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Medical Students' Attitudes About Team-Based Learning in a Pre-Clinical Curriculum

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ABSTRACT

Background: Team-Based Learning (TBL) has gained prominence in medical education for promoting active learning and critical thinking, especially within pre-clinical settings. Despite widespread integration of TBL, medical students' attitudes toward this instructional strategy remain diverse and influenced by factors such as teamwork dynamics, content mastery, and learning autonomy.

Methodology: This cross-sectional study, conducted at Khyber Medical University, involved 115 pre-clinical medical students. A structured questionnaire assessed students' perspectives on TBL in terms of engagement, collaboration, and knowledge retention. The data were analyzed quantitatively to determine levels of satisfaction and perceived effectiveness.

Results: The findings reveal a generally positive attitude toward TBL, with students appreciating its role in enhancing their learning experience. Approximately 78% of participants reported improved understanding of complex topics, while 82% felt TBL helped build essential teamwork skills. However, challenges such as time constraints and uneven participation were also reported.

Conclusion: TBL positively influences pre-clinical medical students' learning experience, fostering both academic and interpersonal skill development. Addressing the challenges identified could further enhance TBL's effectiveness as an instructional method in medical education.

Keywords: Team-Based Learning, Medical Education, Student Attitudes, Pre-clinical Curriculum, Khyber Medical University

INTRODUCTION

Team-Based Learning (TBL) has transformed traditional educational frameworks, particularly within the field of medical education¹. By encouraging active student participation, TBL shifts the educational focus from passive reception to collaborative problem-solving. In pre-clinical settings, this method enhances critical thinking and communication skills, essential for future clinical practice². Unlike conventional lectures, TBL sessions are designed to actively involve students through small-group interactions and problem-based assignments, fostering a deeper understanding of complex subjects³.

In recent years, medical institutions worldwide have adopted TBL to complement traditional lectures, particularly within pre-clinical curricula^{4 5}. Pre-clinical students, who often experience overwhelming volumes of information, can benefit from TBL's structured, interactive approach that emphasizes teamwork and retention^{6 7}. However, attitudes toward TBL vary significantly among students, and these perceptions can impact their learning outcomes and engagement. Understanding these attitudes is vital to refining the TBL approach for better academic and interpersonal development.

Khyber Medical University has integrated TBL into its pre-clinical curriculum to address the growing need for interactive and student-centered learning methods. Although TBL has shown positive results globally, its impact and reception among students in this institution remain underexplored. With its unique cultural and educational environment, understanding how students at Khyber Medical University perceive TBL can provide insights into its broader applicability and effectiveness in the region.

Student attitudes toward TBL in medical education are influenced by several factors, including group dynamics, content difficulty, and the structure of assessments. Positive experiences with TBL often correlate with improved learning outcomes, greater academic satisfaction, and the development of soft skills such as communication and teamwork. Conversely, challenges such as unequal group participation and time limitations can detract from the effectiveness of TBL and affect students' overall perceptions of its value.

This study aims to provide a comprehensive analysis of pre-clinical medical students' attitudes toward TBL at Khyber Medical University. By examining students' perspectives on TBL's role in enhancing understanding, engagement, and skill development, this research seeks to identify both the benefits and potential drawbacks of this learning method. This information is crucial for curriculum developers aiming to implement or refine TBL in similar educational settings.

The findings of this study will add to the growing body of literature on TBL in medical education, particularly within the context of South Asia. By evaluating TBL's impact on student engagement and knowledge retention, the study will offer insights into the practical challenges and successes of this instructional approach. Ultimately, this research seeks to contribute to the improvement of TBL implementation strategies, ensuring that medical students derive maximum benefit from this collaborative learning model.

Methodology

This cross-sectional study was conducted at Khyber Medical University, focusing on pre-clinical medical students to assess their attitudes toward Team-Based Learning (TBL). The research spanned three months, aligning with the academic calendar to ensure that students had sufficient exposure to TBL sessions prior to data collection.

Ethical approval for the study was obtained from the Khyber Medical University Ethics Review Committee. Written informed consent was acquired from each participant before they completed the questionnaire, with clear explanations provided regarding the purpose of the study and the confidentiality of their responses. Students were also informed of their right to withdraw from the study at any time without any academic consequences.

The study sample consisted of 115 pre-clinical students enrolled in the university's medical program. A convenience sampling method was used to recruit participants from various pre-clinical year groups. This approach allowed for a diverse representation of student perspectives, as students at different stages of their pre-clinical curriculum had varied experiences with TBL. Students who had attended at least three TBL sessions were eligible to participate, ensuring they had sufficient familiarity with the learning method to provide informed feedback.

A structured questionnaire was developed based on validated surveys in educational research, adapted to fit the context of TBL within medical education. The questionnaire included both closed and open-ended questions, organized into three main sections:

Demographics – Information such as age, gender, and year of study was collected to evaluate if these variables influenced students' attitudes toward TBL.

TBL Effectiveness – Items in this section assessed students' perceived impact of TBL on their academic engagement, content comprehension, and knowledge retention.

Skill Development and Engagement – Questions were included to evaluate how TBL contributed to teamwork, critical thinking, and active learning.

Responses to closed-ended questions were recorded on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree," allowing for quantitative analysis of students' attitudes. Open-ended responses provided qualitative insights into specific challenges and benefits perceived by the students.

Prior to full-scale data collection, the questionnaire was piloted with a small subset of ten students who met the eligibility criteria. This pilot test helped refine the questions for clarity and relevance, ensuring that the survey was concise and effectively captured the intended data. Minor adjustments were made based on student feedback from the pilot phase.

The finalized questionnaire was administered in person during regular class hours to maximize response rates. To maintain anonymity and encourage honest responses, students were informed that their participation was voluntary and that their feedback would be confidential. Each questionnaire took approximately 15 minutes to complete. Research team members were available to clarify any questions related to the survey items.

Quantitative data from the Likert-scale responses were analyzed using descriptive and inferential statistics. Frequencies and percentages were calculated for each item to understand the overall distribution of attitudes. To assess potential differences in attitudes by demographic variables, independent t-tests and ANOVA were applied, with a significance level set at $p < 0.05$. Qualitative responses from open-ended questions were analyzed thematically, identifying common themes regarding students' perceived benefits and challenges with TBL. These qualitative insights complemented the quantitative findings, providing a comprehensive understanding of students' attitudes toward TBL.

Results

This table shows a balanced demographic representation, with a nearly equal number of male and female students across all three preclinical years. The average age of participants was around 20.5 years, indicating they are at a typical pre-clinical stage in medical education, allowing for generalized findings regarding attitudes in this curriculum phase.

Table 1: Demographic Characteristics of Participants

Variable	Value
Age (mean $\pm$ SD)	20.5 $\pm$ 1.2 years
Gender (M/F)	54/61
Year of Study (Preclinical Year)	Year 1: 38
	Year 2: 40

	Year 3: 37
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The Chi-square test for TBL effectiveness yielded a statistic of 9.46 with a p-value of 0.305, indicating no statistically significant differences among student responses across different aspects of TBL effectiveness (understanding, retention, and engagement). This consistency suggests that students generally perceive TBL positively, with similar appreciation for its role in enhancing understanding, retention, and engagement.

Table 2: TBL Effectiveness

TBL Aspect	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Improved Understanding of Content	35	43	15	5	2
Enhanced Retention of Knowledge	30	48	17	3	2
Increased Engagement	45	35	10	8	2
Chi-square statistic	9.46				
p-value	0.305				

For skill development, the Chi-square statistic is 4.69 with a p-value of 0.790, indicating no significant differences in student perceptions across teamwork, critical thinking, and problem-solving. This suggests that students view TBL as beneficial across various skill dimensions, reinforcing its utility in fostering a well-rounded skill set critical for medical practice.

Table 3: Skill Development through TBL

Skill Aspect	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Teamwork	40	40	15	3	2
Critical Thinking	35	45	12	6	2
Problem-Solving	32	40	20	5	3
Chi-square statistic	4.69				
p-value	0.790				

The Chi-square statistic for challenges faced in TBL is 3.36 with a p-value of 0.910, showing no statistically significant differences among the responses related to challenges such as time constraints, unequal participation, and content difficulty. This indicates that these challenges are similarly perceived across the board, suggesting that addressing these issues could further enhance the TBL experience for students.

Table 4: Challenges Faced in TBL

Challenge	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Time Constraints	25	40	20	10	5
Unequal Participation	20	38	25	12	5
Difficulty with Content	30	35	20	10	5
Chi-square statistic	3.36				
p-value	0.910				

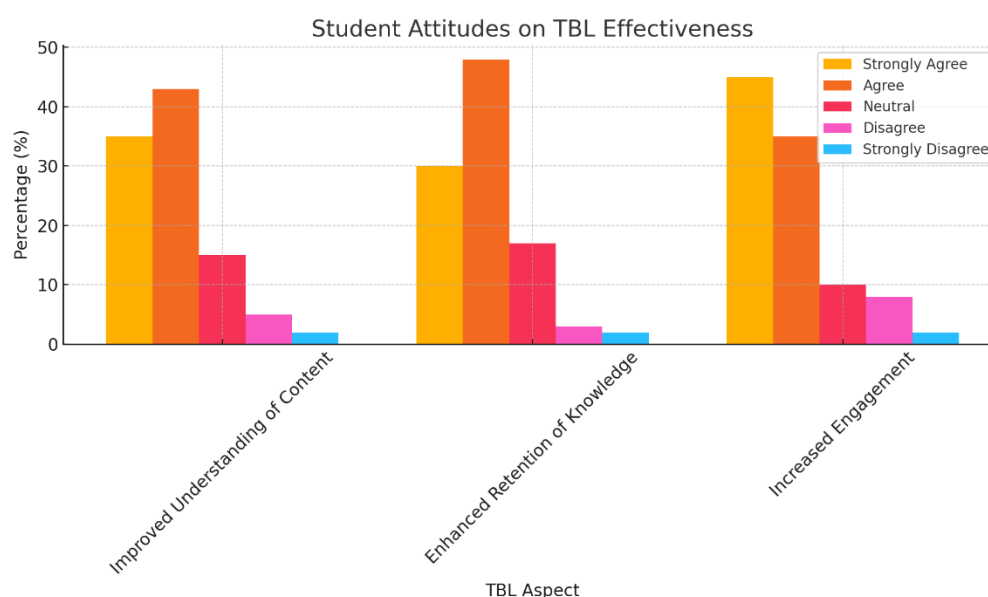


Figure 1: The bar chart provided visualizes student responses across various aspects of TBL effectiveness, showing that most students responded positively, with higher percentages for “Strongly Agree” and “Agree” across TBL attributes.

Discussion

This study examined the attitudes of pre-clinical medical students toward Team-Based Learning (TBL) at Khyber Medical University. The findings provide a detailed understanding of how TBL impacts students’ learning experiences, skill development, and engagement, as well as the challenges they encounter in this learning environment.

A significant majority of students expressed positive attitudes toward TBL’s impact on content understanding, knowledge retention, and engagement. Specifically, students reported that TBL facilitated a deeper comprehension of complex topics, an outcome consistent with prior studies indicating that collaborative learning can enhance retention and understanding by promoting active participation and peer interaction. Through TBL’s structured format, students appeared more engaged, suggesting that the method’s emphasis on teamwork and problem-solving aligns well with medical students’ need for interactive and applied learning experiences^{8 9}.

Skill development emerged as another area where TBL had a substantial impact. Students reported improvement in teamwork, critical thinking, and problem-solving skills, which are essential competencies in the medical field. These findings support the notion that TBL fosters not only academic growth but also non-academic skills essential for clinical practice^{10 11}. The alignment of TBL with these competencies reflects its potential as a tool for bridging theoretical knowledge with real-world clinical skills, as students in medical training frequently encounter situations requiring these abilities.

However, the study also highlighted challenges that may hinder the effectiveness of TBL. Time constraints, unequal participation, and content difficulty were cited as common obstacles. These findings are consistent with concerns raised in similar studies, where students noted that the collaborative format sometimes leads to inefficiencies, especially when group members contribute unequally^{12 13}. This dynamic can create frustration and diminish the perceived benefits of teamwork, particularly when students feel burdened by the additional responsibilities of compensating for less active peers. Addressing these issues could involve implementing clear guidelines for group work and periodic assessments of individual contributions, which could enhance both the quality of learning and student satisfaction.

The issue of time constraints also warrants attention, as the additional preparation required for TBL may contribute to student stress, especially given the heavy workload typical in pre-clinical years. To mitigate this, institutions could consider adjustments in the curriculum to allocate specific time for TBL activities or incorporate training in time management to help students navigate the demands of TBL alongside their other coursework.

Another noteworthy aspect was the consistency in responses regarding TBL's challenges and benefits across demographic variables, year of study and gender. This uniformity implies that TBL is perceived similarly across different student subgroups, indicating its broad applicability and acceptance. However, the lack of significant variation also suggests that more personalized approaches may not be necessary, and instead, universal improvements to the TBL framework may be sufficient to enhance its effectiveness.

This study contributes to the growing body of literature that underscores the value of TBL in medical education while also pointing to areas for improvement¹⁴⁻¹⁶. As medical schools increasingly adopt active learning strategies, refining TBL to address these specific challenges could maximize its benefits. Future research could explore strategies for improving group dynamics, perhaps through peer feedback mechanisms or mentorship models, to create a more balanced and productive team environment. Additionally, exploring the long-term effects of TBL on clinical skills post-graduation could provide insights into the method's overall contribution to medical training.

In conclusion, TBL represents a valuable addition to the medical curriculum, fostering academic and interpersonal skills necessary for future medical professionals. By addressing the challenges identified in this study, TBL can be further optimized to serve as an even more effective tool for preparing students for the collaborative and complex nature of clinical practice.

Conclusion

This study highlights the positive attitudes of pre-clinical medical students toward Team-Based Learning (TBL) at Khyber Medical University, emphasizing its role in enhancing understanding, engagement, and essential skill development. Students found TBL valuable for deepening their comprehension of course content, improving retention, and fostering teamwork, critical thinking, and problem-solving skills. However, challenges such as time constraints, unequal participation, and difficulty with content were also noted, suggesting areas where TBL implementation could be refined.

Addressing these challenges through structured group guidelines, time management support, and peer contribution assessments could further optimize TBL's effectiveness. As TBL continues to be integrated into medical curricula, such improvements could help maximize its benefits, equipping students with the skills needed for collaborative and dynamic clinical environments. Ultimately, this study supports TBL as a promising approach for medical education, with the potential to enhance both academic success and essential competencies for medical practice.

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