Section: Community Medicine

Original Research Article

A STUDY ON PREFERENCES OF TEACHING–LEARNING METHODS, ITS PERCEIVED EFFECTIVENESS, AND LEARNING BARRIERS AMONG UNDERGRADUATE MEDICAL STUDENTS IN TELANGANA

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ABSTRACT

Background: The introduction of Competency-Based Medical Education (CBME) in India has shifted the focus of undergraduate medical education from teacher-centered approaches to learner-centered competency-oriented teaching-learning methods. Understanding students' preferences and perceptions regarding different teaching-learning methods is essential for effective curriculum implementation and educational planning. Furthermore, the COVID-19 pandemic led to increased use of online learning modalities, making it important to evaluate student perceptions regarding various educational approaches during this period. The objective is to assess the preferences regarding teaching-learning methods, evaluate their perceived effectiveness and identify the learning barriers.

Materials and Methods: A cross-sectional study was conducted among 200 undergraduate medical students in a medical college in Telangana from January to February 2021. Fifty students were selected from each MBBS year through simple random sampling. Data was collected using a pretested and pilot-tested structured questionnaire after obtaining Informed Consent. Information regarding preferences for theory and clinical teaching-learning methods, perceived effectiveness of different methods and learning barriers was collected. Data was analyzed using MS Excel and Open Epi Info version 3.0.

Results: Among the 200 participants, 133 (66.5%) were females and 67 (33.5%) were males. Small-group discussion was the most preferred theory teaching-learning method (37%), while bedside clinics were the most preferred clinical teaching learning method (66.5%). More than half of the students preferred small-group teaching approaches overall. Small-group discussion was perceived to be most effective for engagement and understanding, whereas problem-based learning was perceived to improve retention of knowledge. Bedside clinics were perceived as most effective for improving clinical skills and confidence in patient handling. Non-interactive teaching was identified as the most common learning barrier (60.5%).

Conclusion: Medical students demonstrated a strong preference for active, learner-centered, and clinically oriented teaching-learning methods. The findings support the principles of CBME and highlight the importance of small-group learning, integrated teaching, and bedside clinical training in undergraduate medical education.

Keywords: Competency-Based Medical Education; Teaching-learning methods; Undergraduate medical students; Small-group discussion; Integrated teaching; Bedside clinics; Learning barriers.

INTRODUCTION

Medical education has undergone significant transformation over the past decade with increasing emphasis on competency development, learner-centered teaching, and outcome-based education. Traditional medical education has largely relied on didactic lectures and discipline-based teaching

approaches, which often focus on knowledge acquisition rather than the development of competencies required for clinical practice. In response to evolving healthcare needs and educational reforms, Competency-Based Medical Education (CBME) has emerged as an important framework for undergraduate medical training. CBME emphasizes the attainment of predefined competencies through active learning, integration of disciplines, early clinical exposure, and continuous assessment of learner performance.[1-4]

The National Medical Commission (NMC) introduced the Competency-Based Undergraduate Curriculum for the Indian Medical Graduate in 2019 with the objective of producing competent, ethical, and patient-centered physicians. The CBME curriculum promotes student-centered learning through a variety of teaching-learning methods including small-group discussions, problem-based learning, self-directed learning, integrated teaching, and workplace-based clinical training.[1] Such approaches encourage active participation, critical thinking, collaborative learning, and application of knowledge in clinical settings.

Student preferences regarding teaching-learning methods play an important role in determining the effectiveness of educational interventions. Previous studies have demonstrated that active learning approaches such as small-group discussions and problem-based learning improve engagement, conceptual understanding, and long-term retention when compared with traditional lecture-based teaching.[5-8] Understanding students' perceptions can help educators design learning experiences that are both effective and acceptable to learners.

Integrated teaching is another important component of CBME. It facilitates the correlation of concepts across disciplines and promotes meaningful learning by presenting knowledge in a clinically relevant context. Several studies have reported favorable student perceptions regarding integrated teaching and have highlighted its role in improving understanding, retention, and clinical application of knowledge.[9-12]

The COVID-19 pandemic significantly altered the landscape of medical education worldwide. Institutions rapidly adopted online and blended learning approaches to ensure continuity of education. Although online learning offered flexibility and accessibility, concerns were raised regarding student engagement, practical skill acquisition, and clinical training.[13-15] Evaluating student perceptions of online learning during this period provides valuable insights for future curriculum planning.

Clinical teaching remains a cornerstone of undergraduate medical education. Bedside teaching, clinical discussions, demonstrations, simulation-based learning, and case presentations contribute to the development of clinical competence, communication skills, and professional behavior. Previous studies have consistently emphasized the importance of workplace-based learning experiences in achieving competency-based outcomes.[16-19]

The year 2021 represented a unique period in Indian medical education, characterized by the early implementation of CBME and the ongoing impact of the COVID-19 pandemic. Understanding students' preferences, perceived effectiveness of teaching-learning methods, and barriers to learning during this period can provide important baseline evidence regarding educational needs and expectations. Furthermore, such findings continue to remain relevant in 2026 as medical colleges continue to strengthen CBME implementation and adopt blended learning approaches.

Therefore, the present study was undertaken to assess preferences regarding teaching-learning methods, evaluate their perceived effectiveness and identify the learning barriers among undergraduate medical students in Telangana.

Objectives

1. To assess the preferences regarding theory and clinical teaching-learning methods among undergraduate medical students.
2. To evaluate the perceived effectiveness of various theory and clinical teaching-learning methods among the study population
3. To identify the barriers affecting learning among the undergraduate medical students.

MATERIALS AND METHODS

A cross-sectional study was conducted among undergraduate medical students at a private medical college in Telangana, from January to February 2021. A total of 200 students, comprising 50 students each from first, second, third, and final year MBBS, were included using Simple Random Sampling technique to ensure representation from all phases of undergraduate medical training. Students who were willing to participate were included in the study, while those who were absent during data collection or submitted incompletely filled questionnaires were excluded. Data was collected using a structured, pilot tested, self-administered questionnaire. The questionnaire included items on demographic characteristics, preferences regarding theory and clinical teaching-learning methods, perceived effectiveness of various teaching-learning methods and barriers affecting learning. Perceived effectiveness of teaching-learning methods was assessed by asking students to select the teaching-learning method they considered most suitable for achieving each specified educational outcome. For theory teaching methods, the outcomes included engagement, better understanding, better retention, and examination-oriented learning. For clinical teaching methods, the outcomes included improvement of clinical skills, better understanding of clinical concepts, confidence in patient handling, and examination-oriented learning. Ethical approval was obtained from the Institutional Ethics Committee

before commencement of the study, and participation was voluntary with confidentiality and anonymity maintained throughout the study. The collected data were entered into Microsoft Excel and analyzed using Open Epi Info (version 3.0). Descriptive statistics were expressed as frequencies and percentages, while associations between year of study and preferred theory and clinical teaching-learning methods was assessed using the Chi-square test. A p-value of <0.05 was considered statistically significant.

RESULTS

1.Socio-demographic Characteristics

A total of 200 undergraduate medical students participated in the study. Of them, 133 (66.5%) were females and 67 (33.5%) were males.

Table 1: Gender distribution of study participants (N=200)

Gender	Number (n)	Percentage (%)
Male	67	33.5%
Female	133	66.5%
Total	200	100%

2.Preferences Regarding Theory Teaching-Learning Methods

Small-group discussion was the most preferred theory teaching-learning method (37%), followed by interactive lecturing (20.5%) and problem-based learning (16%). Traditional lectures were preferred by only 5.5% of students.

Table 2.1: Most Preferred Theory Teaching-Learning Method (N=200)

Method	Number (n)	Percentage (%)
Lectures	11	5.5
Lecture-cum-demonstration	30	15
Interactive lecturing	41	20.5
Small-group discussion	74	37
Tutorial	12	6
Problem-based learning	32	16
Total	200	100%

Small-group discussion was the most preferred theory teaching-learning method (37%), followed by interactive lecturing (20.5%) and problem-based learning (16%). Traditional lectures were preferred by only 5.5% of students.

Table 2.2 Preference for large-group and small-group teaching methods (N=200)

Method	Preferred (n)	Percentage (%)
Large group	82	41%
Small group	118	59%
Total	200	100

When grouped, small-group teaching approaches (small-group discussion, tutorial, and problem-based learning) were preferred by 118 (59%) students, whereas large-group teaching methods (lecture, lecture-cum-demonstration, and interactive lecturing) were preferred by 82 (41%) students.

3.Perceptions regarding Integrated Teaching

Table 3.1 Perceptions regarding integrated teaching (N=200)

Opinion	Number of Students (n)	Percentage (%)
Very interesting	9	4.5
Helps gain knowledge	39	19.5
Both interesting and knowledge-enhancing	144	72
Not useful	8	4
Total	200	100

A majority of students perceived integrated teaching positively. Nearly three-fourths (72%) reported that integrated teaching was both interesting and knowledge-enhancing.

Table 3.2: Need for more integrated teaching sessions (N=200)

Opinion	Number of Students (n)	Percentage (%)
Yes	172	86
No	28	14
Total	200	100

Most students (86%) expressed a desire for more integrated teaching sessions.

4. Preferences Regarding Online Learning

Table 4: Preferences regarding online learning (N=200)

Preference	Number of Students (n)	Percentage (%)
Yes	120	60
No	80	40
Total	200	100

Of the 200 students, 120 (60%) preferred online learning over traditional teaching methods, while 80 (40%) preferred conventional classroom teaching.

5.Preferences Regarding Clinical Teaching Learning Methods

Bedside clinics were the most preferred clinical teaching-learning method (66.5%), followed by demonstrations (16%) and clinical discussions (13%).

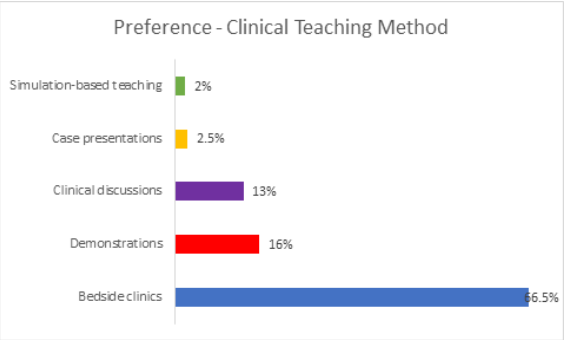

Figure 2: Preferred Clinical Teaching Learning Method (N=200)

Table 5: Preferences regarding Clinical Teaching Learning Methods (N=200)

Clinical Teaching Method	Number of Students (n)	Percentage (%)
Bedside clinics	133	66.5
Demonstrations	32	16
Clinical discussion	26	13
Case presentation	5	2.5
Simulation-based teaching	4	2
Total	200	100

Bedside clinics were the most preferred clinical teaching-learning method (66.5%), followed by demonstrations (16%) and clinical discussions (13%).

6.Preferred Duration of Classes

Table 6.1 Preferred duration of theory classes (N=200)

Duration	Number of Students (n)	Percentage (%)
30 minutes	86	43.0
45 minutes	109	54.5
60 minutes	4	2.0
90 minutes	1	0.5
Total	200	100

Most students preferred theory classes of 45 minutes (54.5%) followed by 30 minutes (43%).

Table 6.2 Preferred duration of clinical classes (N=200)

Duration	Number of Students (n)	Percentage (%)
1 hour	82	41
1 hour 30 minutes	42	21
2 hours	49	24.5
2 hours 30 minutes	24	12
3 hours	3	1.5
Total	200	100

For clinical teaching, one-hour sessions were preferred by the largest proportion of students.

7.Preferred Teaching Aids

Table 7: Preferred Teaching Aids (N=200)

Teaching Aid	Number of Students (n)	Percentage (%)
Blackboard	58	29
PowerPoint presentation	48	24
Overhead projector	3	1.5
Combined board and PowerPoint	91	45.5
Total	200	100

Combined Board and Powerpoint teaching was preferred by 45.5% of students, followed by only Black board Teaching (29%).

8.Perceived Effectiveness of Teaching-Learning Methods

Table 8.1 Major perceived effectiveness of different theory teaching-learning methods (N=200)

Perceived Effect	Lecture n(%)	Lecture-cum-demonstration n(%)	Interactive Lecture n (%)	Small-group Discussion n (%)	Tutorial n (%)	PBL n(%)	Total (n)
Most engaging	8 (4)	16 (8)	48 (24)	96 (48)	10 (5)	22 (11)	200
Provides better understanding	10 (5)	34 (17)	42 (21)	74 (37)	12 (6)	28 (14)	200
Improves retention of knowledge	6 (3)	18 (9)	22 (11)	38 (19)	12 (6)	104 (52)	200
Exam oriented	72 (36)	38 (19)	44 (22)	18 (9)	8 (4)	20 (10)	200

Small-group discussion was primarily perceived as most engaging and provides better understanding followed by Interactive Lecturing, while problem-based learning was mainly perceived to enhance retention of knowledge and lecture classes were found to be more exam oriented

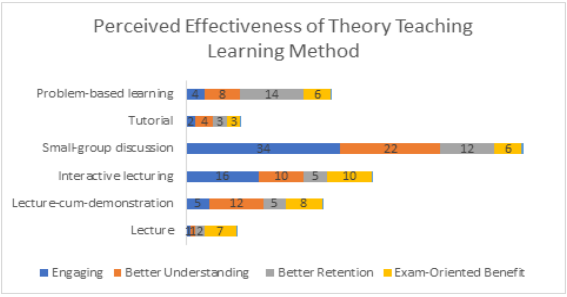

Figure 3: Perceived Effectiveness of Theory Teaching-Learning Methods (n=200).

Table No:8.2 Major perceived effectiveness of different clinical teaching learning methods (n=200)

Perceived Effect	Bedside Clinics n (%)	Demonstrations n (%)	Clinical Discussion n (%)	Case Presentation n (%)	Simulation-based Teaching n (%)	Total (N)
Improves clinical skills	118(59)	32 (16)	24 (12)	10 (5)	16 (8)	200
Better understanding of clinical concepts	62 (31)	28 (14)	74 (37)	18 (9)	18 (9)	200
Best for practical examinations	44 (22)	30 (15)	36 (18)	70 (35)	20 (10)	200
Improves confidence in patient handling	126(63)	20 (10)	28 (14)	8 (4)	18 (9)	200

Bedside clinics were primarily valued for improving clinical skills and increasing confidence in patient handling. Clinical discussions were perceived to improve understanding of clinical concepts, while case presentations were perceived as beneficial for examination preparation.

9. Barriers affecting learning

Table 9.1. Major Barriers affecting learning during Theory classes (N=200)

Barrier	Number (n)	Percentage %
Non-interactive teaching	82	41
Large class size	40	20
Speed of teaching	34	17
Voice/audibility	22	11
Time constraints	18	9
Language barrier	4	2
Total	200	100

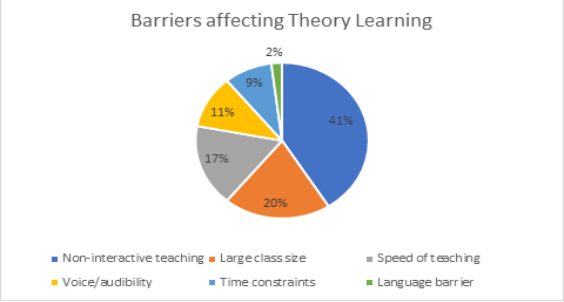

Figure 4: Major barriers affecting learning during Theory classes (N=200)

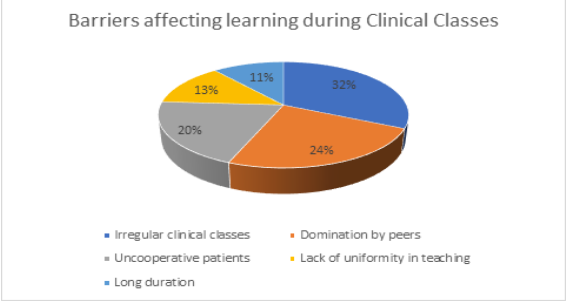

Figure 5: Major Barriers affecting learning during Clinical classes (N=200)

Non-interactive teaching emerged as the most commonly perceived barrier to learning during theory classes, reported by 41% of students. This was followed by large class size (20%), rapid speed of teaching (17%), poor voice audibility (11%), and time constraints (9%). Only a small proportion of students identified language barrier (2%).

Table 9.2. Major Barriers affecting learning during Clinical classes (N=200)

Barrier	Number (n)	Percentage (%)
Irregular clinical classes	64	32
Domination by peers	48	24
Uncooperative patients	40	20
Lack of uniformity in teaching	26	13
Long duration	22	11
Total	200	100

The most frequently reported barrier to effective learning during clinical teaching was irregular clinical classes (32%), followed by domination by peers (24%).

10. Relationship between Teaching Learning Method and Perceived Effect

Table 10.1. Relationship between Theory Teaching Learning Method and Perceived Effect (N=200)

Perceived Effect	Lecture n(%)	Lecture-cum-demonstration n(%)	Interactive Lecture n (%)	Small-group Discussion n (%)	Tutorial n (%)	PBL n(%)	Total (N)
Most engaging	8 (4)	16 (8)	48 (24)	96 (48)	10 (5)	22 (11)	200
Provides better understanding	10 (5)	34 (17)	42 (21)	74 (37)	12 (6)	28 (14)	200
Improves retention of knowledge	6 (3)	18 (9)	22 (11)	38 (19)	12 (6)	104 (52)	200
Exam oriented	72 (36)	38 (19)	44 (22)	18 (9)	8 (4)	20 (10)	200

Chi-square test: $\chi^2 = 332.06$, df = 15, $p < 0.001$

A statistically significant association was observed between the theory teaching learning method and perceived effect ($\chi^2 = 332.06$, df = 15, $p < 0.001$). Small-group discussion was most frequently selected as the most suitable method for promoting student engagement (48%) and better understanding (37%), whereas problem-based learning was predominantly perceived as the most suitable method for improving retention of knowledge (52%). Traditional lectures were most commonly selected as the most suitable method for examination-oriented learning (36%)

Table 10.2. Relationship between Clinical Teaching Learning Method and Perceived Effect (N=200)

Perceived Effect	Bedside Clinics n (%)	Demonstrations n (%)	Clinical Discussion n (%)	Case Presentation n (%)	Simulation-based Teaching n (%)	Total (N)
Improves clinical skills	118(59)	32 (16)	24 (12)	10 (5)	16 (8)	200
Better understanding of clinical concepts	62 (31)	28 (14)	74 (37)	18 (9)	18 (9)	200
Best for practical examinations	44 (22)	30 (15)	36 (18)	70 (35)	20 (10)	200
Improves confidence in patient handling	126(63)	20 (10)	28 (14)	8 (4)	18 (9)	200

Chi-square test: $\chi^2 = 196.20$, $p < 0.001$.

A statistically significant association was observed between the perceived effect and the clinical teaching-learning method. Bedside clinics were most frequently perceived as the most suitable method for improving clinical skills (59%) and confidence in patient handling (63%). Clinical discussion was most commonly selected for improving understanding of clinical concepts (37%), whereas case presentation was perceived as the most suitable method for practical examination preparation (35%).

11. Relationship between Year of Study and Preference for Theory Teaching Learning Method

Table 11: Relationship between Year of Study and Preference for Theory Teaching Learning Method (N=200)

Teaching Method	First Year (n)	Second Year (n)	Third Year (n)	Final Year (n)	Total (n)
Lecture	5	3	2	1	11
Lecture-cum-demonstration	12	8	6	4	30
Interactive lecturing	10	12	10	9	41

Small-group discussion	12	18	20	24	74
Tutorial	4	3	2	3	12
Problem-based learning	7	6	10	9	32
Total	50	50	50	50	200

Chi-square = 18.72, p = 0.028

A statistically significant association was observed between year of study and preferred theory teaching-learning method. Increasing preference for small-group discussion was observed among students in higher years.

DISCUSSION

The present study assessed preferences regarding teaching-learning methods, their perceived effectiveness, and barriers affecting learning among undergraduate medical students during the early phase of Competency-Based Medical Education (CBME) implementation in India. The findings demonstrated a clear preference for active, learner-centered, and clinically oriented teaching-learning strategies, reflecting the changing educational expectations of medical students in the CBME era.

Small-group discussion emerged as the most preferred theory teaching-learning method, accounting for 37% of student preferences. Furthermore, when considered collectively, small-group teaching approaches including small-group discussion, tutorials, and problem-based learning were preferred by 59% of participants. These findings are consistent with the learner-centered philosophy of CBME, which emphasizes active participation, collaboration, and self-directed learning. Similar findings have been reported by Freeman et al., who demonstrated that active learning strategies significantly improve student performance compared with traditional lecture-based teaching.[5] Deslauriers et al. also reported that active engagement promotes meaningful learning despite students often perceiving traditional lectures as easier.[6]

The present study also evaluated the perceived effectiveness of various theory teaching-learning methods. Small-group discussion was most frequently perceived as effective for enhancing student engagement and improving understanding of concepts and the association was found to be statistically significant. This may be attributed to greater opportunities for interaction, peer learning, and clarification of doubts within smaller learning groups. Similar observations have been reported by Burgess et al., who highlighted the effectiveness of small-group learning in promoting communication skills, critical thinking, and deeper understanding.[17]

Problem-based learning was perceived to be particularly effective for improving retention of knowledge. Previous studies have demonstrated that PBL encourages self-directed learning, integration of knowledge, and long-term retention of concepts through problem-solving and contextual learning.[7,8] The findings support the inclusion of PBL within CBME curricula as an effective strategy for promoting higher-order cognitive skills.

Integrated teaching received overwhelmingly positive responses. Nearly three-fourths of students reported that integrated teaching was both interesting and knowledge-enhancing, while 86% expressed a desire for more integrated classes. Similar positive perceptions regarding integrated teaching have been reported by Basu et al. and Sharma et al., who found that integrated teaching improved student satisfaction, conceptual clarity, and clinical relevance of learning.[9,10]

An important finding of the present study was that 60% of students preferred online learning over traditional teaching methods. The study was conducted during the COVID-19 pandemic when online learning had become an essential educational modality. Students primarily cited comfort, convenience, and flexibility as major advantages of online learning. Similar findings have been reported by Rose and Wilcha, who highlighted the increasing acceptance of technology-enhanced learning in medical education.[11,12]

Among clinical teaching-learning methods, bedside clinics emerged as the most preferred approach, with approximately two-thirds of students selecting this method. Bedside clinics were also perceived as the most effective method for improving clinical skills and increasing confidence in patient handling and the association was statistically significant. These findings emphasize the continued importance of direct patient interaction in undergraduate medical education. Ramani and Burgess et al. similarly reported that bedside teaching remains one of the most effective methods for developing clinical competence, communication skills, and professional behavior.[13,14]

The significant association observed between year of study and preferred theory teaching-learning methods suggests that students' educational needs evolve throughout undergraduate training. Junior students tended to prefer structured and guided learning approaches, whereas senior students increasingly preferred discussion-based learning methods. Similar trends have been reported in studies evaluating educational preferences across different stages of medical training.[24]

The present study is particularly significant because it was conducted during January–February 2021, shortly after the introduction of CBME and during the COVID-19 pandemic. Consequently, it provides valuable baseline evidence regarding student perceptions during a critical period of curricular transition. Importantly, the preferences and perceived effectiveness outcomes identified in this study remain highly relevant in 2026. Current CBME

implementation continues to emphasize active learning, integration, workplace-based learning, competency acquisition, and blended educational approaches. The findings therefore provide useful insights for educators and curriculum planners seeking to optimize teaching-learning strategies in undergraduate medical education.[1,15,21,25]

CONCLUSION

1. The study demonstrated a clear preference for active and learner-centered teaching-learning methods among undergraduate medical students.
2. More than one-third of the students preferred small-group discussion, making it the most preferred theory teaching-learning method, while overall small-group teaching approaches were preferred by more than half of the participants.
3. Nearly three-fourths of the students considered integrated teaching to be both interesting and knowledge-enhancing, and more than four-fifths expressed a desire for an increased number of integrated teaching sessions.
4. More than half of the students preferred online learning over traditional teaching methods, indicating increasing acceptance of technology-enhanced learning.
5. Approximately two-thirds of the students preferred bedside clinics for learning clinical skills.
6. Most of the students preferred theory classes of 45 minutes duration and clinical classes of one hour duration. For nearly half of the students Combined Blackboard and Powerpoint teaching was the most preferred teaching aid
7. Regarding perceived effectiveness, small-group discussion was most commonly perceived as effective for enhancing student engagement and understanding of concepts and Bedside clinics was perceived as the most effective method for improving clinical skills and increasing confidence in patient handling.
8. Non-interactive teaching emerged as the most frequently reported barrier in theory learning. Lack of interest, large class size, irregular clinical classes, peer domination, and uncooperative patients were identified as important barriers affecting learning.

Recommendations

1. Small-group teaching methods such as small-group discussions, tutorials, and problem-based learning should be incorporated more frequently into the undergraduate medical curriculum.
2. Integrated teaching sessions should be strengthened and conducted regularly across disciplines to enhance understanding, retention, and clinical correlation of knowledge.
3. Bedside clinics should continue to remain the cornerstone of clinical teaching, supplemented by case discussions, demonstrations, and simulation-based learning.
4. Faculty should adopt interactive and learner-centered teaching approaches to overcome barriers related to non-interactive teaching and improve student engagement.
5. Blended learning strategies combining conventional classroom teaching with online learning resources should be encouraged within the CBME curriculum.

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