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Revolutionizing Nursing Education: Problem-Based Learning vs. Traditional Methods for Higher-Order Thinking: A Systematic Review

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Abstract

Traditional lecture-based teaching in nursing education faces increasing criticism for inadequately preparing students for the complex demands of contemporary healthcare. Problem-based learning (PBL) has emerged as an alternative pedagogical approach emphasizing active learning, critical thinking, and problem-solving through real-world clinical scenarios.This systematic review examines the effectiveness of PBL compared to traditional teaching methods in enhancing higher-order thinking skills among nursing students. A comprehensive search of electronic databases (PubMed et al.) encompassed studies published between 2019 and 2024. Studies focusing on nursing students or trainees in higher education settings, comparing PBL to traditional learning methods and reporting outcomes related to higher-order thinking skills were included. The review identified twenty-seven (27) studies that met the inclusion criteria, including qualitative and quantitative designs, systematic reviews, meta-analyses, and randomized controlled trials. The findings consistently indicate that PBL significantly improves critical thinking, problem-solving abilities, and applying theoretical knowledge to practice compared to traditional teaching approaches. PBL's success stems from its ability to create an active, engaging learning environment that mirrors the challenges nurses face in real-world settings. The evidence strongly supports the integration of PBL into nursing education curricula. While traditional teaching methods retain value in conveying foundational knowledge, incorporating PBL is essential for equipping students with critical thinking and problem-solving skills necessary to deliver high- quality care in today's complex healthcare landscape.

Keywords: Higher-Order Thinking among Nursing Students, Problem-Based Learning, Systematic Review, Traditional Learning Methods.

INTRODUCTION

Traditional learning methods, particularly lecture-based teaching, have long dominated nursing education. However, this method of learning has been increasingly criticized for failing to prepare nursing students for today's complex healthcare environment. Traditional lectures are often teacher-centred and focus on the passive transfer of knowledge from the instructor to the student, usually limiting engagement in learning and minimizing the development of critical thinking skills (Du et al., 2022). In the fast-paced and ever-evolving healthcare industry, nurses must possess strong critical thinking and problem-solving skills to address complex patient needs effectively and make sound clinical decisions (Moorman et al., 2017). Although traditional courses provide essential knowledge,

this fundamental active engagement and application of knowledge in practical scenarios, which are necessary to develop these essential skills, are not encouraged (Purghazian et al. As a result, educators and researchers have a growing consensus that more interactive and student-centred approaches, such as problem-based learning and simulation, are needed to develop critical thinking and decision-making skills essential for contemporary nursing practice (Felicidad-Reynaldo & Utley, 2015). Educators are increasingly emphasizing the essential imparting of thinking and problem-solving skills to future nurses, aiming to enhance the quality of patient care. This shift in focus is transforming the approach to nursing education. While traditional lectures are integral for providing essential knowledge to nurses, they have faced criticism for their limited effectiveness in fostering critical thinking abilities, such as information analysis, making connections, and situational assessment (University of Tulsa, 2024). These skills are imperative for healthcare professionals to effectively process information, comprehend complexities, and navigate crises, ultimately delivering optimum patient care (Papathanasiou et al., 2024). In response to these challenges, Problem-Based Learning (PBL) has emerged as an innovative educational approach in nursing. Unlike traditional methods, PBL immerses students in real clinical scenarios, strongly emphasising the student's learning journey. This methodology enhances information retention and fosters teamwork and practical application of theoretical knowledge (Wei et al., 2024; Matlala, 2021). Integrating PBL in nursing institutions has yielded positive results, including increased student satisfaction and improved skill acquisition. This approach has facilitated the development of students' ability to make prompt decisions (PubMed, 2023). However, despite the growing adoption of PBL in nursing programs, there remains insufficient evidence to ascertain its superior efficacy in promoting profound thinking compared to traditional teaching methods. It is crucial for educational institutions and policymakers to conduct comprehensive evaluations to ensure evidence-based strategies are employed, adequately preparing students for the complexities of contemporary healthcare. Systematic reviews and studies that consolidate diverse data are invaluable for addressing these gaps, distilling extensive information into actionable recommendations for advancing evidence- based teaching methods in nursing education.

METHODOLOGY

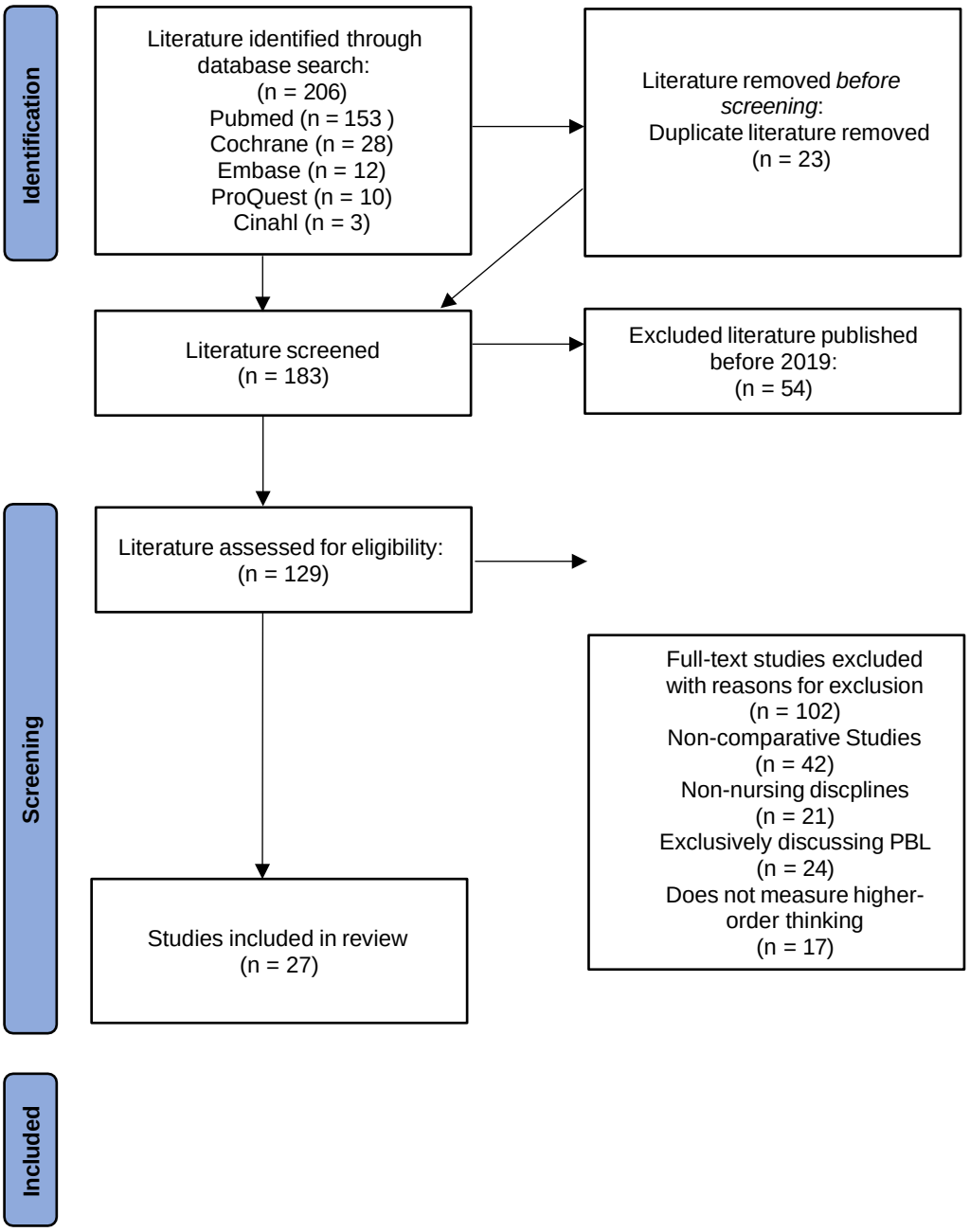
The following steps were undertaken in the composition of this systematic review: The classical evidence-based methodology for formulating the research question typically encompasses the elements of population, intervention(s), comparison, outcome(s), and study design (Hosseini et al., 2024). The population

(P) in this review comprises nursing students. The intervention(s) (I) identified is the problem-based approach in nursing education, which was evaluated in comparison

(C) to traditional learning methods. The desired outcome(s) (O) of this systematic review is enhancing higher-order thinking among nursing students.

Review Procedure

Figure 1.



The Flow diagram of the systematic review process.

Literature Search Strategy

Electronic database searches were conducted through the following databases: PubMed, Cochrane, CINAHL, Embase, and ProQuest. No language or date restrictions were imposed during the search process. The complete search strategy utilized by the researcher is available in Supplementary File 1. Two (2) results were identified in PROSPERO using the key terms "problem-based learning" (PBL) and "traditional learning methods." However, these results pertained to a systematic review of PBL in physiotherapy and the efficacy of interprofessional knowledge, clinical skills, and self-confidence in nursing education. Additional electronic sources and references were also examined to identify relevant

information meeting the established inclusion criteria.

Data Collection and Extraction

Data collection and extraction were carried out independently by two authors. They recorded information on the following domains: study citation, study design, setting, country, study period, inclusion/exclusion criteria, number of participants, methodology, outcomes, and time points. The third author resolved any discrepancies in the authors' judgments, resulting in a single consolidated dataset. The researchers used Zotero software in data collection and extraction.

Inclusion and Exclusion Criteria

Studies included in this review included nursing students or 1. trainees in higher education and nursing faculty in delivering the teaching methods as respondents or population. Randomized controlled trials (RCT), systematic reviews and meta-analyses as the articles provided relevant comparisons with PBL and traditional learning methods with outcome measures or reporting higher-order thinking skills. Studies in another language that were translated into English were included in this review. The articles, including theses and dissertations, were peer- reviewed with full text available. The selected literature was published between 2019 and 2024. Studies that talk exclusively about PBL alone and hybrid or mixed methods without clear distinction, non-nursing disciplines or professionals and participants that are not in higher education, including professional practice, were excluded from this review.

Search Outcomes

Two hundred six (206) pieces of literature were identified using database searching. The researchers used SR Accelerator software to remove duplicates. After deduplication, one hundred eighty-three (183) pieces of literature were screened for relevance to the topic. Titles or abstracts were screened for relevance to the inclusion and exclusion criteria. This literature was rigorously evaluated by reviewing the entire text in Zotero to determine the details of the studies. Nine (109) studies were excluded or did not fit the inclusion criteria. Twenty-seven (27) passed the screening process and were included in this review. These include qualitative and quantitative designs, systematic reviews, meta-analyses and RCTs.

RESULTS AND DISCUSSION

The following sections will present a detailed analysis of the results, exploring the specific benefits and challenges associated with PBL and traditional teaching methods while also considering future directions for research and implementation.

Several sources highlight PBL as a valuable tool for improving nursing education. For instance, Wei et al. (2023) conducted a meta-analysis focusing specifically on PBL's impact on nursing students' critical thinking. The study concluded that PBL significantly improves these skills compared to control groups using traditional methods. Sharma et al. (2022) echo this sentiment in their meta- analysis, indicating PBL's effectiveness in fostering analytical and evaluative skills essential for critical thinking in nursing.

A specific example of PBL implementation and its benefits is illustrated in Chang et al. (2019). This study analyses a 'nursing case-based learning' course, a form of PBL, and its effect on undergraduate nursing students' critical thinking abilities. When paired with a carefully structured instructional design, the researchers discovered that this approach significantly boosted students' capacity for critical thought.

This finding is crucial as it highlights the importance of structured implementation for maximizing the impact of PBL.

PBL's impact on crucial nursing competencies is further explored by Huang et al. (2019). This longitudinal study investigated how PBL affected nursing students' self-evaluation of their core competencies. They discovered that prolonged exposure to PBL, precisely three years, resulted in higher self-assessed scores across several competencies, including learning attitude, information analysis, execution, and lifelong learning. This finding underscores the long-term benefits of integrating PBL throughout a nursing curriculum.

Significantly, the benefits of PBL extend beyond critical thinking. Chang et al. (2019) also observed that their 'nursing case-based learning' course, built around real-world patient cases, enabled students to connect theoretical knowledge with practical application. The researchers emphasize that this connection is vital for preparing students to handle the complex and multifaceted problems they will face in their careers. A meta-analysis by Sharma et al. (2023) demonstrated that PBL interventions significantly improve overall critical thinking scores compared to traditional methods. His finding aligns with the broader research on PBL's impact on higher education, as highlighted in a meta-analysis by (Zhao et al., 2022), which found PBL to be enormously influential in cultivating critical thinking skills and dispositions.

The sources suggest that PBL's use of realistic clinical scenarios provides students practical experience in applying knowledge and developing problem-solving skills. A study cited in (Wei et al., 2024) reinforces this notion, noting that PBL offers a simulated environment for tackling real-life problems, ultimately enhancing students' problem-solving abilities. Another study referenced in (Li et al., 2021) found that nursing students exposed to multi-episode case studies through PBL demonstrated significant improvements in their perceived problem-solving abilities.

A recurring theme in the sources is PBL's effectiveness in bridging the gap between theoretical knowledge and its practical application. (Li et al., 2021) suggests that PBL, as a form of contextual learning, helps nurses transition smoothly into practice by simulating work environments.

The sources suggest that traditional teaching, often characterized by lectures, can create a passive learning environment where students primarily function as recipients of information. This passive role may not effectively engage students or encourage them to analyze and apply the information presented critically. For instance, (Wei et al., 2024) and (Li et al., 2021) highlight the benefits of active learning methods like PBL in providing simulated environments and case studies that encourage active problem-solving, contrasting this with the more passive nature of traditional lectures.

While the sources primarily focus on the limitations of traditional teaching, it is important to note that traditional methods can still offer some benefits, particularly in conveying foundational knowledge. Traditional lectures can efficiently deliver a large amount of information to a large group of students. This can be useful for conveying foundational knowledge and establishing a shared understanding of critical concepts before progressing to more interactive or applied learning activities. Traditional teaching often follows a structured format, benefiting some learners who prefer a clear and predictable learning path. This structured approach can help students organize information and track their progress through the curriculum.

A consistent critique of traditional teaching in the sources is its perceived struggle to connect theoretical knowledge with practical application in real-world clinical settings. This disconnect can be particularly challenging for nursing students as they transition from the classroom to clinical practice, potentially

impacting their confidence and competence in applying learned concepts. (Li et al., 2021), For instance, it emphasizes the role of contextual learning, such as PBL, in easing this transition by simulating work environments, indirectly highlighting a potential weakness of traditional methods in this area.

While the sources predominantly highlight the drawbacks of traditional teaching methods in nursing education, it is crucial to acknowledge their potential role in efficiently delivering foundational knowledge and providing a structured learning experience. Traditional lectures can efficiently deliver a large amount of information to a large group of students. This can be useful for conveying foundational knowledge and establishing a shared understanding of critical concepts before progressing to more interactive or applied learning activities. Traditional teaching often follows a structured format, benefiting some learners who prefer a clear and predictable learning path. This structured approach can help students organize information and track their progress through the curriculum.

CONCLUSION

The findings of this systematic review strongly advocate for integrating Problem-Based Learning (PBL) into nursing education curricula. The analysis of various studies consistently demonstrates that PBL significantly enhances critical thinking, problem-solving skills, and applying theoretical knowledge to real-world clinical practice.

While the sources highlight the benefits of PBL, they also acknowledge the ongoing importance of traditional teaching methods for establishing foundational knowledge and providing a structured learning framework. However, to effectively prepare nursing students for the complexities of modern healthcare, educators must adapt traditional approaches to incorporate more active, student-centred learning, with PBL emerging as a particularly compelling model.

The emphasis on PBL reflects a broader movement within nursing education towards pedagogical methods that better equip students with the necessary skills for contemporary healthcare challenges. While the sources do not explicitly critique traditional methods, the consistent emphasis on PBL's success in fostering critical thinking and problem-solving implicitly highlights the limitations of lecture-based teaching. This aligns with broader critiques of traditional education, which often falls short in preparing students for the demands of complex, real-world situations.

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