European Journal of Clinical Pharmacy
Print ISSN: 2385-409X **Online ISSN**: 3105-0409
Website: https://farmclin.com/

Original Research Article

Critical Thinking and Self-Efficacy Using Mind Mapping Learning Technique for Patient Care among Nursing Students

Article History:

Name of Author:
Nyla James[1]*, Sarfraz Masih[2], Madiha Mukhtar[3]

Affiliation: *[1]MSN Scholar, Lahore School of Nursing, The University of Lahore, Pakistan*
[2]Professor, Lahore School of Nursing, The University of Lahore, Pakistan
[3]Associate Professor, Lahore School of Nursing, The University of Lahore, Pakistan

Corresponding Author:
Nyla James

Received: 18-10-2025
Revised: 12-12-2025
Accepted: 18-12-2025
Published: 30-12-2025

Abstract: ***Background:*** Mind Mapping Learning Technique is an active, visual, and student-centered strategy that helps organize information, promote deeper understanding, and enhance learning outcomes. It may play a vital role to improve critical thinking and confidence among nursing students leading to higher quality of patient care. ***Objective:*** To evaluate the effect of the mind mapping learning technique on critical thinking and self-efficacy among nursing students for patient care. Place and Duration of Study: This study was conducted at the Saida Waheed FMH College of Nursing, Lahore from March 2025 to September 2025. ***Methods and Materials***: A quasi-experimental one-group pre-post study was conducted at the Saida Waheed FMH College of Nursing, Lahore. A purposive sample of 57 undergraduate nursing students of 3rd and 4th years participated. Critical thinking was measured using the Aleksander Kobylarek, Kamil Błaszczyński, Luba Ślósarz, and Martyna Madej Critical Thinking Questionnaire (CThQ), self-efficacy was assessed using the Schwarzer & Jerusalem General Self-Efficacy Scale and quality of patient care was measured by using the Wandelt and Ager Quality Patient Care Scale (Qualpacs)-Physical Category. The intervention focused on the critical thinking and self-efficacy for quality of patient care among nursing students. Data were analyzed using descriptive statistics and Wilcoxon Signed Rank test. ***Results:*** Post-intervention, critical thinking scores significantly increased from 1.8% to 75.4%, and self-efficacy increased from 7% to 78.9% and quality of patient care increased from 3.5% to 61.4% with p-values < 0.001 for all outcomes, demonstrating a substantial improvement. ***Conclusion:*** The mind mapping learning technique is effective in enhancing critical thinking, self-efficacy among nursing students for quality of patient care. It is a low-cost, non-pharmacological intervention with potential for broader application in healthcare and educational settings.

Keywords: Mind mapping learning technique, critical thinking, self-efficacy, nursing students, patient care.

INTRODUCTION

Poor quality and substandard healthcare to patients leading to harmful results are of the many global public health challenges in recent times, potentially devastating, and often preventable. Millions of patients suffer injuries due to medication errors, misdiagnoses, and surgical complications contribute to avoidable deaths and severe health outcomes each year (1). Around 1 in every 10 patients is harmed in health care and more than 3 million deaths occur annually due to unsafe and substandard care. In low-to-middle income countries, as many as 4 in 100 people die from unsafe care (2)

Pakistan, located in South Asia, is one of the lower-middle-income countries which has a population of over 220 million with diverse ethnic population (3). The stats show that 82.8% of patients were not satisfied with the care they received (4).

Nurse-led interventions can substantially significantly improve patient outcomes which may result in reduction in hospital readmission rates by 25% (5),

improvement in patient satisfaction scores by 15% (4), helping to promote a positive and constructive work environment and decrease in reducing nurse turnover rates by 20% (6) and enhancing improvement in patient safety (7).

A mind mapping learning technique is a brainstorming technique which is used to visually organize random information into an orderly manner. It features one main idea being the focus point as the central point of the diagram, with subtopics branching out and connecting to supporting ideas (8).

Critical thinking is the way of analyzes critically and adapting to new challenges situations. It encompasses a range of essential skills such as, the ability to analyze arguments, draw inferences through inductive or deductive reasoning, assess and evaluate situations, and make informed decisions or solve problems (9).

Critical thinking is a core nursing competency that enables accurate assessment, analysis, and informed clinical decision-making. Mind mapping is an effective learning strategy for nursing students, enhancing understanding and promoting analytical and critical thinking skills (10).

Improved self-efficacy is often necessary for better academic results and overcoming challenges among nursing students (11). By fostering critical thinking and self-efficacy, mind mapping learning technique can contribute to produce more confident and competent nursing professionals, which is essential for positive health outcomes and patient safety (12).

Methodology

A quasi-experimental one-group pretest–posttest study was conducted at Saida Waheed FMH College of Nursing, Lahore, to evaluate the effect of the Mind Mapping Learning Technique on critical thinking, self-efficacy, and quality of patient care among nursing students. Using a purposive sampling technique, 57 undergraduate BSN students from the 3rd and 4th academic years (aged 18–25 years) were recruited, while students with severe psychiatric or medical conditions were excluded. Data were collected using validated instruments, including a demographic questionnaire, the 25-item Critical Thinking Questionnaire (CThQ), the Schwarzer and Jerusalem General Self-Efficacy Scale, and the physical category of the Wandelt and Ager Quality Patient Care Scale (QUALPACS), with permission obtained from the original developers. The intervention was implemented over 16 weeks and comprised 32 structured sessions incorporating conceptual, creative, clinical, and collaborative mind-mapping activities aimed at enhancing analytical thinking, confidence, clinical reasoning, and patient care competence. Pre- and post-intervention assessments were conducted using the same tools, and data were analyzed using SPSS version 25 with descriptive statistics and the Wilcoxon Signed Rank Test, considering $p \leq 0.05$ as statistically significant. Ethical approval was obtained from the Institute Research Ethics Board of The University of Lahore, written informed consent was secured, confidentiality and anonymity were maintained, and participants were informed of their right to withdraw at any time without penalty.

RESULTS

Table 1: Demographic characteristics of the participants (n=57)

Sr #	Demographic characteristics	Frequency(f)	Percentage (%)
1	**Age**		
	18-21 years	21	36.8%
	22-25 years	**36**	**63.2%**
	Mean ±SD	22.0±1.13	
2	**Gender**		
	Male	24	42.1%
	Female	**33**	**57.9%**
3	**Academic Year in BSN Program**		
	3rd year	**31**	**54.4%**
	4th year	26	45.6%

Table 1 shows that the majority of participants were aged 22–25 years (63.2%), followed by aged 18–21 (36.8%). In terms of gender distribution, 57.9% were females and 42.1% were male. Academic status data revealed that 26 (45.6%) participants were from final year and 31 (54.4%) were from third year.

Table 2: Comparison of Critical Thinking Before and After Intervention group (N=57)

Critical Thinking Category	Pre Intervention (n, %)	Pre Intervention Mean ± SD	Post Intervention (n, %)	Post Intervention Mean ± SD	Mean Difference
Low Critical Thinking (25-58)	31(54.4)	55.09±2.21	1(1.8)	58.00±0.00	+2.91
Average Critical Thinking (59-92)	25(43.9)	64.08±3.72	13(22.8))	85.92±5.13	+21.84
High Critical Thinking (93-125)	1(1.8)	93.00±0.00	43(75.4)	102.65±5.35	+9.65

Table 2 showed a marked improvement in critical thinking levels following the intervention. Participants with low critical thinking decreased from 54.4% to 1.8%, while those with high critical thinking increased from 1.8% to 75.4%, with the highest gain observed in the high-level group. The statistically significant results ($p < 0.001$) confirm that the intervention effectively enhanced participants' critical thinking skills.

Table 3: Comparison of Self-Efficacy Before and After Intervention group (N=57)

Self-Efficacy Category	Pre Intervention (n, %)	Pre Intervention Mean ± SD	Post Intervention (n, %)	Post Intervention Mean ± SD	Mean Difference
Low Self-Efficacy (10-20)	43(75.4)	17.06±1.62	4(7.0)	19.00±2.00	+1.94
Moderate Self-Efficacy (21-30)	12(21.1)	23.50±2.77	8(14.0)	25.75±2.71	+2.25
High Self-Efficacy (31-40)	2(3.5)	31.00±0.00	45(78.9)	34.97±1.99	+3.97

Table 3 demonstrated a substantial improvement in self-efficacy levels after the intervention. Low self-efficacy decreased from 74.5% to 7%, while high self-efficacy increased from 3.5% to 78.9%, with the greatest gain observed in the high self-efficacy group. Overall, the statistically significant changes ($p < 0.001$) indicate that the intervention effectively enhanced participants' confidence and perceived ability to manage challenges.

Table 4: Comparison of Quality of Patient Care Before and After Intervention group (N=57)

Quality of Patient Care Category	Pre Intervention f (%)	Pre Intervention Mean ± SD	Post Intervention f (%)	Post Intervention Mean ± SD	Mean Difference
Poor Care (15-30)	53(93.0)	21.43±2.11	2(3.5)	27.50±2.12	6.07
Average Care (30-45	1(1.8)	31.00±0.00	1(1.8)	36.00±0.00	5
Better Care (45-60)	1(1.8)	47.00±0.00	19(33.3)	58.94±0.91	11.94
Best Care (61-75)	2(3.5)	64.00±2.82	35(61.4)	69.11±5.90	5.11

Table 4 revealed a marked improvement in quality of patient care following the intervention. The proportion of students providing poor care decreased from 93% to 3.5%, while those delivering best care increased from 3.5% to 61.4%, with corresponding rises in mean scores. Improvements were also observed in the better and average care categories, with the greatest gain noted in the better care group. Overall, the findings demonstrate that the intervention significantly enhanced nursing students' clinical competency and quality of patient care across all performance levels.

Table 5: Critical Thinking, Self-Efficacy and Quality of Patient Care Before and After Intervention Analysis (n=57)

Variable	N	Pre-Intervention Median (IQR)	Post-Intervention Median (IQR)	Z-Value	P-value
Critical Thinking Score	57	58(8)	99(13)	-6.532	<.001
Self-Efficacy Score	57	18(6)	34(8)	-6.295	<.001
Quality of Patient Care Score	57	22(15)	62(15)	-6.530	<.001

Wilcoxon Signed Test with p<0.05 value as significant

Table 5 demonstrated a highly significant improvement in critical thinking, self-efficacy, and quality of patient care scores following the intervention ($p < .001$). The findings indicate that the mind mapping learning technique effectively enhanced

participants' clinical competence, confidence, and ability to deliver high-quality patient care.

DISCUSSION

The results of the current quasi-experimental study indicated a statistically significant increase in critical thinking, self-efficacy among nursing students for quality of patient care who participated in the mind mapping learning technique intervention. These findings provide evidence to support the alternative hypothesis and reinforce the importance of supportive and engaging learning environment and help to prepare the nursing students to think critically and act confidently in high-pressure or high-stress clinical environments.

According to current study findings nursing students were within age group of 18–25 years, showing the common enrollment trend in undergraduate nursing programs. Similar age distributions have been documented in studies conducted in Pakistan, where the majority of nursing students fall into this young adult age range (13). The Majority of nursing students are females 33(57.9%). This pattern is generally documented in the literature, as females continue to represent the majority of nursing students (14). However, a contrasting study from India reported a higher percentage of male nursing students (15), reflecting gender diversity is gradually increasing in some areas. In the current study the majority of nursing students participating in the intervention were from third year as compared to the fourth year. This pattern aligns with previous research (13), perhaps as a result of a more balanced academic load than in the final year. In contrast, a research conducted in Karachi indicated a higher representation of fourth-year nursing students (16). These demographic features may have favorably influenced the effectiveness of mind-mapping, since learners at this stage tend to be more flexible to new instructional methodologies and motivated to develop their clinical decision-making abilities.

One of the most notable findings of the mind mapping learning technique was the extensive enhancement in overall critical thinking among nursing students. These results closely coincide with the findings of Wu and Wu (10) and Elasrag and Elsabagh (17) who professed that mind-mapping improved critical thinking among undergraduate nursing students ($p < .001$) rather significantly. However, a study conducted in Benue State, Nigeria contradicted these findings as it mind-mapping intervention did not result in a considerable change in critical thinking among nursing students. It may be possible due to comparatively shorter intervention duration and contextual differences in instructional delivery (18).

This study indicates a significant improvement in nursing students' analytical skills and attention to detail, showing improved critical thinking for patient care. The cognitive benefits of same nature were observed in the studies by Mohamed El-Sayed, Mahmoud Abdel-Azeem (19) and Ernawati and Dewi (20) where organized interventions such as mind mapping improved nursing students' critical thinking and decision-making abilities; however, the visual, organizational, and integrative thinking techniques combined together in the current study, rather uniquely, which may have contributed to the superior gains observed in overall critical thinking.

Significant improvements in applied critical thinking skills were also displayed by the participants as evidently observed in this intervention. Similar effects were observed in other studies as well; for example, YANG, LI (21) demonstrated improved problem-solving and integrative thinking among nursing students following structured mind mapping exercises and Lestari, Wibowo (22) reported increased analytical skills and clinical reasoning after mind mapping interventions.

Significant improvements indicated that the mind-mapping intervention enhanced both nursing students' ability to approach patient information from multiple perspectives and strengthened their critical evaluation of diverse sources, leading to more operative and conversant clinical decision-making. Our results showed consistency with the De Jesus study (23).

The results strongly suggest that the mind mapping learning technique intervention is greatly effective in enhancing critical thinking self-efficacy among nursing students transitioning to clinical rotations for quality of patient care. This intervention may prove to be particularly effective in promoting active engagement, deeper analysis of patient information when it is compared to traditional lecturers' methods (24) and concept mapping interventions (25) educational orientations (26), or simulated-based learning (27), resulting in fostering nursing students' confidence in clinical decision-making.

Overall, the results give us clearly indication that mind-mapping is highly effective when it comes to improving nursing students' critical thinking abilities. These results are in line with Zheng, Johnson (28), who reported that as compared to traditional teaching methods, the collaborative mind-mapping significantly enhanced nursing students' self-efficacy, and motivation.

The present study demonstrated a substantial improvement in nursing students' quality of patient care following the mind-mapping intervention. These results align with a quasi-experimental study conducted among maternity nurses, which discovered

that nurses' performance significantly improved after implementing a mind-mapping strategy intervention, and intrapartum women reported higher satisfaction with the quality of patient care (29). This aligns with previous studies indicating that mind-mapping increased patient-reported satisfaction when combined with standardized patient simulation (30). Zhang, Jiao (31) also reported improvements in clinical care performance following mind-mapping interventions.

The findings of this study highlight that the mind-mapping learning technique is an effective, student-centered strategy to enhance nursing education outcomes. Overall, this study provides a framework for innovative teaching practices in nursing programs across Pakistan and similar contexts, supporting the development of competent, confident, and patient-centered nurses capable of delivering higher-quality care.

CONCLUSION

The study demonstrated that the mind-mapping learning technique was effective in significantly improving critical thinking, self-efficacy, and quality of patient care among nursing students. Post-intervention results showed remarkable improvements across all three domains, indicating that mind mapping encourages active engagement, reflection, and integration of theory with practice. The findings confirm that visual and student-centered learning approaches enhance not only cognitive skills but also clinical confidence and performance in patient care. Therefore, mind mapping can be considered a powerful educational tool to promote higher-order thinking and professional competence in nursing education.

Acknowledgements

The authors thank the administrative and technical support provided by Saida Waheed FMH College of Nursing, Lahore and the nursing students who participated in the study.

Funding Source

There is no funding source which supports this research in the design of the study, data collection, analysis, interpretation, or in writing the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this study.

REFERENCES

1. Bremner BT, Heneghan C, Aronson JK, Richards GC. A systematic narrative review of coroners' prevention of future deaths reports (PFDs): a potential metric for patient safety in hospitals. medRxiv. 2023:2023.05. 19.23290187.
2. World Health Organization. Patient safety 2023 [Available from: https://www.who.int/news-room/fact-sheets/detail/patient-safety.
3. Samad L, Ashraf MN, Mohammad AA, Fatima I, Fowler Z, Albutt K, et al. Access and Financial Burden for Patients Seeking Essential Surgical Care in Pakistan. Ann Glob Health. 2022;88(1):107.
4. Rashid I, Noorain Z, Hussain A, Rehman H-u, Waqar SH, editors. Patient satisfaction with regards to health care services provided in general surgery ward at PIMS, Islamabad2019.
5. Astik GJ, Kulkarni N, Cyrus RM, Yeh C, O'Leary KJ. Implementation of a triage nurse role and the effect on hospitalist workload. Hospital Practice. 2021;49:336 - 40.
6. Bilyeu TE, Dorrell JJ, Ewing EM, Herwick BJ, Kreiser JB, Winslow SA. Magnet® and the charge nurse role. American Nurse Journal. 2023.
7. Doherty DP, Hunter Revell SM, McCurry MK, Asselin ME. Exploring the Charge Nurse Role Transition. Journal for Nurses in Professional Development. 2021;38:196 - 205.
8. Basri N, Syamsia S. The effect of applying mind mapping method in writing descriptive text. Langua: Journal of Linguistics, Literature, and Language Education. 2020;3(2):36-56.
9. Sultonova M. The significance of critical thinking in learning languages. O'zbekiston davlat jahon tillari universiteti konferensiyalari. 2024:443-6.
10. Wu H-Z, Wu Q-T. Impact of mind mapping on the critical thinking ability of clinical nursing students and teaching application. Journal of International Medical Research. 2020;48(3):0300060519893225.
11. Elsayed Farid Amr A, ELsayed El Sawah E, H Salama A, Mohamed Mansour Gad A, Ibrahim Doma N. Effect of Using Electronic Mind Maps as a Teaching Strategy on Academic vitality, Self-Efficacy, and Achievement among Nursing Students. International Egyptian Journal of Nursing Sciences and Research. 2023;3(2):546-62.
12. Imran, Iqbal N, Ahmad S, Kim DH. Health monitoring system for elderly patients using intelligent task mapping mechanism in closed loop healthcare environment. Symmetry. 2021;13(2):357.
13. Khan S, Din ZU, Ali M, Ali S, Anees M, Hussain A, et al. Academic Challenges Faced by Undergraduate Students in Nursing Colleges: A Quantitative Analysis. Journal of Asian Development Studies. 2023;12(3):1038-46.
14. Ogunmuyiwa AO, Anyama SC, Howells BB, Ogunleye CA, Esan DT. Gender and Age Differential on Competence Level in Clinical Practice Among Nursing Students in a Tertiary Institution in Nigeria. SAGE Open Nurs. 2025;11:23779608251331587.
15. Kumar V, Kashif NJ, Nawaz HI. Prevalence and Correlates of Depression, Anxiety, and Stress

among BSN Students in Karachi, Pakistan. Multidisciplinary Surgical Research Annals. 2025;3(2):28-37.
16. Ali A, Naz S, Rasheed A, Jasmin S. Attitudes Towards Learning Communication Skills Among University Nursing Students: Attitudes Towards Learning Communication Skills. Pakistan Journal of Health Sciences. 2024:65-9.
17. Elasrag GAA, Elsabagh NE. The effect of mind mapping on critical thinking skills of undergraduate nursing students. Pharmacophore. 2020;11(1-2020):73-84.
18. Laagye Zachariah AS. Effect of Concept Mapping and Mind Mapping Instructional Tools on Students' Achievement on Higher-Order Cognitive Ability Tasks and Retention in Secondary School Biology in Benue State. International Peer-Reviewed Journal. 2025;VOL. 11 NO. 3 2025(BACK).
19. Mohamed El-Sayed N, Mahmoud Abdel-Azeem A, Khaled Abd El-Aziz Zaki A. The effect of mind mapping on cognitive achievement and critical thinking skills of nursing students. International Egyptian Journal of Nursing Sciences and Research. 2023;3(2):685-703.
20. Ernawati Y, Dewi IM. The effect of reflective clinical learning with mind map on critical thinking students at the nursing profession program in Yogyakarta. Indonesian Nursing Journal of Education and Clinic (INJEC). 2022;7(2):222-30.
21. YANG Y, LI J, LI J. Application value of individualized nursing care in intensive care unit patients with mind mapping as a guide. Chinese Journal of Integrated Traditional and Western Medicine in Intensive and Critical Care. 2019:463-6.
22. Lestari R, Wibowo ME, Awalya A. Group guidance of mind mapping to improve critical thinking skills. Jurnal Bimbingan Konseling. 2019;8(3):8-13.
23. De Jesus C. The Effectiveness of Mind Maps as an Instructional Approach for Developing Critical-Thinking Skills and Dispositions: A Meta-Analysis: University of San Francisco; 2024.
24. Azizi M, Ramezani G, Karimi E, Hayat AA, Faghihi SA, Keshavarzi MH. A comparison of the effects of teaching through simulation and the traditional method on nursing students' self-efficacy skills and clinical performance: a quasi-experimental study. BMC Nursing. 2022;21(1):283.
25. Maryam A, Mohammadreza D, Abdolhussein S, Ghobad R, Javad K. Effect of concept mapping education on critical thinking skills of medical students: a quasi-experimental study. Ethiopian journal of health sciences. 2021;31(2).
26. Anisi E, Sharifian P, Sharifian P. The effect of an educational orientation tour on anxiety of nursing students before their first clinical training: a quasi-experimental study. BMC Nursing. 2025;24(1):522.
27. Abdalla Jarelnape A, Idris Sagiron E. Evaluation of the effectiveness of Simulation-based teaching on nursing education: a systematic review. Egyptian Journal of Health Care. 2023;14(3):302-11.
28. Zheng X, Johnson TE, Zhou C. A pilot study examining the impact of collaborative mind mapping strategy in a flipped classroom: learning achievement, self-efficacy, motivation, and students' acceptance. Educational Technology Research and Development. 2020;68(6):3527-45.
29. E. S. A, Ibrahim Essawi Hendiya R, Fawzi El-boudy D, Hassan Abd El Mageed H, A. Abdel Latif A, Bekhatroh Rashed A. Effect of Mind Mapping Strategy on Nurses' Performance and Maternal Satisfaction Regarding Intrapartum Nursing Management. Egyptian Journal of Health Care. 2023;14(2):860-77.
30. Wang L, Wang Y, Wang X, Xue C. Effects of mind mapping based on standardized patient program in patient education among postgraduate nursing students in clinical setting. BMC Medical Education. 2023;23(1):982.
31. Zhang J, Jiao X, Ma X, Yu R, Pan J, Yuan M, et al. Effect of nursing care based on goal-oriented mind mapping model on the prognosis of patients with severe brain injury. Medicine (Baltimore). 2024;103(41):e39896.

