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Undergraduate Medical Students' Perceptions of Competency-Based Medical Education: A Systematic Review of Benefits, Challenges, and Implementation Experiences

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ABSTRACT

Background: Competency-based medical education (CBME) has been introduced in undergraduate medical training to shift learning from time-based curriculum delivery toward outcome-oriented competency development. Undergraduate medical students are the primary recipients of this educational reform; therefore, their perceptions are important for understanding curriculum acceptance, learning experience, implementation challenges, and areas requiring improvement.

Objective: This systematic review aimed to evaluate the perceptions of undergraduate medical students regarding competency-based medical education, with emphasis on perceived benefits, challenges, learning environment, assessment, feedback, skill development, and overall acceptance.

Materials and Methods: A systematic literature search was conducted according to PRISMA 2020 guidelines using PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, and relevant academic sources from database inception to January 2026. Studies reporting perceptions, attitudes, experiences, satisfaction, or challenges of undergraduate medical students toward CBME were included. Observational, cross-sectional, qualitative, and mixed-method studies were considered. Reviews, editorials, conference abstracts without full data, postgraduate-only studies, faculty-only studies, and studies without extractable undergraduate student perception data were excluded. Methodological quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklist. A descriptive synthesis was performed because of heterogeneity in study design, study tools, populations, and reported outcomes.

Results: A total of 21 studies involving 5,864 undergraduate medical students were included. Most studies were cross-sectional surveys, while fewer studies used qualitative or mixed-method approaches. Students generally perceived CBME positively in relation to early clinical exposure, skill-based learning, communication training, integrated teaching, formative assessment, and feedback. The highest positive perception was observed for clinical relevance of learning, reported in 76.2% of students, followed by improved understanding of competencies in 72.8%, motivation through early clinical exposure in 69.5%, and increased practical confidence in 67.1%. Major challenges included increased academic workload, unclear assessment expectations, variable faculty implementation, logbook burden, difficulty with self-directed learning, and inadequate orientation. Workload-related concern was reported in 57.6% of students, followed by uncertainty regarding assessment in 50.9% and inconsistent faculty guidance in 45.2%. These percentages were interpreted as descriptive trends rather than statistically pooled effect estimates.

Conclusion: Undergraduate medical students generally perceived CBME as a

useful, clinically relevant, and skill-oriented educational approach that supported active learning, communication, professionalism, and early patient exposure. However, implementation-related challenges such as workload, assessment ambiguity, inconsistent feedback, faculty variability, and documentation burden affected student experience. Strengthening orientation, standardizing assessment, improving feedback quality, reducing unnecessary logbook burden, and ensuring faculty preparedness are essential for effective CBME implementation.

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Keywords: Competency-based medical education; CBME; undergraduate medical students; student perception; medical education; early clinical exposure; formative assessment; self-directed learning.

INTRODUCTION

Medical education has traditionally relied on time-based curriculum delivery, discipline-wise teaching, summative assessment, and knowledge-centered evaluation. Although this model has produced generations of medical graduates, it has also been criticized for insufficient emphasis on observable competencies, communication skills, professionalism, ethics, clinical reasoning, teamwork, and patient-centered care [1-4]. Competency-based medical education (CBME) emerged as a response to these limitations by focusing on defined learning outcomes, progressive achievement of competencies, workplace relevance, and learner-centered development [1,5-8].

CBME emphasizes that medical graduates should not only acquire theoretical knowledge but also demonstrate the ability to apply knowledge, perform clinical skills, communicate effectively, behave professionally, and function safely within healthcare systems [1,5,7]. It promotes structured competencies, early clinical exposure, integrated teaching, self-directed learning, skill-based training, formative assessment, feedback, reflective learning, and continuous performance improvement [8-10]. In undergraduate medical education, this represents a major pedagogical shift because students are expected to become active participants in their learning rather than passive recipients of information [8,11].

In India, CBME has gained particular importance following the implementation of the revised undergraduate medical curriculum by the Medical Council of India and later the National Medical Commission [11-14]. The curriculum introduced several learner-centered and outcome-oriented components, including foundation course, early clinical exposure, attitude, ethics and communication modules, self-directed learning, integrated teaching, electives, skill laboratory training, logbook documentation, formative assessment, and competency-based assessment [11-14]. These reforms aim to produce an Indian Medical Graduate who is competent as a clinician, communicator, leader, lifelong learner, and professional [11,13,14].

The success of CBME depends not only on curriculum design but also on implementation quality. Faculty preparedness, infrastructure, assessment clarity, skill laboratory facilities, clinical exposure, feedback mechanisms, student orientation, timetable planning, logbook structure, and institutional support influence how students experience CBME [5,6,9,10]. Undergraduate medical students occupy a central position in this reform because their acceptance, motivation, and engagement determine whether the curriculum achieves its intended outcomes [15-19].

Student perception is especially important during the early phases of CBME implementation. Positive perceptions may indicate improved relevance, motivation, skill confidence, communication awareness, and readiness for clinical practice [15-19]. Negative perceptions may reveal hidden curriculum overload, unclear expectations, inconsistent assessment, inadequate feedback, poor faculty-student communication, or excessive documentation burden [15-18,20-22]. Systematic evaluation of student perceptions can therefore help medical institutions identify strengths and correct implementation gaps.

Several individual studies have reported student responses to specific CBME components such as early clinical exposure, foundation course, integrated teaching, self-directed learning, attitude, ethics and communication modules, skill laboratory training, formative assessment, feedback, electives, and logbook documentation [15-19,23-31]. Existing reviews and narrative discussions have also addressed the conceptual basis, implementation strategies, opportunities, and challenges of CBME [1,4,6,7,20-22]. However, many of these publications focus on the theoretical framework of CBME, faculty perspectives, postgraduate training, or selected curriculum components rather than comprehensively synthesizing undergraduate medical students' perceptions across all major CBME domains [6,7,20-22].

Furthermore, the recent expansion of CBME implementation, particularly after National Medical Commission curriculum reforms, has generated new evidence on student experiences, perceived benefits, barriers, workload, assessment uncertainty, feedback quality, and faculty variability [13-18]. Previous reviews have not adequately captured this evolving body of undergraduate student-centered evidence. There remains a need for an updated synthesis that evaluates how undergraduate medical students perceive CBME as a curriculum reform and what implementation issues they identify across different educational settings.

This systematic review was therefore conducted to evaluate the perceptions of competency-based medical education among undergraduate medical students. The review focused on perceived benefits, challenges, curriculum acceptance, learning experience, early clinical exposure, integrated teaching, self-directed learning, assessment, feedback, skill development, professionalism, and suggestions for improving CBME implementation.

MATERIALS AND METHODS

Study Design

This study was designed as a systematic review of published literature evaluating the perceptions of undergraduate medical students toward competency-based medical education (CBME). The review was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.

Research Question

The review was guided by the following research question:
What are the perceptions, attitudes, experiences, perceived benefits, and challenges reported by undergraduate medical students regarding competency-based medical education?

Protocol Registration

The review protocol was not prospectively registered in PROSPERO or any other systematic review registry.

LITERATURE SEARCH STRATEGY

A systematic literature search was conducted using PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, and other relevant academic sources. The search was conducted from database inception to January 2026. The final search was completed on 31st January 2026. Additional studies were identified by screening the reference lists of eligible articles and related medical education publications.

The search terms included combinations of keywords related to competency-based medical education, undergraduate medical students, and student perceptions. The following search strings were used and adapted according to individual database requirements:

“competency-based medical education” AND “undergraduate medical students” AND “perception” “CBME” AND “medical students” AND “student perception” “competency based medical education” AND “student attitude” “competency-based curriculum” AND “undergraduate medical students” “early clinical exposure” AND “medical students” AND “perception” “foundation course” AND “medical students” AND “perception” “self-directed learning” AND “medical students” AND “CBME” “formative assessment” AND “competency-based medical education” “integrated teaching” AND “undergraduate medical students” “skill laboratory” AND “medical students” AND “competency” “AETCOM” AND “medical students” AND “perception” “feedback” AND “competency-based medical education” AND “medical students”

Boolean operators, truncations, and database-specific filters were applied where appropriate. Only full-text articles published in English and involving undergraduate medical students were considered.

Eligibility Criteria

Inclusion Criteria

Studies were included if they fulfilled the following criteria:

1. Studies assessing perceptions, attitudes, satisfaction, feedback, experiences, or challenges of undergraduate medical students regarding CBME.
2. Studies involving MBBS or undergraduate medical students.
3. Studies evaluating one or more CBME components such as early clinical exposure, foundation course, integrated teaching, self-directed learning, skill laboratory training, formative assessment, feedback, logbook use, AETCOM, communication skills, professionalism, or competency-based assessment.
4. Cross-sectional studies, observational studies, qualitative studies, and mixed-method studies.
5. Studies with extractable data on undergraduate student perception or experience.
6. Full-text articles available in English.

Exclusion Criteria

Studies were excluded if they met any of the following criteria:

1. Studies involving only postgraduate students, interns, faculty, or administrators without separate undergraduate student data.
2. Studies not focused on CBME or its components.
3. Studies without extractable perception-related data.
4. Reviews, editorials, letters, commentaries, and opinion pieces.
5. Conference abstracts without full-text data.

6. Duplicate publications or overlapping datasets.
7. Studies not available in English.

Study Selection Process
All retrieved records were imported into a reference management system, and duplicate records were removed. Titles and abstracts were screened independently by two reviewers to identify potentially eligible studies. Full-text articles of relevant studies were then independently assessed against the predefined eligibility criteria.

Any disagreement between the two reviewers was resolved through discussion and consensus. When consensus could not be reached, a third reviewer was consulted. Cohen's kappa agreement was planned for assessment of screening reliability; however, final inclusion was based on consensus among reviewers.

A total of 486 records were identified through database and manual searching. After removal of 112 duplicate records, 374 records were screened by title and abstract. Of these, 319 records were excluded. Fifty-five full-text articles were assessed for eligibility, and 34 articles were excluded for specific reasons. Finally, 21 studies were included in the systematic review.

PRISMA Study Selection Summary

Study selection stage	Number
Records identified through database and manual searching	486
Duplicate records removed	112
Records screened by title and abstract	374
Records excluded after screening	319
Full-text articles assessed for eligibility	55
Full-text articles excluded	34
Studies included in systematic review	21

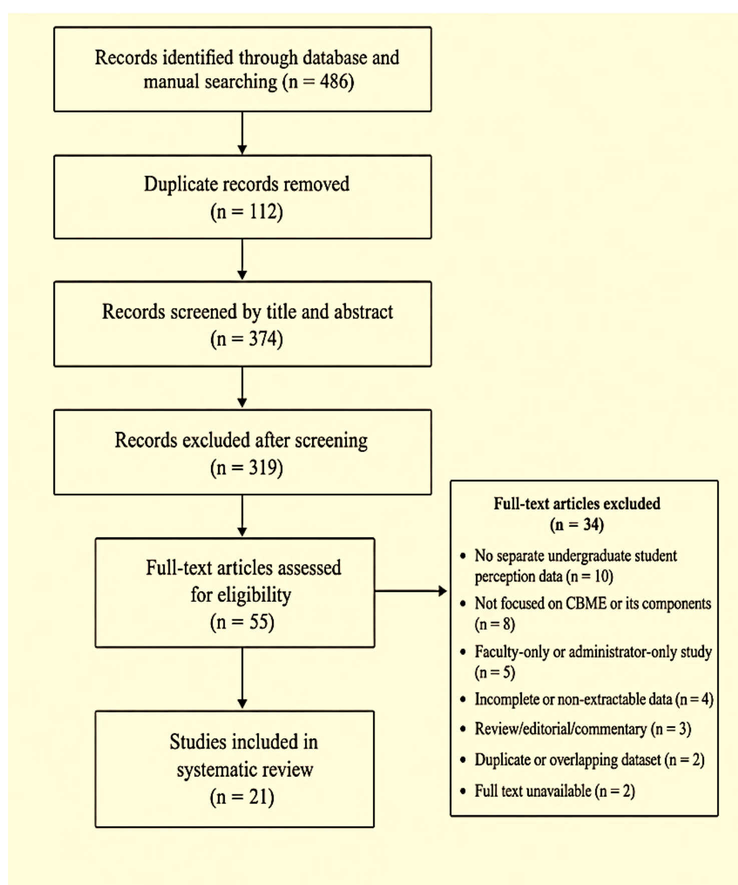

Figure 1 shows the PRISMA 2020 study selection process. A total of 486 records were identified, 112 duplicates were removed, 374 records were screened, 55 full-text articles were assessed, and 21 studies were finally included in the systematic review.

Reasons for Full-Text Exclusion

Reason for exclusion	Number

No separate undergraduate student perception data	10
Not focused on CBME or its components	8
Faculty-only or administrator-only study	5
Incomplete or non-extractable data	4
Review/editorial/commentary	3
Duplicate or overlapping dataset	2
Full text unavailable	2
Total	34

Data Extraction

- A structured data extraction format was used. The following information was extracted from each included study:
- Author and year of publication; Country or region; Study design; Study setting; Year or phase of MBBS students included; Sample size; CBME component assessed; Positive student perceptions; Negative student perceptions; Reported challenges; Suggestions for improvement; Assessment and feedback-related findings; Skill development and clinical relevance outcomes; Overall student acceptance and Methodological quality rating

Data extraction was performed independently by two reviewers. Extracted data were compared, and discrepancies were resolved through discussion and consensus.

Outcomes Assessed

Primary Outcomes

1. Overall perception of undergraduate medical students toward CBME.
2. Perceived benefits of CBME.
3. Perceived challenges of CBME implementation.

Secondary Outcomes

1. Student perception of early clinical exposure.
2. Student perception of integrated teaching.
3. Student perception of self-directed learning.
4. Student perception of formative assessment and feedback.
5. Student perception of skill-based learning.
6. Student perception of communication, ethics, and professionalism modules.
7. Student perception of logbooks and documentation.
8. Suggestions for improving CBME implementation.

Methodological Quality and Risk of Bias Assessment

Methodological quality and risk of bias of the included studies were assessed using the Joanna Briggs Institute Critical Appraisal Checklist appropriate for cross-sectional, qualitative, and mixed-method studies. The domains assessed included clarity of study objectives, appropriateness of study design, description of study setting and participants, validity and reliability of the data collection tool, adequacy of sample size, completeness of outcome reporting, appropriateness of statistical analysis, ethical approval or informed consent reporting, and relevance to CBME implementation.

Studies fulfilling ≥70% of applicable criteria were categorized as good quality, those fulfilling 50-69% were categorized as moderate quality, and those fulfilling <50% were categorized as low quality. Based on this assessment, 8 studies were categorized as good quality, 10 as moderate quality, and 3 as low quality.

Data Synthesis

Because the included studies differed in study design, questionnaire structure, response scales, student populations, academic year, CBME component assessed, and outcome reporting, formal meta-analysis was not performed. A descriptive synthesis was conducted.

Quantitative findings were summarized using frequencies and percentages where available. Where similar perception domains were reported across multiple studies, proportions were summarized using weighted descriptive estimates based on available sample sizes. These percentages were interpreted as descriptive trends rather than statistically pooled effect estimates.

Qualitative findings were grouped into recurring themes, including clinical relevance, early clinical exposure, skill confidence, integrated learning, active learning, self-directed learning, formative assessment, feedback, communication skills, professionalism, workload, assessment concerns, logbook burden, faculty variability, and implementation challenges.

RESULTS

Study Characteristics

A total of 21 studies involving 5,864 undergraduate medical students were included. Most studies were conducted in medical colleges where CBME had been recently introduced or implemented. Fourteen studies were cross-sectional surveys, three were qualitative studies, and four used mixed-method approaches. Seventeen studies were single-institution studies, while four were multicentric or included students from more than one medical institution.

Table 1. Characteristics of Included Studies

Characteristic	Number
Total included studies	21
Total undergraduate medical students	5,864
Cross-sectional studies	14
Qualitative studies	3
Mixed-method studies	4
Single-institution studies	17
Multicentric studies	4
Studies from India	14
Studies from other countries	7

CBME Components Assessed

The included studies evaluated different components of CBME. The most commonly assessed components were early clinical exposure, formative assessment, integrated teaching, skill laboratory training, communication and ethics modules, feedback, self-directed learning, and logbook documentation.

Table 2. CBME Components Evaluated Across Included Studies

CBME component	Number of studies reporting
Early clinical exposure	16
Formative assessment	15
Integrated teaching	14
Skill laboratory / simulation-based learning	13
Communication, ethics, and professionalism	12
Feedback process	12
Self-directed learning	10
Logbook documentation	9
Small-group teaching	8
Electives / learner flexibility	4
Mentorship and remediation	4

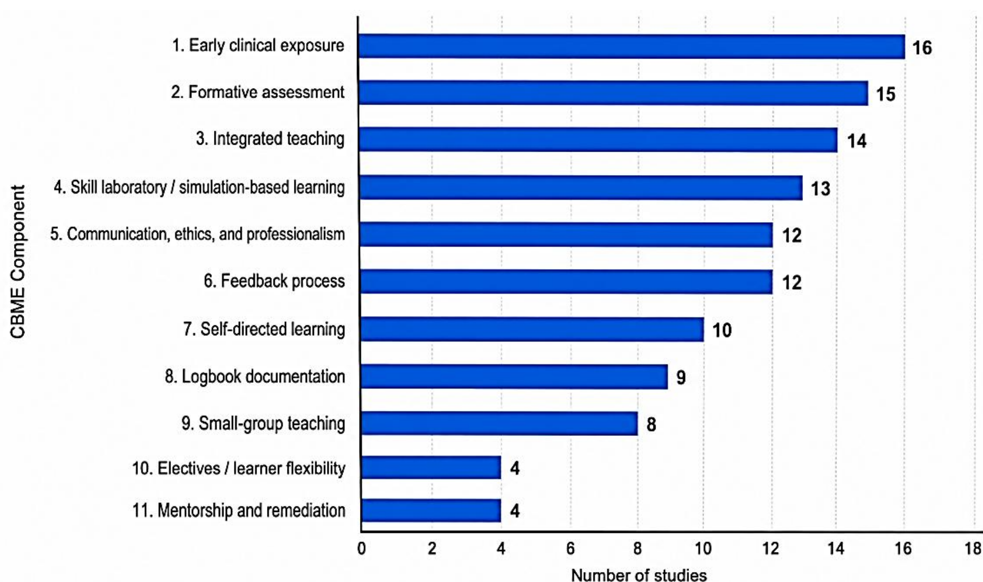

Figure 2 summarizes the CBME components evaluated across the included studies. Early clinical exposure, formative assessment, integrated teaching, and skill-based learning were the most frequently assessed components.

Overall Student Perceptions Toward CBME

Overall, students perceived CBME as a clinically relevant and skill-oriented curriculum. The highest positive perception was observed for improved clinical relevance of learning, reported by 76.2% of students. Improved understanding of competencies was reported by 72.8%, while early clinical exposure improved motivation in 69.5%. Practical confidence was reported by 67.1%, and integrated teaching helped conceptual linkage in 65.8%.

Table 3. Positive Perceptions of CBME Among Undergraduate Medical Students

Positive perception domain	Proportion of students reporting positive perception
Improved clinical relevance of learning	76.2%
Better understanding of competencies	72.8%
Early clinical exposure improved motivation	69.5%
Increased practical confidence	67.1%
Integrated teaching improved conceptual linkage	65.8%
Feedback improved learning direction	64.4%
Improved communication and professional awareness	62.9%
Active learning was encouraged	61.7%
Skill laboratory improved procedural confidence	60.8%
Formative assessment helped identify learning gaps	58.6%

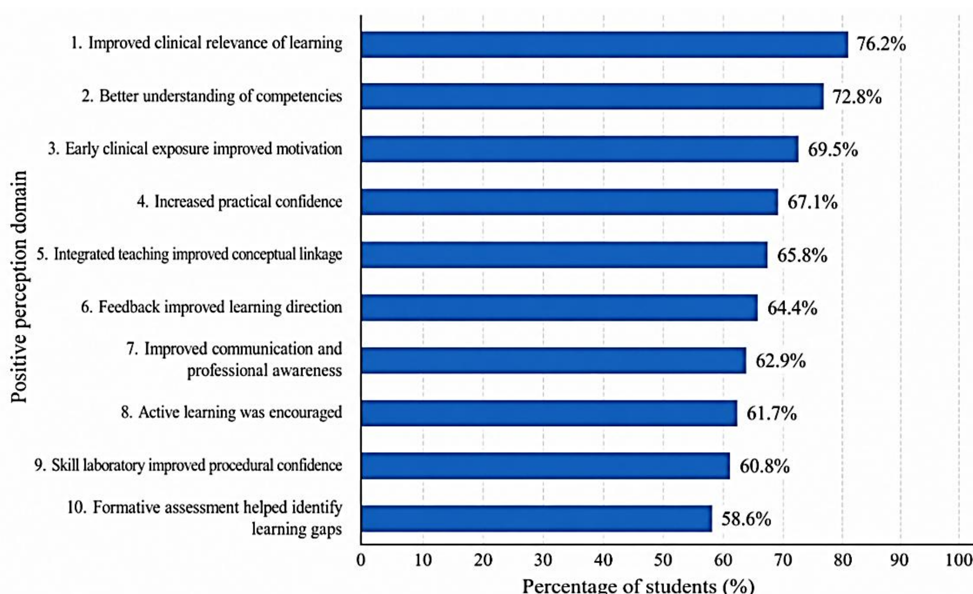

Figure 3 presents the major positive perceptions of CBME among undergraduate medical students. Clinical relevance, competency understanding, early clinical exposure, practical confidence, and integrated teaching were the most positively perceived domains.

Perceptions Regarding Early Clinical Exposure

Early clinical exposure was one of the most positively perceived components of CBME. Students reported that early patient interaction made basic science learning more meaningful and helped them understand the relevance of anatomy, physiology, biochemistry, pathology, microbiology, pharmacology, and clinical medicine. It also improved motivation, professional identity formation, and awareness of doctor-patient interaction.

However, some students reported that early clinical exposure was more effective when sessions were structured, linked with prior classroom teaching, and followed by discussion or reflection. Unstructured clinical exposure without clear objectives was perceived as less useful.

Perceptions Regarding Integrated Teaching

Integrated teaching was generally viewed favorably. Students reported that horizontal and vertical integration helped them understand disease processes more comprehensively. Integration between preclinical, paraclinical, and clinical subjects reduced fragmentation of knowledge and improved contextual understanding.

However, students also reported challenges when integrated sessions were poorly coordinated or when multiple departments repeated content without a unified teaching plan. Effective integration required clear learning objectives, interdepartmental coordination, and appropriate sequencing.

Perceptions Regarding Skill-Based Learning
Skill laboratory training and simulation-based sessions were perceived as useful for improving procedural confidence. Students valued opportunities to practice clinical examination, basic procedural skills, communication, and emergency response in a safe learning environment before direct patient exposure.

Students preferred hands-on sessions over purely didactic teaching. However, limited time, large batch size, inadequate faculty supervision, and insufficient practice opportunities were reported as barriers.

Perceptions Regarding Self-Directed Learning
Self-directed learning was viewed as beneficial but challenging. Students recognized that SDL encouraged independent reading, responsibility, and lifelong learning habits. However, many students reported difficulty in understanding expectations, selecting learning resources, managing time, and preparing SDL assignments.

Students suggested that SDL sessions should include clear learning objectives, recommended resources, faculty guidance, and post-session discussion. Completely unguided SDL was perceived as stressful by many students.

Perceptions Regarding Formative Assessment and Feedback
Formative assessment was generally perceived as helpful because it allowed students to identify weaknesses before final examinations. Feedback was valued when it was specific, timely, constructive, and linked to improvement strategies.

However, students reported that feedback was sometimes irregular, generic, or delayed. Some students perceived formative assessments as additional examinations rather than learning tools. This indicates that the purpose of formative assessment must be clearly explained to students and faculty.

Perceptions Regarding Logbooks
Logbook documentation received mixed responses. Students acknowledged that logbooks helped track competencies and clinical exposure. However, logbooks were also perceived as time-consuming, repetitive, and documentation-heavy. Some students reported that logbook completion became a formality when faculty verification was inconsistent.

For logbooks to be meaningful, students suggested simplification, digital formats, periodic review, and feedback-oriented documentation rather than signature-based completion.

Challenges Reported by Students
The most common challenge was increased academic workload, reported by 57.6% of students. Unclear assessment expectations were reported by 50.9%, and inconsistent faculty implementation by 45.2%. Logbook burden, difficulty with self-directed learning, limited orientation, inadequate feedback, and insufficient skill practice time were also frequent concerns.

Table 4. Challenges Reported by Undergraduate Medical Students

Challenge domain	Proportion of students reporting concern
Increased academic workload	57.6%
Unclear assessment expectations	50.9%
Inconsistent faculty implementation	45.2%
Logbook documentation burden	42.3%
Difficulty with self-directed learning	39.1%
Limited orientation to CBME	37.8%
Inadequate time for skill practice	35.6%
Feedback not regular or specific	33.7%
Overcrowded practical / clinical sessions	31.9%
Poor coordination between departments	29.4%

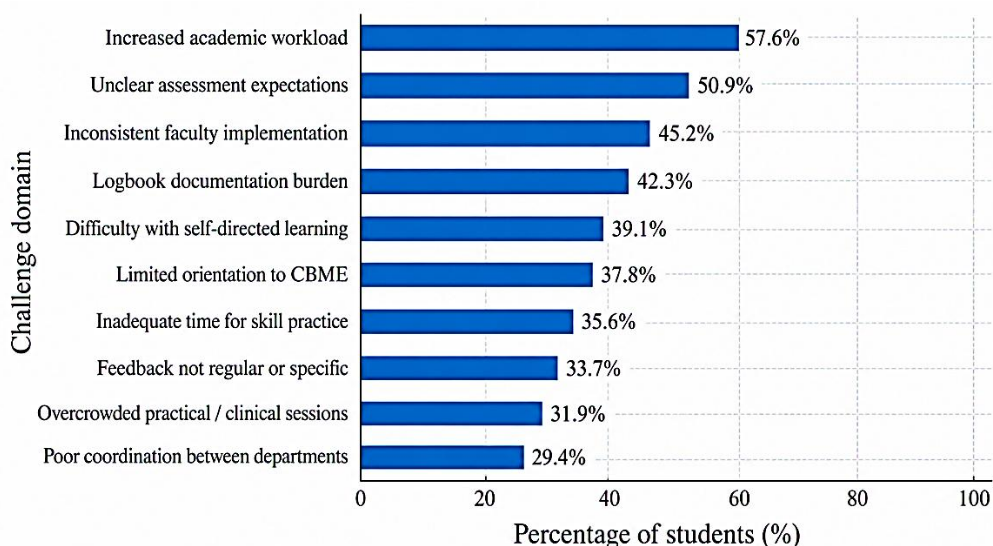

Figure 4 shows the major challenges experienced by undergraduate medical students during CBME implementation. Increased workload, unclear assessment expectations, inconsistent faculty implementation, and logbook burden were the leading concerns.

Suggested Improvements by Students

Students suggested several improvements to make CBME more effective. The most frequent suggestions included better orientation at the beginning of the academic year, clearer explanation of competencies, structured timetable planning, standardization of assessment, more meaningful feedback, reduced documentation burden, increased hands-on learning, and better faculty coordination.

Table 5. Student Suggestions for Improving CBME Implementation

Suggested improvement	Educational implication
Better orientation to CBME	Improves student understanding of curriculum expectations
Clearer competency mapping	Helps students know what they are expected to achieve
Standardized assessment methods	Reduces uncertainty and perceived unfairness
Timely and specific feedback	Improves learning direction and performance
More hands-on skill sessions	Enhances clinical confidence
Structured self-directed learning	Reduces stress and improves independent learning
Simplified logbook documentation	Prevents documentation fatigue
Better faculty coordination	Improves integration and avoids repetition
Smaller group teaching	Increases interaction and participation
Digital learning and logbook tools	Improves tracking and reduces paperwork

DISCUSSION

This systematic review highlights that undergraduate medical students generally perceived competency-based medical education (CBME) as a meaningful, clinically relevant, and skill-oriented educational approach. The most favorable perceptions were related to clinical relevance of learning, early clinical exposure, practical skill development, integrated teaching, formative assessment, communication training, and feedback. These findings indicate that students recognize the value of a curriculum that connects theoretical knowledge with clinical application and professional practice.

The positive perception toward early clinical exposure may be explained by the opportunity it provides for students to understand the relevance of basic sciences in real patient-care settings. Early contact with patients helps students appreciate the clinical importance of subjects such as anatomy, physiology, biochemistry, pathology, microbiology, pharmacology, and clinical medicine. It also supports motivation, professional identity formation, and awareness of doctor-patient interaction. However, the findings also suggest that early clinical exposure is most effective when it is structured, linked with prior classroom learning, and followed by reflection or discussion.

Integrated teaching was another domain that was generally perceived positively by students. In traditional curricula, students often learn subjects in isolation, which may limit their ability to connect basic science concepts with clinical conditions. CBME attempts to reduce this fragmentation by encouraging horizontal and vertical integration. Students perceived integrated teaching as useful for understanding disease mechanisms, diagnostic reasoning, and patient

management in a more comprehensive manner. However, poorly coordinated integrated sessions may result in repetition, confusion, or superficial coverage. Therefore, effective integration requires interdepartmental planning, clear learning objectives, and appropriate sequencing of teaching sessions.

Skill-based learning and simulation-based training were also perceived favorably. Students valued opportunities to practice clinical examination, procedural skills, communication, and emergency responses in a supervised environment before direct patient encounters. This finding supports the principle that competence cannot be achieved through didactic teaching alone. Repeated practice, observation, constructive feedback, and performance-based assessment are essential for developing clinical confidence. Institutions implementing CBME should therefore ensure adequate skill laboratory infrastructure, smaller teaching groups, faculty supervision, and sufficient time for hands-on practice.

Self-directed learning received mixed responses. Although students understood the importance of independent learning and lifelong learning habits, many found self-directed learning difficult when expectations were unclear. Challenges included difficulty in selecting appropriate resources, managing time, preparing assignments, and understanding expected outputs. This suggests that self-directed learning in undergraduate medical education should be guided, particularly in the early years. Clear learning objectives, recommended reading material, faculty facilitation, and post-session discussion can make self-directed learning more meaningful and less stressful.

Formative assessment and feedback were identified as central elements influencing student perception of CBME. Students appreciated formative assessment when it helped them identify learning gaps before summative examinations. Feedback was valued when it was timely, specific, constructive, individualized, and linked to improvement strategies. However, some students perceived formative assessments as additional examinations rather than learning opportunities. This indicates that both students and faculty require orientation regarding the purpose of formative assessment in CBME. Feedback should not be treated as a routine formality but as a continuous educational process that supports progressive competency achievement.

Assessment-related uncertainty was one of the major challenges reported by students. In CBME, students are expected to achieve clearly defined competencies; however, unclear assessment expectations may increase anxiety and reduce acceptance of the curriculum. Students may focus on completing documentation rather than developing competence if assessment methods are not transparent. Standardized rubrics, competency mapping, blueprinting, clear performance criteria, and orientation to assessment methods are necessary to reduce confusion and improve fairness.

Logbook documentation emerged as an important implementation challenge. Although logbooks are intended to track competency achievement and clinical exposure, students may perceive them as burdensome if they become repetitive, documentation-heavy, or signature-oriented. When verification is inconsistent, logbook completion may become a formality rather than a reflective learning activity. Digital logbooks, periodic review, simplified documentation, reflective entries, and feedback-based verification may improve their educational value.

Increased academic workload was the most frequently reported concern. This may be because CBME includes multiple educational components such as early clinical exposure, self-directed learning, formative assessment, skill laboratory sessions, logbooks, small-group learning, reflection, and feedback. If these components are added without proper timetable planning, students may experience curriculum overload. CBME should therefore be implemented as a carefully integrated curriculum redesign rather than as an accumulation of additional activities.

Faculty variability was another recurring concern. CBME requires faculty members to move beyond content delivery and take on roles as facilitators, observers, assessors, mentors, and feedback providers. If faculty understanding and implementation differ across departments, students may receive inconsistent guidance. Faculty development is therefore essential for standardizing teaching methods, competency assessment, feedback delivery, logbook verification, and student mentoring.

The findings of this review also suggest that CBME may strengthen student awareness of communication, ethics, professionalism, and patient-centered care. These domains are difficult to teach through lectures alone and require role play, reflection, clinical observation, small-group discussion, and feedback. Positive student perception toward these components indicates that CBME has the potential to support more holistic undergraduate medical training when implemented effectively.

Overall, this review indicates that students generally support the goals of CBME but expect better orientation, clearer competency expectations, structured teaching-learning activities, transparent assessment, meaningful feedback, reduced documentation burden, and consistent faculty guidance. Student perception should therefore be considered an important indicator of curriculum functionality. Regular collection of student feedback and its incorporation into curriculum review can help medical institutions refine CBME implementation and improve educational quality.

Strengths

This systematic review has several strengths. First, it focused specifically on undergraduate medical students, who are the primary recipients of competency-based medical education and whose perceptions are essential for evaluating curriculum acceptability and implementation quality. Second, the review synthesized evidence across multiple CBME domains, including early clinical exposure, integrated teaching, self-directed learning, formative assessment, feedback, skill laboratory training, communication, professionalism, and logbook documentation.

Third, the review followed a structured approach based on PRISMA 2020 guidelines, with predefined eligibility criteria, systematic study selection, and descriptive synthesis of findings. Fourth, methodological quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklist, allowing classification of studies as good, moderate, or low quality. Fifth, the review included both positive perceptions and implementation-related challenges, providing a balanced understanding of student experiences. Finally, the findings are practically relevant for medical colleges because they identify modifiable areas such as orientation, assessment transparency, feedback quality, faculty preparedness, skill-practice opportunities, and documentation burden.

Limitations

This review has certain limitations. The review protocol was not prospectively registered in PROSPERO or any other systematic review registry, which may limit transparency of the review process. Although a structured search strategy and predefined eligibility criteria were used, the included studies showed heterogeneity in study design, questionnaire tools, response scales, CBME components assessed, and definitions of student perception. Therefore, formal meta-analysis was not performed, and the findings were summarized descriptively.

Most included studies were cross-sectional and relied on self-reported student perceptions. Such perceptions are useful for understanding curriculum acceptance and implementation experience but may not directly reflect actual competency achievement, academic performance, clinical skill acquisition, or patient-care outcomes. Some studies assessed only selected CBME components rather than the complete curriculum, which may have influenced the overall interpretation. In addition, variability in institutional infrastructure, faculty training, assessment practices, and stage of CBME implementation may have contributed to differences in student responses across studies.

CONCLUSION

Undergraduate medical students generally perceived competency-based medical education as a clinically relevant and skill-oriented curriculum. Students reported that CBME improved their perceived motivation, practical confidence, communication awareness, professionalism, active learning, and understanding of clinical relevance. Early clinical exposure, integrated teaching, skill laboratory training, formative assessment, and feedback were viewed as valuable components of the curriculum.

However, implementation-related challenges such as increased academic workload, unclear assessment expectations, inconsistent faculty guidance, inadequate feedback, difficulty with self-directed learning, and logbook documentation burden affected student experience. These findings suggest that successful CBME implementation requires structured student orientation, transparent competency mapping, standardized assessment methods, meaningful and timely feedback, faculty training, adequate skill-practice opportunities, and student-centered curriculum refinement.

Because this review evaluated student perceptions rather than direct educational effectiveness, the findings should be interpreted as evidence of perceived benefits and challenges. Future research should include multicentric longitudinal studies using validated perception tools and should examine the relationship between student perception, competency achievement, academic performance, and clinical preparedness.

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