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PROTOCOL STUDY FOR CONCEPT-MAPPING AS A LEARNING STRATEGY TO FACILITATE CRITICAL THINKING AMONG NURSING STUDENTS IN SIKKIM MANIPAL COLLEGE OF NURSING

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Abstract

Background: *The methods used in nursing education to teach and learn are always being improved. Due to difficult exams and advanced clinical practise, students must develop their critical thinking skills. Nurse educators' jobs involve guiding pupils away from the conventional linear mode of thinking and towards critical thinking. Traditional educational systems encourage memorization and inhibit critical thinking in the classroom and in therapeutic settings. To help nursing students develop their critical thinking abilities, the traditional nursing care plan needs to be updated with evidence-based therapies. One of the most effective teaching methods for fostering critical thinking is concept mapping (CM), which has been researched and found to be helpful.* ***Methods:*** *This true experimental research study at Sikkim Manipal College of Nursing, Sikkim, uses a pre-posttest control group design to compare the effectiveness of concept mapping in terms of change in critical thinking skills of nursing students in the experimental group as compared to the students receiving traditional care plan in the control group. In order to determine whether there is an interaction between the critical thinking abilities' pre-test levels and specific demographic factors, the secondary goal is to evaluate and contrast the critical thinking abilities of nursing students in the experimental and control groups before and after the assessment. The experimental and control groups will be randomly assigned to 96 third-year B.Sc. nursing students (46 in each group).* ***Discussion:*** *Student nurses must assess patient problems and make a diagnosis using nursing ideas. The faculties are responsible for developing efficient teaching strategies that enable nursing students to absorb and apply material. Concept mapping is one method for better comprehension of connections between concepts through knowledge segmentation. The goal of this study is to ascertain if nursing students who use idea mapping to plan nursing care make more progress than those who do not in strengthening their critical thinking skills.*

Keywords: *Concept-Mapping, Nursing Students, Critical Thinking, Traditional Nursing Care Plan, Learning Strategy*

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INTRODUCTION

Delivering quality care demands nurses who have taken the time to learn their lessons in a time that is frequently referred to as the information era. This places a significant premium on improving teaching and learning processes. According to educational experts and theorists, implementing teaching/learning strategies improves learning significantly. Nursing education must place a strong emphasis on acquired cognitive abilities like reasoning, critical thinking, and problem solving.

Others have developed a more complex description of critical thinking and remark that the majority of classroom training methodologies do not effectively support it, despite the fact that many programmes still perceive it as linear problem-solving. Researchers and educational theorists have found that strategies that promote active conceptual thinking and participation in the learning process are more likely to lead to an improvement in critical thinking abilities.

Teaching nursing students to think critically so they can thrive in a complex, changing health care system with a scarcity of experienced nurses is a problem for nursing educators. Clinical judgments, which are the outcome of critical thinking, necessitate the use of clinical reasoning for nursing graduates. It is accepted that the cornerstone of nursing practice for a bachelor's degree in nursing generalist is the acquisition of information and skills required for practice. Critical thinking is defined as "all or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity".

Both in the classroom and in the clinical setting, teachers must use instructional strategies that successfully promote and improve critical thinking in nursing students. Better clinical thinking will result from this, and safe clinical judgments will follow. More research is required to identify the critical thinking promotion strategies that are supported by data and yield the desired results. To help students think critically, comprehend complicated relationships, apply theory to nursing practice, and develop into lifelong learners, nurse educators must create and execute new teaching strategies.

For nurses, there are many hurdles, including documentation, learning updated protocols, and adjusting to management and administrative changes. To be effective in the high-tech, high-acuity, and fast-paced workplace, nurses must be prepared. For nurses to effectively adapt to technological challenges, they must develop critical thinking abilities. As nurses begin their careers, critical thinking abilities will need to be honed, according to research on recent nursing graduates. The development of critical thinking abilities for nurses starts in the nursing programme. Although rote memorization was once a common learning strategy, it is no longer advised because it does not incorporate the acquisition of meaningful meaning. The learning process requires that nursing students participate actively and develop into self-directed learners.

Concept mapping enables students to evaluate their own learning through decision-making. Self-awareness is essential for learning and for turning knowledge into action.

An understanding-enhancing meta-cognitive intervention is concept mapping. A concept map is a visual representation of the connections between concepts, ideas, and words. By highlighting connections and assisting students in understanding how many ideas fit together to form a greater whole, concept maps can help students improve their analytical thinking and study techniques.

Additionally, because idea mapping encourages in-depth understanding among the students, it is acknowledged as a teaching approach that supports critical thinking. The nurse educators, however, have not given the concept mapping the attention it deserves.

One of the active teaching techniques that can assist nursing educators in producing graduates who are competent of critical thought and problem solving is concept mapping. Theoretical underpinnings

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of the concept mapping teaching strategy are based on Ausubel's meaningful learning. According to him, learning happens when a person can organize and relate new ideas and information to their cognitive mental systems.

SIGNIFICANCE OF THE STUDY

Nursing educators have long utilized nursing care plans to show students how to set up, organize, and schedule care for their patients. However, studying nursing care plans may cause students to become task-focused and unable to fully understand all the elements of a patient's care plan. Students are unable to make connections between problems and treatments because nursing care plans are linear. Concept mapping, a nonlinear cognitive function like critical thinking, is an excellent technique for strengthening higher-order cognitive talents and critical thinking.

Concept maps have been suggested as effective teaching and learning tools for nursing programmes that promote deep understanding. Concept mapping is an active learning technique that encourages critical thinking and can be used in conjunction with or in substitute of traditional lectures, readings, and class discussions.

The majority of the nursing literature agrees that conventional teaching strategies might not help students grasp. According to learning theory, proficient learners have excellent metacognitive skills and typically outperform others who lack such skills.

Active teaching tactics are necessary to foster meaningful learning rather than depending on conventional teaching techniques that encourage rote memorization because nurse educators are under pressure to produce graduates who can think critically and solve problems in a range of clinical practice contexts. Concept mapping is a teaching-learning strategy that helps nurse educators educate graduates to think critically in the complicated health care environment, according to an evaluation of the state of the science in this area.

The majority of our students are unable to reason clearly or with logic. It demonstrates how reasoning cannot be developed with the current educational strategies. In such a circumstance, educational programmes that aid in the pupils' ability to reason and think critically are necessary. With students of various learning styles, concept mapping is a teaching method that has been employed in a variety of educational contexts to foster meaningful, integrative learning and critical thinking. We see a need for educational initiatives that support the growth of reasoning. Concept mapping had demonstrated to be a successful learning technique.

A quasi-experimental study was conducted among junior-level baccalaureate students to assess the effectiveness of student learning with concept mapping of care plans in community-based education. The sample included 23 nursing students. The average score for the first set of idea maps was 15.35, with a standard deviation of 2.95, whereas the average score for the second group was 17.39, with a standard deviation of 1.12. The study found that the accuracy of idea maps significantly increased with time.

Daley et al. in 1999 recommended concept mapping as a means to illustrate this, emphasizing the necessity of teaching and assessing critical thinking in nursing students within the context of nursing practice. Too often, instruction does not prioritize carefully crafted exercises that encourage critical thought. Among the teaching strategies that have been recommended to promote critical thinking are service learning, role acting, reflective learning, the critical incidence conference, recorded vignettes, preceptorship, and concept mapping.

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Due to its "identification of non-linear relationships among the components of the nursing process," idea mapping was said to reflect critical thinking in nursing by Abel & Freeze in 2006. In this study, concept mapping will be looked at as a technique for enhancing critical thinking in clinical settings with nursing students. Nursing educators have the challenging task of providing teaching-learning techniques that develop nursing students' critical thinking, the cornerstone of reliable clinical judgement. In both hospital and outpatient practise settings, freshly graduated nurses are taking care of more challenging patients.

In her study to look at the idea mapping as a technique to Enhance Critical Thinking, which was published in 2010, Green discovered the efficacy of idea mapping as a teaching tool to gradually build critical thinking.

Nurses must possess strong analytical and critical thinking abilities as well as the capacity to deliver professional and caring care in the continually evolving health care industry. To gather and integrate facts and make wise health care decisions, one needs critical thinking and analytical skills.

Ausubel's Assimilation Theory and idea mapping have been used in numerous educational settings, however St. Cyr et al. (2009) pointed out that its application in nursing is still relatively new.

Concept maps are now among the top 10 active learning strategies for scientific instruction. In 2006, Hinck et al. conducted an empirical study to determine the efficacy of idea mapping for student learning and the satisfaction of the students with the method. The majority of students were satisfied with the idea mapping technique, and they discovered that it considerably increased students' capacities to spot patterns and correlations in order to plan and assess nursing care.

2010 saw the completion of a quasi-experimental study by Sarhangi and Masumi employing a pre-test-post-test design to assess nursing students' cognitive learning levels using a lecture approach and idea mapping. They discovered that the concept mapping strategy is more effective in fostering deep knowledge and meaningful learning.

However, nursing care plans do not do a very good job of encouraging critical thinking since they are conceptually flat and linear. The concept map is a different approach that uses a metacognitive strategy to combine emotive and cognitive abilities to improve pattern recognition and speed up learning.

Horton et al. came to the conclusion that employing concept maps had a positive effect on both student success and attitudes in a meta-analysis of 19 studies comparing its use in the classroom to other teaching techniques. The best results were achieved when students created the maps and provided the terminology rather than the teacher.

In a longitudinal study, Roberts, Sucher, Perrin, and Rodriguez employed concept mapping as a teaching strategy for a two-semester nutrition therapy course. The majority of students thought creating idea maps was an effective strategy for enhancing their capacity for critical thought and problem-solving. By the end of the second semester, 68% of students had made the connection between their participation in mapping activities and an enhanced ability to identify and link key ideas from their reading assignments.

According to Linda, Wheeler, and Collins' quasi-experimental study, which used a pretest-posttest design with a control group to assess the effectiveness of concept mapping in developing critical thinking skills in baccalaureate nursing students, concept mapping is effective in assisting students in developing critical thinking skills.

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In 2011, Khodadady and Ghanizadeh conducted a study to determine the impact of idea mapping as a post-reading technique on EFL learners' capacity for critical thought. 36 EFL students at the upper intermediate and advanced levels participated in the study and were randomly assigned to the experimental (n = 18) and control (n = 18) groups using a pretest-posttest control and experimental group design. According to the pretest results, the participants in the two groups had similar levels of proficiency and critical thinking skills. The "Watson-Glaser Critical Thinking Appraisal" was used to evaluate the critical thinking ability. The posttest findings showed that idea mapping had a favorable and significant impact on students' capacity for critical thought.

Although critical thinking is essential for nursing students and professionals, its definition and assessment remain a challenge. There is a lack of clarity in the literature, as evidenced by the different ways that critical thinking is defined and assessed among nursing students and the requirement for additional evidence-based research into the teaching methods that promote critical thinking. Because it might be challenging to provide care for sicker patients who are more severely ill in healthcare settings, nursing graduates must demonstrate critical thinking abilities. This study examined the issue in the context of the current student body.

Statement of the Problem

Nursing graduates must exhibit critical thinking abilities in order to care for more critically ill patients in healthcare environments. The American Association of Colleges of Nursing (AACN), Indian Nursing Council (INC), and the National League for Nursing Accrediting Commission (NLNAC) all demand that nursing schools provide evidence of their students' ability to engage in critical thought.

OBJECTIVES

With a pre-posttest control group design, this true experimental research study aims to compare the effectiveness of concept mapping in terms of change in critical thinking skills of nursing students in the experimental group as compared to the students receiving traditional care plan in the control group at Sikkim Manipal College of Nursing, Sikkim. The secondary goal is to assess and compare the critical thinking abilities of nursing students in the experimental and control groups before and after the exam, as well as to determine whether there is a relationship between the critical thinking abilities' pre-test levels and particular demographic factors.

Research Question

1. Can B.Sc. nursing students use concept mapping to make nursing care plans that clearly show priorities and discover links in patient clinical data in order to exhibit critical thinking?
2. Does idea mapping in clinical settings affect students' critical thinking test results?
3. Do the critical thinking abilities of the two groups of nursing students one using concept mapping and the other using the conventional method differ?

Hypothesis

- H_{01}: After applying concept mapping, the nursing students in the experimental groups mean post-test critical thinking scores did not significantly differ from their mean pre-test CT scores.
- H_{02}: The mean post-test critical thinking scores of students in the control and experimental groups do not significantly differ from one another.

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Operational definitions

1. **Concept Mapping:** Concept maps are "graphical depictions of the flow of thought processes, and require analyzing, synthesizing, and evaluating information or knowledge to determine an action or nursing intervention. Group will receive teaching session for 5 days for learning and preparing concept maps, followed by 1week for preparation of concept maps on given scenario preclinical and 8 concept maps for 8 weeks for preparing concept map care plan based on clinical scenario post clinical.
2. **Traditional Nursing Care Plan*:*** Traditional care plans are seven-column linear worksheets that utilize the nursing process to plan and guide nursing care for a client. This includes assessment, goal, nursing diagnosis, planning, rationale, implementation, and evaluation.
3. **Critical thinking:** In this study, it refers to the ability acquired by the students in terms of inference, recognition of assumption, deduction, interpretation and evaluation of arguments as assessed by the California Critical Thinking Skills Test.
4. **Nursing students:** It refers to the female students studying in third year B Sc Nursing programme at Sikkim Manipal College of Nursing; Sikkim and has successfully completed the prerequisite classes, Foundations Nursing and Medical Surgical Nursing I.
5. **Selected demographic variables:** In this study, selected factors are age, previous knowledge and experience and classes attended second year university exam result and percentage, senior secondary school percentage, place of residence, average number of study hours.

Theoretical framework

Ausubel's Assimilation Theory of Learning is the theoretical underpinning of this study. Ausubel stated that meaningful learning takes place when a person relates new learning to prior knowledge. This new information is not just added to the old information, but reacts with the old information to produce a new, more detailed cognitive structure. In contrast to rote learning which is just memorizing material, meaningful learning aids in longer retention of knowledge because relationships and links are established between concepts (Ausubel, 1968). This framework is appropriate for this study because concept mapping is an active teaching and learning strategy that seeks to find relationships between patient problems. It promotes meaningful learning. Meaningful learning is necessary for a person to critically think and problem solve.

Critical Thinking skills

- Critical thinking will be defined as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, inference, as well as the explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment was based".

- **Concept Map**

Concept maps are "graphical depictions of the flow of thought processes, and require analyzing, synthesizing, and evaluating information or knowledge to determine an action or nursing intervention".

- **Nursing Students**

Students that are enrolled in a four year college or university nursing program which includes third year B Sc nursing students.

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- **Traditional Care Plans**

Traditional care plans are seven-column linear worksheets that utilize the nursing process to plan and guide nursing care for a client. The nursing process includes assessment, goal, nursing diagnosis, planning, rationale, implementation, and evaluation.

METHODS & PROCEDURES

Approach: Evaluative research approach.

Research design: This study is true experimental approach with pretest posttest control group design among two experimental groups and one control group with nursing students being individually allocated to either of the groups. The allocation ratio is 48:48 and is as follow:

Control group (n=48)

Experimental group (n=48)

Figure 2: ***Schematic presentation of research design***

Setting: Sikkim Manipal College of Nursing, Sikkim

Sampling Technique: Complete enumeration with random assignment of the subjects in experimental and control group

Study Population: 3rd yr. B.Sc. nursing students studying at Sikkim Manipal College of Nursing, Sikkim

Sampling Frame: Classroom Attendance register of 3rd year B Sc Nursing student (2021-25 Batch)

Sample size: 96 (48 each group)

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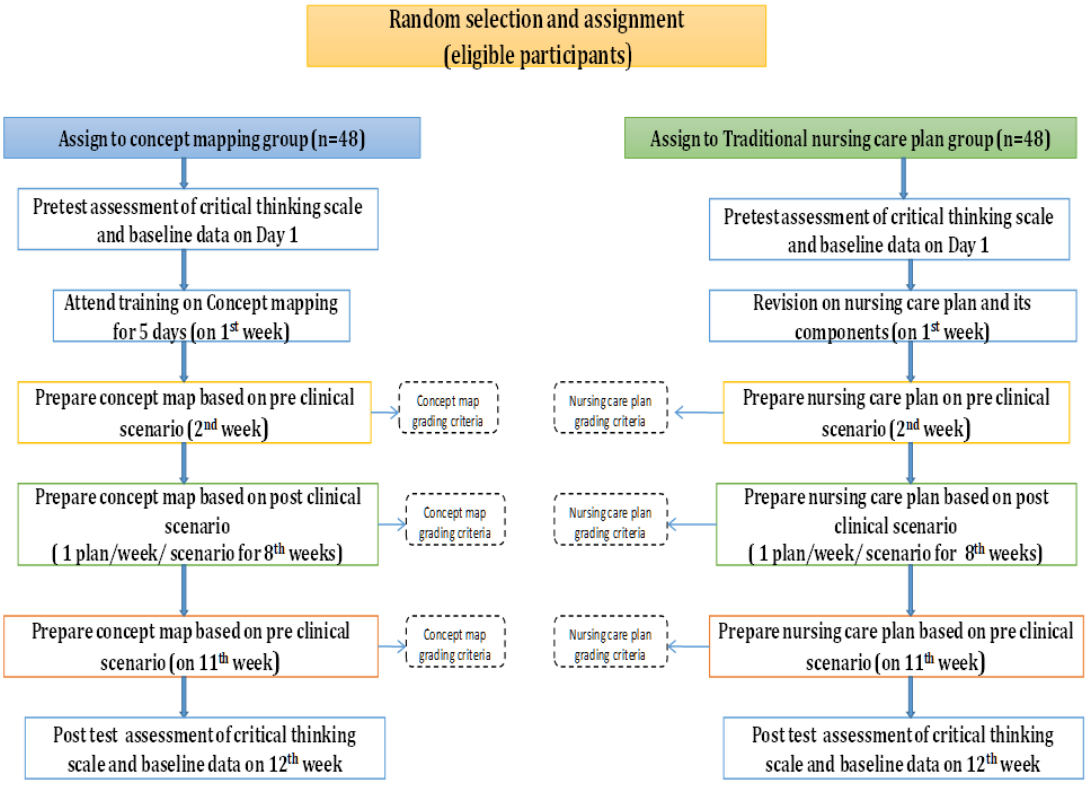

Fig 2: Schematic representation of sampling

Sampling criteria

Inclusion criteria

- willing to participate in the study
- Students who are available at the time of data collection

Exclusion criteria

- Students who have attended formal concept mapping classes
- Students who have not cleared first year B Sc Nursing programme

Tools for Data Collection:

- Demographic profile
- A test of one's critical-thinking abilities based on the Critical Thinking Test

The technique chosen for this study to test critical thinking is well-known, established, and trustworthy. The Critical Thinking Skills Test, which includes subscales for analysis (9 items), evaluation (14 items), inference (11 items), and two forms of reasoning (deductive reasoning and inductive reasoning comprised 16 and 14 items respectively), will be used to assess CT skills. This scale was chosen since it has undergone validity and reliability testing in Indian nursing students. This test consists of 34 multiple-choice questions, with 15 questions with five options and 19 questions with four options. The range of potential total scores is 0-34, and the range of potential subscale scores is 0-12.

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- Concept mapping grading criteria to assess the effectiveness of the treatment strategy.

Care plan evaluation using concept mapping: Researchers will grade concept mapping care plans according to the following ten criteria: primary health problem, two nursing diagnoses, prioritising of diagnoses, supporting information, goals, interventions, assessment of care, education, cross-links, and A single page, numerous unique hierarchies, and a well-organized map are all present. Maximum scores on the concept mapping items varied from 1 to 4, for a total of 20 points.

- One qualitative written response to an open-ended topic, which can be analysed for a recurring theme.

Data Collection Plan

Following the administration of the intervention to the experimental groups, Table 1 presents the strategy for data collection using the validated structured tool. It begins on Day 1 using the baseline measurement and lasts for 7 months of follow-up.

Table 1: Schematic representation for plan of data collection

Group	First day of menstruation	Pre Test	Pot test				
		Day 1	Intervention 2-6 (1st week)	2nd week	8th week	11th week	12th week
Concept mapping Group (RE)	Background information	√					
	Critical thinking skills test based on critical thinking Test	√	√				√
	Concept mapping grading criteria	√	√	√	√	√	
Traditional nursing care plan group (RC)	Background information	√					
	Critical thinking skills test based on critical thinking Test	√	√				√
	Nursing care plan criteria	√	√	√	√	√	

Ethical Consideration

1. Ethical Consideration will be obtained from the Institutional Ethics Committee.
2. An Official permission will be sought from the Principal, Sikkim Manipal College of Nursing.
3. Patient information sheet will be provided and Informed Consent will be obtained from all the participants.
4. Confidentiality of the participants will be ensured.
5. Participants will be assured that their participation is voluntary and they have the full right to withdraw from the study at any time without any penalty

Intervention Plan

Administrative approval will be taken and formal permission to be sought. The samples will be chosen for the study based on their suitability for participation in the criteria for inclusion. The kids will be assigned numbers and a sampling frame will be created. After describing the goal of the study, a random approach using an envelope will be used to choose and place volunteers in each group. Finally, a list to be prepared to keep the document of three groups subjects. Written informed consent to be taken from all subjects and personal background information will be collected.

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The students will be divided according to random assignment into 2 groups with each group consisting of 48 students. The groups will be divided as experimental group (Concept mapping group), and control group (Traditional nursing care plan group).

On day 1, the consent will be taken from all the participants and pretest assessment of critical thinking scale and baseline data among both experimental and control group will be done.

On day 2, the students will be kept in separate lecture hall according to their specific group. The co-investigators will train the students on Concept mapping for 5 days on 1st week. For the control group, revision on nursing care plan and its components will be done by the principal investigator.

In the 2nd week, the students in experimental group will be told to prepare concept map based on pre-clinical scenario and the students in control group will be instructed to prepare nursing care plan based on pre-clinical scenario. The concept map will be evaluated by using the concept map grading criteria and the nursing care plan will be evaluated by nursing care plan grading criteria.

When the students start going to the clinical, the students in experimental group will be told to prepare 1 concept map per week based on post clinical scenario for 8 weeks and the students in control group will be told to prepare 1 nursing care plan per week based on post clinical scenario for 8 consecutive weeks.

On the 11th week, the students in experimental group will be told to prepare concept map based on pre-clinical scenario for delayed recall and the students in control group will be told to prepare nursing care plan based on pre-clinical scenario for delayed recall and the post-test assessment of critical thinking and baseline data for both the groups will be done on the 12th week.

Statistical methods

The author will collect the data and analyzed the same to meet the research objectives. Both descriptive and inferential statistics will be used to establish the primary analysis of each group before intervention. After collecting the data, it will be analyzed utilizing descriptive statistics for Mean, Percentage, Frequency and Standard Deviation.

The primary outcome is the efficacy of concept mapping on critical thinking skills through frequency, percentage, mean, SD, median and t test to see the difference within each group before and after the administration of each learning techniques to two groups. The between the group comparison will be done through unpaired t test. The long-term effectiveness of each learning technique will be analyses through repeated measures ANOVA. The baseline influencing factor with outcome variable will be checked through chi square or fisher exact test. All analysis will be done through SPSS 21software.

Dissemination Plans:

The outcome and conclusions of this study will be disseminated to other research customers through oral and poster presentations on a variety of platforms, as well as publication in peer-reviewed publications of general and niche interest.

Expected outcomes:

Nursing concepts must be used to analyze patient issues and arrive at a diagnosis for student nurses. The task of establishing effective teaching methods for nursing students to comprehend and apply topics falls to the faculties. One technique for improving understanding of relationships between concepts by segmenting knowledge is concept mapping. Students may find it easier to bridge the gap between theoretical and clinical practise with the help of concept mapping. The findings of the study can be used as guidance in the teaching and learning process to enhance nursing abilities in all areas.

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DISCUSSIONS

Nowadays, across the educational spectrum and particularly in regard to higher and professional education, critical thinking is a highly valued educational outcome. A number of professional and regulatory organisations in nursing education have required that critical thinking be a fundamental part of all nursing courses. Nurses must possess good critical thinking skills in order to set priorities and make decisions that have the potential to save lives. Nursing students can learn some information about other specialisations through traditional educational methods, but they do not receive the tools necessary to build critical thinking skills as nurses.

As a rule, nurse educators do not comprehend the notions of critical thinking; hence they continue to use traditional teaching methods. One academic teaching technique that has been shown to be effective in promoting active learning and the use of analytical and application-based critical thinking skills is concept mapping. Third-year nursing students should use concept maps to lay the groundwork for the development of critical thinking. There are difficulties and a gap between comprehending critical thinking ideas and frequently applying them to practical therapeutic circumstances. The chance to carry out this study will also offer more proof of the importance of concept mapping and show that it might be an effective method for students to improve in their nursing education. The American Association of Colleges of Nursing (AACN), Indian Nursing Council (INC), and the National League for Nursing Accrediting Commission (NLNAC) all demand that nursing schools provide evidence of their students' ability to engage in critical thought.

In a quasi-experimental study, the value of concept mapping as a teaching and evaluation strategy for nursing students was investigated. The study used a convenience sample technique to choose the institutions, and all of the students present during the data collection were included. The sample size was comprised of 122 B Sc nursing students from the selected Mangalore institutions. The experimental group's students participated in a one-hour idea mapping lesson. The mean post-test score for the experimental group (67.44) was considerably higher than the score for the control group (14.29). The findings showed a significant difference between the experimental and control groups' post-test concept map means.

A study was done to determine how well idea mapping helped nursing students develop their basic medical care nursing competencies. A doctor who serves as the nursing students' practicum preceptor and an instructor in the community health nursing division made up the sample size, which included 15 fourth-year nursing students. In this work, a quasi-experimental single group design was used. Concept mapping was the topic of a 45-minute lesson for the students. For each primary medical care topic, students were instructed to develop idea maps. A post-test was administered to gauge the nurses' proficiency in providing primary medical care. The mean pre-test score was 43.27, with a 5.06 standard deviation, while the mean post-test score was 58.40, with a 2.00 standard deviation. According to the research, idea mapping is an effective educational innovation for helping nursing students summarize their own concepts and advance their nursing care competency.7

A study was done to find out how using the Inspiration concept mapping programme affected fifth grade pupils' academic performance. 46 students made up the sample, 23 of whom were in the experimental group and 23 of whom were in the control group. Convenience sampling was used to choose the sample. A non-equivalent control group design was employed in the investigation. The instruments used were multiple choice assessments, concept map scoring rubrics, and interview questions for students. The experimental group attended a quick introduction to concept mapping and the procedures for creating one in the computer lab. At the end of the inquiry, the experimental group's performance was statistically significant at an alpha level of 0.05. The experimental group

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performed generally better on the post-test. The findings demonstrated that concept mapping had a considerable impact on students' attitudes and academic achievement.

Another study was conducted to examine whether the construction of concept maps by students improves their achievement and ability to solve higher order questions in chemistry. The sample consisted of 60, grade 10 chemistry students .The samples were randomly assigned to experimental and control groups. The instruments used were Chemistry achievement tests and Concept Map Scoring Rubric. Both the group were given classes on some particular topics in chemistry. The experimental group was given special classes on concept mapping. A significant difference was found for the questions at knowledge level ($t=1.97$. $p<0.05$) on which the experimental group scored 8% higher than the control group. The results of study revealed that concept mapping helps to improve student's achievement in knowledge level.[9]

In order to evaluate the impact of interactive computer animation and concept mapping on tenth grade students' biology achievement, a study was carried out.65 students made up the sample, with 31 in the experimental group and 34 in the control group. The experimental group received training that included concept mapping and interactive computer animation. This study employed a quasi-experimental pre-post-control group design. A biology achievement test and an attitude scale were the tools employed. The control group's mean pre-test score was 4.50, whereas the experimental group's was 4.12.The control group's mean post-test score was 7.73, whereas the experimental group's was 10.87.The study found that concept mapping and computer animation can both be beneficial.[10]

The focus of nursing education is shifting away from rote memorization and towards developing students' analytical and problem-solving skills. Due to this transformation, educators must switch from using traditional teaching techniques to new educational ones.

In order to look into the long-term impacts of concept map instruction on nursing students' critical thinking, Lee et al. conducted a quasi-experimental study in 2012. The two-year registered nursing baccalaureate curriculum at a university in central Taiwan was chosen using the convenience selection approach. At several stages during the first semester, data were collected using standardized questionnaires, such as the Critical Thinking Scale. The second semester of the medical-surgical nursing course included the implementation of the idea map teaching intervention. The data showed that the students' mean critical thinking scores initially ranged from 41.32 to 0.42 over time, but this loss was not statistically significant. The final model, which took into account individual differences, showed that the experimental group's critical thinking score increased over time more than the control group's did. Lack of clinical experience and a higher pre-test score were the two variables that most reliably predicted first critical thinking status. Lower pre-test scores, lower scores on traditional methods, and lower scores on organized study were the best indications of the development of critical thinking. According to the study, using idea maps as a teaching tool could help students develop their capacity for critical thought..

Critical thinking is becoming a crucial component of nursing education in an effort to prepare nursing students to provide safe, high-quality care. Critical thinking abilities are something that nurse educators are constantly trying to develop. Concept mapping is a technique that has been applied by educators. Students can plan nursing care by using concept maps to organise their thoughts, identify connections between ideas, and see how those ideas relate to one another.

In order to investigate the connection between idea mapping and critical thinking in first-year nursing students, Pickens carried out a quantitative study in 2007. A quantitative and qualitative design was used in the investigation. With a non-randomized control group and intervention group, a pre- and post-test quasi-experimental design was adopted. A phenomenological method was used in the

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qualitative design to analyse the participants' lived experiences. The difference in the pretest mean scores between the two groups was not significant (p=.825). The results showed that no factor had a significant effect on pretest scores (p=.884). Both groups' post-test scores significantly increased, according to a paired t-test (experiment group p=.006, control group p=.028). The experimental group's mean change score was considerably higher than the control group, according to an independent t-test. When comparing the idea mapping group's post-test scores to those of the control group while controlling for other factors, the results showed a considerably better improvement (p=.022). Concept mapping gave the participants guidance on how to get ready for clinical assignments, according to the qualitative study. Participants' concept maps evolved into a model of thought as they created them. The participants gained a sense of ownership and empowerment over the knowledge as they developed their model. The panelists went on to say that concept mapping required more sophisticated thinking. Participants said that because idea mapping forced them to conduct research and look at relationships, it helped them think critically.

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References

1) Jonathan S, Berek MD. 15th ed. Philadelphia: Williams and Wilkins; 2012. Novak's Gynecology; pp. 481–3.

2) Berek G. 13th ed. Philadelphia: Lippincott Williams and Wilkins; 2003. Novak's Gynecology; pp. 393–5.

3) Berek y. 14th ed. Philadelphia: Wilkins Company; 2007. Novak's Gynecology; pp. 516–9.

4) Sperroff L, Fritz MA. 9th ed. Philadelphia: Lippincott Williams and Wilkins; 2005. Clinical gynecologic endocrinology and infertility; p. 473.

5) Thomas E, Andreoli-charles CY, Carpenter Robert C, Criggs- Joseph Loscalzo. 6th ed. Philadelphia: Saunders; 2004. Cecil Essentials Medicine; pp. 651–2.

6) Mackay HT. Current Medical Diagnosis a Treatment. 41th ed. New York City, U.S: The McGraw -Hill companies; 2002. Gynecology; p. 748.

7) Ahmed M, Minawi EL, Fred M. Howard. Pelvic Pain Diagnosis and management. Philadelphia: LWW; 2000. Dysmenorrhea; pp. 100–9.

8) Hsua CS. Effect of “Dang – Qui – Shao – Yao-San” a Chinese medicinal prescription for dysmenorrhea on uterus contractility *in vitro*. Phytomedicine. 2006; 13:94–100. [PubMed]

9) AK, Agarwal A. A Study of Dysmenorrhea during Menstruation in Adolescent Girls. Indian J Community Med. Jan 2010; 35(1): 159–164. Available from G:\Net\A Study of Dysmenorrhea during Menstruation in Adolescent Girls.mht.

10) Pour eslami M, Amin A, Sarmast H. Knowledge, attitude and practice of girl student of 15-18 years about dysmenorrhea and menstrual health in Karaj high schools. Iran J IazdUniv Med Sci. 1998; 9:30–3.

11) Jalili Z, Safi ZH, Shams PN. Prevalence and facing of primary dysmenorrhea in college students in Sirjan. Iran J Paiesh. 2004; 4:61–7.

12) Mirzaii F, Bakhshi H, Iasini M, Bashar DN. Frequency of primary dysmenorrhea according by personality type in girl students, at Rafsanjan high schools — 2001. Iran J RafsanjanUniv Med Sci. 2003; 2:151–7.

DOI: 10.5281/zenodo.8433462
Vol: 60 | Issue: 10 | 2023

13) Kamjou A. Prevalence and intensity of primary dysmenorrhea and some of its related risk factors in dormitory students. Iran J HormozganUniv Med Sci. 2001; 5:6–9.

14) Nag RM. Adolescent in India. Calcutta: Medical Allied Agency; 1982. pp. 18–26.

15) George A, Bhaduri A. Dysmenorrhea among adolescent girls – symptoms experienced during menstruation. Health Promotion Educ. 2002; 17:4.

16) EnsiyehJenabi. The effect of ginger for relieving of primary dysmenorrhoea. J Pak Med Assoc. Vol. 63, No.1, January 2013.8-1.

17) Wu D, Mura C, Beharka AA, Han SN, Paulson KE, Hwang D, et al. Age-associated increase in PGE 2 synthesis and COX activity in murin macrophages is reversed by vitamin E. Am Physiol SOC. 1998:661–6. [PubMed]

18) Ellattar TM, Lin HS. Effect of vitamin C and vitamin e on prostaglandin synthesis by fibroblasts and squamous carcinoma cells. Prostaglandins LeukotEssent Fatty Acids. 1992; 47:253–7. [PubMed]

19) Ziaei S, Faghihzadeh S, Sohrabvand F, Lamyian M, Emamgholy T. A randomized placebo controlled trial to determine the effect of Vitamin E in treatment of primary dysmenorrhea. Br J Obstet Gynecol. 2001; 108:1181–3. [PubMed]

20) Ms. P. Padmavathi1, Dr. Raja Sankar1, Dr. N. Kokilavani. Study to Assess the Effectiveness of Ginger Powder on Dysmenorrhoea among Adolescents in a Selected School at Erode. Asian J. Nursing Edu. And Research 2(2): April- June 2012.79-82.

21) S. Leelavathi, Prof. V. Hemavathy. Effectiveness of Ginger Remedy on Dysmenorrhea. International Journal of Innovative Research in Science, Engineering and Technology; Vol. 4, Issue 5, May 2015.

22) http://herbaltreatment.over-blog.com/article-home-remedies-for-painful-menstrual-periods-or-dysmenorrhoea-71626643.html

23) Doty E, Attara M. Managing primary dysmenorrhea. J PediatrAdolescGynecol 2006; 19:e341–4.

24) Aparecida Adriana. De Paul elloiagono d el al. The use of progressive muscle relaxation technique for pain relief in gynaecology and obstetrics. 2002. March; 3(6):654-659.

25) Mathias Jesveena. A study on the prevalence of PMS among B.Sc. nursing students of selected nursing colleges at Mangalore.NNT.2007. March; 15(2):24-27.

26) file:///D:/ginger/health-ginger.html. Accessed on 1st October 2011

27) http://merrilynhope.com/ginger-roots-in-folk-medicine/. Acessed on 1St October 2011.

28) Ozgoli.G, Goli.M, Moattar.F, Comparison of effects of ginger, Mefenamic acid and ibuprofen on pain in women with primary dysmenorrhea. Journal of alternate and complementary Medicine. Volume 15, Number 2, 2009, pp. 129–132

29) Halder A. Effect of Progressive Muscle Relaxation versus Intake of Ginger Powder on Dysmenorrhoea amongst the Nursing Students in Pune. The Nursing Journal of India. Jul/Aug 2012; 103(4): 152-6.

30) Parvin.R. the effects of Zingiber Officinale R. on Primary dysmenorrhea. Journal; of medicinal plants. Dec 2010; 9(36): 81-86.

31) Wu D, Mura C, Beharka AA, Han SN, Paulson KE, Hwang D, et al. Age-associated increase in PGE 2 synthesis and COX activity in murin macrophages is reversed by vitamin E. Am Physiol SOC. 1998:661–6. [PubMed]

32) Ellattar TM, Lin HS. Effect of vitamin C and vitamin e on prostaglandin synthesis by fibroblasts and squamous carcinoma cells. Prostaglandins Leukot Essent Fatty Acids. 1992; 47:253–7. [PubMed]

33) Ziaei S, Faghihzadeh S, Sohrabvand F, Lamyian M, Emamgholy T. A randomized placebo-controlled trial to determine the effect of Vitamin E in treatment of primary dysmenorrhea. Br J Obstet Gynecol. 2001; 108:1181–3. [PubMed]

ISSN：1674-2974 | CN 43-1061 / N

DOI: 10.5281/zenodo.8433462
Vol: 60 | Issue: 10 | 2023

34) Iaghmaii M, Mir teimouri M, Mokhtari M, Mohammadi M. Comparison of Mefenamic acid / Vitamin E and Mefenamic acid effect on primary dysmenorrhea. Iran J FertilSteril. 2005; 6:187–93.

35) Ziaei S, Faghihzadeh S, Sohrabvand F, et al. A randomized placebo-controlled trial to determine the effect of vitamin E in treatment of primary dysmenorrhoea. *BJOG*. 2001; 108:1181-1183.

36) Ziaei S, Zakeri M, Kazemnejad A. A randomized controlled trial of vitamin E in treatment of primary dysmenorrheal. BJOG: An International Journal of Obstetrics &Gynaecology. 2005; 112(4): 466-469.

37) Bjelakovic G, Nikolova D, Gluud LL, et al. Antioxidant supplements for prevention of mortality in healthy participants and patients with various diseases. Cochrane. Database.Syst.Rev. 2012; 3: CD007176. retrieved from http://www.mayoclinic.org/drugs-supplements/vitamin-e/hrb-20060476

38) Nayeban S. Jafarnejad F, Nayeban S, Sefidgaran A. A Comparison of the Effects of Vitamin E and Vitamin B1 on the Severity and Duration of Pain in Primary Dysmenorrhea. Journal of Midwifery and Reproductive Health. 2014;2(2): 143-146

39) Zamani M, Soltanbeigi F. Evaluation the Treatment Effect of Vitamin B1 in Primary Dysmenorrhea. Journal of Arak University of Medical Science. 2001; 4:7-15

40) Doty E, Attara M. Managing primary dysmenorrhea. J PediatrAdolescGynecol 2006; 19:e341–4.

41) Danny Sushma S. Effect of acupressure on reducing dysmenorrhea. Nightingale nursing times. 2009. September; 12(5): 29-32.

42) Nag RM. Adolescent in India. Calcutta: Medical Allied Agency; 1982. pp. 18–26.

43) George A, Bhaduri A. Dysmenorrhea among adolescent girls – symptoms experienced during menstruation. Health Promotion Educ. 2002; 17:4.

44) Hayes EC, Rock JA. Cox-2 inhibitors and their role in gynecology. ObstetGynecol 2002; 57:768–80.

45) Berek J. Berek& Novak Gynecology. 14th ed. USA: Lippincott Williams & Wilkins; 2007. P. 481–484.

46) Ostad SN, Soodi M, Shariffzadeh M. The effect of fennel essential oil on uterine contraction as a model for dysmenorrhea, pharmacology and toxicology study. Journal of Ethnopharmacology 2003; 76(3):299-304.

47) Pakniat H, Chegini V, Ranjkesh F, Hosseini MA. Comparison of the effect of vitamin E, vitamin D and ginger on the severity of primary dysmenorrhea: a single-blind clinical trial. ObstetGynecol Sci. 2019 Nov; 62(6): 462–468.

48) Chen X, Barrett B, Kwekkeboom K: Efficacy of oral ginger (zingiberofficinale) for dysmenorrhea: a systematic review and meta-analysis. Evid Based Complement Alternat Med. 2016, 2016:1-10. 10.1155/2016/6295737

49) Rahnama P, Hosseini F, Mohammadi KH, et al.: A study of the ginger effect on girls suffering from primary dysmenorrhea. J Med Plants. 2011, 4:81-6.

50) Lakhan SE, Ford CT, Tepper D: Zingiberaceae extracts for pain: a systematic review and meta-analysis.Nutr J. 2015, 14:10.1186/s12937-015-0038-8

.