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RESEARCH ARTICLE

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Effect of Concept Mapping on Developing Clinical Judgement Among 2nd Year BSc Nursing Students

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Abstract

Background: Nursing program aims to provide students with the necessary skills to apply sound clinical judgment. Concept mapping fosters meaningful learning and promotes critical thinking abilities that are essential for achieving this goal. **Objective:** To evaluate the effectiveness of concept mapping methods among nursing students in developing clinical judgement skills. **Materials and Methods:** A quasi-experimental pretest-post-test study design was adopted. The study was conducted at Krupanidhi College of Nursing, affiliated with Rajiv Gandhi University of Health Sciences (RGUHS). A convenient sample of 41 second-year undergraduate nursing students during the academic year 2022-2023 were divided randomly into experimental groups (n=103) and control groups (n=103). The students were given case scenarios and asked to make a care plan, and their clinical judgement was evaluated. After a few days of the pre-test, the same group of students were given the same case scenarios and asked to make a concept mapping to prepare a care plan. Then, the clinical judgement of the students was evaluated. Pearson Chi-square and Paired t-test were used for statistical analysis. **Result:** Most of the students (n=4; 9.75%) were in the age group 20 years, and females were predominant (n=30; 73.2%) compared to males (n=11;26.8%). Most subjects, 34.1%, were Hindu, followed by 31.7% Christians, 24.4% Buddhist and 9.8% Muslim. The results showed a statistically significant difference between pre- and post-awareness sessions among the study group regarding concept mapping on clinical judgement (p<0.05). There was no correlation between the students' pre- and post-test clinical judgement skills with demographic variables (p>0.05), except for the pre-test clinical judgement skills with gender. **Conclusion:** Using concept mapping may provide an interactive way to foster the growth of clinical judgment skills in nursing students.

Keywords: Concept mapping; Clinical judgement; Mind mapping; Clinical reasoning; Problem solving

1 Introduction

Learning is a dynamic and a lifelong process. Nursing knowledge is constructed based on the matrix of simple to complexity. In the past decades, increasing emphasis has been on the importance of critical thinking. Rote memorization has been an accepted learning method but is not recommended because in-depth meaning is not elicited.[1] Finding techniques to encourage and assess critical thinking in nursing students is a problem for nurse educators. Concept maps are an effective metacognitive technique for facilitating information acquisition through meaningful learning. A core competence of baccalaureate nursing education is critical thinking. Concept mapping can be stated as active teaching and learning that helps nursing teachers inculcate students' critical thinking and problem-solving strategies.[2] It has been suggested as a learning strategy to encourage nursing students to think critically as it stimulates the use of thinking skills such as analysis, inference, and evaluation, thus promoting the development of critical thinking.[3]

One of the essential activities in nursing practice is creating a concept map. The idea map provides broad benefits in nursing, such as encouraging patient understanding, making the nursing process more efficient, and improving the nursing professional's critical thinking skills. Concept maps help learners acquire the information they need.[4] Preparation, production of statements, structuring of statements, representation of statements, interpretation of maps and utilization are all steps in the concept mapping process. Concept maps can be prepared in a variety of shapes. Various visual organizer solutions were proposed and labelled as concept maps, but they lacked the intellectual features required. Finally, concept mapping research has progressed to an established stage, but there is still a need for a transformative stage.[5] Therefore, the main aim of the study is to utilize concept mapping as a technique on clinical judgement skills in nursing education to deliver comprehensive information and improve learning retention in nursing topics among second-year B.Sc. Nursing students.

2 Materials and Methods

2.1 Study Design

The study employed a quasi-experimental design with a single-group pre-test and post-test research design. The quasi-experimental design entails altering an independent variable to observe its impact on a dependent variable without the use of randomization. The students were given case scenarios and asked to make a care plan, and the clinical judgement of the students was evaluated. After a few days of the pre-test, the intervention was given. On the day of the post-test, the same group of students as before were given the same case scenarios, but this time, they were told to make a concept mapping to prepare a care plan. The clinical judgement of the students was evaluated.

2.2 Sampling

In this study, purposive sampling was the method deliberately chosen for participant selection.

2.3 Data collection

Demographic characteristics of nursing students (age, gender, religion and academic achievement) was collected with the help of a demographic Performa. Bussard Lasater Clinical Judgement Rubric Scoring Sheet was used to measure the clinical judgment of the students. On the day of the pre-test, the researcher divided the students into 4 groups (10 students in 3 groups and 11 in one group) through the lottery method and distributed the 4 different case scenarios to the groups, and they were asked to make a care plan according to the case scenario with prioritized nursing diagnoses and prioritized nursing intervention. The clinical judgment of the students was evaluated. After the pretest, a training session on concept mapping was given to the students and they were trained to prepare concept maps for various medical surgical conditions. After 7 days, the same case scenarios which were used for pretest was given to the same groups of students and were told to make a concept mapping to prepare a care plan for the given scenario and post-test measure of clinical judgment was obtained by Bussard Lasater Clinical Judgement Rubric Scoring Sheet.

2.4 Data Analysis

SPSS 26 software was used to conduct descriptive and inferential statistical analysis. To determine the effectiveness of concept mapping, paired t-test was computed. Chi square test was used to determine the association between clinical judgment skills and selected demographic variables.

3 Results

3.1 Data on demographic variables

The current study used frequency and percentage distribution, and the results revealed that the initial characteristics of the subjects, including factors like age, gender, religion, batch, roll number, and first-year results, were described in terms of frequency and percentage. Table 1 shows that the majority of the subjects (43.90%), were of 20 years and 2.43%, were of 23 years. The majority of the subjects (73.2%) were female, whereas 26.8% were male. A greater proportion of subjects, i.e., 34.1%, were Hindu, 31.7% were Christians, 24.4% were Buddhist and 9.8% were Muslim. With respect to 1st-year results, 65.9% of them passed, and 34.1% failed.

Table 1. The distribution of subjects according to their demographic characteristics, expressed as frequency and percentage

Demographic Variables	Frequency	Percentage
Age in years		
19 years	4	9.75%
20 years	18	43.90%
21years	11	26.82%
22years	7	17.07%
23years	1	2.43%
Gender		
Male	11	26.80%
Female	30	73.20%
Religion		
Hindu	14	34.1
Christian	13	31.7
Buddhist	10	24.4
Muslim	4	9.8
1st year result		
Passed	27	65.90%
Failed	14	34.10%

Table 2. Effectiveness of concept mapping on clinical judgment of 2nd yr students (N = 41)

Variable	Pre-test Clinical Judgement		Post- test Clinical Judgement		SEM	p value	Inference
	Mean	Standard deviation	Mean	Standard deviation			
Effective noticing	5.00	.00	5.00	.00	0.00	0.05	t value cannot be calculated as the SEM is 0.
Effective interpreting	3.09	1.20	5.17	1.20	1.82	0.001	Concept mapping proved to improve the effective interpreting skill.
Effective responding	6.04	2.23	9.51	1.97	0.31	0.001	Concept mapping proved to improve the effective responding skill.
Effective reflecting	2.00	0.00	4.00	0.00	0.00	0.05	t value cannot be calculated as the SEM is 0.

*p value: significance

3.2 Effectiveness of concept mapping on clinical judgement of 2nd B.Sc. nursing students

In the domains of effective interpreting and effective responding, the post-test clinical judgment scores of the students surpassed their pre-test scores. With a p-value below 0.05, the null hypothesis was rejected, suggesting that concept mapping effectively enhanced the clinical judgment of 2nd-year B.Sc. nursing students. However, the pre-test and post-test clinical judgment scores appeared to be similar when it comes to the domains of effective noticing and effective reflecting. Consequently, it can be inferred that concept mapping did not prove effective for these two domains Table 2.

3.3 Association of pre-test clinical judgment skill with demographic variable

The results indicate that a relationship exists between clinical judgment and gender, as the p-value was less than 0.05. Furthermore, this data demonstrates no correlation between

clinical judgment and other demographic factors like religion and first-year results Table 3.

Research on the application of concept mapping to enhance clinical judgement skills demonstrated that participants' comprehension of the clinical situation and the cultivation of their clinical decision-making abilities have improved as a result of the concept mapping activity. The domain "effective responding" yielded results comparable to this investigation's results.

3.4 Association between post-test clinical judgment skill and demographic variable

This signifies an association between clinical judgment and gender, as the p-value was less than 0.05. This data also reveals no association between clinical judgment and other demographic variables such as religion and first-year results Table 4.

4 Discussion

Complex healthcare environments, quick advancement of social, technological, and medical elements of patient care, nurses face enormous difficulties and challenges. Hence nursing educators have to select the most effective teaching strategy that can equip student nurses to work in various healthcare settings, enabling them to think critically to solve patients' problems and deliver safe patient care.

The teaching and learning techniques that enhance critical thinking abilities and knowledge acquisition should be considered by nursing educators. In this direction, this study aimed to evaluate the effect of concept mapping methods to enhance nursing student's critical thinking and independent knowledge acquisition. The primary goal was to investigate how nursing students may use the Lasater Bussard clinical judgment Rubric scale to improve their clinical judgment. Its four useful realms are noticing, interpreting, responding and reflecting. The outcome demonstrates that the Concept mapping was only successful in two areas: effective responding and effective interpreting. However, since the results of the pre-and post-tests were identical, it was ineffective for the remaining two domains, effective noticing and reflecting. This could have happened as a result of using fewer samples or exposing them to fewer concept maps based on case studies. Nonetheless, we can unequivocally state that concept mapping helps nursing student's clinical judgement. The finding is highly noteworthy that because it suggests that concept mapping helped students improve their clinical judgement by helping them make the best decisions for patient care. The current discovery aligns with a study conducted in Bangalore, India, which shows notable enhancement in clinical judgment scores was observed in comparison to the control group, suggesting that concept mapping can serve as an effective method for nursing students

to enhance their clinical judgment.[6] An additional study was conducted in 2022, involving nursing students and their preceptors. They applied the notion of applying concept maps to improve clinical learning abilities when providing patient care. 70.97% of the preceptors and 62.5% of the students thought favorably of concept mapping. As a result, the idea was seen as a practical clinical nursing tool.[7] The current finding is consistent with other studies by Elmeghawri & Sleem, who found that students in the concept map-based learning group had significantly more knowledge than those in the lecture-based group.[8]

Elmeghawri & Sleem support our study's findings and demonstrate that most students perform better than the standard for map assignments when using the rubric evaluation approach. They emphasized that concept mapping helps students better grasp, synthesize, and reflect on the course material.[8] Our findings go hand in hand with Frederick; they discovered that concept mapping had a beneficial effect on nursing students preparing for licensure's critical thinking and stated that it might be the best strategy in teaching and learning techniques to help nursing students build their critical thinking abilities.[9] The findings of the Binoy suggest that the difference between pre-test and post-test mean knowledge scores in Concept mapping (variables- analysis, synthesis and evaluation) was found to be significantly higher than the traditional group at 0.05 level.[10]

According to Tarm et al., concept mapping motivates nursing students to actively look for information and connect new knowledge and experiences to what they already know. This results in the organization of their knowledge and the growth of adaptive expertise in health practice.[11] Additionally, Elmeghawri & Sleem suggested adopting concept mapping teaching techniques to support nursing students' need to learn by doing and experiencing things in a genuine setting. To continue the educational path and to become a professional who can self-direct, the person must be adept at self-learning.[8] Mathew et al., skill training was given to nursing students through objective structured clinical examination (OSCE), and their performance improved in the clinical procedures.[12]

The current study on the effectiveness of concept mapping in the improvement of student clinical judgment was statistically significant. These findings may be explained by the fact that concept mapping teaching techniques aid in the organization, analysis, and synthesis of knowledge and develop self-assurance, cognitive maturity, truth-seeking, open-mindedness, and inquisitiveness in study participants. Cognitive abilities like reasoning, critical thinking, and problem-solving are essential for nursing education, and nursing students choose educational methodologies that make the material they learn more useful and long-lasting when applied.

Table 3. Association of pre-test clinical judgement skill with demographic variable (N = 41)

Demographic variables	Adequate clinical Judgement (Pre-Test)	Inadequate clinical judgement (Pre-Test)	Chi-square	p value	Inference
Gender					There is an association between gender and clinical judgement skill.
Male	2	9	4.794	0.038	
Female	17	13			
Religion					
Hindu	8	6			
Christian	4	9	3.408	0.05	No significance
Buddhist	6	4			
Muslim	1	3			
First year result					
Passed	15	12	2.7	0.186	No significance
Failed	4	10			

*p value: significance

Table 4. Association of post-test clinical judgment skill with demographic variable (N=41)

Demographic variables	Adequate clinical Judgment (Post-Test)	Inadequate clinical judgment (Post-Test)	Chi-square	p-value	Inference
Gender					
Male	4	7	1.808	0.29	No significance
Female	18	12			
Religion					
Hindu	7	7			
Christian	4	9	8.14	0.05	No significance
Buddhist	9	1			
Muslim	2	2			
First year result					
Passed	17	10	2.75	0.115	No significance
Failed	5	9			

*p value: significance

5 Conclusion

The current study concluded that there were statistically significant improvements in nursing students' knowledge of concept mapping after the application of teaching methods. Concept mapping is an innovative educational strategy that can improve students' critical thinking. The clinical demands of this new world are increasing daily, so student nurses must also learn to provide proper care through correct judgment. However, since they are novices lacking experience, the global COVID pandemic challenged nurses across acute care settings to be nimbler and more self-assured in their nursing process. 21st-century nursing skills include the emergence of collaborative intelligence and clinical analytics, requiring both practical knowledge and a new mindset to welcome machines as additional contributors to the care team. There is a need to use new methods to improve their judgment while learning about the disease. One method to help them improve their clinical judgment is concept/idea mapping. It helps students think more precisely and manage complex concepts/ideas without losing details, thus improving the judgement of the student nurses. More research is required to compare the impact of concept mapping and other meta-cognition strategies on various learner types.

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