

Original article:

Study of knowledge of staff nurses regarding use of defibrillators in intensive care units

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Abstract:

Introduction: A cardiac arrest, also known as cardiorespiratory arrest, cardiopulmonary arrest or circulatory arrest, is the abrupt cessation of normal circulation of the blood due to failure of the heart to contract effectively during systole. the present study was planned to assess the knowledge regarding use of defibrillators among staff nurses in intensive care units with a view to prepare an information booklet.

Methodology: Registered staff nurses working in Intensive Care Units who are willing to participate in the study. A blue print was prepared prior to the construction of the questionnaire which showed the distribution of the items. All the items were multiple choice question, which had four alternative response .A scoring value of 1 was allotted to each correct response and zero for incorrect answer. An arbitrary classification of knowledge score was done which was classified as, Good knowledge (18 to 27) Average knowledge (11 to 17) Poor knowledge (0-10) The final tool prepared had been tested for its content validity and reliability.

Observations: With respect to gender, majority of the subjects (50) 63%were female and (30) 37% were male.In relation to age majority of the subjects (40) i.e.40% belongs to the age group 21-30 years ,(30) i.e.37 % belongs to the age group 31-40 years and (10) i.e.13% belongs to the age group 41&above .

Conclusion: From the study it can be concluded that there was the challenge for nurses is to work together with other health members of the health team, to know when to use defibrillators for better patient outcomes. The following conclusions were drawn on the basis of the findings of the study.

Introduction:

A cardiac arrest, also known as cardiorespiratory arrest, cardiopulmonary arrest or circulatory arrest, is the abrupt cessation of normal circulation of the blood due to failure of the heart to contract effectively during systole.⁽¹⁾Cardiovascular disease is the nation's number one killer claiming almost as many lives as cancer, accidents, pulmonary infections, and all other causes of death combined. According to 2010 statistics from the American Heart Association (AHA), nearly one million deaths from

cardiovascular diseases were reported, 53.6% of which resulted from heart attacks, 3.1% from hypertensive diseases, 0.7% from rheumatic heart disease, and 27.6% from all other cardiovascular diseases.⁽²⁾

A defibrillator is a device that delivers an electric shock to the heart muscle through the chest wall in order to restore a normal heart rate .The defibrillator was first demonstrated in 1989 by Prevost and Batelli, two Physiologists from University of Geneva, Switzerland. The first use of it on a human was in

1947 by Claude Beck, Professor of Surgery at Western Reserve University, Ohio, U.S.A. Defibrillation is the definitive treatment for life threatening cardiac arrhythmias, Ventricular fibrillation and Pulseless ventricular tachycardia and other Dysrhythmias.⁽³⁾Heart attack is the third commonest cause of death next to only cancer and road accidents in India. Every year 2.5 million people suffer from coronary artery disease & 1.5 million die of it in India. It is estimated that by 2025 every one out of four heart attacks in the world will be an Indian. ⁽⁴⁾Nurses working in Intensive Care Units should be acquainted with the use of defibrillators at any point of time of need since it is an important life saving measure. ⁽⁵⁾Reducing the delay to defibrillate has a major impact on chance of survival from cardiac arrest. They need health care providers who are not only skillful in managing machines but also understanding and supportive during stressful situations.⁽⁵⁾

Findings of the study indicate that self instructional module was significantly effective in increasing the knowledge.⁽⁶⁾ Victims of cardiac arrest can be saved if a defibrillator is available to deliver an electric shock and restore the heart to its normal patterned rhythm. Sudden cardiac death from coronary heart disease occurs over 900 times per day in the United States. The risk in adults is estimated to be about 1 per 1,000 adults 35 years of age and older per year. ⁽⁷⁾Nurses must be knowledgeable about defibrillation so that they can perform as well as detect equipment malfunction. ⁽⁸⁾Nowadays, use of defibrillation is a necessity in the level of care for clients managed in Intensive care and on general care units. The clients who need emergency defibrillation is a challenge to the nurses providing care. Therefore the nurses must be familiar with the equipment,

complications and nursing management. Studies support that education to staff nurses on defibrillation would be helpful in reducing complications and facilitate early recovery. The investigators own experience, discussion with experts and the influence of new models of defibrillators, made him to realize that there is a need to educate the staff nurses regarding correct use of defibrillators. With this background the present study was planned to assess the knowledge regarding use of defibrillators among staff nurses in intensive care units with a view to prepare an information booklet.

Methodology:

The topic was reviewed and permission was obtained from the Ethical Research Committee of the College. Written permission was taken for conducting research from the concerned authorities of the respective hospital. Sampling criteria specifies the characteristics the sample in the population must possess. ⁽⁹⁾ The following criteria are used in present study to select the samples.

Inclusion Criteria:

Registered staff nurses working in Intensive Care Units who are willing to participate in the study.
Staff Nurses available during period of data collection.

Exclusion criteria:

Nursing Aids/Assistants who do not come under the group of registered nurses.
Nurses working in other areas of hospital other than Intensive care units.

Development of the tool:

Development of the tool are planned to assess the existing knowledge by structured knowledge questionnaire.

The following steps were taken before the development of the tool.

1. Literature review related to knowledge regarding defibrillator among staff nurses.
2. Literature review related to practice, attitude, perception and belief about defibrillation among staff nurses.
3. Opinion of different experts in the nursing field was taken into consideration.
4. Personal experience of the investigator also taken into consideration.

A blue print for the structured knowledge questionnaire was prepared.

Preparation of the blue print:

A blue print was prepared prior to the construction of the questionnaire which showed the distribution of the items. The tool consisted of 2 parts.

Part I: Demographic Proforma: A Proforma for selected personal information was used to collect the sample characteristics .The characteristics includes gender, age in years, professional education, experience in years, area of experiences, specific course related to the use of defibrillators.

Part II: The related literature was reviewed for the

construction of structured knowledge questionnaire.

It consists of 27 items divided into,

Questions related to heart: 1 to 5 =5

Questions related to defibrillator (hardware):6to 12=7

Questions related to procedure: 13 to 27=15

All the items were multiple choice question, which had four alternative response .A scoring value of 1 was allotted to each correct response and zero for incorrect answer. An arbitrary classification of knowledge score was done which was classified as, Good knowledge (18 to 27) Average knowledge (11 to 17) Poor knowledge (0-10)

The final tool prepared had been tested for its content validity and reliability. Checklist had been developed for validating the tools. The checklist included three categories which were relevant, appropriate and measureable. The prepared instruments along with the problem statement, objectives, research question, and operational definitions, blueprint and criteria checklist were submitted to 10 experts for establishing the content validity comprising 8 nurse educators and 2 medical personal.

Observations and Results:

Table no. 1:-Knowledge of staff nurses regarding use of defibrillators working in Intensive care units.

		n=80
Knowledge variables	Frequency	Percentage (%)
Good knowledge (18 to 27)	19	24%
Average knowledge (11 to 17)	43	54%
Poor knowledge (0-10)	18	22%

Table 2:- shows knowledge variables and percentage distribution. Knowledge variables divided into 3 parts

Good knowledge 18 to 27=19 Average knowledge 11 to 17=43 Poor knowledge 0 to 10=18

Staff nurses have good knowledge 24%, average knowledge 54%, and poor knowledge 22% regarding use of defibrillators working in Intensive Care Units

Table no.3: Association between knowledge and selected demographic variables regarding the use of defibrillators among staff nurses:

Sr. No.	Variables	Good knowledg e	Average knowledg e (11-17)	Poor knowledg e	Valu e	Table Value	df
		(18-27)		(0-10)	χ^2		

n=80

1. Gender

Male	3	20	7	6.98	5.99 ^(S)	2
Female	16	23	11			
2. Age in years						
21-30	8	21	11	7.31	9.41 ^(NS)	4
31-40	8	19	3			
41 & above	1	5	4			
3. Professional education						
RGNM	11	28	11	18.47	9.49 ^(S)	4
Basic BSc(N)	3	6	3			
Post Basic BSc(N)	3	10	5			
4. Area of Work						10
Medical ICU	5	9	1	2.73	18.31 ^(NS)	
Surgical ICU	4	9	7			
C.C.U.	4	6	6			
PM.ICU	2	9	3			
CTS .ICU	2	8	0			
Renal ICU	1	3	1			

5. Experience in year

0-5 years	10	28	12	15.29	9.49 ^(S)	4
6-10 years	6	8	6			
11 &above	2	8	0			

6. Specific course related to the use of defibrillators

Yes	1	2	1	29.58	5.99 ^(S)	2
No	18	41	17			

NS: Not Significant S: Significant at 0.05 level of significant.

Discussion:

Main findings of the study are discussed under the following headings, Section I: Percentage-wise distribution of socio-demographic variables of the staff nurses.

Section II: Assess the knowledge regarding use of defibrillator among staff nurses.

Section III: Association between knowledge and selected demographic variables regarding the use of defibrillators among staff nurses in Intensive Care Units.

Section I: Percentage-wise distribution of socio-demographic variables of the staff nurses.

Major findings:

The data on sample characteristics revealed that majority of the subjects (50) 63% were female and (30) 37% were male.

In relation to age majority of the subjects (40) i.e.40% belongs to the age group 21-30 years ,(30) i.e.37 % belongs to the age group 31-40 years and (10) i.e.13% belongs to the age group 41&above .

Regarding the professional education, majority of subjects (50) ie.63% done General nursing

&midwifery, (12) ie.15% done Basic BSc (Nursing) and (18) i.e.25% subjects done Post Basic BSc (Nursing) course.

In relation to experience in years majority of subjects have experience in (0-5) years were (50) i.e.63 % ,(6-10) years (20) i.e.25% ,(11 &above) years (10) i.e.12 % .Regarding the specific course related to the use of defibrillators majority of subjects were not taken (76) i.e.95 %, and taken 4 i.e.5%.

The present study assessed the existing knowledge of staff nurses regarding use of defibrillators and found all 19 subjects (23%) had good knowledge, 43 subjects (54%) had average knowledge and 18 subjects (23%) had poor knowledge.

While assessing the existing knowledge regarding the use of defibrillators among staff nurses, the pre test data revealed that the mean score was 14 and standard deviation was 4. Inferential statistics analysis using chi- square to find out the association between knowledge and selected demographic variables, gender, professional education experiences in years ,specific course related to the use of defibrillators show significant association. The demographic

variables gender with calculated χ^2 values 6.98 at df 2 shows an association with pre test knowledge score at 0.05 level of significant. The demographic variables professional education with calculated χ^2 values 18.47 at df 4 shows an association with pre test knowledge score at 0.05 level of significant

Inferential statistics analysis using chi- square to find out the association between knowledge and selected demographic variables age in years and area of work does not show significant association. They are independent each other.

Section II: Assess knowledge regarding use of defibrillator among staff nurses.

Overall knowledge of staff nurses reveals that the existing knowledge of staff nurses regarding use of defibrillators and found all 19 subjects (23%) had good knowledge, 43 subjects (54%) had average knowledge and 18 subjects (23%) had poor knowledge. While assessing the existing knowledge regarding the use of defibrillators among staff nurses, the pre test data revealed that the mean score was 14 and standard deviation was 4. The findings of the present study were consistent with the study conducted in Bangalore to assess the knowledge of staff nurses regarding the use of defibrillator in critical care units of selected hospitals with a view to develop teaching module by Mohd. Mubeen Ahmed in 2007. The study was done using descriptive research approach. Non-experimental descriptive design was used for the study. Samples were selected by using non probability sampling purposive sampling technique and found that the pre test score was 14. The staff nurses have good knowledge 18%, average knowledge 50% and 38% have poor knowledge regarding use of defibrillators. The chi-square test

The findings of the present study were also consistent with the study conducted in Mangalore (India), to determine the effectiveness of self instructional module on implantable cardioverter defibrillator among staff nurses in a selected hospital, by Ms. Bethia.P.James in 2010. The study was done using evaluative research approach. Quasi experimental pre test post test design was used. Samples were selected by using non probability convenience sampling technique and found that the pre test score was 10 and post test score was 17 which was increased after giving self instructional module. The chi-square test value was 8.48 (table value=5.99) at 0.05 level of significant. The t -test value was 2.258 (table value=0.3866) at 0.05 level of significant which is considered to be extremely significant of knowledge, so improvement in knowledge after giving self instructional module. Findings of the study indicate that self instructional module was significantly effective in increasing the knowledge. ⁽¹⁹⁾Inadequate knowledge may be lack of training programme among staff nurses, lack of cooperation from physicians, availability of equipment. Hence it was necessary for the investigators to improve the subject knowledge by giving information booklet regarding use of defibrillators.

Section III: Association between knowledge and selected demographic variables regarding the use of defibrillators among staff nurses in Intensive Care Units.

Inferential statistics analysis using chi- square to find out the association between knowledge and selected demographic variables, gender, professional education experiences in years, specific course related to the use of defibrillators show significant association. The demographic variables gender with calculated χ^2 values 6.98 at df 2 shows an

association with pre test knowledge score at 0.05 level of significant. The demographic variables professional education with calculated χ^2 values 18.47 at df 4 shows an association with pre test knowledge score at 0.05 level of significant. The demographic variables experiences in years with calculated χ^2 values 15.29 at df 4 shows an association with pre test knowledge score at 0.05 level of significant. The demographic variables specific course related to the use of defibrillators with calculated χ^2 values 29.58 at df 2 shows an association with pre test knowledge score at 0.05 level of significant.

The findings of the present study were consistent with the study conducted in Bangalore (India), to determine effectiveness of self instructional module on knowledge regarding defibrillation among staff nurses of selected hospital, by Mrs.Teena George in 2009. The study was done using evaluative research approach. Quasi experimental pre test post test design was used. The findings of the present study were also consistent with the study conducted in Tumkur. (India) to assess the effectiveness of structured teaching programme on knowledge of defibrillation among the staff nurses in selected hospitals at by Mr.Rohith Rao in 2012. The study was done using evaluative research approach. Quasi experimental pre test post test design was used. Samples were selected by using non probability convenience sampling technique and found that the pre test score was 12 and post test score was 18 which was increased after giving self instructional module. The demographic variables gender with calculated χ^2 values 9.80 at df 2 shows an association with pre test knowledge score at 0.05 level of significant.

The demographic variables experiences in years with calculated χ^2 values 13.20 at df 4 shows an

association with pre test knowledge score at 0.05 level of significant. The demographic variables age in years with calculated value 30.01 at 4 df shows an association with pre test knowledge score at 0.05 level of significant, and area of work does not show significant association. They are independent each other. The t -test value was 2.410 (table value=0.3866) at 0.05 level of significant which is considered to be extremely significant of knowledge, so improvement in knowledge after giving self instructional module. Findings of the study indicate that structured teaching programme was significantly effective in increasing the knowledge.⁽²³⁾

Conclusion:

From the study it can be concluded that there was the challenge for nurses is to work together with other health members of the health team, to know when to use defibrillators for better patient outcomes. The following conclusions were drawn on the basis of the findings of the study.

With respect to gender, majority of the subjects (50) 63% were female and (30) 37% were male. In relation to age majority of the subjects (40) i.e.40% belongs to the age group 21-30 years, (30) i.e.37% belongs to the age group 31-40 years and (10) i.e.13% belongs to the age group 41&above.

Regarding the professional education, majority of subjects (50) i.e.63% done General nursing &midwifery, (12) i.e.15% done Basic BSc (Nursing) and (18) i.e.25% subjects done Post Basic BSc (Nursing) course.

The present study assessed the existing knowledge of staff nurses regarding use of defibrillators and found all 19 subjects (23%) had good knowledge, 43 subjects (54%) had average knowledge and 18 subjects (23%) had poor knowledge.

Nursing implication:

As members of the health team, the staff nurses play an active role in promotion of health. The findings in the study have implications not only in the field of nursing but also to other allied areas. The findings of the study have implication for nursing practice .nursing education, nursing administration and nursing research.

Nursing Education:

Nursing education is an important area of nursing research where nurse investigators try to generate or refine the knowledge, which is useful to improve the teaching /learning methods and environment in nursing discipline. Education is an integral part of the clinical governance agenda, which includes education, clinical audit, clinical experiences, risk management, research and development. The introduction of a formalized educational programme provides a staff nurses with evidences based rational which challenge their practice, build and improve their knowledge regarding use of defibrillators.

Limitations:

1. The study was limited to staff nurses who are working in selected Intensive Care Units.
2. The study did not use any control group.
3. The study did not assess the attitude of staff nurses regarding defibrillation

Recommendation:

A similar study can be conducted on large samples to draw more definite conclusion and make generalization.

The study can be done in different setting.

The same study can be done with an experiment research approach having control group.

Comparative study can be done between two hospital staff nurses working in intensive care unit.

A similar study can be conducted with view to develop a protocol or procedure manual on defibrillators based on institution policy.

A study can be conducted to find out the effectiveness of various methods of teaching (Planned Teaching Programme, Structured Teaching Programme, and Demonstration) to improve the knowledge of staff nurses.

A similar study can be conducted on student nurses who are posted in intensive care unit.

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