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"A COMPARATIVE STUDY TO EVALUATE THE EFFECTIVENESS OF SIMULATION BASED EDUCATION Vs DEMONSTRATION ON NEUROLOGICAL EXAMINATION IN TERMS OF KNOWLEDGE AND PARCTICE AMONG NURSING STUDENTS IN SELECTED COLLEGE OF MEERUT (U.P)"

MS. SHAIFALI SINGH CHAUHAN – M.S.C NURSING (BATCH 2019-2021) DEPARTMENT OF MEDICAL SURGICAL NURSING, SVSU, MEERUT (U.P.).

UNDER THE GUIDANCE OF – PROFESSOR HEPSI NATHA, DEPARTMENT OF MEDICAL SURGICAL NURSING, SVSU, MEERUT (U.P.).

ABSTRACT:- Neurological examination gait, balance, cranial nerves examination, deep tendon reflexes, and superficial reflexes, assessment of tremor, coordination, upper and lower limbs power and sensation. Staff nurse require continuous assessment of their neurological examination to diagnose and manager their complex medical conditions. So that the student must have to know how to do neurological examination. This is mostly attained by the use of direct neurological system, known as neurological examination. In this study student learn neurological examination though the simulation-based education method and demonstration method. **OBJECTIVE:- 1.** To develop and validate the simulation-based education method and demonstration method on neurological examination. **2.** To evaluate the effectiveness before and after administration of simulation-based education method Vs Demonstration method on neurological examination in terms of knowledge and practice in both experimental groups. **3.** To compare the pre-test and post-test knowledge and practice scores on neurological examination before administration of simulation-based education method Vs Demonstration method between both experimental groups. **4.** To find the correlation between knowledge and practice post-test scores on neurological examination among both experimental groups. **METHODS AND RESULT:-** In this study quantitative research approach is used. Quasi experimental pre-test post-test design was considered to be appropriate to compare and evaluate

the effectiveness of simulation based education method and demonstration method on neurological examination among B.Sc. nursing 1st year students in selected nursing colleges at Meerut. Sample size 60 (30 in experimental group-1 and 30 in experimental group-2) were selected in college setting by probability simple random sampling technique. Structured questionnaire knowledge and modified practice checklist were used to assess the knowledge and practice regarding neurological examination among B.Sc. nursing 1st year student. Data was collected and analysed descriptive and inferential statics. In this study findings of experimental group 1. Regarding age, the students (37%) were in the age group of 17 years whereas (30%) of the students were in the age group of 18 years and (20%) of the students were in the age group 19 years and remaining (13%) were in age group of 20 years. As per gender difference majority of the students were females 20(67%) and the students 10(33%) were males. Regarding parents history of the neurological problem majority of the students 27(90%) had no parents history of the neurological problem and only 3(10%) of the students had parents history of the neurological problem. In experimental group-1 pre-test , majority of the students 18(60%) had inadequate knowledge and 12(40%) had moderate knowledge and no one had adequate knowledge. In post-test score majority of the students 21(70%) had adequate knowledge whereas 09(30%) had moderate knowledge regarding neurological examination. In experimental group-2 pre-test, majority of the students 17(57%) had Inadequate level of practice, 13(43%) had moderate knowledge in practice and no one had Adequate knowledge of practice. In post-test score the majority of students 19(63%) had Adequate Knowledge of practice, 11(37%) had moderate knowledge of practice and no one had inadequate knowledge of practice regarding neurological examination. In experimental group 2: regarding age, the students (33%) were in the age group 17 years whereas (27%) of the students were in the age group 18 years and (23%) of the students were in the age group 19 years and remaining (17%) were in age group 20 years. As per gender difference majority of the students were female 21(70%) and minority of the students were male 09(30%) Regarding any parent's history of the neurological problem students majority 25(83%) were said No and only 5(17%) the students had parents history of the neurological problem. In experimental group-2 post-test, majority of the students 22(74%) had inadequate knowledge and 08(26%) had moderate knowledge and no one had adequate knowledge. In post-test score shows that majority of the samples 18(60%) had adequate knowledge whereas 12(40%) had moderate knowledge and no one had inadequate knowledge of practice regarding neurological examination. The comparison between post-test knowledge of experimental group-1 and experimental group-2. The post-test knowledge of experimental group-1 means was 21.8 whereas in experimental group-2 the post-test Mean was 17.8 with mean difference (MD) 4.0. The standard deviation (SD) in experimental group-1 was 2.5 and 3.4 in experimental group-2 with SD_D- 0.9. The unpaired t calculated value was 9.46 which was more than the tabulated value t=2.00 where P<0.05 level of significance. Hence null hypothesis (H_{o2})is fail to accept and alternate hypothesis (H_2) is fail to reject. The comparison between post-test practice of experimental group-1 and experimental group-2 The post-test practice of experimental group-1 and experimental group-2 the post-test Mean was 13.39 with mean difference (MD) 3.31. The standard deviation (SD) in experimental group-1 mean was 3.8 and 4.3 in experimental group-2 with SD_D- 0.5. The unpaired t calculated value was 15.58 which was more than the tabulated value t= 2.00 where P<0.05 level of significance. Hence null

hypothesis (H_{o2}) is fail to accept and alternate hypothesis (H_2) is fail to reject. There was a strong positive relationship between knowledge and practice in experimental group-1 and the Post-test knowledge and practice score of students were compared and Karl's Pearson correlation coefficient was applied at 0.05 level of significance and r=0.24 which shows that there was a weak positive relationship between knowledge and practice in experimental group-2. Hence null hypothesis (H_{03}) is not accepted so alternative hypothesis(H_3) accepted. So, it is statistically interrupted that in experimental group-1. The simulation-based education method was more effective than the Demonstration method in increasing the knowledge and practice. **CONCLUSION:** The study concludes that students were having deficit knowledge and practice on simulation based education and demonstration regarding neurological examination. On the basis of the above finding of in study there was knowledge and practice deficit among B.Sc. nursing 1st year student regarding neurological examination using by the structured questionnaire and practice checklist. There was comparison between simulation-based education method and demonstration method, and simulation based education method was more effective in increase the knowledge and practice as compared to demonstration method. There is strong positive correlation between the knowledge and practice score in experimental group-1 and there is week positive correlation between the knowledge and practice score in experimental group-1 and there is week positive correlation between the knowledge and practice score in experimental group-2.

KEYWORDS:- Comparative, Evaluate, Effectiveness, Simulation based Education, Demonstration, Neurological examination, Knowledge, Practice, Nursing students.

INTRODUCTION:-

Neurological examination is gait, balance, cranial nerves examination, deep tendon reflexes, and superficial reflexes, assessment of tremor, coordination, upper and lower limbs power and sensation. This typically include a physical examination and a review of the patient's medical history, but not deeper investigation such as neuro imaging, in general, a neurological examination is focused on finding out whether there are lesion in the central and peripheral nervous or there is another diffuse process that is troubling the patient. It can be used both as a screening tool and as an investigative tool. Neurological examination is an essential component of a comprehensive physical examination that surveys that function of nerves delivering sensory information to the brain and impulses back to the brain for processing and coordinating.

NEED FOR THE STUDY:-

Neurological examination is screening for the presence of discrete abnormalities in patients at risk for the development of neurological disorders. This is appropriate for individuals who have no particular subjective symptoms suggestive of a neurological problem, yet have systemic illnesses that might put them at risk for subtle dysfunction. Diabetic patients, for example (particularly those with long sanding poor control). May develop peripheral nerve dysfunction. This may only be detected through careful sensory testing (see below under Sensory Testing), which would have important clinical implications.

Demonstration Vs simulation-based education on student's achievement of energy conservation in comparison with traditional teaching, the conservation of energy concept was taught using a demonstration control group. Data collected by the test was statistically assessed applying the analysis of covariance. To explore obviously the class atmosphere in experimental group, it was utilized from the teacher's observation notes and student interviews. The statical comparison showed that there was a significant difference between group with respect to student score of the test. Moreover, the analysis of the qualitative data indicated that such a class atmosphere supported the constructive and meaningful learning.

STATEMENT OF THE PROBLEM :-

"A comparative study to evaluate the effectiveness of simulation based education Vs demonstration on neurological examination in terms of knowledge and practice among nursing students in selected college of Meerut (U.P.)"

OBJECTIVES OF THE STUDY:-

- To develop and validate the simulation-based education method and demonstration method on neurological examination.
- To evaluate the effectiveness before and after administration of simulation-based education method Vs demonstration method on neurological examination in terms of knowledge and practice in both experimental groups.
- To compare the pre-test and post-test knowledge and practice scores on neurological examination before administration of simulation-based education method Vs Demonstration method between both experimental groups.
- To find the correlation between knowledge and practice post-test scores on neurological examination among both experimental groups.

OPERATIONAL DEFINITIONS:-

- **Comparison:**

  According to Cambridge dictionary: The act of comparing tow or more people or things.

In this study, comparative study refers to measuring or judging the quality of Simulation Based Education Vs Demonstration method of teaching on neurological examination.

- **Evaluate:**

  According to Cambridge dictionary: To judge or decide the amount, value, quality, or importance of something.

In this study it refers to the measurement of the difference of knowledge and practice of students regarding neurological examination.

- **Effectiveness:**

According to Oxford dictionary: The degree to which something is successful in producing a desired result; success.

In this study, effectiveness refers to the outcomes of the simulation-based education method and demonstration method in term of knowledge and practice on neurological examination among B.Sc. nursing 1st year students.

- **Neurological examination:**

According to Oxford dictionary: A neurological examination is performed to took for any signs of brain dysfunction.

In this study 'neurological examination is a perform to look for any signs of brain dysfunction.

- **Simulation based education method:**

According to Cambridge dictionary: A model of a set of problems or events that can be used to teach someone how to do something, or the process of making such a model

It refers to education activities that utilize simulation aides to replicate clinical scenarios on Neurological Examination.

- **Demonstration method:**

According to Cambridge dictionary: The act of showing someone how to do something, or how something works.

- **Knowledge:**

According to Oxford dictionary: Facts, information, and skill acquired through experience or education; the theoretical or practical understanding of a subject.

In this study, knowledge refers to the facts, information and skill regarding neurological examination among B.Sc. nursing 1st year students.

- **Practice:**

According to Cambridge dictionary: Practice is a commercial or professional procedure that are accepted as being corrected or most effective.

In this study, Practice refers to the using modified practice checklist for evaluate the practice of student on neurological examination.

- **Nursing Students:**

According to Cambridge dictionary: Person who are studying at school, college, university in nursing.

In this study, students refers to the who is studying in B.Sc. nursing 1st year.

HYPOTHESIS (at 0.05 level of significance):

The following hypothesis will be tested mentioned on 0.05 level of significance.

H_1: The mean post-test knowledge and practice score is significantly higher than the mean pre-test score in experimental group-1 as compare experimental-group-2.

H_2: There will be a significant difference between the post test knowledge and practice scores of experimental group-1 who received simulation Based Education method as compared to experimental group-2 who received Demonstration method of teaching on neurological Examination.

H_3: There will be a significant difference between the post test knowledge and practice scores of experimental group-1 who received simulation Based Education method as compared to experimental group-2 who received Demonstration method of teaching on neurological Examination.

H_4: There will be significant correlation between post-test knowledge and practice scores of experimental group-1 and experimental group-2 on neurological examination.

ASSUMPTION:

- The B.sc(N) nursing 1st year students in the selected nursing colleges may have some knowledge regarding neurological Examinations.
- Demonstration method of teaching may have impact on student's learning.
- Simulation Based Education method will stimulate the learning capacity of the students.

DILIMITATIONS:-

The study is delimited to:

- B.Sc. Nursing 1st year student only.
- Students present during data collection.
- Assessment of knowledge and practice will be done only once before pre-test and after given simulation based education method and demonstration method on neurological examination.

REVIEW OF LITERATURE

Review of related literature is essential part of any study of research of the research project. It enhances the knowledge and inspires a clear insight into the problem. Literature review throws light on the studies and their findings reported about the problem under study.

In this chapter the researcher presents the review of literature under following headings:

Section A: Review of literature related to Neurological examination.

Section B: Review of literature related to Simulation based education method on neurological examination.

Section C: Review of literature related to Demonstration method on Neurological Examination. Section D: Review of literature related to comparison of Simulation Based Education and Demonstration method on Neurological Examination.

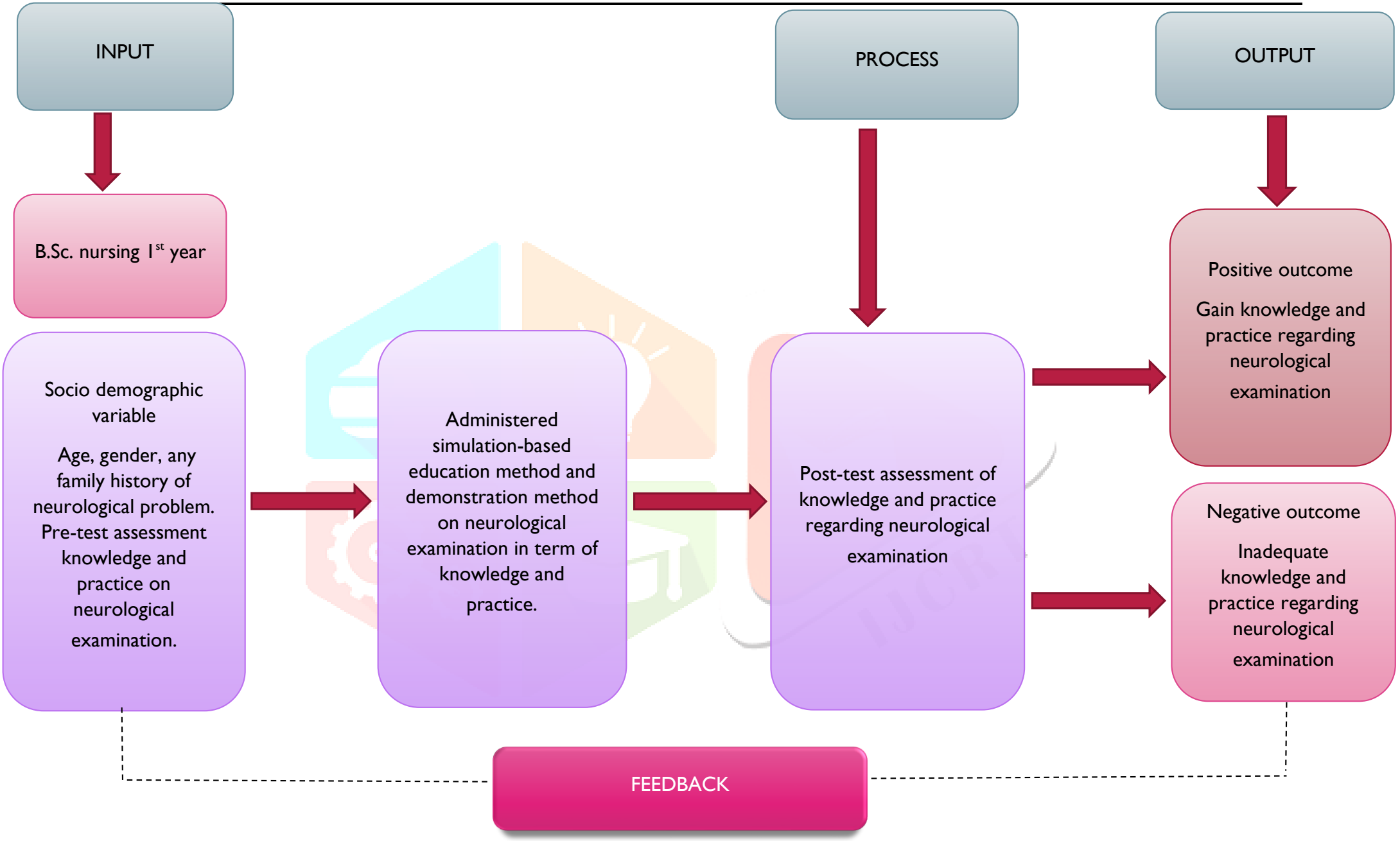

Fig.I:Conceptual framework of the study based on Ludwig Model(1968)

SETTING OF THE STUDY

The present study was conducted in IIMT,KMC, and Kalka college of nursing among B.Sc. nursing 1st year students at Meerut.

SCHEMATIC PRESENTATION OF RESEARCH

Target Population

B.Sc. nursing 1st year students.

SAMPLING

Sample

B.Sc. nursing 1st year students who met the inclusion criteria.

Sample size

Sample Size in the study consists of 60 samples which includes 30 samples in experimental group-1 and 30 sample in experimental group-2.

Sampling Technique

Probability simple random sampling technique was used in this study.

CTITERIA FOR SAMPLE SELECTION

The samples were selected based on the following inclusion and exclusion criteria:

Inclusion Criteria

- Students who are willing to participant in this study.
- Students who are available at the time of data collection.

Exclusion Criteria

- Students who had studied under graduation and post graduation other than nursing.
- Students who were repeating B.Sc.(N) nursing 1st year course.

DEVELOPMENT OF TOOL

TOOL 1 : Demographic tool

It included variables like age, gender, any family history of neurological problem.

TOOL 2 :

PART A : Structured knowledge questionaries related to neurological examination.

In this part structured knowledge questionaries regarding neurological examination are to be used to assess the knowledge. It consists of 25 questions.

PART B: MODIFIED PRACTICE CHECKLIST (OSCE CHECKLIST)

In this part modified practice checklist to be used to assess the practice for simulations. Based education method demonstration method on neurological examination. It consisting of 25 questions with maximum score of 25.

Table interpretation are:

Categorization score of knowledge and practice:-

Score	Level of knowledge and practice
1-8	Inadequate
9-16	Average
17-25	Adequate

DATA ANALYSIS AND INTERPRETATION

1.Description of the demographic variable of sample.

Experimental group-1 :

- As per age, the students (37%) were in the group of 17 years where as (30%) of the students were I the group of 18 years and (20%) of the students were in the age group 19 years and remaining (13%) were in age group of 20 years.
- As per gender difference majority of the students were female 20(67%)and the students 10(33%) were males.
- As per parents history of the neurological problem majority of the students 27(90%) had no parents history of the neurological problem.
- In pre-test, majority of the students 17(57%) had Inadequate level of practice, 13(43%) had moderate knowledge in practice and no one had Adequate knowledge of practice.
- In post-test score the majority of students 19(63%) had Adequate Knowledge of practice, 11(37%) had moderate knowledge of practice and no one had inadequate knowledge of practice regarding neurological examination.

Experimental group-2:

- As per age, the students (33%) were in the age group 17 years where as (27%) of the students were in the age group 18 years and (23%) of the students were in the age group 19 years and remaining (17%) were in age group 20 years.
- As per gender difference majority of the students were female 21(70%) and 09(30%) were male students.
- As per parents history of the neurological problem students majority 25(83%) were said no and only 5(17%) the students had parents history of the neurological problem.

- In pre-test, majority of the students 22(74%) had inadequate knowledge and 08(26%) had moderate knowledge and no one had adequate knowledge.
- In post-test score shows that majority of the samples 18(60%) had adequate knowledge whereas 12(40%) had moderate knowledge and no one had inadequate knowledge of practice regarding neurological examination.

2. Comparison between simulation based education Vs Demonstration:

The comparison between post-test knowledge of experimental group-1 and experimental group-2. The post-test knowledge of experimental group-1 means was 21.8. Whereas is experimental group-2 the post-test Mean was 17.8 with mean difference (MD) 4.0. The standard deviation (SD) in experimental group-1 was 2.5 and 3.4 in experimental group-2 with SD_D-0.9. The unpaired t calculated value was 9.46 which was more than the tabulated value t-2.00 where $p<0.05$ level of significance. Hence mall hypothesis (H_{o2}) is fail to accept and alternate hypothesis (H_2) is fail to reject.

The comparison between post-test practice of experimental group-1 and experimental group-2. The post-test practice of experimental group-1 and experimental group-2 the post-test Mean was 13.39 with mean difference (MD) 3.31. The standard deviation (SD) in experimental group-1 was 3.8 and 4.3 in experimental group-2 with SD_D-0.5. The unpaired t calculated value was 15.58 which was more than the tabulated value t-2.00 where $P<0.05$ level of significance. Hence null hypothesis (H02) is fail to accept and alternate hypothesis (H_2)is fail to reject.

3. Correlation between the Knowledge and practice of simulation based education Vs demonstration:

There was a strong positive relationship between knowledge and practice in experimental group-1 and the Post-test knowledge and practice score of students were compared and Karl's Pearson correlation coefficient was applied at 0.005 level of significance and r=0.24 which shows that there was a weak positive relationship between knowledge and practice in experimental group-2. Hence null hypothesis (H_{03}) is not accepted so alternative hypothesis (H_3) accepted. So, it is statistically interrupted that in experimental group-1. The simulation-based education method was more effective that the Demonstration method in increasing the knowledge and practice.

IMPLICATIONS OF THE STUDY

The findings of the present study have implication for nursing education. Nursing administration, nursing practice, and nursing research.

NURSING EDUCATION

Knowledge regarding neurological examination is essential for students. The finding of present study can be utilized in nursing education by the academicians in nursing. Simulation based education method and demonstration method can be organized in the nursing institutions regarding procedures and train the nursing students. Educating the nursing students regarding neurological examination will enhance and update their knowledge and in turn motivate them to perform the procedure skillful.

NURSING PRACTICE

Nursing is an art and science, Nursing is based upon a body of knowledge that is always changing with new discoveries and innovations. Nurses are the key members of the health care team. The finding of the signifies importance of the simulation-based education method and demonstration method can be organized for nursing students and staff nurse which can be helpful in improving the practice skills of nurses and thereby human life can be benefitted.

NURSING ADMINISTRATION

Nurse administrators are the key person to plan, organize and conduct various learning opportunities to the students, through the education programme. The finding of the study can be utilized for conducting similar types of simulation-based education and demonstration for the students so that their knowledge and skill can be improve and update. Nursing administration can be formulating the polices to lead out the nurse executives to organize the different simulation-based education method and demonstration method to improve the skills of staff nurses and nursing students.

NURSING RESEARCH

The main goal of the nursing research is to enhance and improve the knowledge. The practicing nurses need more on regarding research articles, journals and to be involved in various research activities. The finding of the research is a way for further researches in the same aspects. The findings can be utilized by the nurse researches for review and in making plans for similar types of research works.

LIMITATIONS

- Due to covid scenario it was difficult to conduct study.
- Difficult in data collection because many students were on leave.
- This study was confined to a small number of students i.e. 60 Students (30 in experimental group-1 and 30 in experimental group-2) this limits generalization of the findings.

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