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Assessing the Impact of Competency-Based Medical Education (CBME): Insights from Medical Students

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Abstract

The National Medical Commission (NMC) in India introduced the Competency-Based Medical Education (CBME) curriculum to enhance medical education quality and align with global standards. This curriculum emphasizes developing specific competencies, and ensuring medical students possess essential skills, knowledge, and attitudes. A survey among 500 final-year students and CRMIs at Sree Balaji Medical College and Hospital assessed their views on the CBME curriculum using a Google Forms questionnaire. Key findings include the majority finding the Foundation Course necessary for their medical training, most students rating Basic Life Support (BLS) training as very useful, and field visits generally seen as beneficial, while opinions on IT skills sessions were mixed. Early clinical exposure significantly enhanced the learning experience, with high preferences for small group teaching, self-directed learning, reflective learning, and AETCOM training in Phase I MBBS. Elective postings were considered beneficial by most respondents. Students had a mixed understanding of the new assessment schemes under CBME, and subject integration was found to be very beneficial, with preferences for both horizontal and vertical integration. Many students found Phase I MBBS to be academically stressful and strongly suggested more time for sports and physical activities. Overall, the CBME curriculum was positively received, particularly in early clinical exposure, skill development, and subject integration. However, areas such as IT skills training, the duration of the Foundation Course, and better synchronization of vertical integration require improvement. Addressing these concerns can lead to better-prepared medical graduates, capable of meeting the healthcare needs of the population with a strong emphasis on practical skills, ethical practice, and continuous learning.

Keywords: *AETCOM, BLS, CBME, Early Clinical Exposure, Elective Postings, Integration*

Introduction

Competency-Based Medical Education (CBME) represents a significant shift in the paradigm of medical education, transitioning from a traditional time-based educational model to one that focuses on the development and demonstration of specific competencies in medical students. The National Medical Commission (NMC) in India introduced this new approach in 2019 to produce more competent and practice-ready medical graduates [1]. The traditional medical curriculum in India, which has been in place for decades, is primarily time-based. It emphasizes the duration of study, number of hours spent in lectures, and rote memorization of vast amounts of information. This approach often leads to students focusing on passing exams rather than truly understanding and applying their knowledge. It has been criticized for producing graduates who may lack practical skills and the ability to think critically in clinical settings. The need for change became evident with the evolving healthcare landscape, advancements in medical science, and the demand for more patient-centred care. The traditional curriculum was seen as insufficient in preparing students

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for real-world challenges, prompting the NMC to adopt a competency-based approach. CBME aims to address these gaps by ensuring that medical graduates possess the necessary competencies to effectively practice medicine upon completion of their education. It focuses on the outcomes of the educational process. It defines specific competencies that students must achieve, including knowledge, skills, and attitudes essential for medical practice. Unlike the rigid time-based approach, CBME allows flexibility in the duration of study [2]. Students can progress at their own pace, moving forward only when they have demonstrated the required competencies. CBME emphasizes active learning and learner engagement. It encourages students to take responsibility for their learning, with teachers acting as facilitators and mentors. CBME integrates theoretical knowledge with practical skills. It promotes early clinical exposure and continuous assessment of clinical competencies [3]. Continuous feedback and reflective practice are integral components of CBME. Regular feedback helps students identify their strengths and areas for improvement, fostering a culture of continuous learning [3-7]. The CBME curriculum introduced by the NMC is structured around predefined competencies in various domains, including Medical Knowledge, Patient Care, Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice [8]. The Medical Knowledge domain covers foundational and clinical sciences, ensuring comprehensive medical knowledge. The Patient Care domain focuses on providing effective and compassionate care, including clinical skills, diagnosis, and treatment planning. Professionalism emphasizes ethical practice, communication skills, and professional attitudes and behaviours [6]. Interpersonal and Communication Skills ensure effective communication with patients, families, and healthcare teams [6]. Practice-Based Learning and Improvement involves self-directed learning, critical appraisal of medical literature, and evidence-based practices. Systems-based practice includes understanding the healthcare system, collaborative work in healthcare teams, and advocating for patient safety and quality care. This structured approach aims to produce well-rounded medical professionals who are knowledgeable, skilled in practical aspects, and adept in interpersonal relationships within the healthcare environment. The traditional curriculum relies heavily on summative assessments, such as end-of-year exams, which often emphasize rote memorization. CBME employs continuous formative assessments, including objective structured clinical examinations (OSCEs), mini-clinical evaluation exercises (mini-CEX), and workplace-based assessments, focusing on the demonstration of competencies [9]. Students take personal responsibility by adopting self-directed learning (SDL), performing under observation in the laboratory and dealing with real and simulated patients [10]. The learner must demonstrate and document the evidence of acquisition of competency. Traditional teaching methods are primarily lecture-based, with limited opportunities for hands-on learning. CBME incorporates a variety of teaching methods, including problem-based learning (PBL), simulation-based training, and early clinical exposure, promoting active learning and practical skills development. The traditional curriculum is teacher-centred, with students often passively receiving information. CBME is learner-centred, encouraging active participation, self-directed learning, and critical thinking [9]. In the traditional curriculum, feedback is often limited and provided only at the end of a course or rotation. CBME emphasizes continuous feedback and reflection, helping students identify their strengths and areas for improvement throughout their education. The traditional curriculum often treats basic sciences and clinical sciences as separate entities. CBME integrates these

disciplines, promoting a more holistic understanding of medical knowledge and its application in clinical practice. CBME offers several advantages over the traditional curriculum. By focusing on competencies, CBME ensures that students develop practical skills and are better prepared for clinical practice. CBME promotes active learning and critical thinking, encouraging students to apply their knowledge to real-world scenarios. Despite its advantages, the implementation of CBME poses several challenges. Effective implementation of CBME requires faculty to be trained in new teaching and assessment methods. This necessitates significant investment in faculty development programs. CBME requires adequate infrastructure, including simulation labs, clinical training facilities, and technology for assessment and feedback. Many medical colleges may face challenges in providing these resources [8,11]. Transitioning from a traditional curriculum to CBME requires a cultural shift in medical education. Both faculty and students need to embrace the new approach, which can be challenging in institutions with entrenched traditional practices. Designing and implementing effective assessment tools for CBME can be complex. Continuous formative assessments require careful planning and standardization to ensure reliability and validity. Aligning CBME with existing regulatory and accreditation frameworks can be challenging. Ensuring that CBME meets national and international standards is essential for its success. To understand the practical implications of CBME, it is essential to examine its implementation in Indian medical colleges. The NMC has mandated the adoption of CBME across all medical colleges in India, to produce competent and practice-ready graduates. The initial phase of implementation faced several challenges, including resistance from faculty accustomed to traditional teaching methods, lack of awareness among students, and inadequate infrastructure. Training programs for faculty and awareness campaigns for students were crucial in addressing these challenges. Comprehensive faculty development programs were organized to train educators in CBME principles, teaching methods, and assessment techniques. These programs focused on developing skills in formative assessment, feedback, and reflective practice. Medical colleges revised their curricula to align with CBME principles. This involved integrating basic and clinical sciences, introducing early clinical exposure, and incorporating a variety of teaching methods, including PBL and simulation-based training. New assessment strategies were implemented to evaluate competencies continuously. This included the use of OSCEs, mini-CEX, and workplace-based assessments. Regular feedback sessions and reflective practice were also emphasized. Efforts were made to engage students actively in their learning process. This included promoting self-directed learning, critical thinking, and problem-solving skills. Students were encouraged to take responsibility for their learning, with faculty acting as facilitators and mentors.

Materials and Methods

A cross-sectional descriptive was conducted in 2024 among 500 medical students (MBBS final year and CRMI) in Sree Balaji Medical College and Hospital, Chennai, India in July 2024 to gather their perceptions of the CBME curriculum. The survey included questions about various aspects of the curriculum, such as the Foundation Course, BLS training, ECE, and AETCOM training. Incomplete forms, non-consenting participants were excluded. A questionnaire was administered via Google Forms, covering topics such as the necessity of the Foundation Course, the usefulness of Basic Life Support (BLS) training, field visits, IT skills sessions, early clinical exposure, elective postings, small group teaching, self-directed learning, and the integration of subjects. Informed consent was obtained from the

participants. The Google Forms link containing the questionnaire was distributed via WhatsApp and Gmail to eligible participants who were provided with clear instructions on how to complete the survey. A period of 5 days was given for the participants to complete the survey with periodic reminders to maximise response rates. Privacy was maintained throughout the study by anonymising the data. The responses were analysed to identify common themes and trends. Descriptive statistics were used to summarize the data, and qualitative analysis was performed on open-ended responses to extract insights and suggestions.

Results

The Foundation Course is designed to acclimate new medical students to the medical environment, covering essential skills such as communication, ethics, and basic clinical skills. According to the survey, 88.4% of the students found the Foundation Course necessary [Figure 1]. This high percentage indicates that the course plays a crucial role in helping students transition into the rigorous demands of medical education. BLS training is a critical component of the CBME curriculum, providing students with essential skills to handle medical emergencies. The survey results showed that 100% of students rated BLS training as useful [Figure 1]. This overwhelming approval highlights the importance of BLS training in preparing students for real-world scenarios where they may need to perform life-saving procedures. Field visits are an integral part of the Competency-Based Medical Education (CBME) curriculum, designed to provide students with real-world insights into various medical and healthcare settings. The study results indicate that 93% of students found field visits beneficial [Figure 1]. These visits offer several advantages real-world experience, contextual learning, interdisciplinary exposure and patient interaction. Small group teaching is a core component of the Competency-Based Medical Education (CBME) curriculum, receiving high approval from 83.7% of students in this study [Figure 1]. This educational approach involves dividing students into smaller groups to facilitate more personalized and interactive learning experiences. The benefits and characteristics of small group teaching include personalised attention, active learning, enhanced communication skills, peer learning, immediate feedback, flexibility in teaching methods and better assessment of learning. ECE is another vital aspect of the CBME curriculum, offering students practical experience in clinical settings from the early stages of their education. A significant 95.30% of students agreed that ECE enhanced their learning experience [Figure 2]. This early exposure helps students apply theoretical knowledge in practical scenarios, fostering a deeper understanding of medical concepts. AETCOM training focuses on developing professional attitudes, ethics, and communication skills. According to the survey, 97.7% of students acknowledged the importance of AETCOM training [Figure 2]. This component is crucial in shaping well-rounded medical professionals who not only possess clinical skills but also demonstrate ethical behaviour and effective communication. Elective postings are a significant feature of the Competency-Based Medical Education (CBME) curriculum, designed to provide medical students with the opportunity to explore areas of interest in greater depth. In the study, 95.3% of students found elective postings to be beneficial [Figure 2]. Self-directed learning (SDL) is a cornerstone of the Competency-Based Medical Education (CBME) curriculum, and was supported by 81.4% of students in the study [Figure2]. This approach empowers students to take charge of their education, fostering independence and lifelong learning skills. Information Technology (IT) and computer skills training are essential components of the Competency-Based Medical Education (CBME) curriculum,

reflecting the growing importance of digital proficiency in modern medical practice. The study results indicate that 74.4% of students found IT skills sessions useful [Figure 2]. The CBME curriculum integrates various subjects to provide a holistic understanding of medical science. Both horizontal (integration within the same phase) and vertical (integration across different phases) integration were evaluated. The survey indicated that 97% of students found the integration of subjects beneficial. Out of which 11.6% of students said vertical integration is beneficial, 14% of students found horizontal integration is useful and 67.4% found both vertical and horizontal integration to be useful [Figure 3]. Integrated learning helps students see the connections between different disciplines, enhancing their overall comprehension and retention of knowledge. However, 69.8% of students found Integrated learning sessions time-consuming [Figure]. Assessment schemes in Competency-Based Medical Education (CBME) are designed to evaluate the comprehensive development of students' competencies, ensuring they meet the required standards for medical practice. In the study, 83.7% of students had a good understanding of the new assessment schemes, indicating students have a better understanding of the assessment schemes [Figure 5].

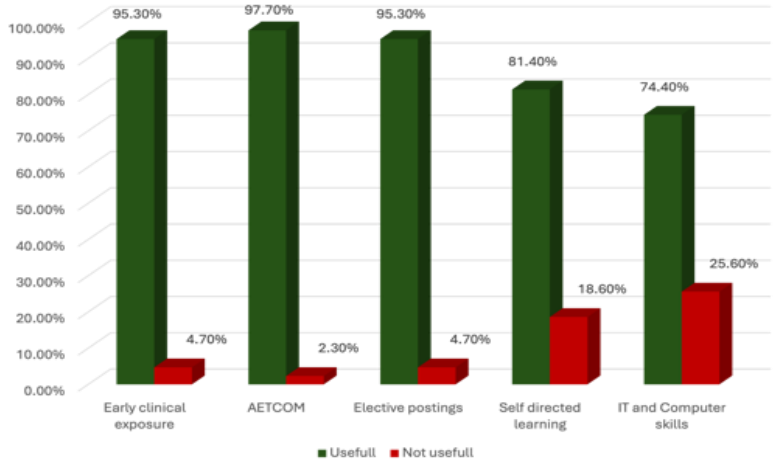

Figure 1. CBME Components

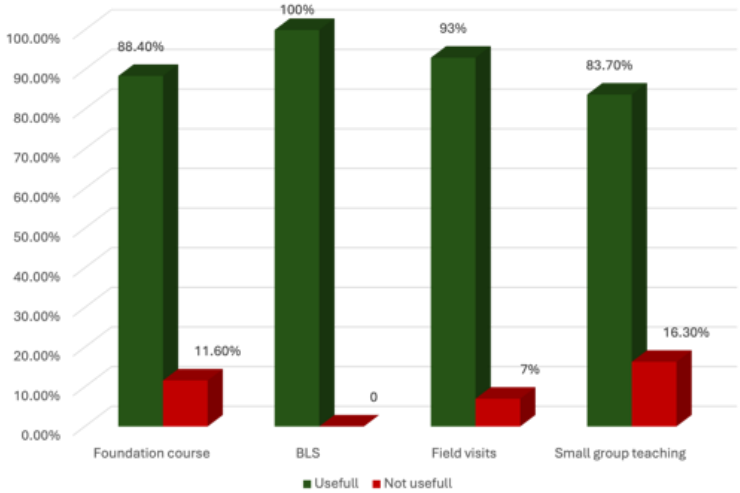

Figure 2. CBME Components

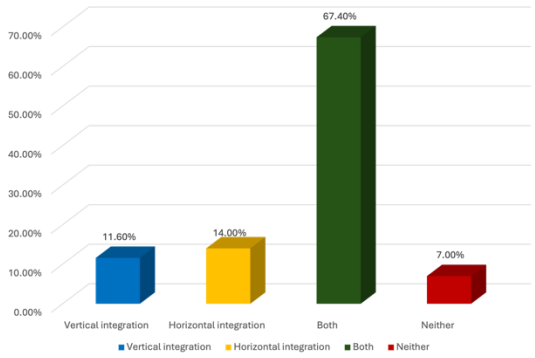

Figure 3. Integrated Sessions

Discussion

The CBME curriculum introduced by the NMC represents a significant advancement in medical education in India. Its focus on competency development, early clinical exposure, and integrated learning aligns to produce well-rounded medical professionals. As Indian medical students start their medical curriculum earlier than other countries it is essential to have a smooth transition for the students [12,13]. Suman *et al*. in 2007 concluded that the majority of the students welcomed foundational courses positively [14]. The positive reception of the curriculum components, such as the Foundation Course, BLS training, and AETCOM training, indicates that the curriculum is effectively addressing the needs of medical students. Previous studies in India have concluded that there is a need for communication skills training among medical graduates in India and there are some pilot projects undertaken that are successful [15-20]. Despite the strengths of the CBME curriculum, a significant number of students reported finding Phase I MBBS academically stressful [Figure 6]. This stress can be attributed to the rigorous demands of the curriculum and the transition from high school to medical school. The same has been agreed by many previous studies [21-26]. Students highlighted the need for better time management strategies and reduced academic pressure. Additionally, 88.4% of students suggested allocating more time for sports and physical activities to help manage stress [Figure 7]. Physical activities can provide a necessary break from academic work, promoting overall well-being and better academic performance. Field visits are an integral part of the CBME curriculum, providing students with practical insights into various medical settings. While 93% of students found field visits useful, there were suggestions for increasing their frequency. Students believe that more frequent field visits would enhance their practical knowledge and exposure to real-world medical environments.

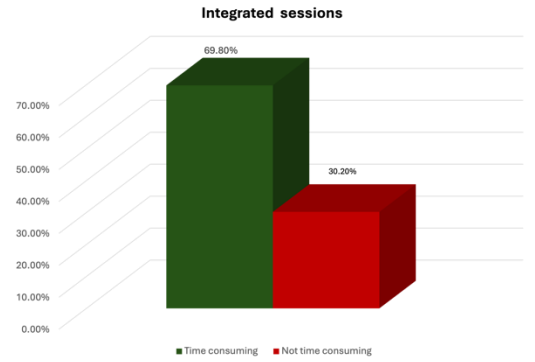

Figure 4. Time Management

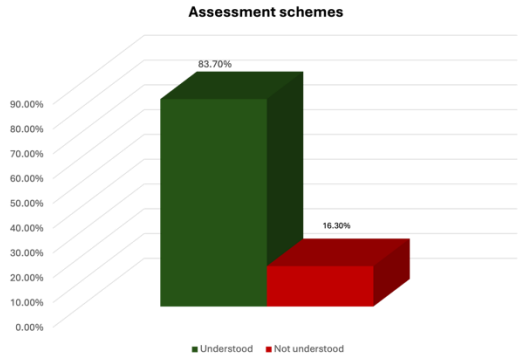

Figure 5. Assessment Schemes

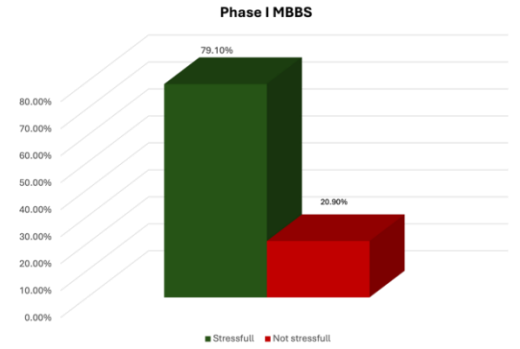

Figure 6. Stressfulness

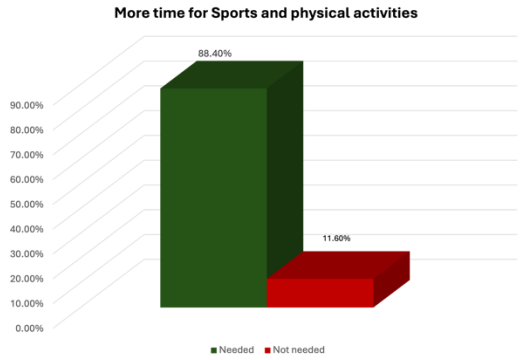

Figure 7. Physical Activities

While IT and computer skills sessions received positive reviews with 74.4% of students rating them as useful, there is a need for curriculum adjustments to make these sessions more engaging and relevant. In an increasingly digital world, proficiency in IT and computer skills is essential for modern medical practice. Therefore, these sessions should be tailored to meet the evolving needs of medical students. Increasing clinical exposure and hands-on practice is essential for developing competent medical professionals. Incorporating more practical training opportunities, such as administering injections and intravenous therapies, can help students build confidence and proficiency in essential medical skills. Adopting interactive teaching methods, such as case-based learning, simulations, and direct clinical orientations, can enhance student engagement and retention of knowledge. These methods provide a more dynamic and immersive learning experience, preparing students for real-world medical scenarios.

Conclusion

The CBME curriculum by the NMC has been positively received by medical students at

Sree Balaji Medical College. The curriculum's strengths lie in its focus on practical skills, early clinical exposure, and integrated learning. However, there is room for improvement in areas such as time management, stress reduction, and enhancing practical training. Continuous evaluation and adaptation of the curriculum based on student feedback will ensure its success in producing competent medical professionals. As the curriculum evolves, it holds the promise of significantly improving the quality of medical education and healthcare in India.

Conflicts of Interest

There are no conflicts of interest.

Acknowledgement

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