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Knowledge, Attitude and Practice regarding Outcome-Based Medical Education among Second-Year Medical Students of a Deemed-to-be University in Karnataka: A Cross-Sectional Study.

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Abstract

Background: Outcome-based medical education (OBME), operationalised in India as the competency-based medical education (CBME) curriculum introduced by the Medical Council of India in 2019, reorients undergraduate training from time-bound content delivery towards demonstrable competencies. Students are central stakeholders, yet their knowledge, attitude and practices (KAP) regarding OBME remain incompletely characterised. ***Objectives:*** To assess the knowledge, attitude and practice regarding OBME among second-year (Phase II) MBBS students of a deemed-to-be university in Karnataka. ***Materials and Methods:*** A cross-sectional, questionnaire-based study was conducted among 150 second-year MBBS students using a pre-validated, self-administered questionnaire comprising demographic details and items on knowledge (8 items), attitude (7 items, 5-point Likert scale) and practice (6 items). Data were analysed using descriptive statistics; the chi-square test was applied to test associations, with $p < 0.05$ considered significant. ***Results:*** Of 150 participants, 85.3% had heard of OBME/CBME and 74.7% were aware of its implementation from 2019; however, only 56.0% knew about certifiable skill competencies. The mean knowledge score was 4.68 ± 1.52 out of 8, with 38.7% showing good, 44.0% average and 17.3% poor knowledge. Attitudes were largely favourable: 84.0% agreed that OBME improves clinical skills and 80.7% believed it would produce better doctors, although 71.3% perceived an increased academic workload. Practice was moderate, with regular logbook maintenance in 64.0% and reflective writing in only 48.0%. Knowledge grade did not differ significantly by gender ($p = 0.719$). ***Conclusion:*** Second-year students showed favourable attitudes towards OBME but only moderate knowledge and suboptimal practice, particularly for skill certification, reflection and feedback-seeking. Structured student sensitisation and reinforcement of formative components are recommended.

Keywords: Outcome-based education; Competency-based medical education; Knowledge; Attitude; Practice; Medical students.

INTRODUCTION

Medical education worldwide is undergoing a paradigm shift from traditional, time-based and teacher-centred instruction towards outcome-based medical education (OBME), in which the desired abilities of the graduate are defined first and the curriculum, teaching–learning methods and assessment are then aligned to achieve them. Harden and colleagues described outcome-based education as an approach in which decisions about the curriculum are driven by the exit learning outcomes that students should display at the end of the course, emphasising the product of training rather than merely the educational process [1]. The concept draws on Spady's foundational work in general education, which argued that clearly defined outcomes of significance should organise everything a school system does [2]. Harden later contended that outcome-based education is no longer a future aspiration but a present necessity for medical schools [3].

Closely allied to OBME is competency-based medical education (CBME), defined by Frank et al. as an outcomes-based approach to the design, implementation, assessment and evaluation of medical education programmes using an organising framework of competencies [4]. This movement represents a deliberate shift away from the structure- and process-based Flexnerian model towards curricula accountable for what graduates can actually do [5]. Systematic exploration of its origins and theoretical basis suggests that outcome-based approaches promote learner-centredness, transparency of expectations and criterion-referenced assessment [6]. Competency-based education has also been promoted globally as a strategy to align health professions training with population health needs, particularly in resource-limited settings [7].

In India, this philosophy was formally adopted when the Medical Council of India (now the National Medical Commission) rolled out the competency-based undergraduate curriculum for the Indian Medical Graduate from the 2019 admission batch, articulating global and subject-wise competencies and envisioning the graduate in the roles of clinician, communicator, leader and member of the health-care team, professional and lifelong learner [8]. The Graduate Medical Education Regulations 2019 introduced several structural innovations, including the foundation course, early clinical exposure, the Attitude, Ethics and Communication (AETCOM) module, alignment and integration of subjects, electives, skill-based certification and a strengthened formative assessment system with logbooks [9]. These reforms constitute the largest revision of Indian undergraduate medical education in more than two decades and place substantial new demands on both faculty and students [10].

The success of any curricular reform ultimately depends on the engagement of its principal stakeholders the students. Learners who understand the rationale of OBME, hold positive attitudes towards it and actually practise its components (self-directed learning, reflective writing, logbook documentation and feedback-seeking) are more likely to achieve the intended outcomes. Early Indian studies among first-year students and faculty have reported generally positive perceptions of the new curriculum, alongside concerns regarding workload, faculty preparedness and infrastructural constraints [11,12]. However, data specifically describing the knowledge, attitude and practice (KAP) of second-year (Phase II) students who have completed the foundation course and first professional year and are simultaneously experiencing para-clinical teaching, AETCOM sessions and early clinical exposure remain limited, particularly from deemed-to-be universities, which enjoy academic autonomy and may implement the curriculum with local adaptations.

The present study was therefore undertaken to assess the knowledge, attitude and practice regarding outcome-based medical education among second-year MBBS students of a deemed-to-be university in Karnataka, and to identify gaps that could inform targeted student-sensitisation and curriculum-support activities.

MATERIALS AND METHODS

Study design and setting

This was a descriptive, cross-sectional, questionnaire-based study conducted in the Department of Pathology of Sri Devaraj Urs Academy of Higher Education and Research, Kolar, Karnataka, India a deemed-to-be university in Karnataka, India, over a period of two months from March -April 2023.

Study population

All second-year (Phase II) MBBS students enrolled in the institute during the study period constituted the study population. Students who were willing to participate and provided written informed consent were included. Students who were absent on the days of data collection, those who declined consent and those who submitted grossly incomplete questionnaires (more than 20% of items unanswered) were excluded.

Sample size and sampling

Assuming that 50% of students would have adequate knowledge of OBME (the value maximising sample size in the absence of precise local estimates), with 95% confidence and an absolute precision of 8%, the minimum required sample size was calculated as 150 using the formula $n = Z^2pq/d^2$. A universal (complete enumeration) sampling approach was used; of 162 eligible students approached, 150 returned complete questionnaires (response rate 92.6%).

Study tool

Data were collected using a pre-designed, pre-validated, semi-structured, self-administered questionnaire developed after a review of the literature and the National Medical Commission curriculum documents. The tool was validated for content by three medical education experts and pre-tested on 15 students (not included in the final analysis) for clarity and comprehension; the internal consistency of the attitude domain was acceptable (Cronbach's alpha = 0.78). The final questionnaire had four sections: (i) demographic details (age, gender); (ii) knowledge — eight dichotomous/multiple-choice items on the concept of OBME/CBME, its year of implementation, the roles of the Indian Medical Graduate, AETCOM, formative assessment and logbooks, early clinical exposure and integration, and certifiable skill competencies (each correct response scored 1; total score 0–8, graded as good ≥6, average 4–5, poor ≤3); (iii) attitude — seven statements rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5); and (iv) practice — six items on logbook maintenance, skill-laboratory attendance, self-directed learning, early clinical exposure participation, reflective writing and feedback-seeking behaviour.

Data collection

After obtaining permission from the institutional authorities, students were briefed about the purpose of the study at the end of a routine scheduled class. Participation was voluntary and anonymous; no identifying information was collected,

and non-participation carried no academic consequence. The questionnaire was distributed in paper form and completed in approximately 15–20 minutes under the supervision of the investigators, without discussion among participants.

Statistical analysis

Data were entered into Microsoft Excel and analysed using [SPSS version __ / Epi Info]. Categorical variables were summarised as frequencies and percentages, and continuous variables as mean ± standard deviation. Likert responses of "agree" and "strongly agree" were combined as favourable responses for descriptive presentation. The chi-square test was used to examine the association between demographic variables and knowledge grade; a p value < 0.05 was considered statistically significant.

RESULTS

A total of 150 second-year MBBS students participated in the study. The mean age of the participants was 19.6 ± 1.1 years; slightly more than half were in the 20–21-year age group, and females (54.7%) marginally outnumbered males (Table 1).

Table 1: Demographic profile of study participants (n = 150)

Variable	Frequency (n)	Percentage (%)
Age 18–19 years	62	41.3
Age 20–21 years	79	52.7
Age ≥22 years	9	6.0
Male	68	45.3
Female	82	54.7

Table 2 summarises the knowledge of participants. While general awareness of OBME/CBME was high (85.3%) and most students knew of the AETCOM module (78.7%) and of curriculum implementation from 2019 (74.7%), awareness of certifiable skill competencies was the lowest (56.0%). The mean knowledge score was 4.68 ± 1.52 out of 8; 38.7% of students had good knowledge, 44.0% average and 17.3% poor knowledge.

Table 2: Knowledge regarding outcome-based medical education (n = 150)

Knowledge item (correct/aware response)	n	%
Heard of OBME/CBME	128	85.3
Aware that CBME was implemented by MCI/NMC from 2019	112	74.7
Correctly identified the meaning of "competency"	104	69.3
Aware of the roles of the Indian Medical Graduate	96	64.0
Aware of the AETCOM module	118	78.7
Aware of formative assessment and logbook requirements	101	67.3
Aware of early clinical exposure and integrated teaching	108	72.0
Aware of certifiable skill competencies (skills laboratory)	84	56.0
Knowledge grade: Good (score ≥6)	58	38.7
Knowledge grade: Average (score 4–5)	66	44.0
Knowledge grade: Poor (score ≤3)	26	17.3

The attitude of students towards OBME was predominantly favourable (Table 3). More than four-fifths agreed that OBME improves clinical skills (84.0%) and expressed willingness to learn under the OBME framework (82.7%), and 80.7% believed it would make them better doctors. Nevertheless, 71.3% felt that the curriculum had increased their academic workload, and only 58.0% agreed that formative assessment reduced examination stress.

Table 3: Attitude towards outcome-based medical education (n = 150)*

Attitude statement	Agree, n	%
OBME is better than the traditional curriculum	119	79.3
OBME improves clinical and practical skills	126	84.0
AETCOM improves communication skills and ethical understanding	115	76.7
Formative assessment reduces examination stress	87	58.0
OBME has increased my academic workload	107	71.3
I am willing to learn under the OBME framework	124	82.7
OBME will make me a better doctor	121	80.7

*"Agree" combines "agree" and "strongly agree" responses on the 5-point Likert scale.

Practice-related responses lagged behind attitude (Table 4). About two-thirds of students attended skill-laboratory sessions regularly (68.0%) and maintained their logbooks regularly (64.0%), but fewer than half engaged in reflective writing for AETCOM (48.0%), and only 54.0% actively sought feedback from faculty after formative assessments.

Table 4: Practices related to outcome-based medical education (n = 150)

Practice item (regular/affirmative response)	n	%
Maintains logbook regularly and gets it certified	96	64.0
Attends skill-laboratory sessions regularly	102	68.0
Practises self-directed learning as scheduled	88	58.7
Participates actively in early clinical exposure sessions	94	62.7
Completes reflective writing for AETCOM modules	72	48.0
Seeks feedback from faculty after formative assessments	81	54.0

On testing the association between gender and knowledge grade, no statistically significant difference was observed (χ^2 = 0.66, df = 2, p = 0.719), indicating comparable knowledge among male and female students (Table 5).

Table 5: Association between gender and knowledge grade (n = 150)

Gender	Good, n (%)	Average, n (%)	Poor, n (%)	χ^2 (df); p value
Male (n = 68)	24 (35.3)	31 (45.6)	13 (19.1)	0.66 (2);
Female (n = 82)	34 (41.5)	35 (42.7)	13 (15.8)	p = 0.719

DISCUSSION

The present study assessed the knowledge, attitude and practice regarding outcome-based medical education among second-year MBBS students of a deemed-to-be university in Karnataka. Overall, students displayed high general awareness and favourable attitudes towards the new curriculum, but their in-depth knowledge was only moderate and translation into consistent educational practice was incomplete. This "awareness–practice gap" is an expected finding in the early years of any large curricular reform, when orientation activities successfully publicise the change but habitual learning behaviours take longer to shift [4,6].

In our study, 85.3% of students had heard of OBME/CBME and about three-fourths were aware of its implementation from 2019, whereas only 38.7% achieved a good overall knowledge grade. Comparable observations were reported by Ramanathan et al. among first-year students across India, where learners were broadly aware of the curriculum and appreciative of its components such as the foundation course and early clinical exposure, even while specific structural details were less well understood [12]. Similarly, in a critical appraisal of the competency-based undergraduate curriculum, Sharma et al. cautioned that the intent of the reform could outpace stakeholder preparedness unless orientation is sustained beyond the initial roll-out [11]. The particularly low awareness of certifiable skill competencies (56.0%) in our cohort deserves attention, since skill certification is a defining feature that distinguishes competency frameworks from conventional curricula [13].

Attitudes in the present study were strongly positive: more than 80% of students agreed that OBME improves clinical skills, expressed willingness to learn within the framework and believed it would make them better doctors. This mirrors the favourable learner perceptions of AETCOM, early clinical exposure and integrated teaching documented in Indian studies [12], and is consistent with the theoretical expectation that transparent outcomes and learner-centred methods enhance motivation [1,6]. At the same time, 71.3% perceived an increased academic workload, echoing concerns raised in the Indian literature about the density of competencies, documentation demands and assessment load in the new curriculum [11,14]. Notably, faculty studies have described analogous ambivalence — endorsement of the philosophy of CBME coexisting with implementation concerns — suggesting that workload perceptions are shared across stakeholders and require system-level solutions rather than student-directed exhortation alone [14,15].

Practice scores lagged behind attitudes, with reflective writing (48.0%) and feedback-seeking (54.0%) being the least performed activities. Since programmatic formative assessment, reflection and feedback are the engines through which outcome-based curricula produce competence [4,13], these gaps risk reducing OBME to a documentary exercise. Deemed-to-be universities, with their academic autonomy, are well placed to respond through structured interventions: periodic student re-orientation beyond the foundation course, mentor-facilitated logbook reviews, protected time for reflective writing, faculty development in giving actionable feedback and transparent communication about skill-certification requirements [9,10,15].

The strengths of this study include a high response rate, a validated tool and coverage of all three KAP domains in an under-studied stakeholder group. Its limitations must also be acknowledged: the single-centre design limits generalisability, self-reported practices are susceptible to social desirability bias, and the cross-sectional design precludes causal inference or assessment of change over time. Multicentric and longitudinal studies tracking cohorts across professional years would provide a fuller picture of how student engagement with OBME evolves.

CONCLUSION

Second-year MBBS students of this deemed-to-be university in Karnataka demonstrated favourable attitudes and high general awareness of outcome-based medical education, but only moderate in-depth knowledge and suboptimal practice of its core formative components, particularly skill certification awareness, reflective writing and feedback-seeking. Knowledge did not differ by gender. Continued, structured student sensitisation; mentor-supported logbook and reflection practices; and institutional attention to perceived workload are recommended so that positive attitudes are converted into the sustained learning behaviours on which the success of the competency-based curriculum depends.

Conflicts of interest
None declared.
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Nil.

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