

Team-Based Learning in Health Education: A Scoping Review

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Abstract

Aim: This study aimed to map and critically examine the existing evidence on the use of Team-Based Learning (TBL) in health higher education, focusing on educational outcomes and methodological trends. **Methods:** A Scoping Review was conducted following the Joanna Briggs Institute (JBI) methodology and PRISMA-ScR guidelines, including studies addressing TBL in undergraduate and postgraduate health programs. **Results:** The literature shows a predominance of studies in medicine and nursing education. TBL is associated with improved academic performance, student engagement, teamwork, and self-directed learning when compared with traditional lectures. However, evidence regarding higher-order outcomes, such as clinical reasoning, long-term retention, and patient-related impact, remains limited. Considerable heterogeneity was identified in TBL implementation, with frequent use of modified formats and a predominance of quasi-experimental designs. **Conclusions:** TBL demonstrates consistent benefits for short-term learning outcomes, but stronger methodological designs and evaluation of higher-level educational and clinical outcomes are needed.

Keywords: Education; Education, Professional; Learning; Problem-Based Learning; Teaching.

1. Introduction

Health higher education faces increasing demands to prepare graduates able to manage complexity, work interprofessionally, and apply knowledge in dynamic clinical contexts. Traditional lecture-based approaches show limitations in promoting active learning and higher-order thinking (Fatmi et al., 2013; Reimschisel et al., 2017). Consequently, active methodologies have expanded across health professions education.

Team-Based Learning (TBL) is a structured strategy integrating individual preparation, teamwork, and immediate feedback. Although originally developed outside health education, it is now widely adopted in medicine, nursing, pharmacy, dentistry, and allied health programs (Alizadeh et al., 2024; Cranford et al., 2025; Trill et al., 2024).

Reviews consistently report positive effects on academic performance and engagement compared with lectures (Alizadeh et al., 2024; Considine et al., 2020; Sterpu et al., 2024). In nursing and midwifery, TBL has been associated with higher satisfaction, improved communication, and greater self-directed learning (Alberti et al., 2020; Dearnley et al., 2018). Similar findings emerge in interprofessional and geriatrics education, particularly regarding collaboration (Joshi et al., 2022; Pajuelo-Vasquez et al., 2023).

However, important limitations persist. Evidence is centred mainly on short-term cognitive outcomes, with limited exploration of clinical reasoning, long-term retention, or patient-related measures (Roossien et al., 2025; Sterpu et al., 2024). Furthermore, frequent modifications of the classical model weaken comparability (Reimschisel et al., 2017; Sterpu et al., 2024). Most studies rely on descriptive or quasi-experimental designs, with few randomized or theory-informed investigations (Cleland et al., 2025; Fatmi et al., 2013). Given the rapid expansion and heterogeneity of TBL, mapping the evidence is essential. This review synthesizes current knowledge, identifies dominant trends, and highlights research gaps.

2. Methods

This scoping review followed the JBI methodology for scoping reviews (Peters et al., 2020) and reported in accordance with the PRISMA-ScR guidance (Tricco et al., 2018). The protocol is registered (10.17605/OSF.IO/J4D9S).

2.1. Search Strategy

Searches were conducted in January 2026 in PubMed, CINAHL, ERIC, and Scopus using combinations of “Team-Based Learning” and health education descriptors, combined with the Boolean operators AND and OR. Strategies were adapted to each database. Reference lists of reviews were screened. No date limits were applied.

2.2. Eligibility Criteria

We included empirical studies examining TBL in undergraduate or postgraduate health education and reporting outcomes on knowledge, skills, attitudes, or competencies. Non-health and non-empirical publications were excluded. Two reviewers conducted screening, with a third resolving disagreements.

2.3. Data Extraction and Analysis

Data on discipline, level, design, implementation, and outcomes were extracted. Findings were synthesized descriptively and thematically.

3. Results

Of 348 records, 24 duplicates were removed. After screening, 48 full texts were excluded, and 19 studies were included. Results are presented by disciplinary contexts, outcomes, and methodological features.

3.1. Disciplinary Contexts and Settings

Most studies were conducted in medicine and nursing education, followed by pharmacy, dentistry, and allied health fields (Considine et al., 2020; Cranford et al., 2025; Trill et al., 2024). The majority focused on undergraduate education, with fewer studies addressing postgraduate or clinical training contexts (Dearnley et al., 2018; Hobenu et al., 2025). Geographically, research has been concentrated in the United States and China, with limited representation from Europe and low- and middle-income countries (Alizadeh et al., 2024; Sterpu et al., 2024).

In nursing and medical education, TBL is widely applied, particularly in undergraduate and pre-clinical settings, to promote collaborative learning, clinical reasoning, and theory–practice integration. Evidence suggests positive effects on student engagement, communication skills, and individual accountability, although substantial variability persists in implementation and assessment approaches (Alberti et al., 2020; Considine et al., 2020; Dearnley et al., 2018). While TBL shows strong conceptual support, especially in foundational science courses, its use in advanced clinical contexts remains less systematic, with limited evidence regarding long-term outcomes and transfer to professional practice (Cleland et al., 2025; Sterpu et al., 2024). Moreover, most studies are confined to academic settings, with limited representation of real clinical or in-service contexts (Hobenu et al., 2025).

Other health disciplines, including pharmacy, dentistry, physician assistant education, and allied health professions, present a smaller yet growing evidence base. These studies point to the potential of TBL to foster critical thinking, shared decision-making, and preparation for interprofessional practice, although implementation is often episodic and restricted to specific modules (Cranford et al., 2025; Joshi et al., 2022; Trill et al., 2024).

Research on TBL is predominantly centered on undergraduate programmes, with limited attention to postgraduate education, continuing professional development, and advanced clinical training (Joyce et al., 2025; Moffett et al., 2021). Geographically, studies are concentrated in the United States and China, reflecting global asymmetries and limited representation from Europe and low- and middle-income countries, which raises concerns about transferability (Alizadeh et al., 2024; Sterpu et al., 2024). Overall, despite being well documented, TBL research remains disciplinarily concentrated, predominantly academic, and geographically uneven, highlighting the need for studies in authentic clinical settings and underrepresented contexts.

3.2. Educational Outcomes

Across disciplines, TBL was associated with improved academic performance when compared with lecture-based instruction (Alberti et al., 2020; Fatmi et al., 2013; Joshi et al., 2022). Additional benefits included increased student engagement, satisfaction, teamwork, communication, and self-directed learning (Considine et al., 2020; Dearnley et al., 2018; Pajuelo-Vasquez et al., 2023). Evidence regarding long-term knowledge retention, clinical reasoning, and professional decision-making was inconsistent or limited (Pajuelo-Vasquez et al., 2023; Roossien et al., 2025; Sterpu et al., 2024). Few studies explored patient-related outcomes or links between TBL and clinical performance (Cranford et al., 2025; Joshi et al., 2022).

The available evidence indicates relatively consistently that TBL is associated with short-term improvements in academic performance when compared with traditional lecture-based teaching methods. Systematic reviews and umbrella reviews report modest but statistically significant gains in knowledge tests and summative assessments, particularly in pre-clinical and undergraduate education contexts (Alberti et al., 2020; Alizadeh et al., 2024; Fatmi et al., 2013; Joshi et al., 2022). These effects appear to be more pronounced in disciplines with a strong conceptual component, such as medicine and nursing, where TBL has been implemented more systematically (Considine et al., 2020; Sterpu et al., 2024).

Beyond academic performance, the literature consistently reports benefits in terms of student engagement, satisfaction with the learning process, and perceived pedagogical value of TBL. Studies across different health disciplines describe improvements in teamwork, interpersonal communication, and self-directed learning, in alignment with the principles of student-centered education and collaborative learning (Considine et al., 2020; Dearnley et al., 2018; Pajuelo-Vasquez et al., 2023). These outcomes are most often supported by self-reported data collected through satisfaction questionnaires and perceived learning scales.

However, evidence regarding more complex and long-term educational outcomes remains substantially weaker, particularly due to the lack of longitudinal studies capable of demonstrating its long-term effectiveness. Knowledge retention in the medium and long term, the development of clinical reasoning, and professional decision-making are underexplored and show inconsistent findings across studies (Roossien et al., 2025; Sterpu et al., 2024). Similarly, few studies have established clear links between participation in TBL and outcomes related to clinical performance or patient care, representing a significant gap in the literature, particularly within clinical and professional training contexts (Cranford et al., 2025; Joshi et al., 2022).

3.3. Implementation Characteristics

Substantial heterogeneity was observed in the operationalization of TBL. Many studies reported modified versions of the classical TBL model, omitting essential components such as readiness

assurance tests or structured team application exercises (Reimschisel et al., 2017; Sterpu et al., 2024). This variability complicates comparisons across studies and limits conclusions regarding the pedagogical mechanisms of TBL (Roossien et al., 2025).

One of the most salient characteristics of the literature on TBL in health education is the high degree of heterogeneity in its implementation. Although the classic TBL model comprises well-defined components - such as individual and team readiness assurance tests, immediate feedback, and structured team application exercises - many studies report adapted or partial versions of the method (Reimschisel et al., 2017; Sterpu et al., 2024).

These adaptations often involve omitting readiness assurance tests, reducing application time, or integrating TBL with other methods (e.g., problem-based learning or simulation). While context-driven, such modifications raise concerns about implementation fidelity and the validity of reported outcomes (Roossien et al., 2025).

Variability in TBL implementation limits comparability across studies and hinders identification of underlying pedagogical mechanisms. Inadequate reporting of TBL components further compromises replicability and the linkage between instructional design and outcomes (Reimschisel et al., 2017; Roossien et al., 2025). This issue is particularly evident outside medicine and nursing, where TBL is often implemented episodically (Cranford et al., 2025; Trill et al., 2024).

3.4. Methodological Trends

Most studies employed quasi-experimental or descriptive designs, frequently relying on self-reported measures of satisfaction and perceived learning (Cleland et al., 2025; Considine et al., 2020). Randomized controlled trials and theory-driven investigations were scarce (Fatmi et al., 2013; Roossien et al., 2025). The literature was characterized by a predominance of justification studies, with limited exploration of explanatory mechanisms (Cleland et al., 2025).

4. Discussion

This scoping review synthesizes the current evidence on TBL in health higher education, highlighting consistent benefits alongside important limitations. Overall, the findings indicate that TBL is associated with improvements in short-term educational outcomes, particularly academic performance, student engagement, teamwork, and self-directed learning. These results are in line with previous reviews in health professions education (Alizadeh et al., 2024; Considine et al., 2020; Fatmi et al., 2013), reinforcing the relevance of active and collaborative learning strategies in preparing health professionals.

The positive effects observed may be explained by the core pedagogical principles underlying TBL, including structured peer interaction, individual accountability, and immediate feedback

(Reimschisel et al., 2017). These elements align with constructivist and social learning perspectives, supporting active knowledge construction and deeper engagement with content. In this sense, TBL appears particularly effective in structured educational environments, especially in undergraduate and pre-clinical settings, where foundational knowledge and teamwork can be systematically integrated (Cleland et al., 2025; Sterpu et al., 2024).

Despite these consistent benefits, the available evidence remains largely focused on short-term cognitive and affective outcomes. More complex educational outcomes, such as clinical reasoning, long-term knowledge retention, and transfer to professional practice, remain underexplored and show inconsistent findings (Roossien et al., 2025; Sterpu et al., 2024; Pajuelo-Vasquez et al., 2023). This limitation may be explained by the predominance of quasi-experimental and descriptive designs, as well as the frequent use of self-reported measures of learning and satisfaction (Cleland et al., 2025; Considine et al., 2020). Consequently, current evidence provides stronger support for the immediate educational benefits of TBL than for its long-term impact on professional competence and patient-related outcomes.

A further critical key finding concerns the heterogeneity in TBL implementation. Many studies report modified or partial versions of the classical TBL model, often omitting essential components such as readiness assurance processes or structured team application exercises (Reimschisel et al., 2017; Sterpu et al., 2024). While these adaptations may reflect contextual and institutional constraints, they raise concerns regarding implementation fidelity and comparability across studies (Roossien et al., 2025). This variability limits the ability to identify which elements of TBL are most responsible for the observed outcomes and contributes to inconsistencies in the evidence base.

The analysis also suggests that TBL is not equally effective across all educational contexts. It appears to be particularly well suited to undergraduate and pre-clinical settings, as well as to learning environments that aim to promote collaboration, communication, and student engagement (Cleland et al., 2025; Joshi et al., 2022). Conversely, its effectiveness may be more limited in advanced clinical contexts that require highly individualized decision-making or in settings where faculty training and institutional resources are insufficient to support full implementation of the method.

From a practical perspective, these findings support the use of TBL as a complementary pedagogical strategy rather than as a complete replacement for traditional teaching approaches. Effective implementation requires alignment with learning objectives, preservation of key structural components of the model, and adequate faculty development (Reimschisel et al., 2017; Considine et al., 2020). Particular attention should be given to avoiding diluted or hybrid implementations that may compromise the pedagogical integrity of TBL.

When positioned in relation to previous reviews, the findings of this study confirm the general trend of positive short-term outcomes associated with TBL while also reinforcing concerns

regarding methodological limitations and gaps in the literature (Alizadeh et al., 2024; Cleland et al., 2025; Roossien et al., 2025). This review contributes by offering a broader synthesis across multiple health disciplines and by highlighting patterns in study design, implementation variability, and outcome assessment. In particular, the predominance of justification studies and the limited number of theory-driven and longitudinal investigations identified in previous research (Cleland et al., 2025) are further corroborated.

This review presents several limitations that should be considered when interpreting the findings. As a scoping review, no formal quality appraisal of the included studies was conducted, which limits the assessment of methodological robustness. Additionally, the relatively small number of included studies and the predominance of quasi-experimental designs may affect the generalizability of conclusions. The heterogeneity in TBL implementation and the frequent reliance on self-reported outcomes further constrain interpretability (Considine et al., 2020).

Future research should prioritize more rigorous, theory-informed, and longitudinal study designs capable of assessing the sustainability of learning outcomes and their transfer to clinical practice (Fatmi et al., 2013; Roossien et al., 2025). Greater standardization in outcome measures and more detailed reporting of implementation processes would strengthen the evidence base. Additionally, the integration of digital tools and hybrid learning environments within TBL frameworks (Burton et al., 2024) represents a promising direction for future investigation. Furthermore, the findings indicate that variability in TBL implementation is not merely a contextual feature but a central factor limiting comparability, interpretability, and cumulative knowledge development in this field.

5. Conclusions

This scoping review highlights TBL as a promising pedagogical approach in health higher education, particularly for enhancing student engagement, collaboration, and short-term academic outcomes. However, evidence remains focused on immediate cognitive gains, with limited insight into higher-order competencies such as clinical reasoning and transfer to practice. Variability in implementation further constrains generalizability. Future research should prioritize rigorous, theory-informed, and longitudinal designs to better understand the sustainability and impact of TBL. Overall, its effective integration into curricula requires fidelity to the model, pedagogical rigor, and alignment with learning objectives.

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