Section: Anatomy

Original Research Article

ASSOCIATION BETWEEN CLASS ATTENDANCE AND PERFORMANCE IN ANATOMY EXAMINATION: A COMPREHENSIVE AND EVIDENCE-BASED STUDY IN A MEDICAL COLLEGE FROM EASTERN INDIA

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ABSTRACT

Background: Student's absenteeism is becoming a continuous and major problem in medical education despite mandatory attendance policies introduced by universities. Medical education truelydemands high attendance for good understanding and grasps over the subject. Anatomy teaching in medical education traditionally relies on didactic lectures supplemented by practical sessions, particularly cadaveric dissection. In recent years, declining class attendance and increased reliance on online learning resources, especially after the COVID-19 pandemic have raised concerns about their impact on academic performance. Evidence relating attendance to learning outcomes in preclinical subjects from eastern India remains limited. **Objectives:** (1) To determine the association between attendance in theoretical and practical anatomy classes and student assessment outcomes, and (2) to evaluate whether attendance in dissection practical classes is associated with better overall assessment performance.

Material and Methods: A retrospective, cross-sectional observational study was conducted in the Department of Anatomy, RG Kar Medical College and Hospital, among first-year MBBS students of the 2023–24 batch (n = 250). Attendance records for theory and practical classes and marks obtained in three departmental examinations were collected. Pearson correlation analysis was used to assess the relationship between attendance and examination performance.

Results: Mean theory attendance was 58.48% (±10.21), while mean practical attendance was 85.18% (±22.94). Theory attendance showed a significant positive correlation with theory examination scores ($r = 0.471$, $p < .001$). Practical attendance demonstrated a stronger correlation with practical examination scores ($r = 0.634$, $p < .001$) and was also significantly correlated with total examination performance (theory + practical) across all three semesters ($r = 0.467–0.552$, $p < .001$).

Discussion: Regular class attendance, particularly in practical anatomy sessions, is strongly associated with improved academic performance among first-year medical students. Emphasizing consistent participation in both theory and practical classes may be an effective strategy to enhance learning outcomes in anatomy. Perhaps medical schools should offer as many unique quality resources as budgets allow, inform students of their availability and let students decide which learning methods work best for them individually, thus facilitating self-directed learning.

Conclusion: Emphasizing consistent student participation may therefore be a simple yet effective strategy for enhancing academic success in anatomy among first-year medical students.

Keywords: anatomy; medical education, class attendance, assessment, performance.

INTRODUCTION

Anatomy in medical curricula is profoundly taught via pedagogy consisting of didactic lectures combined with a practical component. Since the 16th century the practical part has predominantly focused around human cadaveric dissection.[1] In recent times, restrictions on time and resource have resulted in institutional specific modifications to this traditional pedagogy. Moreover, the practical component has undergone quick reform.[2] To study in a medical college has real demand to attend the classes of both theory and practical, as the curriculum is very vast and students are being exposed to many concepts for the very first time. During classes of theory and practical learning occurs in a significant ways.[1,2] Studies have shown that class attendance in college has a positive impact on college examination grades. Presently we face diminishing attendance in both theoretical and practical anatomy classes. In addition, there is widespread use of online material by students, especially after COVID-19 pandemic.[3] In this scenario, there is a dearth of information regarding the relationship of class attendance and academic performances in a preclinical subject from the eastern part of the country.

Anatomy is an essential subject in medical education that contributes effective knowledge of human body. The classroom lectures as well as practical sessions of dissection and histology are the primary teaching methods in anatomy. The lecture based learning enhances the cognitive, affective and psychomotor skills despite being didactic in nature and having poor feedback. Cadaveric dissection being the most effective tool for improving students' knowledge, goes by in a handholding way with theory classes.[4] A study was conducted by Wendy L et a on comparison of the effectiveness of dissection and prosection on short-term anatomic knowledge retention in a reciprocal peer-teaching program concluded that there are no disparities in the effectiveness of learning anatomy via dissection or prosection.[5]

Objectives

1. To determine if there is an association between attendance at theoretical and practical classes in anatomy and student assessment outcomes.
2. To determine if assessment outcomes were better when students attended dissection practical classes.

MATERIALS AND METHODS

Type of study: Retrospective, cross sectional and observational study.

Place of study: Department of Anatomy, RG Kar Medical College and Hospital

Study population: First year MBBS students of batch 2023-24

Sample size calculation: We used sample size formula for finite population as below

Where z= z score (1.96).

p= expected proportion =50%

epsilon = margin of error =5%

N= population size=250

n= unlimited sample size calculated by formula

Whereby, sample size comes to 152 which was the minimum number of subjects required for this study. Since in one MBBS batch we had 250 students, we have conducted this study on these 250 first year MBBS students only.

Sampling technique: Attendance records of all students were retrieved from attendance registers. Theory and practical marks of first and second semesters along with internal assessments, ie, total of three departmental examinations were to be taken from tabulation sheets kept at the department.

Inclusion Criteria: All students of MBBS first year batch 2023-24 were included.

Exclusion Criteria: Students who did not appear for at least two of the three departmental examination were excluded.

Ethical issues related to study: Examination marks may be a sensitive issue for an individual. Data were disclosed without written consent with full confidentiality after getting the permission from Intuitional Ethics Committee (IEC) [Memo No. RKC/1360 dated 07/02/2025].

RESULTS

Table 1 shows the attendance and assessment outcome of the first year M.B.B.S students. Whereas average percentage of practical classes attended was 85.18%, average theory class attended was only 58.48%. Total marks obtained in three semesters in theory and practical examination were 33.07% and 45.88% respectively.

Table 1: Attendance and assessment outcomes of first year MBBS students of batch 2023-24 in Anatomy(n=250)

Parameter	Mean	SD
Theory attendance (%)	58.48	10.21
Practical attendance (%)	85.18	22.94
Total marks obtained in theory examination in three semesters(%)	33.07	12.99
Total marks obtained in practical examination in three semesters(%)	45.88	15.29
Percentage of total marks in theory plus practical examination in 1st semester(%)	39.19	14.49
Percentage of total marks in theory plus practical examination in 2nd semester(%)	42.17	15.24
Percentage of total marks in theory plus practical examination in 3rd semester(%)	37.75	14.10

Table 2: Association between attendance and academic performance in Anatomy of first year MBBS students of batch 2023-24 (n=250)

Parameter	Pearson correlation coefficient	P value
Attendance in theory class* marks obtained in theory examination	0.471	<.001
Attendance in practical class* marks obtained in practical examination	0.634	<.001
Attendance in practical class* total marks obtained in theory and practical examination in 1st semester	0.467	<.001
Attendance in practical class* total marks obtained in theory and practical examination in 2nd semester	0.552	<.001
Attendance in practical class* total marks obtained in theory and practical examination in 3rdsemester	0.513	<.001

Table 2 shows the association between attendance and marks obtained of the students. It was notedthat theory class attendance was strongly correlated with performance of students in theory examination (p<.001). Similarly practical class attendance was strongly correlated with performance of students in practical examination(p<.001). To determine whether assessment outcomes were better when students attended practical classes, we calculated the correlation between practical class attendance and percentage of marks obtained in both theory and practical examination. It was noted that practical class attendance was strongly correlated with assessment outcomes in all the three semesters(p<.001).

DISCUSSION

Despite mandatory attendance (at least 75%) policies student's absenteeism is a continuous problem in medical education. However, to acquire skills for remarkable performance in future and to understand the subject in a proper way high attendance in both theory and practical course is essential for medical profession.[2]

The present study evaluated the relationship between class attendance and academic performance in anatomy among first-year MBBS students. The statistical findings showed clearly significant positive correlation between attendance including both theory and practical classes and marks obtained in the corresponding examinations. Although the average attendance for practical classes was high (85.18%) in comparison of attendance in theory classes was considerably lower (58.48%), and this difference probably explain the comparatively lower average performance in theory examinations partly.

An average positive correlation ($r = 0.471$, $p < .001$) was observed between theory attendance and theory examination scores, indicating that students who regularly attended theory classes tended to achieve higher marks. Anatomy theory includes detailed concepts, terminology, and applied aspects that require continuous classroom exposure and reinforcement, which may explain why lower attendance can adversely affect theoretical understanding. These findings are consistent with previous research in medical education that highlights classroom engagement as a key contributor to conceptual clarity and long-term retention that reflected in performances.

The study also revealed an even stronger correlation between practical attendance and practical examination performance ($r = 0.634$, $p < .001$). As we all know that Anatomy is primarily a visual and hands-on subject, and cadaveric dissection, prosection demonstrations along with other model-based learning form the core of practical demonstration. Students with irregular attendance may miss crucial instructions that cannot be effectively substituted by self directed learning. This likely contributed to the strong association seen in the present study. Academic outcome is correlated with cognition and motivation of the students. Both of this is highly influenced by attendance of students. The cognition helps in process, integration and recalling of information where as motivation having about behavioral changes to enable them to be self-directed learners.[6]

Additionally, practical attendance showed significant positive correlation with total examination performance (theory + practical) across all three semesters (r ranging from 0.467 to 0.552, $p < .001$). This indicates that the benefits of attending practical classes extend beyond practical skills alone and enhance overall anatomical comprehension. Practical sessions often integrate theoretical concepts with demonstration-based learning, which may strengthen understanding and improve performance in theory components as well. These findings suggest that practical classes play a central role in reinforcing learning and improving cumulative academic outcomes.

The results of this study have important implications for anatomy teaching. Strengthening attendance policies, incorporating interactive teaching methods, and providing timely support to low-attendance students may improve academic performance. Encouraging active participation in both theory and practical sessions may help bridge the gap between teaching and learning outcomes.

Additionally, Goyal et al. conducted the Assessment on Competency Based Medical Internship Training with the 'Cumulative Grade Points Average

System.[7] A competency is achieved gradually, step–by-step. These steps are designated as milestone. Assessment may not always be objective, and we should be prepared for subjective assessment by experts. These have been found to be reliable and provide more meaning and direction to the learner than numeric scores.[8,9]

This study has some limitations. It was conducted in a single institution and included only one batch of students, which may limit generalizability. Other factors influencing academic performance such as study habits; motivation, learning environment, and prior academic background were not evaluated. Future studies could adopt a multi-centre approach and include additional variables to develop a more comprehensive understanding of predictors of student performance.

CONCLUSION

In conclusion, the study clearly demonstrates a strong positive relationship between class attendance and academic performance in anatomy. Regular attendance, particularly in practical classes, significantly improves learning outcomes and examination scores. Emphasizing consistent student participation may therefore be a simple yet effective strategy for enhancing academic success in anatomy among first-year medical students.

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