



Original Research Article

CHALLENGES AND MENTAL HEALTH CONCERNS AMONG MEDICAL STUDENTS IN THE COMPETENCY-BASED MEDICAL EDUCATION ERA: A MIXED-METHODS STUDY

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ABSTRACT

Background: Medical education in India is academically demanding, with the implementation of Competency-Based Medical Education (CBME) curriculum from 2019 onwards, introducing various competencies for undergraduate students to transition as Indian medical graduates. This study aimed to explore students' attitudes, mental health concerns and the challenges they face within the CBME framework.

Materials and Methods: A mixed-methods convergent design study was conducted among 169 medical students. The quantitative component used a pre-tested structured questionnaire and the DASS-21 scale to assess anxiety, depression and stress with analysis performed using SPSS-27 trial version. The qualitative component involved free listing and pile sorting followed by cognitive domain analysis by multidimensional scaling and cluster analysis done among 10 students. Smith's Salience scores were calculated using ANTHROPAC software 1.0.

Results: Among the 169 participants, 80 (47.3%) reported anxiety, 92 (54.5%) reported depression, and 67 (39.8%) reported stress. While many students viewed frequent tests and end-of-posting examinations as academically useful, hectic schedules and difficulties adapting to the CBME structure were major stressors. Pile sorting of 27 salient items obtained by freelist, led to emergence of six thematic clusters: Mental health problems, AETCOM-related challenges, Exam pattern, Time management, Attendance-related concerns and Difficulty in Time bound – attainment of competencies.

Conclusion: CBME implementation poses challenges and mental health concerns among students which may require careful attention. Addressing these concerns is crucial to creating a supportive learning environment and fostering the development of healthy, competent future doctors.

Keywords: Free listing, Pile sorting, CBME, Medical students, Attitudes, Curriculum.

INTRODUCTION

Medical schools provide an intensive academic environment and are entrusted with delivering a highly structured curriculum to undergraduate medical students.^[1] They hold the responsibility of ensuring that graduates emerge as knowledgeable, skilled, and professionally competent physicians.^[2]

However, the demands of medical training may often expose students to significant levels of stress, anxiety, and depression.

To optimise medical training, the National Medical Commission (NMC)—the regulatory authority for medical education in India—introduced the Competency-Based Medical Education (CBME) curriculum. CBME is defined as an outcome-oriented

approach that guides the design, implementation, assessment, and evaluation of International Journal of Medicine and Public Health, Vol 15, Issue 4, October-December 2025 (www.ijmedph.org) 1 medical training on the basis of clearly organized competencies, in contrast to the traditional model that focused heavily on predetermined objectives.^[3] These competencies are structured to ensure progressive development through appropriate teaching, learning, and assessment strategies.

Under CBME, several reforms were introduced. A one-month foundation course was added prior to the commencement of MBBS to orient students to the Indian health-care system, medical ethics, communication skills, and basic professional behaviours. The Attitude, Ethics and Communication (AETCOM) module was developed to nurture the values and attributes necessary for an effective first-contact physician. Additionally, horizontal and vertical integration of subjects was incorporated to help students better apply theoretical knowledge and early clinical exposure was initiated from the first year onwards. The revised course duration was set at fifty-two months instead of fifty-four, with notable restructuring such as reducing the second year of MBBS to one year (previously one and a half). Collectively, these changes aim to enhance medical learning, improve clinical relevance, streamline assessments and reduce unnecessary academic burden to attain the vision of a competent Indian Medical Graduate.^[4]

Despite these wide-ranging curricular reforms, there is limited evidence regarding the impact of the CBME curriculum on the mental health of medical students in India. Understanding this relationship is essential since newer generations of health-care professionals are being trained under this system and their competence, well-being will be influencing the future health-care workforce.

The present study was conducted in a tertiary care teaching hospital in Thrissur, South India, with the objective of evaluating the effect of the CBME curriculum on the mental health of undergraduate medical students, identifying challenges and potential areas for improvement within the curriculum.

MATERIALS AND METHODS

Study Design: This study followed a mixed-methods convergent study design, merging an initial quantitative phase with the qualitative phase. The quantitative component was a cross-sectional study conducted among 169 medical students and the qualitative component included free listing and pile sorting exercises. Smith's Salience scores were calculated using ANTHROPAC version 1.0, followed by multidimensional scaling and cluster analysis conducted among 10 medical students to assess their cognitive domain. Study Setting and **Participants:** The study involved 169 MBBS

students from Competency-Based Medical Education (CBME) batches admitted between 2021 and 2023 at a tertiary-care teaching hospital in Thrissur, Central Kerala. Data collection was carried out from April to November 2024. Quantitative Component Study Tools

Pre-tested, semi-structured questionnaire: Used to collect sociodemographic details and assess attitudes towards key elements of the CBME curriculum, including variables- frequency of examinations, maintenance of logbooks, end-of-posting assessments, the foundation course, curriculum adaptation, and AETCOM. Items were rated on a modified 5-point Likert scale (Very unsatisfied to Very satisfied).

DASS-21 Questionnaire^[14]: This tool comprises 21 statements assessing symptoms of depression, anxiety and stress over the previous week. Each item was scored from 0 to 3, ranging from —Did not apply to me at all to —Applied to me very much or most of the time. Scores were summed up and multiplied by two to obtain final domain scores.

Data Collection: After obtaining informed consent, questionnaires were explained to the students and completed forms were subsequently transcribed into Google Forms for ease of analysis.

Sample Size and Sampling: Sample size was calculated using the formula $n = 4pq/d^2$,^[8] with a prevalence (p) of 39.3%,^[8] q = 60.7, and d set at 20% of prevalence. This yielded a sample size of 154, which was increased to 169 to account for 10% non-response.

Sampling followed a simple random technique, with batch representation determined using probability proportional to size (PPS). Phase-wise distribution included:

Phase I: 54 students (total 177) Phase II: 55 students (total 174)

Phase III Part 1: 60 students (total 191)

Inclusion Criteria: Those students who gave informed consent on their own volition were included in the study.

Exclusion Criteria: Those students already receiving treatment for psychiatric illnesses with a history of substance use, bipolar disorder, epilepsy, severe conduct disorders, autism spectrum disorders were excluded.

Scoring and Classification: Final DASS scores were doubled and interpreted as follows: Depression: Normal (0–9), Mild (10–13), Moderate (14–20), Severe (21–27), Extremely severe (>28) Anxiety: Normal (0–7), Mild (8–9), Moderate (10–14), Severe (15–19), Extremely severe (>20) Stress: Normal (0–14), Mild (15–18), Moderate (19–25), Severe (26–33), Extremely severe (>34)

Qualitative Component

Participants and Data Collection: Ten students of the main group were selected through purposive sampling. After obtaining informed consent, participants completed a free-listing exercise on their attitudes and perceived challenges associated with the CBME curriculum. Smith's salience was calculated,

after which participants did the pile sorting exercise, thereafter Cognitive mapping was performed using Visual Anthropac version 1.0.

Data Analysis: Quantitative data retrieved from Google Forms were exported to Microsoft Excel and analysed using SPSS-27 trial version. Descriptive statistics (mean, standard deviation, percentages, and proportions) were used as appropriate. Associations between categorical variables (Depression, Stress and Anxiety) were examined using the Chi-square test, with $p < 0.05$ considered statistically significant. Qualitative data obtained from free listing and pile sorting were analysed and cognitive maps were generated accordingly using Visual Anthropac version 1.0.

RESULTS

A total of 169 MBBS students from the CBME batches (2021–2023) participated in the study. The socio-demographic characteristics, mental health profile, attitudes toward the CBME curriculum, and factors associated with anxiety, stress, and depression are presented below.

Socio-demographic Characteristics: Most respondents (70.4%) were between 21–23 years of age, followed by 19.5% in the 18–20-year group. Only 8.9% were aged 24–26 years, and 1.2% were above 26 years. Females comprised 56.8% of the sample, while males represented 43.2%. (Table 1) More than half of the participants were Hindus (55.6%), followed by Muslims (29.6%) and Christians (14.2%), 0.6% belonged to other religions. Students were distributed relatively evenly across the batches—39.1% from the 2021 cohort, 29.6% from 2022, and 31.4% from 2023. A majority (55.0%) hailed from rural areas, while 40.8% were from urban regions; 4.1% did not specify their residence.

Mental Health Status (Table 2): Based on the DASS-21 tool,^[14] nearly half of the respondents (47.3%) experienced some level of anxiety. This included 43 females and 37 males, corresponding to 44.7% of all female participants and 50.6% of all male participants.

Stress was reported by 39.8% of the students ($n = 67$), with 40 females and 27 males affected. Depression was the most common issue, seen in 54.5% ($n = 92$), including 52 females (54.1%) and 40 males (54.7%). Attitudes toward the CBME Curriculum (Table 3): Frequent examinations were viewed as stressful by 41.8% of the students, while 20.7% expressed satisfaction with the frequency of assessments. When asked about perceived benefits, 37.3% were satisfied with the frequent exams, including a small group who found them particularly useful. A total of 20.2% were not satisfied.

Only 26% of respondents were satisfied with the practice of conducting examinations in subjects outside their respective phase, whereas 65 students reported a neutral stance. Logbook maintenance

emerged as a major concern, with 67.4% dissatisfied and 21.3% remaining neutral.

End-of-posting examinations were viewed positively by most participants (71.6%), and only 7.1% found them unhelpful. The academic schedule, however, was a notable stressor: 36.1% felt it had become more hectic and were dissatisfied, an additional 14.2% were very dissatisfied, and 24.2% expressed satisfaction.

Adaptation to the CBME curriculum was challenging for many—43.8% found it difficult, while only 16% felt confident about adapting. Similarly, perceptions of the foundation course were mixed: 25.4% found it beneficial, 46.2% were neutral, and 28.4% were dissatisfied.

AETCOM sessions received relatively poor feedback. Only 15.4% were satisfied and 5.9% very satisfied, while 35.5% remained neutral. Dissatisfaction was recorded in 25.4%, and 17.8% were not at all satisfied.

Factors Associated with Anxiety, Stress, and Depression (Table 4):

Students dissatisfied with academic schedules demonstrated higher levels of anxiety (47.1%) and depression (57.6%), though these associations were not statistically significant. A significant association was observed between dissatisfaction with academic schedules and stress, with 47.1% of dissatisfied students reporting elevated stress compared to 32.1% of those satisfied.

Frequent examinations showed no significant association with anxiety, but were significantly associated with stress and depression. Among students dissatisfied with exam frequency, 50.7% reported anxiety, 42% reported stress, and 64.8% had symptoms of depression, compared with 46.9% depression in those satisfied. Dissatisfaction with logbook upkeep was not significantly associated with anxiety, stress, or depression, although 46.5% reported anxiety, 41.2% reported stress, and 54.4% reported depression. Students who found it difficult to adapt to the curriculum showed elevated levels of anxiety (45.9%), stress (51.4%), and depression (54.1%). Only the association with stress was statistically significant.

Qualitative Findings: Free Listing and Pile Sorting. Free listing among 10 respondents was done; Smith's Salience scores were calculated using ANTHROPAC 1.0, followed by multidimensional scaling and cluster analysis for CDA Cognitive domain Analysis. Pile sorting of 27 salient points among the respondents generated six thematic clusters shown in a Cognitive Domain Analysis Map namely (Fig 1):

1. Mental health problems, 2. AETCOM-related challenges, 3. Exam pattern, 4. Time management, 5. Attendance-related concerns 6. Difficulty in Time bound – attainment of competencies (Difficulty attaining competencies within limited time period).

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Mental health and well-being: Students expressed that a lack of vacations, limited leisure time, and reduced opportunities for arts and sports had an adverse impact on their mental well-being.

Time management challenges: Heavy workloads and continuous assessments contributed to difficulty in balancing academic tasks, leading to stress and poor time management.

Concerns related to AETCOM: AETCOM sessions were perceived as ineffective, overly dependent on PowerPoint-based seminars, and burdensome. Several students felt that the sessions did not communicate their intended themes.

Attainment of competencies: Students reported difficulty completing competencies within limited timeframes. Significant time was spent obtaining logbook signatures, often at the expense of study time. Several respondents suggested strengthening skill-lab-based learning.

Attendance pressures: Maintaining attendance in both theory and practical sessions was challenging, though MCQ-based examinations were appreciated. Teaching-learning and exam preparation issues: Respondents believed that more practical-oriented teaching, interactive theory sessions, stress-management support, and reduced Operating Theatre posting hours would enhance learning.

Table 1: Distribution of students based on sociodemographic variables [N = 169]

	Frequency	Percent
Age groups		
18 - 20 years	33	19.5
21 - 23 years	119	70.4
24 - 26 years	15	8.9
Above 26 years	2	1.2
Gender		
Female	96	56.8
Male	73	43.2
Religion		
Christian	24	14.2
Hindu	94	55.6
Muslim	50	29.6
Others	1	0.6
Batch based on year of admission to MBBS		
2021	66	39.1
2022	50	29.6
2023	53	31.4
Residence		
Rural	93	55.0
Urban	69	40.8
Don't Know	7	4.1

Table 2: Stress, Anxiety, Depression among the respondents [N = 169]

S. No	Mental health Concerns	Gradation	Frequency	Percent
1.	Anxiety			
		Normal (no anxiety)	89	52.7
		Mild	10	5.9
		Moderate	46	27.2
		Severe	8	4.7
		Extremely Severe	16	9.5
2	Stress			
		Normal (no stress)	102	60.4
		Mild	28	16.6
		Moderate	18	10.7
		Severe	15	8.9
		Extremely Severe	6	3.6
3	Depression			
		Normal (no depression)	77	45.6
		Mild	15	8.9
		Moderate	47	27.8
		Severe	15	8.9
		Extremely Severe	15	8.9

Table 3: Attitude of students towards CBME

	Very satisfied	Satisfied	Neutral	Unsatisfied	Very unsatisfied
Frequent exams	3 (1.8%)	32 (18.9%)	63 (37.3%)	62 (36.7%)	9 (5.3%)
Benefits from frequent exams	5 (3.0%)	58 (34.3%)	72 (42.6%)	29 (17.2%)	5 (3.0%)
Exams apart from respective phase subjects	8 (4.7%)	36 (21.3%)	65 (38.5%)	46 (27.2%)	14 (8.3%)
Maintaining the logbook	1 (0.6%)	18 (10.7%)	36 (21.3%)	45 (26.6%)	69 (40.8%)
End-of-posting Exams	19 (11.2%)	102 (60.4%)	36 (21.3%)	10 (5.9%)	2 (1.2%)
Academic Schedules	9 (5.3%)	32 (18.9%)	43 (25.4%)	61 (36.1%)	24 (14.2%)
Adapting to the CBME curriculum	4 (2.4%)	23 (13.6%)	68 (40.2%)	56 (33.1%)	18 (10.7%)
Foundation course	9 (5.3%)	34 (20.1%)	78 (46.2%)	28 (16.6%)	20 (11.8%)
AETCOM sessions	10 (5.9%)	26 (15.4%)	60 (35.5%)	43 (25.4%)	30 (17.8%)

Table 4: Factors Associated with Depression, Stress and Anxiety among Medical Students

Academic schedules			
	Normal	Depressed	Total
Satisfied	41(48.8%)	43(51.2%)	84(100%)
Not satisfied	36 (42.4%)	49(57.6%)	85(100%)
Total	77(45.6%)	92 (54.4%)	169(100%)
Pearson chi-square value – 0.710 p value – 0.399			
	Normal	Stressed	Total
Satisfied	57 (67.9%)	27 (32.1%)	84 (100%)
Not satisfied	45 (52.9%)	40 (47.1%)	85 (100%)
Total	102 (60.4%)	67 (39.6%)	169 (100%)
Pearson chi square value – 3.928 p-value – 0.047			
	Normal	Anxious	Total
Satisfied	44 (52.4%)	40 (47.6%)	84 (100%)
Not satisfied	45 (52.9%)	40 (47.1%)	85 (100%)
Total	89 (52.7%)	80 (47.3%)	169 (100%)
Pearson chi-square value – 0.005 p value – 0.942			
Frequent exams			
	Normal	Anxious	Total
Satisfied	54(55.1%)	44(44.9%)	98(100%)
Not satisfied	35(49.3%)	36(50.7%)	71(100%)
Total	89(52.7%)	80(47.3%)	169(100%)
Pearson chi square value – 0.557 p value – 0.456			
	Normal	Stressed	Total
Satisfied	71(72.4%)	27(27.6%)	98(100%)
Not satisfied	31(43.7%)	40(56.3%)	71(100%)
Total	102(60.4%)	67(39.6%)	169(100%)
Pearson chi- square value – 14.259 p value – 0.000			
	Normal	Depressed	Total
Satisfied	52(53.1%)	46(46.9%)	98(100%)
Not satisfied	25(35.2%)	46(64.8%)	71 (100%)
Total	77(45.6%)	92(54.4%)	169(100%)
Pearson chi square value – 5.289 p value – 0.021			
Logbook upkeep			
	Normal	Anxious	Total
Satisfied	28(50.9%)	27(49.1%)	55(100%)
Not satisfied	61(53.5%)	53(46.5%)	114(100%)
Total	89(52.7%)	80(47.3%)	169(100%)
Pearson chi square value – 0.101 p value – 0.751			
	Normal	Stressed	Total
Satisfied	35(63.6%)	20(36.4%)	55(100%)
Not satisfied	67(58.8%)	47(41.2%)	114(100%)
Total	102(60.4%)	67(39.6%)	169(100%)
Pearson chi-square value – 0.367 p value – 0.545			
	Normal	Depressed	Total
Satisfied	25(45.5%)	30(54.5%)	55(100%)
Not satisfied	52(45.6%)	62(54.4%)	114(100%)
Total	77(45.6%)	92(54.4%)	169(100%)
Pearson chi-square value – 0.000 p value – 0.984			
Adapting to the new Curriculum			
	Normal	Anxious	Total
Satisfied	49(51.6%)	46(48.4%)	95(100%)
Not satisfied	40(54.1%)	34(45.9%)	74(100%)
Total	89(52.7%)	80(47.3%)	169(100%)
Pearson chi-square value – 0.102 p value – 0.749			
	Normal	Stressed	Total
Satisfied	66(69.5%)	29(30.5%)	95(100%)
Not satisfied	36(48.6%)	38(51.4%)	74(100%)
Total	102(60.4%)	67(39.6%)	169(100%)
Pearson chi-square value – 7.539 p value – 0.006			
	Normal	Depressed	Total
Satisfied	43(45.3%)	52(54.7%)	95(100%)
Not satisfied	34(45.9%)	40(54.1%)	74(100%)
Total	77(45.6%)	92(54.4%)	169(100%)
Pearson chi-square value – 0.008 p value – 0.930			

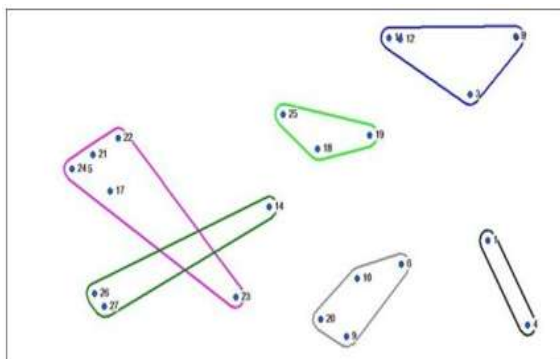


Figure 1: Cognitive Domain Analysis (CDA) map on the Attitudes and Challenges faced in New CBME curriculum by Medical Students (n=10)

DISCUSSION

This study, conducted in a government tertiary care teaching hospital in Thrissur, Kerala, explored the prevalence of anxiety, stress and depression among MBBS students and examined their association with the recently implemented Competency-Based Medical Education (CBME) curriculum. The prevalence of anxiety in our cohort was 47.3%, closely matching the estimate reported by Alvi et al. (47.7%),^[5] and slightly higher than that documented by Junaid et al. (40%).^[8] Stress was present in 39.8% of our respondents, which is comparatively lower than the 73% reported by Supe et al. using the Zung scale,^[12] and the 42.5% observed by Brahmabhatt et al. with the PSS.^[13] Depression was the most frequently reported concern in our sample (54.5%), aligning with the wide range (11.7%– 71.3%) described in the meta-analysis by Goel et al. using the Beck Depression Inventory, which indicated that nearly two-fifths of medical students experience mild-to-moderate depression.^[7]

Beyond mental health, our study examined students' attitudes toward key components of CBME, including academic workload, frequent examinations, AETCOM sessions, the foundation course, logbook maintenance and end-of-posting assessments. Satisfaction with AETCOM sessions was notably low (21.3%), with 43.2% expressing dissatisfaction—substantially lower than the 68% of students who found AETCOM useful in the study by Bishwalata et al.^[11] Similarly, only 25.4% of our respondents felt the foundation course was beneficial, compared with 48.5% in Bishwalata's study. In contrast, satisfaction with end-of-posting examinations was substantially higher in our cohort (71.6%) compared to 53.3% in their findings. Frequent exams were perceived as stressful by 41.8% of our participants, comparable to the 46% reported by Bishwalata et al., while 37.3% of our students felt they benefited from frequent assessments, again reflecting their observation that 42.6% saw value in repeated testing. Logbook upkeep posed difficulties for a majority, 67.4% of students, although only 21.3% adopted a neutral view—lower than the 34.9%

neutrality observed in Bishwalata's study. Attitudes toward examinations.

outside respective phase subjects were mixed, with 26% satisfied and 38.5% neutral, comparable to the 34.2% agreement reported previously. A substantial portion of our cohort perceived academic schedules as hectic (36.1%) and found it difficult to adapt to CBME (43.8%), findings that mirror the patterns seen in Bishwalata's study, where 47.8% perceived schedules as hectic and 32% disagreed that they could easily adapt.

Analysis of associated factors revealed that hectic academic schedules significantly increased stress levels but were not significantly associated with anxiety or depression. Frequent examinations were identified as contributors to both stress and depression, but were not associated with anxiety; however, despite these negative associations, many students simultaneously acknowledged the academic benefits of frequent and end-of-posting assessments showing their reflective behaviour. Logbook maintenance, although widely viewed as burdensome, did not demonstrate a significant association with anxiety, stress or depression. Importantly, difficulty in adapting to the CBME curriculum showed a significant association with elevated stress levels, suggesting that the process of transitioning to a more continuous, competency-driven system may contribute to psychological strain among learners in the initial batches. These findings underscore the need for targeted curricular modifications, improved student support mechanisms and periodic evaluation of CBME implementation to optimize both learning outcomes and student well-being.

CONCLUSION

This mixed-methods convergent design study highlights significant psychological morbidity among students under the CBME curriculum, with notable proportions experiencing depression, anxiety and stress. Frequent assessments, difficulty adapting to the new curriculum and demanding academic schedules emerged as key contributors to this burden. Insights from the qualitative component further revealed clusters of academic, emotional, and curriculum-related challenges influencing student well-being. These findings underscore the need for responsive modifications within the CBME framework to reduce stressors and better support learners. Strengthening institutional support systems and refining curricular processes may contribute substantially to a healthier and more conducive MBBS learning environment.

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