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Chapter 2

Comparison of the educational outcome in pharmacology, among the MBBS students of CBME and pre-CBME batch: A cross-sectional study

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Abstract

In 2019, the new competency based medical education (CBME) was implemented for undergraduate medical students. Competence is defined as the habitual and prudent application of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in everyday practice for the benefit of the individual and community being served. The objective of the newly introduced curriculum is to continue and promote medical education by making it more learner-centric, patient-centric, gender-sensitive, outcome-oriented, and environment-appropriate. Students of CBME and pre-CBME were divided in to 3 groups based on their previous academic performance. A sample size of 90 was considered, 45 students from CBME and 45 from pre-CBME batch. Students were given the questionnaire framed according to the domains of CBME curriculum. Later, assessment was done at the end and the results were compared between 2 batches. CBME curriculum students performed better than pre-CBME batch in terms of theoretical and practical knowledge, also in attitude, ethics and communication (AETCOM).

Keywords: CBME, Domains, AETCOM, Integration, Assessment, Learner-centric, Patient-centric, Gender-sensitive, Outcome-oriented, Community physician, Small group discussion, Skills, Self-directed learning.

Introduction

The new 'competency-based medical education' curriculum (CBME) was introduced in 2019 for the MBBS students. The objective of the newly introduced curriculum is to continue and promote medical education by making it more learner-centric, patient-centric, gender-sensitive, outcome-oriented, and environment-appropriate, such that the graduate can perform as a community physician, in a better effective and more responsible way [1]. Though CBME was proposed a century ago, only in the early twenty-first century, there was revived attention in the medical education setting. In their thorough literature review study, Frank, Snell et al cited four underlying elements: a focus on outcomes, an emphasis on abilities, a de-emphasis of time-based training, and the promotion of learner-centeredness [2].

CBME is an outcome-based approach that integrates knowledge, skills, attitudes, and ethics into discernible and quantifiable competencies [3]. Competence is defined as the habitual and prudent application of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in everyday practice for the benefit of the individual and community being served [4].

Harden proposed that the curriculum must include following components: learning outcomes, content, educational strategies, learning opportunities, assessment, and educational environment [5].

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Each student must complete a study period of 4½ academic years, divided into nine semesters, followed by a year of compulsory rotatory residential internship (CRRI). There will be a minimum of 240 training days every academic year, with eight hours of work per day. It is divided into three phases: the pre-clinical phase (phase I), the para-clinical phase (phase II), and the clinical phase (phase III).

The new curriculum includes the foundation course (FC), early clinical exposure (ECE), attitudes, ethics, and communication (AETCOM), self-directed learning (SDL), elective posts (EP), skill training, clinical clerkships, the pandemic module, and the family adoption programme. Another important aspect of the CBME is the use of systematic feedback, reflection writing, and logbook maintenance [1].

Pre-clinical phase (phase I)

First professional phase of 13 months preceded by foundation course of one month: will consist of preclinical subjects - human anatomy, physiology, biochemistry, introduction to community medicine, humanities, professional development including attitude, ethics and communication (AETCOM) module and early clinical exposure, ensuring both horizontal and vertical integration.

Para-clinical phase (phase II)

Second professional (12 months): will consist of para-clinical subjects namely pathology, pharmacology, microbiology, community medicine, forensic medicine and toxicology, professional development including AETCOM module and introduction to clinical subjects ensuring both horizontal and vertical integration.

Clinical phase (phase III)

Third professional (28 months): will consist of part I (13 months), electives (2 months), and part II (13 months).

The clinical subjects include general medicine, general surgery, obstetrics and gynaecology, pediatrics, orthopaedics, dermatology, otorhinolaryngology, ophthalmology, community medicine, forensic medicine and toxicology, psychiatry, respiratory medicine, radiodiagnosis and radiotherapy and anaesthesiology and professional development including AETCOM module [7].

Individual components of pharmacology in UG curriculum

Pharmacology is about treating the patients with the required medications, at the right dose, for the right duration and at an appropriate cost. Knowing the molecular basis of drug action, the side effects, how to prevent and manage them, and the drug interactions will be learned in the context of their clinical application rather than merely as facts. The focus is on the use of pharmacological knowledge in health care settings [7]. The main objective of the pharmacology curriculum is to give Indian medical graduates (IMG) the ability to comprehend the scientific basis of therapeutics and the rational prescribing during the second year of MBBS [7].

Pharmacology comes under phase 2, denoted by the code PH that consists of 5 topics that include knowledge pharmacology, clinical pharmacy, clinical pharmacology, experimental pharmacology, and communication. Outcomes (competencies) in each subject are organised numerically according to topics. The outcome is either core (Y-must accomplish) or non-core (N-desirable). The learning domains (knowledge, skill, attitude, and communication) are defined for each competency mentioned. Pharmacology consists of 85 outcomes (knowledge pharmacology-64, clinical pharmacy-4, clinical pharmacology-8, experimental pharmacology-2, and communication-7) [8].

Pharmacology is allotted a total 230 hours with 80 lecture hours and 150 non-lecture hours that include small group discussion (SGD), tutorials, skills, self-directed learning (SDL). Integration is a learning process that enables the learner to recognize connections between knowledge building blocks and to create a cohesive understanding of both basis and their application. It may involve horizontal integration within a phase or vertical integration across phases [4]. The 37-hour AETCOM module in phase-II includes a foundation in communication, bioethics, in health care as a right. Working as a medical team, bioethics (decision-making and autonomy), What exactly does it mean to be a sick person's family member?

Assessment methods in CBME

Formative assessment

An evaluation done during instruction with the primary objective of receiving feedback to enhance learning.

Summative assessment

A test given at the conclusion of instruction to assess how much the student has understood.

Internal assessment

A variety of tests conducted by teachers to determine what students have learned. Internal evaluation can serve summative and formative purposes.

Methods

According to a study conducted by Patil et al [9]. Sample size was calculated using the formula given.

$$n = \frac{4pq}{d^2}$$

Where, p=35, q=65, d=10, and n=90. Students of CBME and Pre-CBME were divided in to 3 groups based on their previous academic performance (>70%, 50 to 70%, <50%) and from these 3 groups 15 students from each group willing to participate were selected.

Students were asked to report to the pharmacology department, each student was given a unique identification number and they were given the questionnaire with 12 questions framed according to the domains of CBME curriculum (knows, knows how, shows, shows how, AETCOM). A time of period of 15 minutes was given to the students to complete the form. Later, assessment was done at the end using simple parametric percentage calculation and the results were compared between 2 batches.

Results

In this study, the competency based medical education curriculum was evaluated within the domains of knows (K), knows how (KH), shows (S), shows how (SH), AETCOM. The questionnaire had 12 questions with a total of 15 points. Both the groups scored near equal average score of 61%.

In pre-CBME 7.14% scored <5, 64.29% scored 5 to 10, 28.57% scored >10 out of 15, with a maximum score of 13 and minimum of 3.

In CBME 14.29% scored <5, 42.86% scored 5 to 10, 42.86% scored >10 out of 15, with a maximum score of 14 and minimum of 4 (Figure 2).

In the frame of knowledge evaluation pre-CBME scored 85% and CBME scored 87%. There was no statistically significant difference in the aspect of knowledge (K, KH) pre-CBME versus CBME. On practical (S, SH) evaluation pre-CBME scored 50% and CBME 86%.

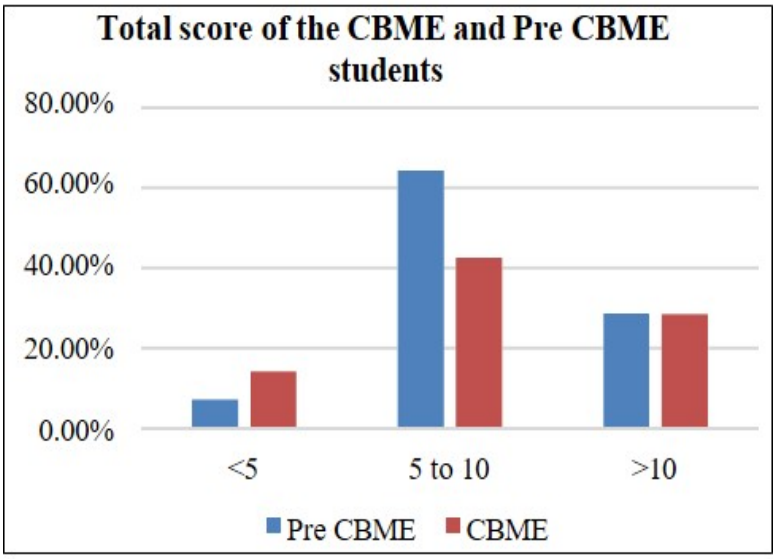

Figure 1: Total scores of evaluating the competency based medical education curriculum through questionnaire.

A clinical scenario was given and they were asked to respond based on the principles of ethics, in which 28% of pre-CBME and 35% of CBME were able to justify their answer (Figure 2).

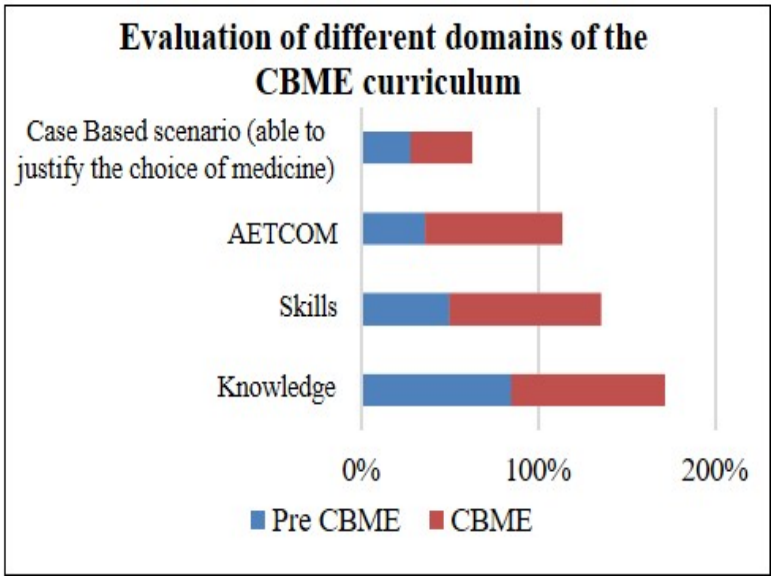

Figure 2: Evaluation of domains of knowledge, skills, attitude, ethics, communication, ability to justify the use of drugs in the given case-based scenario.

Limitations

We only included a smaller number of participants in this study, also, there was recall bias because the pre-CBME batch completed pharmacology, two years back. The sample size was small for the results to be generalized.

Conclusion

The traditional pharmacology curriculum was time-based and subject-centered. CBA is ongoing and longitudinal assessment of theory and practical's and it has complemented in learning pharmacology. The objective is to enhance learning and ability to apply acquired knowledge and skills for patient care. However, the CBA becomes fundamentally less objective but more reliable than previous standard assessment methods. From this study, CBME students performed better than pre-CBME in terms of theoretical and practical knowledge, also in terms of attitude, ethics, and communication, despite having less theoretical hours. When asked for the feedback from the individual students of both the batches, they said that 'CBME curriculum was better in terms of being learner-centric, patient-centric, gender-sensitive, and outcome-oriented'. The CBME as a whole is still an emerging concept and we are still in a beginning phase.

Declaration

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Conflict of interest: None declared.

Ethical approval: Not required.

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