBSc/PBBSc with certified course	0%	0±0	0.40	NS, p>0.05
M. Sc and above qualifications	0%	0±0		

Df-2,77   p value>0.05   NS- Not significant

Table No.1.10: Association between post-test knowledge score on crash cart and work experience
n=80

Work experience	No. of staff nurses	Mean posttest knowledge score	F-value	p-value
0-5 yrs	61%	26.27±1.63		
6-10 yrs	12%	26.58±1.24		0.74
11-15 yrs	4%	27±0	0.41	NS, p>0.05
≥16 yrs	3%	26±1.73		

Df-3,76   p value>0.05   NS- Not significant

DISSCUSSION:

The findings of study shows that Percentage distribution of knowledge on crash cart among staff nurses before intervention revealed that, overall percentage of knowledge among Staff nurses was around 52.62%. However, majority of them had average knowledge (51.2%) with a frequency of 53Staff nurses whereas one of them had excellent knowledge (83.3%). Further, the Staff nurses (with a frequency of 16) had very good knowledge (66.4%).

Before intervention, the Staff nurses had mean knowledge score of 3.81+1.68in terms of General information. Meanwhile, the mean knowledge score was found to be 3.52+1.69 in terms of

contents and articles. Further, it is seen that mean knowledge score among Staff nurses in terms of maintenance/arrangement was 7.23+3.26.

Before intervention, the knowledge score was 52.6%with an overall mean of 15.78+3.25 which is supported with the findings of a similar study conducted by Madhav Madhusudan Singh (2019) where overall knowledge of Staff nurses was 23%with a mean& SD of19.5+3.2.

In the present study it is observed that the knowledge among Staff nurses increased by 35.21% after administration of information booklet with an improvement in mean from 15.78±3.25 to 26.35±1.53. However, it is contradictory to the findings of a study conducted by RawiaaIbrahim (2017) who observed an overall improvement of 33% in knowledge after such teaching program. 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 hospitals care. At least 50% of the medical equipment's 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. This information can be shared in a simple, short in service or during department orientation. It is vital to the success of the system[5].

A similar study was conducted (2016) to assess the knowledge of critical care nurses related to essential crash cart trolley with basic emergency medications concluded that there is lack of knowledge related to essential crash cart trolley with basic emergency medications[6].

A study was conducted (2015) among168 intensive care unit nurses to assess the knowledge regarding the crash cart trolley. 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 questionnaire. Additional research is needed on a larger scale to validate these findings and determine if critical care nurses' knowledge of crash cart trolley is sufficient to maintain quality standards of safety and optimal patient care[7].

A study was conducted (2017) among 100 final year B. Sc. Nursing students to find out the effect and knowledge regarding utilization of crash cart in hospitals. Evaluative approach with quantitative research design was adopted. The study result showed that final year B. Sc. Nursing students had average knowledge score 11-20 and 97%of them had good knowledge score 21-30 regarding utilization of crash cart[8].

A study was conducted (2016) by resuscitation council UK and national accreditation board of hospitals and health care providers among staff nurses to assess the management of crash carts in a tertiary care teaching hospital. The study showed that there is high amount of workload and insufficient information regarding crash cart which led to neglect of labeling and improper documentation resulting in decreased accountability and inefficient monitoring. The researcher concluded that study was increasing sensitivity and awareness to standard protocols can help achieve maximum compliance in terms of the effective functioning of cart in the emergency[8].

A study was conducted (2014) to determine the effectiveness of structured teaching program for nurses on organization of selected emergency drugs to critical care units by using crash cart trolley. Findings of the study revealed that the knowledge scores of nurses on organization of emergency drugs were inadequate and after teaching program, there was a significant increase in the knowledge[9].

A study conducted (2018) in Kerala, India to assess the effect of Structured Teaching Program on Knowledge Regarding Crash Cart System among 30 Staff Nurses of medical wards revealed that structured teaching program impart knowledge among staff nurses. And 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[10].

An experimental study (2017) to assess the effectiveness of structured teaching programme on knowledge regarding utilization of crash cart in hospitals among100 final year B.Sc. nursing

students of selected nursing colleges in Pune city revealed that Structured teaching programme is found effective to increase the knowledge score of final year B.sc nursing students regarding utilization of crash cart in hospitals[11].

A study conducted in Saudi Arabia to find out Resuscitation Performance among 192staffnurses revealed that nurses were well-prepared and trained for resuscitation care, and they play avital role in performance. There is aneed to establish formal education and training for other resuscitation team members to improve their performance in resuscitation. Periodic debriefings from the team leader will improve team spirit and may reduce the possibility of future mistakes. If the corrective measures are incorporated in improvement plans and actions taken effectively, then the team can demonstrate excellent resuscitation practice in the teachinghospital[12].Related needs are evident from different studies [13-16]. Similar articles on knowledge and awareness were reviewed [17-22].

LIMITATION:
- Limited to knowledge domain of selected 80 staff nurses.
- The study was limited to selected private multispecialty hospital at urban region of Maharashtra.
- The study was limited to the at MNC staff nurses who have registration of RNRM.
- The study was limited to convenient sampling technique.
- Limited to pre experimental design.
- The data collection was limited to 2 weeks of it was cross sectional approach.

Implication:
NURSING SERVICES
- The huge of a health personnel can use the information booklet or a self-learning material.
- The Information Booklet can be used by the staff nurses now and then in regular health care services.
- The Information Booklet can significantly used in patient care as especially in all intensive care unit.
- As a specialist intensive care nurse counsellor, nurse can conduct individual counselling, group counselling and organize self-help groups which will improve the quality of nursing practice.
- Nurse may play a key role in changing the attitude towards treatment of disease for improved treatment success.
- Finding of the study can be incorporated in nursing services especially ICU.

NURSING EDUCATION
- The findings of the study can be incorporated with the existing nursing education curriculum and must include imparting knowledge about the importance of crash cart among students and staff.
- The nursing teachers can use the result of the study as an informative illustration for the students.
- The information Booklet emphasizes significance of instant/ in-service education programmes for nurses related to crash cart.
- The senior staff nurse can use the information Booklet to teach floor nurse.
- Information Booklet can be used among peer group teaching, individual teaching and teaching in small group allotted.

NURSING ADMINISTRATION

- The nurse administrator can take part in developing protocols and standing orders related to crash cart for staff nurses admitted in their hospitals
- The nursing administrator can mobilize the available resource personnel towards the education of staff nurses regarding crash cart.
- The nurse administrator should plan and organize continuing education programme for all staff nurses in the hospital to motivate them in conducting teaching programmes on crash cart for emergency management.

- The nurse administrators should explore their potentials and encourage innovative ideas in the preparation of appropriate teaching material like Information Booklet.
- She should organize sufficient manpower; money and material for disseminating health information like using self-instructional manual, self-instructional booklet, self-learning protocol.

NURSING RESEARCH
- Present study helps nurse researchers to develop appropriate health education tool for educating the staff nurses serving in ICU of all areas
- Nurses should come forward to take up unsolved questions in the field of crash cart to carryout studies and publish them for the benefit of patients, public and nursing fraternity.
- The finding can be used for publication to disseminate knowledge the potential nurse.
- The study will serve as a valuable reference material for the future investigators of a nurse consumer.
- Nurse can use the finding for further research studies as a nurse research producer.

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