

A Systematic Review

Challenges in Learning Anatomy and Preference of Assessment Methods among CBME Phase I Students in a Medical Collage in Andhra Pradesh

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**Abstract:**

**Introduction:** The study of anatomy presents notable challenges for medical students, particularly within the framework of Competency-Based Medical Education (CBME). This approach emphasizes integrated learning and competency development, complicating traditional anatomy teaching. Students often struggle with content complexity and the application of knowledge in clinical settings. This study investigates the difficulties encountered by Phase I CBME students in anatomy and their preferences for teaching and assessment methods.

**Methods:** A cross-sectional study was conducted with 150 Phase I MBBS students at Konaseema Institute of Medical Sciences, Andhra Pradesh. Data were collected using a structured questionnaire administered via Google Forms. The questionnaire explored challenges in learning anatomy and preferences for teaching and assessment methods. Statistical analysis was performed using SPSS software version 20.

**Results and Discussion:** Among participants, 53.3% identified embryology as the most challenging subdivision of anatomy, followed by gross anatomy (31.3%). Key challenges included difficulty recalling content and correlating theoretical knowledge with practical applications. Regarding assessment, 57.3% preferred structured descriptive questions for theory and 56.3% supported spotters with specimen discussions for practical evaluations. Students highlighted the need for increased use of audiovisual aids, frequent revisions, and teaching that integrates clinical relevance. The findings emphasize the importance of tailored approaches to address learning difficulties and improve student engagement in anatomy education.

**Conclusion:** Anatomy education under the CBME framework necessitates innovative strategies to address student challenges. Implementing integrated teaching methods, leveraging technology, and refining assessment practices can enhance comprehension and retention. This study provides insights to optimize anatomy education, ensuring alignment with CBME goals and better preparing students for clinical roles.

**Keywords:** education, Competency-Based Medical Education, learning challenges, assessment preferences, teaching methods,

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## Introduction

The study of anatomy poses significant challenges for medical students, particularly within the framework of Competency-Based Medical Education (CBME). This educational paradigm emphasizes the development of competencies through integrated learning experiences, which can complicate the traditional methods of teaching anatomy. As noted in recent research, the transition to CBME has led to varied student perceptions regarding the effectiveness of new teaching methodologies, including blended learning and integrated approaches that combine anatomy with clinical skills [1]

### Challenges in Learning Anatomy

Anatomy education is inherently complex due to its vast content and the necessity for spatial understanding. Students often report difficulties in grasping three-dimensional structures and their relationships, which are critical for clinical applications. A study highlighted that many students struggle with self-directed learning (SDL) in anatomy, often relying excessively on internet resources without adequate guidance on how to effectively utilize these materials [2,3] Furthermore, the integration of e-learning tools presents both opportunities and challenges; while they can enhance engagement, they may also lead to feelings of isolation among students who miss hands-on experiences like cadaver dissections [4,5]

### Preference of Assessment Methods

Assessment methods in anatomy education also play a crucial role in student learning outcomes. Traditional examinations may not effectively measure practical skills or the ability to apply anatomical knowledge in clinical scenarios. Research indicates a

growing preference among students for innovative assessment methods that align with active learning strategies, such as formative assessments and peer evaluations [1,3] The effectiveness of these methods is often evaluated through learner satisfaction surveys, which reveal that students appreciate assessments that promote critical thinking and application over rote memorization [1]

In conclusion, this research aims to explore the specific challenges faced by Phase I CBME students in learning anatomy and their preferences regarding assessment methods. By understanding these dynamics, educators can better tailor their approaches to enhance student engagement and competency in this foundational subject. The findings from this study will contribute to ongoing discussions about optimizing anatomy education within the CBME framework, ensuring that medical graduates are well-prepared for their future clinical roles.

**Need for the Study:** Similar study was not conducted in the state of Andhra Pradesh.

**Objectives of the Study:** 1. To detect the problems faced by students of 1st MBBS in learning Anatomy and view of students to proposed methods of rectification; 2. To analyse the students view regarding assessment methods and interval in Anatomy.

**Materials and Methods:**

**Study Design:** A cross-sectional study was conducted after obtaining approval from institutional ethics committee, KIMS & RF, Amalapuram.

**Sampling Method:** Convenient sampling

**Source of Data:** 150 students of Phase 1 MBBS (2023 admitted batch) of Konaseema Institute of Medical Sciences and

Research Foundation, Amalapuram were included in the study.

**Method of Collection of Data:** Data was collected by using predesigned structured questionnaire using Google forms to 150 students of first MBBS (2023 admitted batch), irrespective of their performances in Anatomy throughout the year. All students were exposed to regular teaching methods in department of Anatomy during the academic year 2023-2024.

Feedback of students regarding problems faced in learning Anatomy and their views regarding proposed rectification methods were obtained. The feedback of students on assessment methods and interval was also obtained.

Two sets of validated questionnaire was provided to the students, the first set had 7 multiple choice questions, the second set of questions were of closed end type, requiring either positive or negative response.

**Study Setting:** This study was conducted in the department of Anatomy, KIMS and RF, Amalapuram after obtaining IEC (Institutional Ethical Committee) clearance.

Informed consent was obtained from all 150 students.

The study did not require any interventions to be conducted on any human participants.

**Study Duration:** One month from approval from the IEC

**Ethical Issues:** Informed consent and confidentiality of data have been ensured. No issues of beneficence and maleficence.

**Statistical Analysis plan:** Data was entered into MS Excel and statistical analysis was done by applying parametric tests using SPSS software version 20 .

#### **Results:**

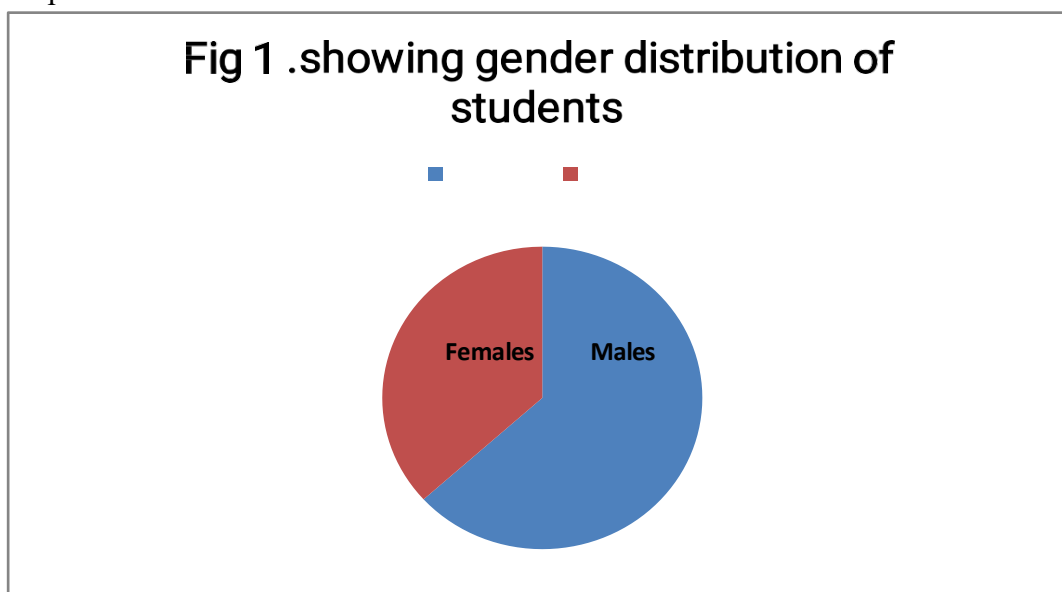
Out of 150 participants, 37 % were males and 63 % were females.

Coming to the difficulties in learning anatomy, 53.3 % students felt embryology to be the most difficult division followed by gross anatomy which amounts to 31.3 %.

In gross anatomy, 70 % students faced inability to recall the subject followed by inability to identify specimen by 16.7 % students.

In histology, 40% students faced inability to identify the slides followed by inability to retain memory in 32 % students.

In embryology, 43.3 % faced inability to follow the sequence of events followed by inability to correlate theory knowledge in identifying charts and models in 25.3% students.



**Table 1: Showing difficulties in learning anatomy**

Question	Subdivisions	Percentage of positive response
<b>1. Divisions of anatomy which you faced most difficulties. Choose any one</b>	a. Gross Anatomy b. Histology c. Embryology d. Osteology e. All of the above	31.3 6 53.3 3.3 6
<b>2. Problems faced in Gross Anatomy by you. Choose any one</b>	a. Disinterest b. Inability to identify specimens c. Inability to correlate theory with specimens d. Inability to recall	1.3 16.7 12 70
<b>3. Problems faced in histology by you. Choose any one</b>	a. Disinterest b. Inability to comprehend c. Inability to identify slides d. Inability to retain memory	6 22 40 32
<b>4. Problems faced in embryology Choose any one the most common problem</b>	a. Disinterest - b. Inability to follow the sequence of events c. Inability to correlate theory knowledge in identifying charts and models d. Inability to retain memory	7.3 43.3 25.3 24
<b>4. Problems faced in osteology Choose any one the most common problem</b>	e. Disinterest f. Inability to identify bones g. Inability to correlate theory knowledge in cadaveric dissection h. Inability to retain memory	6 9.3 37.3 47.3
<b>5. Evaluation method for theory which you feel is most appropriate (choose one)</b>	a. Structured descriptive question b. Short answer questions c. MCQs d. Combination of the above	57.3 13.3 6.7 22.7
<b>6. Evaluation method for practicals which you feel is most appropriate (choose one)</b>	a. Spotters and discussion on specimens b. Spotters and discussion on histology c. both of the above	56.3 21.3 22.7
<b>7. Interval of assessment Choose any one</b>	a. Weekly b. Monthly c. at the end of the topic.	28.7 34 37.3

In osteology, 43.3 % faced inability to retain memory followed by inability to correlate theory knowledge in cadaveric dissection in 37.3 % students 57.3% students felt structured descriptive questions as the most appropriate method of evaluation for theory

knowledge.

56.3 % felt spotters and discussion on specimens as the most appropriate methods of evaluation of practical knowledge.

37.3 % felt assessment to be at the end of the topic.

**Table 2: showing teaching methods that help improve learning**

Questions	Yes	No
1. Introducing quizzes, student seminars, tutorials and written test at end of each region would help you to improve.	93.7	6.7
2. Inculcating habits of self and group reading in dissection hall with already demonstrated specimens and bones would help you to improve.	98	2
3. Embryology to be taught in sequence coordinating with gross Anatomy would help you to improve.	98.7	1.3
4. Liberal use of audio visual aids such as dissection videos and animation would help you to improve	96.7	3.3
4. More frequent revisions would help you to improve.	98.7	1.3
5. Reducing the speed of teaching and repeating key points would help you to improve	96.7	3.3
6. Utilizing digital resources and software would help you to improve	96.7	3.3
7. Seeking guidance from instructors or mentors would help you to improve	100	0
8. Relating to clinical scenarios would help you to improve	98.7	1.3

100 % students felt seeking guidance from mentors help them improve in the subject.

98.7 % felt embryology to be taught in coordination with gross anatomy and more revisions for improvement of learning, 96.7 % sought liberal use of audio-visual aids for teaching dissection, reducing the speed of teaching and repeating key points, utilizing digital resources and software and 98 % felt self and group reading help improve learning.

93.7 % students felt introducing quizzes, student seminars; tutorials and written test at end of each region would help to improve.

### Discussion:

This study highlights several challenges faced by phase I MBBS students under the CBME framework. Among the 150 participants, embryology was perceived as the most difficult division (53.3%), followed by gross anatomy (31.3%). In histology, 40% students faced inability to identify the slides followed by inability to retain memory in 32 % students.

But in a study by Sudakshina Chakrabarti et al., majority of students chose histology [40%] which showed the students were not

able to cope up and understand histology easily.

57.3% students felt structured descriptive questions as the most appropriate method of evaluation for theory knowledge. [6]

56.3 % felt spotters and discussion on specimens as the most appropriate methods of evaluation of practical knowledge. 37.3 % felt assessment to be at the end of the topic.

In the study by Shoaib Rafique students preferred multiple choice questions as best method of assessment. [7] Whereas in the study conducted by Rashmi Jaishwal<sup>8</sup>, 55.03% of students favoured descriptive and short essay questions with multiple choice questions as a pattern of examination and only 21.7% students agreed for multiple choice questions with true/false type questions. [8]

Considering the interval of assessment about 70% of students preferred weekly test in the study conducted by S K Nagarc [9] whereas in study conducted by Rashmi Jaishwal<sup>8</sup> students preferred test at the completion of region or part which is very similar to the present study.

In this study, 100 % students felt seeking guidance from mentors help them improve

in the subject .98.7 % felt embryology to be taught in coordination with gross anatomy and more revisions for improvement of learning, 96.7 % sought liberal use of audio-visual aids for teaching dissection, reducing the speed of teaching and repeating key points, utilizing digital resources and software and 98 % felt self and group reading help improve learning.

According to B Karmer, solutions to problems in learning Anatomy can be addressed by providing more time, scheduling and restructuring lectures, using more visual aids, and including tables and summaries which can be easily recalled. [10] It is important to emphasize that students will only remember 20% of what they read, 30% of what they hear, 40% of what they see, 50% of what they say, and 60% of what they do. This average increases to 90% for information they say, hear, see, and do. [11] Other studies have shown that students learn better by using active learning strategies, because active learning methodologies reach all types of students. [12-14]

### Conclusion

Students' needs change with time and hence, their learning strategies. Introduction of technology in teaching-learning methods help improve their comprehension. National Medical Commission has already introduced different teaching-learning methods and modes of assessment based on the level of competency. It helps the student get motivated to retain the subject and make it more applicable.

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