International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

A Study to Evaluate the Effectiveness of In-Service Educational Program on Nurse's Competencies Related to Cardiovascular Assessment in Critical Care Units at Selected Hospital of Greater Noida, Uttar Pradesh

Netra Gautam[1], Nikhil Raj[2], Christa Mathew[3]

[1]School of Nursing Science and Research, Sharda University, Plot no. 32, 34 Knowledge Park-III, Greater Noida, UP- 201306, India
Email Id: *arten.gtm2049[at]gmail.com*

[2]Associate Professor, Mental Health Nursing, School of Nursing Science and Research, Sharda University
Email Id*: nikhil.raj[at]sharda.ac.in*

[3]Assistant Professor, Medical Surgical Nursing, School of Nursing Science and Research, Sharda University
Email Id: *christa.mathew[at]sharda.ac.in*

Abstract: ***One of the leading causes of death worldwide is cardiac diseases. Cardiovascular examination is a part of the physical examination including evaluation of the cardiovascular system. Through the competencies nurses can readily identify and prioritize patients' needs and provide rapid recovery from the critical condition of the patient which hence decreases mortality and morbidity. So, Critical care nurse should have good vigilant and prompt decision making while caring the critically ill patient poetizing their needs for steady recover. The aim of the study was to evaluate the effectiveness of in-service educational program on nurses competencies related to cardiovascular assessment in Critical Care units at selected Hospital of Greater Noida, Uttar Pradesh. Objectives of the study: 1) To assess the level of nurses competencies regarding cardiovascular assessment among the nurses working in Critical care units. 2) To evaluate the effectiveness of in-service education program on nurses competencies regarding Cardiovascular Assessment among nurses working in critical care units. 3) To find out the association of nurses competencies regarding Cardiovascular Assessment with their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information. Hypothesis: Hypothesis will be tested at 0.05 level of significant. H1: There will be significant difference in nurses Competencies regarding cardiovascular assessment before and after the implementation of the in-service education program. Methodology: A Quantitative research approach was used and the research design adopted for the present study was quasi-experimental pre-test, post-test control group design. The target population for the study was critical care nurses in selected hospital of Greater Noida, UP. This present study was conducted with the sample of 48 where equal subject are divided into 24 participants in experimental and 24 in control group. Structured questionnaire was used to assess knowledge level and skill level was assessed by using rating scale. The feasibility of the study and the tools were assessed through a pilot study. The data collection for the main study was done the month of July 2021. The study was conducted in Sharda Hospital. Probability simple random sampling technique was used for selection of subjects. Those nurses who were willing and who were available during the data collection was inclusion criteria of this study. Pretest and posttest was done in both experimental group for knowledge assessment and post-test was done for skill in experimental group only. Pre-test knowledge level was assessed and then in-service education on cardiovascular assessment along with demonstration followed by re demonstration was given as intervention to experimental group only. After 7 days of intervention, post-test on Cardiovascular assessment was done. The obtained data was analyzed based on objective and hypothesis by using descriptive and inferential statistics and hypothesis was tested at 0.05 level of significance. There was a statistically significant difference noted in the mean scores of knowledge at p<0.001 between pre-test and post-test among sample in experimental group. It shows that intervention was effective in improving the knowledge. Hence researcher accepted research hypothesis (H1). This study concluded that in service educational program on cardiovascular assess was effective to improve nurse's competencies in terms of knowledge and skill on cardiovascular assessment among nurses working in critical care units.***

Keywords: Evaluate**,** Effectiveness, In-Service Education, Nurses, Competencies, Cardiovascular Assessment, Critical Care Units.

1. Background of the Study

"A nurse will always give us hope, an angel with a stethoscope."

– Terri Guillemets

Webster's medical dictionary defines Critical or intensive care as the specialized care of patients whose conditions are life-threatening and who require comprehensive care and constant monitoring, usually in intensive care units.[1]

Assessment is the process of collecting, validating, and clustering data. It is the first and most important step in the nursing process (Dillon, 2007). [3]Physical examination is a process during which nurses use their senses to collect objective data. Assessment is a crucial first step in order to determine a client's care needs.

The evaluation of the cardiovascular system includes a thorough medical history, a detailed examination of the heart and the peripheral arterial and venous circulations, and appropriate laboratory studies.[4] In-service education is a type

of education that is provided to the employees while they are on the job so as to improve their working capacity and efficiency.

Critical Care Nursing is one of the most distinguished branches of nursing profession, which, by improving nursing care, management, education, ethic, and professional behavior, tries to reduce mortality and illness complications in critical care settings.[5]

The term "heart disease" refers to several types of heart conditions. Heart disease prevalence rates in India have been estimated over the past several decades and have ranged from 1.6% to 7.4% in rural populations and from 1% to 13.2% in urban populations. **(**National Center for Health Statistics; 2018.)[7]

The cardiovascular examination is a portion of the physical examination that involves evaluation of the cardiovascular system. [8] The competent nurses can readily identify and prioritize patients' needs and provide rapid recovery from the critical condition of the patient which hence decrease mortality and morbidity.

2. Methodology

Research Approach
The present study aimed to evaluate the effectiveness of in-service educational program on nurses competencies related to cardiovascular assessment in Critical Care units at selected Hospital of Greater Noida, Uttar Pradesh, with a view to complete the research objectives, Quantitative research approach was adopted for the study.

Research Design
A quasi-experimental pre-test, post-test, control group design was be used in this study to evaluate the effectiveness of in-service educational program on nurses competencies related to cardiovascular assessment in terms of knowledge and skill.

Table 1: Tabular presentation of the research design

Group	Pre-test	Intervention	Post-test
Experimental group	O1	X	O2
Control group	O3	-	O4

O1-Pre-knowledge assessment among the Experimental group
O2-.Post- knowledge assessment among the Experimental group
X- Implementation of in-service educational program to the Experimental group
O3-Pre- knowledge assessment among the Control group.
O4- Post- knowledge and skill assessment among the Control group

Variables

Demographic variable:
- Age
- Gender
- Educational qualification
- Working experience
- Source of information on cardiovascular assessment.

Independent variable: In-service education program regarding cardiovascular assessment.
Dependent variable: Competencies related to Cardiovascular Assessment.

Setting of the Study
Setting refers to the area where the study was conducted. It may be natural setting of hospital setting depending upon the study topic and researcher's choice. This study was conducted in selected Sharda hospital, Greater Noida Utter Pradesh.

Population
Population is defined as the entire set of individuals or subjects having some common characteristics.[13]
In this study, the population consist of nurses working in Sharda hospital, Greater Noida.

Sample and Sample Size
A representative part or a single item from a larger whole or group especially when presented for inspection or shown as evidence of quality.

In this study, the sample selected for the present study was nurses working in critical care in Sharda hospital, Greater Noida, UP.

Sampling Technique
Sampling technique refers to the process of selecting the population to represent the entire population.
Simple random sampling technique, it is a type of non-probability sampling approach which was found to be appropriate for the present study.

Sample Size
The sample size was calculated based on the the pilot study findings using the following formula.

Formula
$n = 2\ [\{Z\ 1\text{-}\alpha/2 + Z\ 1\text{-}ß\}^2 \times SD]\ /d$
Where,
n= required sample size
Z1-α/2 = 1.96 at 5% level of significance ES= effect size
SD= Standard Deviation

Total required sample was 48 i.e. 24 in experimental group and 24 in control group.

Sampling Criteria

Inclusion criteria
- Nurses who were working in critical care areas at selected hospital of Greater Noida Utter Pradesh.
- Nurses who were available during the period of data collection and participate in the study.

Exclusion criteria
- Nurses who are not willing to participate in the study.

Development of Tool

Development of research tool was done through the various literature reviews. The primary and secondary sources of literature were reviewed to develop the appropriate tool at appropriate time. Validity was obtained from the 8 experts from different department of nursing, Statistician. Their opinions and valuable suggestion were incorporated in the tool and it was finalized by the guide and co-guide.

Description of Tools
The tool consists of two sections:

Section A
Demographic data consist of demographic variables i.e., Age (in years), Gender, Professional qualification, years of experience (in years), and source of information. Section A consist total 5 questions.

Section B
Structured questionnaire on cardiovascular assessment to assess the level of knowledge among experimental and control group to collect pretest and post test score It consist of 20 multiple choice questions (MCQ).

Section C
It consists of 5 point rating scale used to assess the skill of nurses related to cardiovascular assessment.
It consists of 4 criteria in which it is again further divided into 4 sub –criteria.

Validity
Validity of an instrument refers to the degree to which an instrument measures what it is supposed to measure.[13]
Validity of the tool regarding cardiovascular assessment was obtained from 8 nursing experts in the field of medical surgical nursing and 3 cardiologist.
As per the suggestions and recommendations from the experts the tool and content were finalized. Minor corrections given by the experts were incorporated in the tool.

Reliability
Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it is designed to the measure.

- The reliability of the tool was done by test retest method by using Karl Pearson's correlation coefficient formula.
- The reliability of tool for structured questionnaire was determined by kuderichardson technique where the value was 0.74 to assess level of knowledge.
- The reliability of tool for rating scale was determined by Cronbach's Alpha technique where the value was 0.78 for skill.
- Hence the tool was reliable.

3. Discussion

A study to evaluate the effectiveness of In-service educational program on nurses competencies related to cardiovascular assessment in Critical Care units at selected Hospital of Greater Noida, Uttar Pradesh."

Objectives of the study were

- To assess the level of nurses competencies regarding cardiovascular assessment among the nurses working in Critical care units.
- To evaluate the effectiveness of in-service regarding Cardiovascular Assessment among nurses working in critical care units.
- To find out the association of nurses competencies regarding Cardiovascular Assessment with their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information.

Findings Regarding Demographic Variables
The present study showed that, majority of the sample were about 8 (33.3%) in the age group of 25-29 years in an experimental group and in control group, majority 7 (29.2 %) nurses were in the age group of 20-24 years.

The present study showed that, majority 15 (62.5 %) were male in experimental group whereas in control group majority 16 (66.7%) were male.

The present study showed that, majority 10 (41.7%) were GNM nurses in an experimental group whereas majority 8 (33.3%) were GNM nurses in control group.

The present study showed that, majority 12 (50 %) nurses were experienced for 1-5 years in an experimental group whereas in control group, majority 3(54.2%) nurses were experienced for 1-5 years.

The present study showed that, majority 5(20.83 %) nurses were receiving knowledge from workshops in an experimental group whereas under control group, majority 5 (20.83 %) nurses were receiving knowledge from other sources.

Objective 1: To assess the competencies (knowledge and skill) on cardiovascular assessment among nurses working in critical care units.

Experimental Group
The present study shows that, majority 13 (54.2%) of the sample have fair level of knowledge, around 6 (25 %) of them have poor level of knowledge, about 3 (12.5 %) of them have good level of knowledge and only 2 (8.3%) of them have excellent level of knowledge.

Control group
The present study shows that, majority 11 (46%) of the sample have fair level of knowledge, around 8 (33.33%) of them have poor level of knowledge, 3 (12.5 %) of them have good level of knowledge and only 2 (8.3%) of them have excellent level of knowledge.

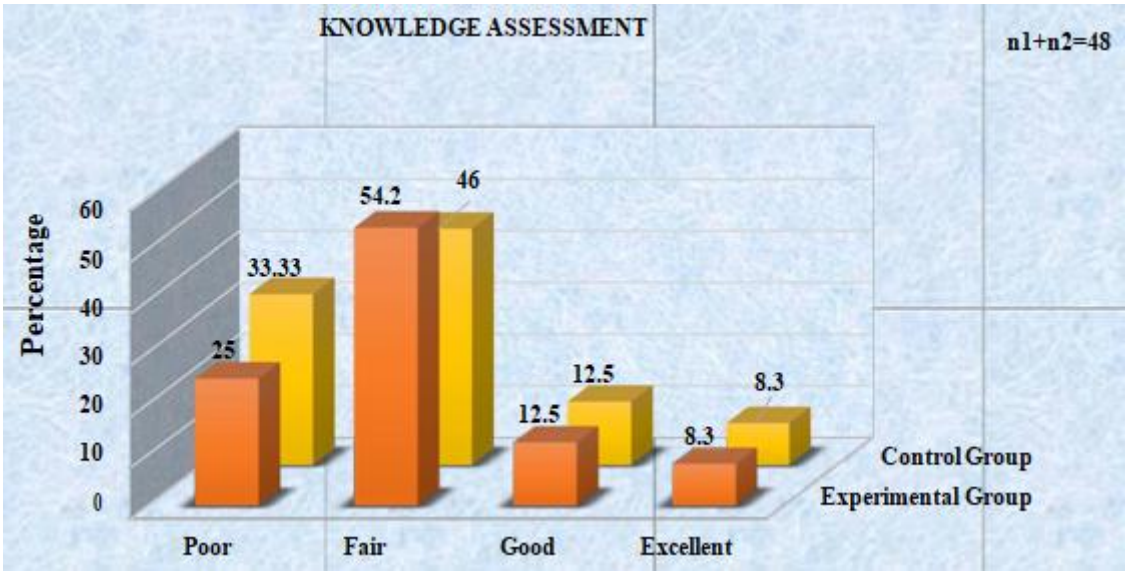

Figure 1: Bar diagram showing the percentage distribution of sample based on competencies (in terms of knowledge) during pre-test in experimental and control group

Mean and SD of nurses competencies (in terms of knowledge) level regarding cardiovascular assessment during pre-test in experimental and control group

Experimental Group: The present study shows that, mean score for the knowledge was 8.04 and standard deviation was 3.45.

Control Group: The present study shows that, the mean score for the knowledge was 7.541 and standard deviation was 3.148.

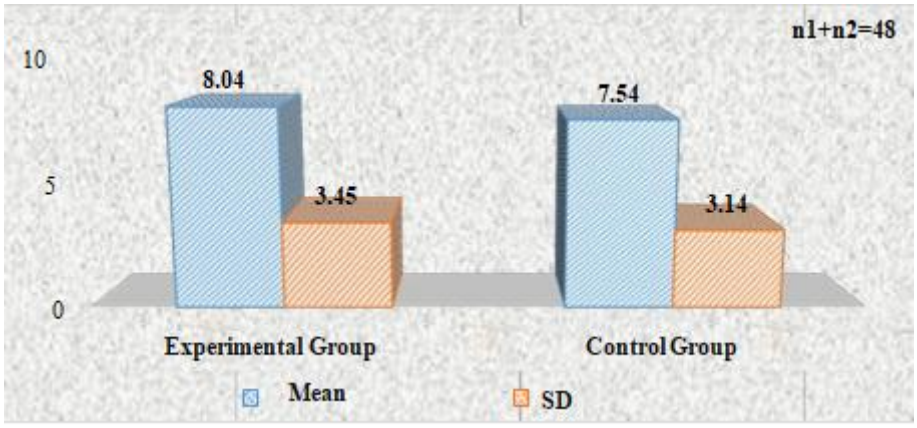

Figure 2: Bar diagram showing the Mean and SD of knowledge level among nurses in experimental and control group

Objective 2: To Evaluate the Effectiveness of In-Service Education Program on Nurses Competencies Regarding Cardiovascular Assessment among Nurses Experimental Group

The present study shows that, during post- test majority of the sample have 20 (83.33%) have excellent level of knowledge and 4(16.7%) of them have good level of knowledge regarding cardiovascular assessment.

Control Group

The present study shows that, during post-test majority 12 (50 %) of the sample have fair level of Knowledge, around 8 (33.33%) of them have good level of knowledge, around 3 (12.5 %) of them have excellent level of knowledge and 1(4.17%) of then have poor level of knowledge regarding cardiovascular assessment.

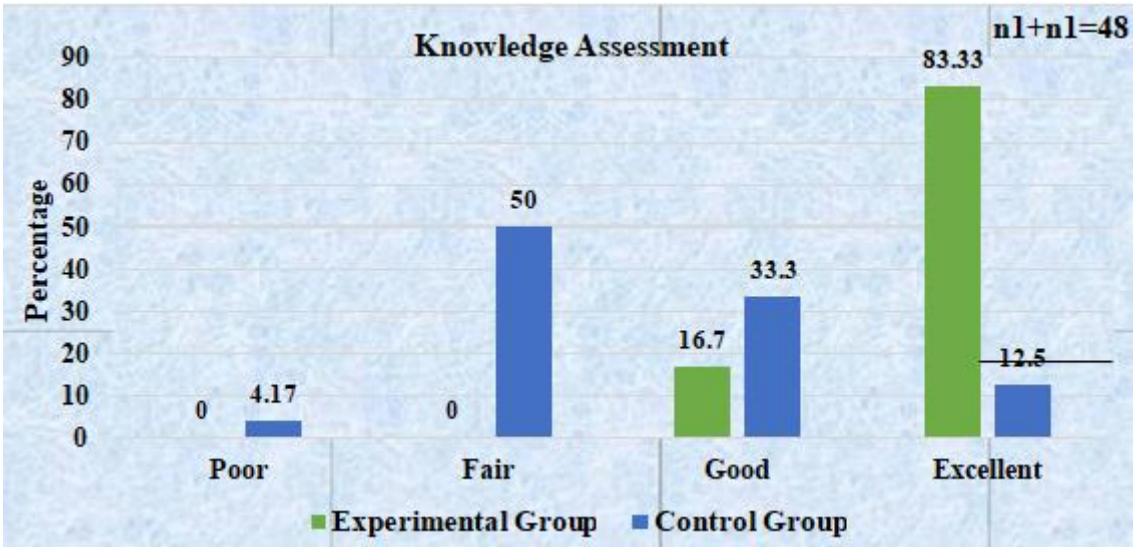

Figure 3: Bar diagram showing the knowledge score after in-service educational program among nurses in experimental and control group

Mean and SD of nurses competencies (in terms of knowledge) level during post-test in experimental and control group

Experimental Group: The data shows that, during post-test mean score for the knowledge was 17.58 and standard deviation was 2.04.

Control Group: Likewise, the data shows that, during post-test the mean score for the knowledge was 7.79 and standard deviation was 2.22.

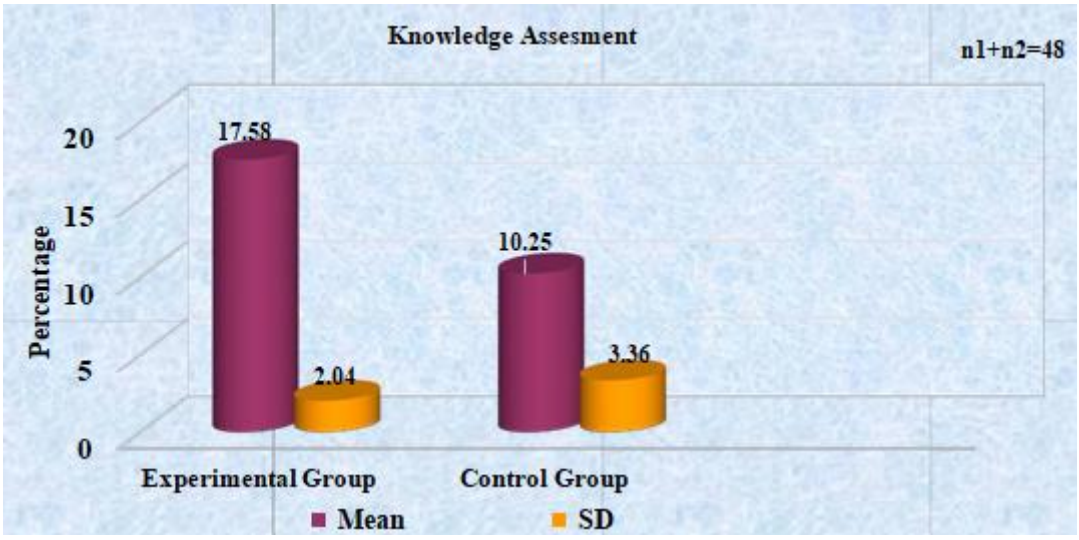

Figure 4: Cylindrical diagram showing the Mean and SD on level of knowledge during post-test in experimental and control group

Frequency and percentage distribution nurses competencies (in terms of skill) regarding Cardiovascular Assessment in experimental group

Experimental Group

The data shows that, majority 20 (83.3%) of the sample have excellent level of skills and around 4 (16.7%) of them have good level of skills on cardiovascular assessment among nurses in experimental group. The mean value of skill was 49.2, and standard deviation of skill was 4.9.

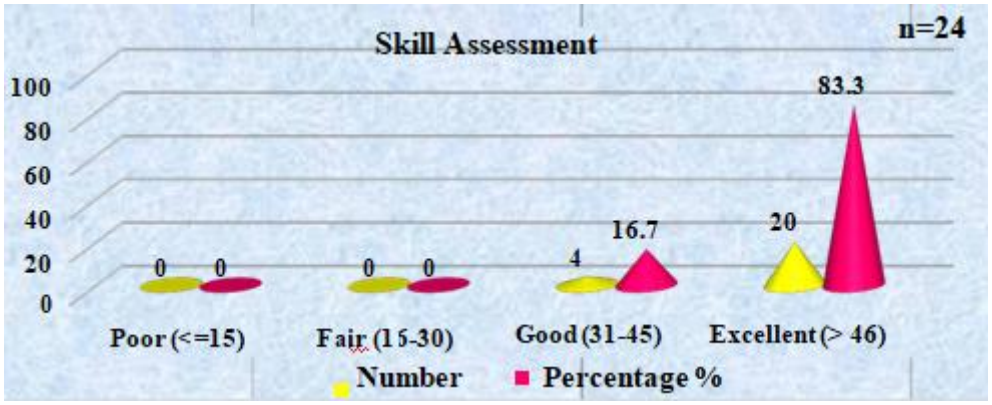

Figure 5: Conical diagram showing Frequency and Percentage Distribution on nurse's competencies (in terms of skill) level in experimental group

To compare the nurses competencies (in terms of knowledge) level regarding cardiovascular assessment under experimental and control group

Experimental Group
The present study shows that, there was a statistically significant difference noted in the mean scores of knowledge at p<0.001 between pre and post-test among sample. The mean difference in knowledge score was 9.54, and t-test was 11.3. It shows that intervention was effective in improving the knowledge.

Control Group
The present study shows that, there was no statistically significant difference noted in the mean scores of knowledge at p>0.3 between pre and post-test among sample. The mean difference in knowledge score was 0.4753, and t-test was 0.923.

Hence, researcher accepted the research hypothesis.

Objective 3: To find out the association between knowledge and skill regarding competencies on cardiovascular assessment with selected demographic variables i.e. age, gender, educational qualification, working experience and source of information of the study

To find association between pre-test knowledge score and post-test knowledge score with their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information in experimental group
The data shows that, there is no significant association between level of knowledge with demographic variables of sample during pre-test and post-test under experimental group.

To find association between pre-test knowledge score and post-test knowledge score with their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information in control group
The data shows that, there is no significant association between level of knowledge with demographic variables of sample during pre-test under control group except for age (p=0.007) and working experience (p=0.01). Similarly, there is no significant association between level of knowledge with their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information during post-test in control group except for professional qualification (p=0.03)

To find association between post-test skill score and their selected demographic variables i.e. age, gender, educational qualification, working experience and source of information in experimental group
The data shows that, there is no significant association between level of knowledge with demographic variables of sample during pre-test under experimental group except for working experience (p=0.02).

4. Conclusion

This study shows the positive results, the researcher believes that the study would benefit from widening scope and use a much larger sample. There was a significant increase in knowledge score among experimental group after the in service educational program on cardiovascular assessment among nurses than in control group. The demonstration followed by re demonstration on cardiovascular assessment was effective in improving skill among nurses. There was no significant association between the knowledge and skill with their demographic variables.

The following conclusions were drawn from "A study to evaluate the effectiveness of In- service educational program on nurses competencies related to cardiovascular assessment in Critical Care unit at selected Hospital of Greater Noida, Uttar Pradesh.''

From this study, researcher concluded that to increase the competencies on cardiovascular assessment, nurses should be given continue nursing education, workshops, seminar, demonstration, simulation and training.

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Institutional Ethics Committee

SHARDA

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Ms. Netra Esutam (MScNursiog2°°Year) PrincpMlnvsslyator DepadmcntofMedca4SurQcsdNursnp SNS%R,ShadaUnivnshy

Ms. Netra Gautam

The research proposal titled "**A Study to Evaluate the Effectiveness of In-Service Educational Program on Nurse's Competencies Related to Cardiovascular Assessment in Critical Care Units at Selected Hospital of Greater Noida, Uttar Pradesh**" Principal Investigator Ms. Necv Gentom, M 'Se *N u roi o g* 2°'• Ye* r t ri clei j t under tHc Supervision of Mr. Nikhil Raj. As socia ie Professor, Dc po rt me ni tit M e n t elf Pie altH Nu roiia g, School of Nursing Science and Research , 11cm been approved by ttie Inst itu Itor› Ethics Cornmittee, SM S mR rim ct Std rrel a Hos pital. Sharda University, by on I in e cipprovol frorri all th e in em U c re of I EC , cm ted 0 I / 0 5/ 202 I ; under th c Clsa*rm a n sPiip of Prof. IN. I(S :i. M DB S , M D (Ph u rm mentor}. KI PM, EA MS.

C.K Sharma, M

[1], Nikhil Raj[2], Christa Mathew[3]

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SHARDA UNIVERSITY

School of Nursing Science and Research

Date: 12/07/2021

From:
Miss Netra Gautam
M.Sc Nursing Second year

Permission Letter

School of Nursing Science end Research Sharda University

To,
The Medical Superintendent Sharda Hospital
Greater Noida, Uttar Pardesh

Through the Guide and Dean
Subject: Requesting letter to conduct main research study.

Respected Sir/ Madam

I Netra Gautam 2nd Year M.Sc Nursing student (Department of Medical Surgical Nursing) would seek your earnest permission for conducting my study titled "A Study to Evaluate the Effectiveness of In service educational program on nurses competencies related to cardiovascular assessment in Critical Care Units at Selected Hospital of Greater Noida, Uttar Pradesh" as a partial fulfilment of Master of Science in Nursing Degree which is submitted to Sharda University, Greater Noida.

Hence I humbly request you to grant me the permission to conduct the research study.

ncerely
Ms. Netra Gautam

Research Guide
Mr. Nikhil Raj
Associate Profressor, SNSR

Research Co-Guide
Ms. Christa Mathew
Assistant Profressor, SNSR

Signature of Dean
SNSR, SU, Greater

Medical Superintendent
Sharda Hospital, Greater Noida

Medical Superintendent
Sharda Hospital
Gr Noida

Address: Plot No. 32,34, Knowledge Park - III, Greater Noida -201310
Tel: +91-120-2333999 / 2329700 | Email: info@sharda.ac.in
www.sharda.ac.in