

Perception of Budding Indian Medical Graduates Towards Competency-based Medical Education: A Cross-sectional Study in a Private Medical College of Northwestern Karnataka, India

CHETHANA WARAD¹, SHUBHRA BHARGAVA², SHRUSTY MOHAPATRA³, PURUSHA TOMAR⁴, JAYASHEELA BAGI⁵



ABSTRACT

Introduction: Competency-Based Medical Education (CBME) has fundamentally reshaped India's medical education since its adoption in 2019-20 under the former Medical Council of India (MCI), now National Medical Commission (NMC). This learner-centric, patient-focused curriculum aims to cultivate "Indian Medical Graduates" (IMGs) who are globally relevant and competent as first-contact physicians. CBME emphasises essential knowledge, skills, values, professionalism, gender sensitivity and adaptability, aligning with international standards to prepare IMGs for diverse healthcare roles.

Aim: To assess the perception of Bachelor of Medicine, Bachelor of Surgery (MBBS) students from all Phases towards CBME and its implementation.

Materials and Methods: This cross-sectional study was conducted at KAHER's, Jawaharlal Nehru Medical College (JNMC), Belagavi, Karnataka, India from April 2024 to June 2024. The study encompassed 759 undergraduate students from Phase I, Phase II, III Part I and III Part II, with no dropouts. A structured, validated questionnaire was distributed to participants via WhatsApp/Email to assess their perceptions regarding CBME and its new components: self-directed learning,

small group teaching and mentorship. The responses were captured on a 5-point Likert scale and analysed statistically using the statistical software R version 4.4.0 and Microsoft Excel.

Results: The study included 759 students with a mean age of 20.46 ± 1.46 years. The participant group was predominantly female (56.52%) compared to male students (43.08%). Regarding the foundation course, the majority of students 691 (91.04%) had a positive perception, with only 7 (0.92%) reporting a negative perception and 61 (8.04%) remaining neutral. A total of 633 (83.4%) students had a positive attitude toward Self-Directed Learning (SDL) and Small Group Teaching (SGT), while 699 (92.09%) favored the new components of CBME. Overall, CBME received positive feedback from 699 (92.09%) students, with only 8 (1.05%) expressing negativity and 52 (6.85%) remaining neutral.

Conclusion: The study found that undergraduate medical students had a predominantly positive perception of the CBME curriculum. Key components like the foundation course, SDL, SGT and integration were well received. These results align with the study's objective, confirming effective implementation at the institutional level.

Keywords: Foundation course, Self-directed learning, Small group teaching, Teaching learning methods

INTRODUCTION

Competency-based Medical Education (CBME) has profoundly transformed the Indian medical education framework. The concept of CBME was first articulated by McGaghie in 1978 and has since been adopted across all medical institutions in India, commencing from the academic year 2019-2020, under the directive of the Medical Council of India (MCI), now succeeded by the National Medical Commission (NMC) [1].

The CBME is meticulously crafted to produce the "Indian Medical Graduate" (IMG), equipped with the requisite knowledge, skills, attitudes, values and responsiveness necessary to function as a competent first-contact physician within the community while maintaining global relevance and competitiveness [2]. This curriculum modernises medical education with a learner-centered, patient-centered, gender-sensitive and outcome-focused approach. Aligned with global standards, it equips IMGs to excel as clinicians, communicators, leaders, team members, lifelong learners and professionals.

The new CBME curriculum includes components like the foundation course, early clinical exposure, elective postings, self-directed

learning, skill lab postings, Attitude, Ethics, and Communication (AETCOM), pandemic modules, topic alignment through integration, Basic Life Support (BLS) workshops and e-logbooks, as recommended by the NMC.

The CBME is implemented because competency development varies for each student, unlike the traditional time-based curriculum that assumes uniform progress. Additionally, CBME has introduced a variety of useful newer teaching-learning methodologies and assessment techniques [3].

The CBME allows students to progress at different rates, with a focus on ongoing longitudinal assessment. This helps faculty create more accurate learning timelines, provide regular feedback and adjust learning milestones [4-7]. Thus, CBME promises greater flexibility, accountability and learner-centeredness.

The Graduate Medical Education Regulations define 35 global competencies for Indian medical graduates across five roles: clinician, communicator, leader, professional and lifelong learner. This necessitates both effective curriculum implementation and competency assessment [8]. The new curriculum demands a more careful and mature selection of assessment tools based on the competency and its expected level of achievement [8].

The adoption of CBME in the academic year 2019 was achieved after extensive faculty development and capacity building through training of medical faculty in basic courses, advanced courses, a Curriculum Implementation Support Program (CISP), framing draft guidelines and rectifying those guidelines after placing them in the public domain [8]. With the shift to CBME, successful implementation requires trained faculty, resources and new technologies. While many studies assess faculty perceptions, data on student perspectives across all MBBS Phases is limited [4-7].

The present study stands out from previous research by evaluating student perceptions across all four MBBS Phases, in contrast to earlier studies that typically focused on faculty views or limited student groups. It provides a robust and holistic analysis of CBME. Additionally, it examines a broad range of CBME components rather than isolated modules and uses a validated, structured questionnaire with defined scoring criteria to ensure objectivity. The study also captures practical aspects of implementation, such as mentorship, blended learning and structured timetables, offering valuable institutional insights.

Hence, the present study was conducted to assess the perception of MBBS students from all Phases towards CBME and its implementation.

MATERIALS AND METHODS

The cross-sectional study was conducted over a period of three months, from April 2024 to June 2024, at KAHER's, J.N. Medical College (JNMC), Belagavi, Karnataka, India. Belagavi. Informed consent was obtained from all students before requesting them to complete the Google Forms questionnaire. The study commenced after obtaining ethical clearance dated 02/04/2024 [JNMCIEC/88].

Inclusion criteria: All students studying in MBBS Phase I, Phase II, Phase III Part I and Phase III Part II of study Institute, during the study period, with no dropouts, were included by convenient sampling.

Exclusion criteria: Students who were on medical leave, dropouts, or not willing to participate in the study were excluded.

Sample size: The convenient sampling method was used, yielding a total sample size of 759 students.

Study Procedure

The questionnaire was developed based on the learnings from the Advancing Competency-based Medical Education (ACME) project, a structured faculty development initiative that trains educators in implementing CBME through hands-on experience, feedback mechanisms and module-based assessment planning. Dr. Chethana Warad (the first author) attended this program and used its framework to construct the questionnaire, which contained 33 questions ensuring alignment with CBME guidelines. The questionnaire addressed various components of CBME and its implementation. The study methodology and questionnaire were reviewed and validated by experts from ACME and the Medical Council at J.N. Medical College, Belagavi, before being distributed to the students.

The questionnaire was sent to the study population via Google Forms, shared through social media platforms like personal WhatsApp and

email. The questionnaire could be completed within 15 minutes, with no participants dropping out. Students who were willing to participate in the study were asked to express their perceptions of CBME in the Google Doc survey form using a 5-point Likert scale scoring system. The responses were recorded and analysed. A scoring system was implemented to assess the responses according to the Likert scale. In this system, the most positive response, "strongly agree," received the maximum score of 5 points, while subsequent responses received one point less, with "strongly disagree" earning a score of 1. Based on the total scores, perceptions were categorised as positive (strongly agree and agree) (>60%), neutral (not aware) (41–60%), or negative (strongly disagree and disagree) (<40%). This method was employed to calculate the overall total score for each respondent and for each subcomponent and the scoring system was meticulously explained to the students.

STATISTICAL ANALYSIS

Data were analysed using statistical software R version 4.4.0 and Microsoft Excel. Categorical variables were presented in frequency tables and continuous variables were expressed as Mean±Standard Deviation (SD) /Median (Min, Max).

RESULTS

The study population consisted of 759 students. The mean age of the participants was 20.46 ± 1.46 years. Females (429, 56.52%) outnumbered males (327, 43.08%) [Table/Fig-1]. Most students (96.84%) were aware of the MBBS curriculum changes, primarily informed by NMC documents available on the official website. A total of 736 students (89.85%) agreed that CBME is well implemented at JN Medical College, fostering student-centered learning. The majority found the Foundation Course, including BLS and field visits, highly beneficial and appreciated SDL and SGT sessions for promoting preparation, interaction and deeper understanding. Early clinical exposure, electives, skill laboratories, AETCOM, didactic lectures with videos and the family adoption program were valued by most students for enhancing practical learning and professional development. Integration of topics, structured timetables and mentorship were well received, while most students were aware of assessment methods and favored MCQs, though some expressed concerns about 100-mark theory papers [Table/Fig-2].

In the present study, students (92.09%) overwhelmingly expressed a positive perception of CBME, with the majority showing a positive

Variables	Subcategory	n (%)
Age (years)	Mean±SD	20.46 ± 1.46
	Median (Min, Max)	20 (17, 25)
Gender	Female	429 (56.52%)
	Male	327 (43.08%)
	Prefer not to say	3 (0.4%)
Current academic year	Phase I	200 (26.35%)
	Phase II	195 (25.69%)
	Phase III part 1	186 (24.51%)
	Phase III part 2	178 (23.45%)

[Table/Fig-1]: Distribution of subjects according to demographic details.

S. No.	Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	CBME is meticulously implemented in the Institute	378 (49.8%)	304 (40.05%)	56 (7.38%)	5 (0.66%)	16 (2.11%)
2	CBME enables student-centric learning	262 (34.52%)	334 (44.01%)	108 (14.23%)	28 (3.69%)	27 (3.56%)
3.1	Basic Life support training was useful	266 (35.05%)	311 (40.97%)	128 (16.86%)	26 (3.43%)	28 (3.69%)
3.2	Field/Health centre visits were useful	389 (51.25%)	299 (39.39%)	54 (7.11%)	4 (0.53%)	13 (1.71%)
3.3	Time management was taught effectively	335 (44.14%)	332 (43.74%)	66 (8.7%)	16 (2.11%)	10 (1.32%)
3.4	Stress management was taught effectively	235 (30.96%)	315 (41.5%)	142 (18.71%)	43 (5.67%)	24 (3.16%)
3.5	Language and communication skills were taught effectively	218 (28.72%)	292 (38.47%)	151 (19.89%)	62 (8.17%)	36 (4.74%)
3.6	Professionalism and ethics were sensitised	260 (34.26%)	356 (46.9%)	92 (12.12%)	39 (5.14%)	12 (1.58%)

3.7	Biomedical waste management was useful	313 (41.24%)	359 (47.3%)	58 (7.64%)	19 (2.5%)	10 (1.32%)
3.8	IT/Computer skills session was useful	394 (51.91%)	314 (41.37%)	41 (5.4%)	6 (0.79%)	4 (0.53%)
4	Early clinical exposure in MBBS Phase I is useful	305 (40.18%)	342 (45.06%)	70 (9.22%)	29 (3.82%)	13 (1.71%)
5	Didactic theory lectures coupled with videos cover vast topics and help me score better marks	260 (34.26%)	365 (48.09%)	96 (12.65%)	30 (3.95%)	8 (1.05%)
6	SDL sessions are useful	255 (33.6%)	319 (42.03%)	109 (14.36%)	52 (6.85%)	24 (3.16%)
7	SDL sessions provoke me to come prepared for the class	252 (33.2%)	334 (44.01%)	106 (13.97%)	46 (6.06%)	21 (2.77%)
8	SDL sessions widen my thinking horizon and make learning more interesting	248 (32.67%)	330 (43.48%)	113 (14.89%)	45 (5.93%)	23 (3.03%)
9	SDL sessions motivated me to find resources	249 (32.81%)	340 (44.8%)	109 (14.36%)	41 (5.4%)	20 (2.64%)
10	Small group teaching sessions are useful	262 (34.52%)	347 (45.72%)	96 (12.65%)	33 (4.35%)	21 (2.77%)
11	Small group teaching enables one to comprehend concepts in a better way	267 (35.18%)	343 (45.19%)	97 (12.78%)	32 (4.22%)	20 (2.64%)
12	Small group teaching provides scope for good student-teacher interaction as well as peer interaction	276 (36.36%)	344 (45.32%)	94 (12.38%)	31 (4.08%)	14 (1.84%)
13	Elective postings are needed in phase III to explore our areas of interest and help us make a wise selection in future career paths	326 (42.95%)	333 (43.87%)	69 (9.09%)	24 (3.16%)	7 (0.92%)
14	Skill lab postings enable to practice clinical skills before applying them to patients in clinical postings	335 (44.14%)	342 (45.06%)	58 (7.64%)	17 (2.24%)	7 (0.92%)
15	The AETCOM session enables one to understand and apply proper ethics and communication skills in professional life	277 (36.5%)	353 (46.51%)	86 (11.33%)	29 (3.82%)	14 (1.84%)
16	Family adoption program has provided experiential learning in community healthcare	310 (40.84%)	330 (43.48%)	87 (11.46%)	23 (3.03%)	9 (1.19%)
17	The alignment of topics allowed a better understanding of the coordinated action of several systems	291 (38.34%)	356 (46.9%)	85 (11.2%)	18 (2.37%)	9 (1.19%)
18	Integrated teaching enabled a better understanding of the topic	299 (39.39%)	344 (45.32%)	87 (11.46%)	21 (2.77%)	8 (1.05%)
19	I felt that the integration of the topics non repetitive as compared to the lectures	266 (35.05%)	357 (47.04%)	103 (13.57%)	24 (3.16%)	9 (1.19%)
20	Time table formed at our Institute is well structured and helped me to link the content across the subjects	285 (37.55%)	347 (45.72%)	87 (11.46%)	28 (3.69%)	12 (1.58%)
21	As an undergraduate student, I am aware of the assessment and feedback methods	279 (36.76%)	391 (51.52%)	70 (9.22%)	11 (1.45%)	8 (1.05%)
22	The inclusion of MCQ'S evokes critical thinking and is useful for NEET preparation	308 (40.58%)	362 (47.69%)	68 (8.96%)	12 (1.58%)	9 (1.19%)
23	Implementation of structured questions based on course outcome is useful	291 (38.34%)	367 (48.35%)	68 (8.96%)	25 (3.29%)	8 (1.05%)
24	100 marks for each paper in theory is apprehensive	256 (33.73%)	341 (44.93%)	116 (15.28%)	40 (5.27%)	6 (0.79%)
25	It is possible for me to maintain separate logbooks for each department	243 (32.02%)	298 (39.26%)	109 (14.36%)	69 (9.09%)	40 (5.27%)
26	Allotment of one faculty as a mentor for less than 10 students is useful	303 (39.92%)	345 (45.45%)	75 (9.88%)	27 (3.56%)	9 (1.19%)

[Table/Fig-2]: The perceptions of MBBS students regarding various domains of CBME as assessed through the questionnaire.

perception of foundation courses, SDL/SGT, new components, alignment and integration and innovative assessment methods [Table/Fig-3].

Component	Negative perception	Neutral perception	Positive perception
Foundation course	7 (0.92%)	61 (8.04%)	691 (91.04%)
SDL and SGT	21 (2.77%)	105 (13.83%)	633 (83.4%)
New components of CBME	8 (1.05%)	52 (6.85%)	699 (92.09%)
Alignment and integration in CBME	10 (1.32%)	75 (9.88%)	674 (88.8%)
Innovation in assessment methods	5 (0.66%)	72 (9.49%)	682 (89.86%)
Overall view on CBME	8 (1.05%)	52 (6.85%)	699 (92.09%)

[Table/Fig-3]: Overall attitude of students on different components of CBME.

DISCUSSION

Competency-based Medical Education (CBME), derived from the broader framework of Competency-Based Education (CBE), has become a significant reform in medical training globally. Although the concept was introduced in medical education nearly sixty years ago, its practical implementation has gained serious traction only in the last decade [9]. CBME reorients medical curricula from a time-based approach to an outcome-oriented model that emphasises demonstrable skills, attitudes and knowledge. While offering clear benefits, CBME also presents challenges in curriculum design, assessment, faculty development and institutional capacity [10].

The present study explored the perception of undergraduate medical students toward the CBME curriculum using a structured

online questionnaire. The results revealed encouraging support across all academic Phases, highlighting CBME's acceptance and impact from the learners' perspective.

Given that Indian MBBS students often enter the program at 17 years of age, with varying socioeconomic and academic backgrounds, the one-month Foundation Course acts as an essential transition Phase [11]. In the present study, 91.04% of students recognised this course as beneficial. They appreciated modules such as Basic Life Support (BLS), communication and time management, professionalism and stress management. Similar findings were reported by Ramanathan R et al., [12], Suman S et al., [13] and Srimati T [14], who underscored the course's role in preparing students both emotionally and intellectually for their academic journey.

Traditional medical education emphasized didactic lectures. In contrast, CBME fosters Self-Directed Learning (SDL) and Small Group Teaching (SGT), which encourage active, participatory learning. In our findings, 83.4% of students found SDL and SGT highly effective. They reported feeling better prepared, more engaged and more curious. Prior literature by Pai KM et al., [15], Ainoada N et al., [16] and Arroyo-Jimenez Mdel M et al., [17] confirmed that SDL enhances autonomy and critical reasoning. SGT fosters collaborative learning and personal attention, supporting learner engagement [18,19].

Early Clinical Exposure (ECE), a cornerstone of CBME, helps bridge theoretical learning with clinical practice. The present study results showed that 85.24% of students found ECE helpful in contextualising

knowledge and enhancing motivation. Similar outcomes were documented by Uma K [20]. Theory lectures augmented with videos were appreciated by 82.35% of students, emphasising the role of blended learning in covering the extensive MBBS syllabus. Elective postings also emerged as a valuable component, with nearly 87% of students acknowledging their role in career guidance and academic exploration. A study by Kaur G et al., [21]. affirmed that electives support holistic development and promote interest-based specialisation.

Skill laboratories, designed to simulate real clinical environments, allow students to practice and refine their clinical abilities without compromising patient safety. In the present study, 89.2% of students appreciated this module. Skill laboratories enhance not only clinical dexterity but also communication and teamwork skills [22]. The Attitude, Ethics and Communication (AETCOM) module received positive responses from 82.97% of students. AETCOM is vital in instilling professionalism, empathy and ethical conduct. A study by Jain et al., [23]. similarly found AETCOM effective in shaping responsible future doctors.

India's rural healthcare disparity is partially addressed through the Family Adoption Program (FAP), where students gain firsthand insight into community health. In this study, over 84% valued this exposure. Vanikar AV and Kumar V, and Vanikar A and Kumar V [24,25] emphasised FAP's long-term benefits in fostering socially accountable physicians.

The emphasis of Competency-based Medical Education (CBME) on alignment and integration was appreciated by 85.24% of students. This method eliminates redundancy and helps learners appreciate the interconnectedness of medical subjects. Muraleedharan A et al., [26] noted similar improvements in comprehension through integrated teaching models.

Assessment in CBME is no longer confined to final exams but includes formative assessments and feedback. Students in the present study recognised the utility of Multiple-Choice Questions (MCQs) and structured assessments in promoting critical thinking. Feedback plays a central role in competency development by guiding reflective learning [27-29]. Additionally, 71.28% of students supported the use of department-wise logbooks, consistent with the CBME philosophy [30].

Mentorship is another innovation within CBME. About 85% of students in our study agreed that mentoring helped them adjust academically and emotionally. Guhan N et al., [31] demonstrated similar benefits in academic performance and motivation. With CBME implemented nationwide across all undergraduate Phases, India is producing globally competent Indian Medical Graduates [32]. Our findings indicate that CBME is not only well-received but is also being effectively implemented at the institutional level.

Limitation(s)

The present study was limited to a single private institution, which may not reflect views across varied medical colleges. Its cross-sectional nature restricts insights into changes over time. Self-reported responses may be biased and the absence of faculty perspectives narrows the scope.

CONCLUSION(S)

The study concludes that undergraduate medical students at J.N. Medical College, Belagavi, have a predominantly positive perception of the Competency-based Medical Education (CBME) curriculum. Key components such as the Foundation Course, Self-Directed Learning (SDL), Small Group Teaching (SGT), Early Clinical Exposure, skill laboratories, AETCOM and integration were well-received. Students appreciated the learner-centered approach, structured assessments and mentorship system.

Acknowledgement

The authors sincerely thank all the students for participating in the study promptly. They also thank the Department of Medical Education (DOME) faculty at KAHER's JNMC for their valuable cooperation regarding the study.

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PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Ophthalmology, KAHER's JNMC, Belagavi, Karnataka, India.
2. Postgraduate Student, Department of Ophthalmology, KAHER's JNMC, Belagavi, Karnataka, India.
3. House Surgeon, Department of Medicine, KAHER'S JNMC, Belagavi, Karnataka, India.
4. House Surgeon, Department of Medicine, KAHER'S JNMC, Belagavi, Karnataka, India.
5. Professor, Department of Physiology, KAHER's JNMC, Belagavi, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Chethana Warad,
Associate Professor, Department of Ophthalmology, KAHER'S JNMC,
Belagavi-590010, Karnataka, India.
E-mail: waradchethana@gmail.com

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Apr 02, 2025
- Manual Googling: Oct 25, 2025
- iThenticate Software: Oct 27, 2025 (9%)

ETYMOLOGY: Author Origin

EMENDATIONS: 9

 Date of Submission: **Mar 17, 2025**

 Date of Peer Review: **May 09, 2025**

 Date of Acceptance: **Oct 29, 2025**

 Date of Publishing: **Apr 01, 2026**