Original Article

Effects of Socratic Questioning on Academic Performance and Critical Thinking Dispositions among Nursing Students

Imran Masih, Madiha Mukhtar and Azeem Kaleem

ABSTRACT

Objective: To assess the effects of Socratic questioning on critical thinking disposition among nursing students and to assess the effects of Socratic questioning on academic performance among nursing students.

Study Design: A Quasi-Experimental Study

Place and Duration of Study: This study was conducted at the School of Nursing Pakistan Institute of Medical Sciences, affiliated with Shaheed Zulfiqar Ali Bhutto medical University Islamabad from March 2024 to Nov. 2024.

Methods: In this investigation, a quasi-experimental study design was employed. A universal census sampling strategy was used to select 40 nursing students from semester 7 School of Nursing Pakistan Institute of Medical Sciences. Critical thinking disposition was evaluated using a validated method, while academic achievement was evaluated using written assignments and quizzes. After a pre-assessment to gather baseline data, the participants received instruction using the Socratic questioning style. Data was gathered following the intervention in order to see the impact of the intervention in the post-assessment.

Results: Following the intervention, there was a noticeable difference between the two scores of critical thinking before and after the intervention. The post assessment of critical thinking had a significantly higher mean score of 167.20 with a standard deviation of 7.528 than the pre assessment 125.40 with a standard deviation (SD) of 7.472 ($p<.001$). Similarly the pre intervention mean academic performance score was 69.69 with a standard deviation of 3.279, which was increased to 89.44 with standard deviation of 3.074 ($p<.001$).

Conclusion: This study appears to have had a significant positive impact on both critical thinking skills and academic performance among nursing students. These results suggest that the intervention effectively enhanced both critical thinking and academic performance, highlighting the potential benefits of targeted interventions in nursing education.

Key Words: Socratic Questioning Method, Critical Thinking, Academic Performance, Nursing students

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INTRODUCTION

The evolving landscape of nursing education aims to address the complex demands of healthcare[1]. A significant part of this transformation involves adopting teaching strategies that promote deep learning and critical thinking. One such strategy is Socratic questioning, rooted in the teachings of Socrates. This method encourages students to critically analyze and reflect on questions, enhancing their problem-solving abilities, which are essential in nursing, where quick, sound decisions are necessary under pressure. Socrates believed that traditional lecturing was ineffective for all students, which led to the development of the Socratic method[2]. Socrates valued the existing knowledge of individuals, believing it could be leveraged to cultivate wisdom and awareness[3]. Despite its potential, there is limited evidence on how Socratic questioning impacts nursing students' academic achievement and critical thinking. The technique, with its roots in ancient Athens, has evolved over centuries and is applied across various fields like law, philosophy, and sciences[4]. In nursing education, traditional methods favor rote memorization, but these are no longer sufficient in a rapidly changing healthcare environment[5]. Over the last century, nursing instruction has moved from lecture-based to more interactive and active learning methods[6]. Influenced by educational philosophies such as radical constructivism and social learning theory, nursing educators are increasingly encouraged to adopt these methods to foster reflection

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and analytical thinking. Research supports the efficacy of Socratic questioning in improving students' critical thinking and academic performance, which are vital for clinical practice in healthcare[7]. Critical thinking (CT) is an essential skill in nursing, allowing practitioners to assess information and make informed decisions[8]. Critical Thinking Disposition (CTD) enhances decision-making and problem-solving abilities, making it a crucial aspect of nursing education[9]. In healthcare, CTD is especially important for nurses making decisions that impact patient outcomes. Understanding CTD can significantly improve nursing practice and patient care[10]. The Socratic method is recognized as an effective way to develop CTD[11], with research showing its impact on academic performance[12]. Academic performance encompasses various factors, including cognitive abilities, skills, and external influences, which are significantly impacted by instructional methods[13]. In nursing, adopting the Socratic method can enhance academic success and critical thinking, preparing students for real-world healthcare challenges[14]. This study aims to explore the role of Socratic questioning in improving nursing education. By addressing this gap, the research aims to enhance nursing education in Pakistan, ensuring that future nurses are better prepared to deliver high-quality patient care. The findings could inform educational interventions that both improve academic outcomes and foster critical thinking, preparing nursing students for the challenges of modern healthcare.

METHODS

Quasi experimental pre-post study design was used to assess the effects of Socratic questioning on critical thinking disposition and academic performance among nursing students. This study was conducted at School of Nursing Pakistan Institute of Medical Sciences, affiliated with Shaheed Zulfiqar Ali Bhutto medical University Islamabad from March 2024 to Nov. 2024. The study participants were the nursing students of seventh semester. A universal sample of n=40 participants was recruited through consensus method.

Ethical Approval Statement:

Inclusion criteria:

1. Both male and female students who were enrolled in Critical care course were recruited
2. Students having 80% attendance were recruited
3. Those who participated in two quizzes and two assignments were recruited.

Exclusion criteria

1. Those students were being excluded which are repeater and retake of classes of same semester
2. Those who did not to participate in quizzes and assignments.

RESULTS

The results indicate significant improvements in both critical thinking and academic performance following the intervention. The post-assessment mean score for critical thinking was 167.20 (SD = 7.528), showing a marked increase from the pre-assessment score of 125.40 (SD = 7.472), with a statistically significant t-test result (p = 0.000). Similarly, academic performance improved notably, with a mean score increase from 69.63 (SD = 3.279) pre-assessment to 89.44 (SD = 3.074) post-assessment, confirmed by a significant Wilcoxon signed-rank test (p = 0.000).

Table No. 1: Demographic Findings (n=40)

S. No	Demographic characteristics	Frequency	Percentage
1	**Age**		
	15-20 years	0	0.00%
	21-25 years	35	87.5%
	26 -30years S	5	12.5%
	30 years and above	0	0.00%
2	**Gender**		
	Male	4	10%
	Female	36	90%
3	**Academic Year**		
	Third Year	0	0.00%
	Fourth Year	40	100%
4	**Academic semester**		
	7th semester	40	100%

DESCREPTIVE STATISTICS

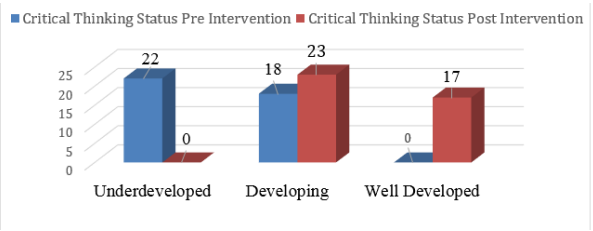

Figure No. 1: Critical Thinking Status Pre and Post Intervention n=40

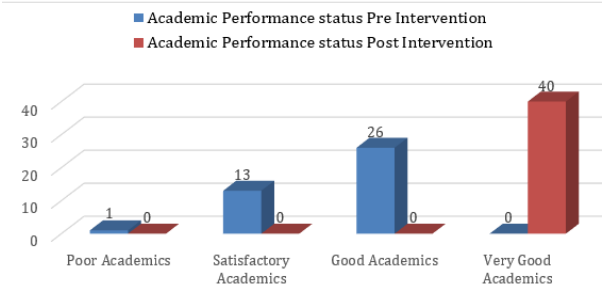

Figure No.2: Academic Performance Pre and Post Intervention (n=40)

According to the demographic profile of the study in Table 1, the bulk of the interventional group (35 participants, 87.5%) were between the ages of 21 and 25, while just a minor percentage (5 participants, 12.5%) were 26 years of age or older. No participants found in the age group 16 to 20 years or age above 30 years. The participant's group was made up of female participants (36 participants, 90%), whereas the male individuals (4 participants, 10%). All participants in the group were fourth-year students, guaranteeing uniformity in terms of educational advancement. Every participant was enrolled exclusively in their seventh semester, suggesting that they were all at a similar academic point in their nursing program.

Table No.2: Comparison of Critical Thinking score Pre-post intervention score (n=40)

Value	Pre Assessment **(Mean±SD)**	Post Assessment **(Mean ±SD)**	**t- test**	**P-value**
Critical Thinking	125.40± 7.472	167.20± 7.528	-511.943	.000

Paired t- test with p<.05 value as significant

Table No.3: Comparison of Academic Performance score Pre-post intervention score (n=40)

Value	Pre Assessment (Mean ±SD)	Post Assessment (Mean ±SD)	Z	P-value
Academic performance	69.63±3.279	89.44±3.074	-5.543[b]	.000

Wilcoxon Signed rank test with p<.05 value as significant

Wilcoxon signed rank test was used to evaluate the effect of Socratic questioning method on academic performance among nursing students. The comparison of academic performance scores between the pre and post intervention shows clear disparities after the intervention. There was a statistically significant difference between the academic performance before and after the intervention. The mean academic performance at the start was 69.69 with a standard deviation of 3.279, and it increased to 89.44 with a standard deviation of 3.074 with a p-value of 0.000 and a Z value of -5.543b.

DISCUSSION

The study demonstrated significant improvements in nursing students' critical thinking and academic performance after an intervention. Participants' assessments of their critical thinking skills showed noticeable progress, with the post-assessment mean score significantly higher at 167.20 (SD = 7.528), and a p-value of .000, indicating statistical significance. The results reflect the effectiveness of the intervention, as no participants were classified as "Under Developed" in critical thinking, and the majority showed "Developed" critical thinking abilities. These findings align with earlier studies that reported improvements in critical thinking following educational interventions[14,15]. In a similar context, studies involving flipped classrooms and problem-based learning have also yielded positive results. These active learning strategies not only enhanced critical thinking skills but also led to better academic performance. For instance, a study by Kousar and Afzal[16] highlighted improvements in critical thinking scores following a problem-based learning intervention, with statistical evidence showing significant gains. The flipped classroom approach was found to improve students' originality and intellectual integrity, reinforcing the idea that active, student-centered learning fosters critical thinking[15]. Moreover, a previous study by López et al[17] found that educational interventions can significantly enhance critical thinking skills in nursing students, emphasizing the importance of such initiatives for better decision-making in healthcare. This aligns with findings from Kazemi et al[18], who noted significant improvements in multiple dimensions of critical thinking, such as analysis, criticism, and self-confidence, after an intervention. In contrast, one study by Gonzalez et al[19] showed no significant change in critical thinking scores after a skills fair intervention. This suggests that not all educational interventions lead to improvements, underscoring the importance of choosing the right method for specific educational goals. Therefore, the design and content of the intervention must align with the desired learning outcomes. The current study also found a remarkable improvement in academic performance. All 40 participants in the intervention group achieved "Very Good" academic performance, moving beyond the "Satisfactory" and "Good" categories. The Wilcoxon signed-rank test revealed a significant increase in the intervention group's post-assessment ranks (Z = -5.543, p = 0.000), indicating a substantial improvement in academic achievement. Similar findings were reported in other studies, such as by Sert, Topçu, and Temel[20], who found that nursing students in an experimental group had significantly higher GPAs than those in a control group after an intervention. Additionally, a study by Kim et al[21] demonstrated that peer tutoring programs improved academic performance, further supporting the importance of interactive learning strategies. Overall, these studies consistently highlight the effectiveness of active learning approaches, such as flipped classrooms and problem-based learning, in enhancing critical thinking and academic performance in nursing students. However, some studies also suggest that not all interventions yield positive outcomes, indicating that future research should focus on refining intervention designs to maximize their impact. Active, student-centered methods like Socratic questioning can thus play a crucial role in preparing nursing students for the complex demands of healthcare, improving both their critical thinking abilities and academic performance.

CONCLUSION

The effectiveness of Socratic questioning in promoting higher-order thinking skills is demonstrated by the large rise in critical thinking and academic performance scores among the study participants. Based on the study's findings, nursing students' academic performance and critical thinking skills are significantly improved by Socratic questioning. Academic performance and critical thinking scores did increased with statistically significance during the post-assessment period. The method's impact on academic results was further demonstrated by the fact that the study participant's academic performance scores were much higher than those of the pre assessment. These findings imply that incorporating Socratic questioning into nursing school might improve students' academic performance and critical thinking skills, giving them the tools they need to make clinical decisions and advance their careers.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Imran Masih, Madiha Mukhtar
Drafting or Revising Critically:	Imran Masih, Azeem Kaleem
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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