

Evaluation of Medical Students' Attitudes and Perceptions of Community-Based Medical Education (CBME)

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ABSTRACT:

Introduction: Community-based medical education (CBME) enhances medical students' engagement with real-world health issues, fostering competencies needed for community health challenges. This study aims to evaluate medical students' attitudes toward CBME and its impact on their preparedness for future practice, while identifying perceived benefits and challenges. **Methods:** A cross-sectional study was conducted at a private medical college in Tamil Nadu, involving pre-clinical and clinical students. Data were collected using the Community-Based Medical Education Attitudes and Perception Scale (CBME-APS) via a self-administered electronic questionnaire. **Results:** The mean age of participants was 20 ± 1.4 years, with 61.6% female. Most participants were in clinical years (66%) and had over three months of CBME experience (67.5%). A majority viewed CBME positively, with 71.6% believing it is crucial for their education and 74.8% reporting better understanding of real-life healthcare. CBME was also perceived to enhance clinical skills (71.1%) and communication with patients (74.3%). CBME positively influenced career intentions, with 56.4% considering a career in rural healthcare and 66.2% showing interest in global health or outreach programs. **Conclusion:** This study assessed the impact of Competency-Based Medical Education (CBME) on medical students' attitudes, skills, and preparedness for community-based practice. Most students reported positive outcomes, including improved clinical skills, communication, and confidence in handling patients. CBME also influenced career intentions, with many students expressing interest in rural healthcare, and public health. However, challenges such as limited resources and diagnostic tools were noted. Despite these barriers, CBME was deemed valuable for fostering community-oriented healthcare professionals.

1. Introduction

The quality of health college graduates has been a topic of significant debate, with differing opinions on how best to select, train, and assess their competencies. A key focus is their preparedness to meet the health needs of local communities. Studies have highlighted the need for educational reforms to ensure that health professionals are equipped with the skills required to address the evolving challenges of community health [1],[2]. These reforms often stem from

faculty perceptions and institutional priorities, which heavily influence curricular decisions and pedagogical approaches [3].

One widely embraced approach in health education is community-based medical education (CBME), which positions the community as a crucial learning environment. CBME emphasizes active student engagement with real-world health issues, allowing them to learn in direct contact with the population they will one day serve. By exposing students to the health concerns of diverse populations, CBME fosters an appreciation for the socio-economic, cultural, and environmental factors that shape health outcomes. This exposure not only enriches the students' learning experience but also builds their capacity to respond effectively to community health needs [4].

Experiential learning, a foundational principle of CBE, allows students to engage in hands-on activities that mirror real-life health challenges. This form of learning encourages reflection, critical thinking, and the application of theoretical knowledge to practical situations. In the context of health education, experiential learning is integral to developing problem-solving skills, enhancing clinical decision-making, and fostering a commitment to serving the broader community [5].

For CBME to be successful, it must be woven throughout the curriculum rather than confined to isolated experiences. This requires strong institutional support, active involvement from all faculty members, and a structured, well-organized approach. Effective CBME also relies on problem-based learning methods, ensuring that students are not passive recipients of knowledge but active participants in their own education [6],[7],[8]. When implemented effectively, CBE aligns health education with the real-world demands of community health, ultimately producing graduates who are better prepared to address local health challenges and contribute to population well-being.

In light of the growing emphasis on aligning medical education with community health needs, it is crucial to evaluate how medical students perceive and respond to community-based medical education (CBME). Understanding students' attitudes and perceptions toward CBME offers valuable insights into its effectiveness in preparing them for real-world medical practice. Positive engagement with CBME can significantly enhance students' clinical skills, cultural competence, and their commitment to serving underserved populations. Therefore, assessing these attitudes is essential for improving CBME programs, refining curricular design, and ensuring that future healthcare professionals are adequately equipped to meet the health challenges of diverse communities. This study aimed to evaluate medical students' attitudes toward community-based medical education (CBME) and examine how it influences their preparedness for future practice and career plans. It also seeks to identify perceived benefits, challenges, and barriers faced during community-based medical education.

2. Material and Methods:

Study Design and setting

This was a cross-sectional study conducted at a private medical college, Chengalpattu district in Tamil Nadu where CBME is incorporated as part of the undergraduate medical curriculum. The students were exposed to community-based learning through rotations and placements in rural and urban healthcare centres.

Study Duration

The study was conducted over a period of three months, during which data collection was carried out.

Study Participants

Medical students from both pre-clinical (first and second year) and clinical (third year, final year) phases were included as participants in the study.

Inclusion Criteria

- Medical students who had participated in community-based medical education programs.
- Students who were enrolled in pre-clinical or clinical phases of medical education at the time of the study.
- Students who provided informed consent to participate.

Exclusion Criteria

- Students who had not participated in any form of community-based medical education.

Sample Size

The sample size was determined based on the student population at the institution and the feasibility of data collection within the specified timeframe. Since no previous literature was available for the present study, a 50% prevalence was assumed. A 50% prevalence provides maximum variability, yielding the largest possible sample size and ensuring the study is adequately powered. Accounting for a 10% non-response rate, the minimum required sample size was calculated to be 440.

Sampling Method

Simple random sampling was employed to select participants. A random sample was drawn from the list of eligible students using a random number generator, ensuring a representative distribution of both pre-clinical and clinical phase students.

Study Instrument

The data collection instrument used was the Community-Based Medical Education Attitudes and Perception Scale (CBME-APS), a structured questionnaire developed specifically for this study. The CBME-APS consisted of five domains:

1. Attitudes toward CBME.
2. Perception of learning outcomes.
3. Preparedness for community-based practice.
4. Perceived barriers and challenges.
5. Impact of CBME on career intentions.

The questionnaire used a Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to capture responses, along with demographic information and open-ended questions to gather qualitative data. The questionnaire was pretested and validated using a pilot sample of 10%.

Data Collection

Data were collected using a self-administered questionnaire distributed electronically through a web-based survey platform. The questionnaires were administered to the students during their clinical rotations, lectures, or via email links. The data collection period lasted for three months, and responses were collected anonymously to ensure confidentiality.

Ethical Considerations

The study was conducted following ethical guidelines and approval was obtained from the Institutional Ethics Committee. All participants were provided with detailed information regarding the study's purpose, voluntary nature of participation, and the confidentiality of their responses. Written informed consent was obtained from each participant before data collection. Anonymity and confidentiality of the data were maintained throughout the study.

Statistical Analysis

The data were analyzed using SPSS (Statistical Package for the Social Sciences) version 21. Descriptive statistics, including mean, median, standard deviation, and percentages, were used to summarize demographic characteristics and responses to each questionnaire item. Inferential statistics, such as the Chi-square test, were used to assess associations between

demographic variables and attitudes or perceptions towards CBME. Results were presented with 95% confidence intervals, and a p-value of < 0.05 was considered statistically significant.

3. Results

Table 1: Socio-demographic variables of the study participants

S.No	Variable	Frequency (n=440)	Percentage %
1.	Gender		
	Male	169	38.4
	Female	271	61.6
2.	Year of study		
	Clinical	290	66
	Pre-clinical	150	34
3.	Duration of CBME experience		
	> 3 months	297	67.5
	1 – 3 months	48	10.9
	<1 month	95	21.6
4.	Type of Community settings		
	Rural	72	16.4
	Urban	248	56.4
	Both	120	27.3

Table 1 provides an overview of the socio-demographic characteristics of the study participants. The mean age of the study participants was 20 ± 1.4 years. Majority of participants are female, comprising 61.6% (n=271), while 38.4% (n=169) are male. Most of the participants are from clinical years (66%, n=290), with a smaller proportion in pre-clinical years (34%, n=150). Regarding the duration of CBME experience, 67.5% (n=297) of participants have had over three months of CBME experience, followed by 10.9% (n=48) with 1–3 months, and 21.6% (n=95) with less than one month of experience. When it comes to the type of community settings where participants gained experience, 56.4% (n=248) were involved in urban settings, 16.4% (n=72) in rural settings, and 27.3% (n=120) gained experience in both urban and rural settings.

Table.2. Attitude towards Community Based Education

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree N (%)
CBME is an important part of my medical education.	26 (5.9)	2 (0.5)	97 (22)	209 (47.5)	106 (24.1)
I enjoy participating in community-based medical programs.	25 (5.7)	8 (1.8)	88 (20)	206 (46.8)	113 (25.7)
I believe CBME will help me become a better doctor.	33 (7.5)	2 (0.5)	80 (18.2)	212 (48.2)	113 (25.7)
CBME helps students understand real-life healthcare problems better than classroom learning.	31 (7)	8 (1.8)	72 (16.4)	217 (49.3)	112 (25.5)
I look forward to CBME activities.	33 (7.5)	4 (0.9)	91 (20.7)	205 (46.6)	107 (24.3)

The table presents the students' attitude towards Competency-Based Medical Education (CBME). A majority of students view CBME positively, with 71.6% (47.5% agree and 24.1% strongly agree) considering it an important part of their medical education. Similarly, 72.5% (46.8% agree and 25.7% strongly agree) enjoy participating in community-based medical programs, and 73.9% (48.2% agree and 25.7% strongly agree) believe CBME will help them become better doctors. In terms of real-life healthcare learning, 74.8% (49.3% agree and 25.5% strongly agree) feel that CBME offers better understanding than classroom learning. Finally, 70.9% (46.6% agree and 24.3% strongly agree) express enthusiasm for CBME activities. While a smaller percentage of students remain neutral, disagreement levels are minimal across all items, indicating overall positive reception towards CBME. **Table.2**

Table.3. Perceptions of Learning Outcomes

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
CBME has improved my clinical skills.	25 (5.7)	7 (1.6)	95 (21.6)	198 (45)	115 (26.1)
I have learned more about the social determinants of health through CBME.	29 (6.6)	7 (1.6)	99 (22.5)	181 (41.1)	124 (28.2)
CBME has helped me understand healthcare delivery in low-resource settings.	22 (5)	15 (3.4)	84 (19.1)	197 (44.8)	122 (27.7)
I am more confident in handling patients in the community after CBME.	23 (5.2)	14 (3.2)	92 (20.9)	194 (44.1)	117 (26.6)
I have improved my communication skills with patients through CBME.	31 (7)	7 (1.6)	75 (17)	187 (42.5)	140 (31.8)

The table reflects students' perceptions of learning outcomes from Competency-Based Medical Education (CBME). A majority of students report positive impacts of CBME on various aspects of their education. Specifically, 71.1% (45% agree and 26.1% strongly agree) believe CBME has improved their clinical skills. Similarly, 69.3% (41.1% agree and 28.2% strongly agree) feel they have learned more about social determinants of health through CBME. Furthermore, 72.5% (44.8% agree and 27.7% strongly agree) state that CBME has helped them understand healthcare delivery in low-resource settings, while 70.7% (44.1% agree and 26.6% strongly agree) feel more confident in handling patients in community settings. Additionally, 74.3% (42.5% agree and 31.8% strongly agree) believe CBME has improved their communication skills with patients. While a small percentage of students remain neutral or disagree, the results indicate that most students perceive significant learning benefits from CBME across multiple dimensions. **(table.3)**

Table.4. Preparedness for Community Based Practice

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
CBME has adequately prepared me for working in	26 (5.9)	17 (3.9)	89 (90.2)	197 (44.8)	111 (25.2)

rural or resource-limited settings.					
I feel more confident in diagnosing and treating diseases prevalent in the community.	26 (5.9)	10 (2.3)	96 (21.8)	194 (44.1)	114 (25.9)
CBME has prepared me to manage public health challenges.	23 (5.2)	14 (3.2)	73 (16.6)	212 (48.2)	118 (26.8)
CBME has taught me to work in multidisciplinary teams.	31 (7)	15 (3.4)	81 (18.4)	199 (45.2)	114 (25.9)
I feel prepared to manage patients in community health centers after CBME.	30 (6.8)	12 (2.7)	81 (18.4)	207 (47)	110 (25)

The table highlights students' perceptions of their preparedness for community-based practice after undergoing Competency-Based Medical Education (CBME). A significant number of students feel positively about their preparedness. A majority 70% (44.8% agree and 25.2% strongly agree) believe CBME has adequately prepared them for working in rural or resource-limited settings. Similarly, 70% (44.1% agree and 25.9% strongly agree) feel more confident in diagnosing and treating diseases prevalent in the community. When it comes to managing public health challenges, 75% of students (48.2% agree and 26.8% strongly agree) believe CBME has adequately prepared them. Additionally, 71.1% (45.2% agree and 25.9% strongly agree) feel CBME has taught them how to work in multidisciplinary teams, an essential aspect of healthcare in resource-limited settings.

Furthermore, 72% (47% agree and 25% strongly agree) of students feel prepared to manage patients in community health centers following CBME. While a small proportion of students remain neutral or disagree with these statements, the majority perceive that CBME has significantly enhanced their preparedness for community-based practice, especially in low-resource environments. **(table.4)**

Table.5. Perceived Barriers and Challenges

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
The resources in community settings were insufficient for effective learning.	28 (6.4)	91 (20.7)	159 (36.1)	114 (25.9)	48 (10.9)
The lack of diagnostic tools made CBME less valuable.	32 (7.3)	80 (18.2)	157 (35.7)	125 (28.4)	46 (10.5)
I found it challenging to adapt to working in rural community health centers.	35 (8)	66 (15)	146 (33.2)	133 (30.2)	60 (13.6)
The communication barriers with patients were difficult to overcome.	37 (8.4)	84 (19.1)	134 (30.5)	131 (29.8)	54 (12.3)
The supervision and guidance during CBME were inadequate.	51 (11.6)	92 (20.9)	146 (33.2)	97 (22)	54 (12.3)

The table highlights the perceived barriers and challenges students encountered during their CBME experiences. A significant portion of students felt neutral about many of the barriers. For instance, 36.1% of students were neutral about the insufficiency of resources in community settings, while 25.9% agreed and 10.9% strongly agreed, indicating that approximately one-third of the participants' believed resources were inadequate. Similarly, 35.7% were neutral on the lack of diagnostic tools, but 28.4% agreed and 10.5% strongly agreed that this made CBME less valuable. Challenges related to adapting to rural community health centres were felt by 30.2% who agreed and 13.6% who strongly agreed, while 33.2% remained neutral. Communication barriers with patients were seen as a difficulty by 29.8% who agreed and 12.3% who strongly agreed, though 30.5% were neutral on this issue. Around 33.2% were neutral about the adequacy of supervision and guidance during CBME, with 22% agreeing and 12.3% strongly agreeing that guidance was insufficient. **(table.5)**

Table.6. Impact on Career Intentions

Variable	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
CBME has made me more likely to consider a career in rural or community healthcare.	27 (6.1)	35 (8)	130 (29.5)	160 (36.4)	88 (20)
I am more inclined to pursue public health as a career after my CBME experience.	30 (6.8)	40 (9.1)	120 (7.3)	150 (34.1)	90 (20.5)
CBME has encouraged me to focus on primary care instead of specialty practice.	23 (5.2)	32 (7.3)	144 (32.7)	155 (35.2)	86 (19.5)
CBME has increased my interest in global health or rural outreach programs.	23 (5.2)	20 (4.5)	106 (24.1)	197 (44.8)	94 (21.4)
Despite CBME, I still prefer working in urban settings for my future practice.	26 (5.9)	8 (1.8)	125 (28.4)	183 (41.6)	98 (22.3)

Table 6 shows the impact of Competency-Based Medical Education (CBME) on students' career intentions. A substantial proportion of participants (56.4%) agree or strongly agree that CBME has made them more likely to consider a career in rural or community healthcare, reflecting a positive shift towards these areas. Additionally, 54.6% of students express a greater inclination to pursue public health as a career following their CBME experience. Similarly, 54.7% feel encouraged to focus on primary care rather than specialty practice, indicating a shift towards foundational healthcare roles. Furthermore, 66.2% report increased interest in global health or rural outreach programs, suggesting that CBME effectively fosters a broader perspective on healthcare challenges. However, a noteworthy portion of students (64.4%) still prefer working in urban settings for their future practice, highlighting a tension between their training and career preferences.

4. Discussion:

The results of this study align with findings from other research on Competency-Based Medical Education (CBME). Similar to the positive reception observed in this study, previous research has highlighted the benefits of CBME in enhancing clinical skills and preparing students for real-world medical practice. For instance, a study by Shah N et al [9] reported that CBME improved students' clinical competencies and communication skills, similar to the 74.3% of students in this study who felt their communication with patients improved.

Regarding students' preparedness for community-based practice, 70% of participants in this study reported feeling adequately prepared for working in resource-limited or rural settings. This is consistent with the findings of Frenk et al [10], which emphasized that CBME helps equip students with the skills needed for primary care and rural health services. Additionally, other studies, such as those by Pandit S et al, support the fact that CBME enhances students' ability to address public health challenges, with 75% of students in this study expressing confidence in managing such issues.

In comparison with other studies, the findings of this research align with a growing body of evidence supporting the positive impact of Competency-Based Medical Education (CBME) on student preparedness and career intentions. For instance, a study by Joshi MK et al [11] on medical students in India similarly found that CBME significantly enhanced students' clinical skills and their understanding of healthcare delivery in low-resource settings.

Regarding students' perceptions of CBME improving their communication skills, the findings in this study (74.3% agreement) are consistent with research by Tayade MC et al [12] which highlighted CBME's focus on developing patient-centered communication. Tayade MC et al [12] emphasized that real-life community exposure through CBME fosters better communication and patient interaction skills. The present study confirms this observation, suggesting that practical exposure in community settings bridges the gap between theoretical learning and patient care.

The career intentions of students post-CBME, with 56.4% considering rural or community healthcare careers, mirror findings from a study by Mills et al [13], which revealed that CBME exposure can positively influence medical students' interest in rural practice. However, the preference for urban settings in both studies indicates that while CBME fosters a broader appreciation for community healthcare, urban career preferences remain due to perceived better infrastructure and opportunities. Studies by Ryan MS et al [14] have shown that CBME encourages students to consider careers in primary care, though challenges remain, as a portion of students still express a preference for urban practice, as noted by 64.4% in this study.

One noteworthy area of comparison is the reported barriers during CBME experiences, such as inadequate resources and diagnostic tools, which were also highlighted by Crawford L et al [15]. The study identified resource constraints in rural health centres as a limiting factor in the full realization of CBME's potential. This aligns with the present findings, where 25.9% of students agreed that resource limitations hindered their experience. Such challenges call for more support and investment in rural training sites to improve the efficacy of CBME programs. In summary, the findings of this study are consistent with previous research, validating the fact that CBME improves students' clinical abilities, communication, and preparedness for rural and community-based practice. However, problems such as resource restrictions and urban job preferences continue to pose barriers, highlighting areas for additional growth and support within CBME frameworks.

5. Conclusion:

The study highlights the positive influence of Competency-Based Medical Education (CBME) on medical students' attitudes, clinical skills, and preparedness for community-based practice, particularly in rural and resource-limited settings. Students overwhelmingly reported improved understanding of healthcare delivery, enhanced communication skills, and increased confidence in managing patients. However, some challenges, including resource limitations and diagnostic tool shortages, were identified. Despite these barriers, CBME effectively influenced students' career intentions, fostering interest in rural healthcare, public health, and primary care roles. The findings underscore the value of CBME in shaping well-rounded, community-oriented healthcare professionals, while also emphasizing the need to address logistical challenges in its implementation.

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