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Exploring Second MBBS Students' Perspectives on Teaching-Learning Methods in Pathology in the Competency-Based Medical Education Curriculum

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Abstract

Pathology is a cornerstone of medical education, bridging basic sciences with clinical practice. This study investigates second-year MBBS students' perceptions of pathology as a subject and evaluates the effectiveness of teaching-learning methods within the Competency-Based Medical Education (CBME) framework. A structured questionnaire with Likert scale items and open-ended questions was administered to gather data on students' perceptions of pathology and the CBME teaching-learning methods. We assessed students' attitudes towards pathology, identified challenges, and analyzed the impact of CBME-based teaching strategies on learning outcomes. The majority of students (77.2%) find pathology challenging. 89.5% of students thought that the number of lectures and duration of each session were adequate. 77.6% of students said that large group lectures were monotonous and a majority wanted a greater number of small group discussions (70.6%) and case-based discussions (78.5%). Integrated teaching was a useful method for a greater depth of understanding of medicine. 57.9% of students wanted horizontal integration while 42.1% wanted vertical integration. 83.8% of students highly appreciated the practical DOAP sessions. Pathology is recognized as a fundamental subject. However, students face challenges in engaging with it fully under the CBME curriculum. The effectiveness of teaching-learning methods varies, with interactive and integrative approaches being more favoured than traditional lectures. While current teaching-learning methods have strengths, there is room for improvement in integrating pathology with clinical practice and addressing resource limitations.

Keywords: *Competency-Based Medical Education, CBME, MBBS Students, Pathology, Teaching-Learning Methods.*

Introduction

Pathology, as the study of disease, plays a critical role in the medical curriculum by linking basic sciences with clinical practice. A clear knowledge of pathology plays a pivotal role in developing scientific clinical acumen. If proper core knowledge is provided at this stage, a student will be able to interpret and analyze the clinical scenarios effectively. Meticulous planning is required to decide the best strategy to teach this extensive subject to students in an interesting way [1, 2].

In the Competency-Based Medical Education (CBME) framework, the focus shifts towards achieving specific competencies and integrating knowledge with practical skills. CBME is an "Outcome-Based Approach" that emphasizes on splitting of competence with learners, especially by taking teaching-learning techniques that keep students as the main focus. CBME approach is organized around competencies, or predefined abilities, as outcomes of the curriculum. This approach encourages learners to take responsibility for their progress towards competence and hence is termed a learner-led approach. The students are expected to identify and negotiate activities to meet their learning needs, which increases their accountability. It also demands that the students should work in a team, focus on active learning, have self-reflection, and develop self-directed learning skills [2, 3].

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Medical schools all over India have didactic lectures as the most widely used teaching-learning method. Furthermore, the teacher-to-student ratio is increasing due to most medical schools enrolling more than 200 students per academic year. Hence active student participation remains a challenge. Innovation in to use of interactive teaching methods in a large classroom is necessary to engage students in a meaningful way [4].

Based on feedback received from students all over the country, the undergraduate medical curriculum has evolved into a new Competency-based Medical Education (CBME) model by the National Medical Commission (NMC) from discipline-based to integrated core and option-based, from being teacher-centred to student-centred, and from passive acquisition of knowledge to active problem-based learning. This emphasizes the significance of students' perceptions and feedback on the delivery of curriculum and in improving the existing teaching-learning methods [5, 6].

This study aims to explore the second MBBS students' perspectives on pathology and evaluate the effectiveness of teaching-learning methods employed under CBME.

Materials and Methods

The study was conducted among second MBBS students at a medical school in India. A total of 228 students were surveyed. A structured questionnaire approach was employed to understand and provide comprehensive details of students' perspectives.

Survey: A structured questionnaire with Likert scale items and open-ended questions was administered to gather data on students' perceptions of pathology and the CBME teaching-learning methods.

Quantitative data from surveys were analyzed using descriptive statistics and analyzed thematically to identify recurring themes and insights. The software used was Microsoft® Excel® 2016 MSO (Version 2407 Build 16.0.17830.20056) 64-bit. Categorical variables were expressed in terms of number and percentage.

Results and Discussion

Students Views on Pathology as a Subject

The study revealed that a majority of students (77.2%) find pathology challenging but essential for understanding disease mechanisms. Most of the students (67.5%) felt that pathology is a vast subject and two semesters were not sufficient for proper understanding to connect theoretical knowledge with clinical practice [Table 1].

The students showed a lot of enthusiasm to learn the subject of pathology to understand disease and apply their knowledge to clinical skills. However, they found it to be challenging due to the vast nature of the subject added to a limited number of lecture hours and lack of continuity of topics in the CBME curriculum compared to the conventional curriculum. In the conventional curriculum, which consisted of teaching Pathology for three semesters, there was a continuity in teaching as well as learning the subject for in-depth understanding which formed the cornerstone for clinical subjects in the following years. However, the CBME curriculum uses Specific Learning Objectives for each topic and hence is more objective-oriented.

The students expressed that both general pathology and systemic pathology were equally challenging in terms of complex concepts and understanding. They reiterated the fact that a strong foundation in pathology is a must for future postgraduate entrance exam preparation and the application of knowledge to clinical skills [1].

Table 1. Views of Students on Pathology as a Subject

1. Is Pathology a difficult subject?	
Yes	176(77.2%)
No	52(22.8%)

2. Are two semesters sufficient for learning pathology?	
Yes	74(32.5%)
No	154(67.5%)
3. Is general pathology more difficult than systemic pathology?	
Yes	121(53.1%)
No	107(46.9%)
4. Is a strong background in pathology beneficial for clinical posting and for future postgraduate entrance preparation?	
Yes	205(89.9%)
No	23(10.1%)

Information and Quality of Teaching Learning Methods

A majority of students felt that the number of classes taken, the duration of each lecture and the content of the lectures were satisfactory. They also said that the lectures offered adequate focus on important topics and key points were sufficiently emphasized along with images, flow charts and diagrams. They were also happy that they were encouraged to ask doubts during the classes [Table 2].

In most of the teaching institutes, the lectures are handled by the faculty ranging from senior professors to junior tutors and postgraduate students. We as authors, with a decade-long experience in teaching institutes, would like to emphasize the fact that uniformity in teaching is a must irrespective of the designation of the faculty involved. This uniformity in teaching can be brought about by having monthly dedicated meetings in the Department among the faculty to discuss the various learning objectives to be fulfilled for that particular month. Also, emphasis should be placed on diagrams, flowcharts and images from standard textbooks for the students to follow and understand.

Most students thought that large group lectures involving 250+ students are quite monotonous and they could be made more interactive for better attentiveness and understanding. However, given the limited number of lecture hours and the number of topics to be covered in each lecture, it may be practically difficult for the faculty to interact with all the students [1, 9].

An innovative and interactive way of engaging the students can be quiz-based, wherein, the important topics covered in the previous month can be compiled into an interesting quiz-based discussion in an SDL session where all the students can be involved to develop better focus and interest in the subject.

Table 2. Information and Quality of Teaching Learning Methods

1. Are the number of classes taken in pathology and the duration of each lecture session adequate?	
Yes	204(89.5%)
No	24(10.5%)
2. Do you think the content of the lectures meets your needs for exam preparation?	
Yes	165(72.4%)
No	63(27.6%)

3. Are you encouraged to ask doubts during the classes?	
Yes	166(72.8%)
No	62(27.2%)
4. Do the lectures offer adequate focus on the important topics?	
Yes	187(82%)
No	41(18%)
5. Do you think that the key points were sufficiently emphasized and proper explanation given in the lectures?	
Yes	143(62.7%)
No	85(37.3%)
6. Do you think the images, flow charts and diagrams shown during the lectures are adequate and exam-oriented?	
Yes	147(64.5%)
No	81(35.5%)

Teaching-Learning Methods in CBME

Large Group Lectures, Small Group Discussions and Case-Based Discussions: The majority of students (77.6%) reported that traditional lectures are often seen as insufficient for deep learning. Students expressed their desire to have a greater number of small group discussions and case-based discussions to gain in-depth knowledge. Most of the students (84.6%) wanted common and frequently asked exam questions to be discussed in small group lectures. On the contrary, only a few students (15.4%) wanted rare and difficult topics to be discussed in small group sessions.

Small Group Discussions are being increasingly encouraged in the new CBME curriculum. They are a very effective way to catch the attention of the students and help them understand complex concepts in the pathogenesis of disease. Small Group Discussions are one the best tools of the CBME curriculum which must be continued for years to come. It greatly benefits the students for a smaller student-to-teacher ratio and better interaction between students and teachers. Some medical schools are completely shifting to Small Group Discussions and eliminating Large Group Lectures. This has consistently produced great results among the students. However, it may lead to faculty burnout. [7, 8]

Case Base Discussions are also an effective way to motivate the students to pay attention and try to understand the topics as it helps them to look at the bigger picture of how learning the disease pathogenesis and pathology helps them diagnose cases in the future and treat the patients accordingly. Case Based Discussions are being routinely conducted in the CBME curriculum and it is indeed a very useful method for the greater benefit of students. It is one of the boons of the CBME curriculum. [8, 9]

Most medical schools in India deal with a large number of students and limited faculty. Increasing the number of small group discussions requires a large dedicated team of faculty in every medical school and that remains a challenge. However, this may be worked upon for the larger benefit of the students by improving our resource-poor settings [1, 7, 8, 9].

Integrated Teaching: The majority (57.9%) of students wanted integrated teaching to be incorporated into their curriculum. Some felt that horizontal integration (64.4%) was more beneficial while others reiterated the importance of vertical integration (45.6%). Most students expressed that integration was indeed beneficial. They believed that horizontal integration was more beneficial for a good understanding of second MBBS subjects. Students also highlighted the benefits of vertical integration, noting that this approach helps bridge

the gap between theory and practice. Students however expressed that they struggled with integrating pathology concepts with clinical scenarios due to limited exposure to clinical cases early in the curriculum. We might be able to address this issue with early clinical exposure as a part of the CBME curriculum. Early clinical exposure is another novel concept introduced in the CBME curriculum which is a well thought out and planned entity. Since it is still in the initial phases, it might take a couple of years for medical schools to completely incorporate it into every batch of students for their greater benefit [4, 8, 10, 11].

Student Seminars and Symposiums: A vast majority (57.9%) were under the impression they were unlikely to benefit from student seminars due to their inability to analyze each topic and present it in a comprehensible manner. Students find it difficult to present seminars and symposiums in the current CBME curriculum due to a lack of in-depth knowledge of the subject. The same may be overcome by incorporating more Small Group Discussions and Case-Based Studies to improve the overall knowledge of the students and in turn encourage them to participate actively in Seminars and Symposiums which will help them to expand their thinking skills [11, 12].

Self-Directed Learning: Most students (61%) preferred the option of self-directed learning. The students wanted to take a self-paced approach to learning pathology. This may be because large group lectures are fast-paced and it may be difficult for the students to cope with the speed of these lectures. Although, in our opinion, SDL may not be a good option for all the students to be able to gain adequate knowledge. Also, they might have been more comfortable with SDL due to the monotonous nature of large group lectures. In addition, due to growing inertia among this generation of students, they may want to take up the more laidback approach to learning. So, if we work towards focused small group discussions (SGD), the students might benefit from it and prefer SGDs over SDLs [12, 13].

Practical Sessions: Students (83.8%) highly valued the hands-on sessions emphasizing Demonstrate, Observe, Assist and Perform (DOAP) sessions including slide reviews and laboratory work, for their role in reinforcing theoretical knowledge [Table 3]. The students unanimously agreed on the fact that Practical classes were interesting, and thought-provoking and helped them gain a better understanding of concepts. We believe that on one interaction with the students in the practical sessions deeply kindles their minds and helps boost their confidence in the subject. We propose that while most medical schools in India involve the junior faculty and residents in practical sessions, it is important that senior faculty be available for discussions so that the students gain knowledge from the stalwarts in the field. This might motivate the students to enjoy and love the subject thereby making it easy for them to understand and retain the subject for future [9, 12].

Table 3. Teaching Methods

1. Are large group lectures monotonous in your point of view?	
Yes	177(77.6%)
No	51(22.4%)
2. Can large group lectures be made more interactive for a better understanding of the topic?	
Yes	132(57.9%)
No	96(42.1%)
3. Are vertical and horizontal integration classes helpful to improve your knowledge?	
Yes	132(57.9%)

No	96(42.1%)
4. Do you want more small group discussions (SGD) to be incorporated into training program?	
Yes	161(70.6%)
No	67(29.4%)
5. Are case-based discussions more useful to improve your knowledge?	
Yes	179(78.5%)
No	49(21.5%)
6. Are more student seminars and symposiums essential for easy understanding of the topic?	
Yes	96(42.1%)
No	132(57.9%)
7. Are Practical – DOAP sessions more beneficial than lectures?	
Yes	191(83.8%)
No	37(16.2%)
8. Is self-directed learning useful to improve your knowledge?	
Yes	139(61%)
No	89(39%)

Teaching Tools

As far as the teaching tools are concerned, the students are most comfortable with PowerPoint presentations (75.9%). They also showed interest in video tutorials (71.1%) and smart board teaching (58.3%). They did not encourage the use of blackboard teaching. We believe, the gen-next is tech-savvy and hence the deviation towards smarter teaching tools. However, a simple blackboard teaching is more than sufficient for an able faculty to tap the minds of the young. Most medical schools have adequate infrastructure for PowerPoint presentations. We might have to work towards building smart boards and video tutorials for the greater benefit of the students. Students expressed that resource limitations such as outdated slide collections and limited access to digital tools, were noted as barriers to effective learning [9, 14, 15].

Recommendations

Enhanced Integration: Increase opportunities for students to apply pathology knowledge in clinical settings early in the curriculum. This will help the students build basic knowledge and kindle their minds to apply and hone their clinical skills.

Innovative Teaching Methods: Incorporate more case-based learning and interactive methods to foster deeper understanding. This can be done by including quiz-based discussions and flipped classroom learning.

Flipped classroom learning: This is a teaching method that reverses the traditional classroom model by moving content delivery outside of class and in-class activities into the classroom. The goal is to increase student engagement and active learning. Students learn content before class through pre-recorded lectures or assigned reading. Students use class time for active learning activities, such as discussion, hands-on work, and collaboration. Students are responsible for their learning and can learn at their own pace. Students have more opportunities for higher-order learning. [16-18]

Resource Improvement: Invest in updated resources and digital tools to support practical learning experiences for the overall benefit of the students.

To summarize, the findings suggest that while pathology is recognized as a fundamental subject, students face challenges in engaging with it fully under the CBME curriculum. The effectiveness of

teaching-learning methods varies, with interactive and integrative approaches being more favoured than traditional lectures. Addressing the identified challenges through enhanced integration with clinical practice and improved resources along with innovative teaching methods, could enhance student engagement and learning outcomes.

Conclusion

Second MBBS students view pathology as a crucial but challenging subject within the CBME curriculum. While current teaching-learning methods have strengths, there is room for improvement in integrating pathology with clinical practice and addressing resource limitations. In addition, the use of innovative teaching methods such as video tutorials, case-based discussions and flipped classroom methodologies kindle interest in the minds of the young. Implementing the recommendations may enhance student engagement and learning outcomes in pathology.

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