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## Original Research Article

## Exploring the correlation between attendance and academic performance in physiology among phase 1st MBBS students: A comprehensive study

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## ABSTRACT

**Background:** Regular attendance is a fundamental component of professionalism, especially in the context of medical schools. It involves consistently being present at a designated location and plays a crucial role in fostering the exploration of diverse skills deemed essential in the contemporary scientific landscape. Recent medical literature underscores a clear and mutually beneficial link between medical student attendance and academic achievement, particularly within the framework of the Competency-based curriculum introduced by the National Medical Commission (NMC). This curriculum prioritizes the development of necessary competence through mandatory clinical contact and skills. Despite the mandate imposed by medical universities, absenteeism remains a significant challenge in medical schools. University policies outline specific expectations, including reporting times, allowed break durations, and daily expected working hours, approved by the College Committee across all campuses. Emphasizing the importance of learning activities, the NMC requires attendance for all assessments, ranging from exams and Readiness Assurance Tests (RATs) to quizzes and Objective Structured Clinical Examinations (OSCEs).

**Materials and Methods:** The study was conducted in the Department of Physiology at GMC Baramulla and its associated hospitals. A total of 198 students from the 2019–20 batches of the first year MBBS, who participated in all internal assessments for both theory and practicals, were included in this study.

**Study Design:** The retrospective observational study involved retrieving attendance and theory plus practical marks from all internal assessments conducted on 198 students of 2019–20 batches of first-year MBBS. Two groups were established on attendance: Group A < 75% theory and < 80% in practicals, and Group B > 75% in theory and > 80% in practicals, The mean marks were compared with their attendance. Karl Pearson correlation coefficient was utilized to assess the strength of the association between the two. Correlation studies were conducted based on gender and residence (hosteller vs. non-hosteller), revealing that female students and non-hostellers exhibited higher attendance and scores in both internal assessments and university examinations.

**Results:** Significantly higher marks in internal assessment and University examination were observed in students with high attendance percentage both in theory and practical's.

**Conclusions:** There was a significant positive association between attendance and the performance of students in both theory and practical aspects of physiology among Phase 1st MBBS students.

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## 1. Introduction

Since the inception of the formal education system, offline classroom teaching has been the sole method in schools and colleges. Punctuality to classes has been considered a major indicator of performance, leading governing

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bodies to establish rules for minimum compulsory attendance to ensure the quality of education remains high. Attendance and punctuality serve as important reflections of professional engagement. In medical school, punctuality and participation instill habits crucial for future clinicians. The vast curriculum of MBBS and high stakes have led universities and regulatory bodies to emphasize attendance policies. Many universities set 75% as the cutoff for exam eligibility. Student absenteeism, especially in the 1st MBBS with reduced duration, poses a challenge, emphasizing the importance of attendance in building foundational knowledge. During the undergraduate curriculum, attendance plays a vital role in extrapolating knowledge for later professional life. Active learning formats dominate learner classroom time, with participation essential for individual and peer learning. Numerous studies have shown a positive correlation between attendance and student performance<sup>1-4</sup> though some suggest that class attendance might not be a reliable marker for performance, especially in theory.<sup>5</sup> College attendance, facilitating interaction with teachers and peers, is viewed as a prime factor in shaping the personality of young doctors, potentially reflecting in their performance. The COVID era significantly impacted the education sector, prompting the closure of institutes and a shift to online education. Despite its pros and cons, online education played a crucial role, saving about two academic years during the pandemic. As COVID-related restrictions eased, institutes resumed offline education, maintaining appropriate behavior. This study aims to explore the impact of this mixed teaching approach—combining online and offline methods—on students' academic performance in both theoretical and practical aspects.

## 2. Aim and Objective

The study aimed to evaluate the previously unexplored correlation between undergraduate medical students' attendance, learning preferences, and their academic performance. It also sought to investigate any differences in the attendance rates between male and female students and determine whether such differences, if present, impact academic performance. This research was conducted in the Department of Physiology.

## 3. Materials and Methods

A retrospective cohort study was conducted on 198 first-year MBBS students from the 2019-20 batches who participated in both three internal examinations and the final University examination in both theory and practicals. These students were selected from the Department of Physiology at GMC Baramulla. After obtaining Institutional ethical clearance, attendance records were meticulously maintained. In-person signature sheets were used during

offline classes, while the MS Teams app's in-built attendance system tracked attendance during online classes. For internal assessments, a variety of exams, including multiple quizzes, two terminals, and a final golden test, were conducted throughout the year. The collected data was entered into MS Excel and categorized into two groups based on attendance percentage. In theory, students with less than 75% attendance were placed in group A, while those with 75% or more were assigned to group B. Regarding practicals, students with less than 80% attendance constituted group A, while those with 80% or more comprised group B. This categorization aligned with the NMC's minimum attendance eligibility criteria for university exams. Additionally, data was separated based on gender and whether the student was a hosteler or not, allowing for the examination of possible gender and accommodation-related variations. The data was then analyzed in the same Excel sheet using the Karl Pearson correlation coefficient to assess the strength of the association between students' attendance and internal assessment marks. Statistical significance was determined using the Student T test, with a p-value less than 0.05 considered significant.

## 4. Results & Discussion

Previous studies have shown a positive but weak correlation between attendance percentage and academic outcome.<sup>6</sup> While several confounding factors may affect academic outcome, class attendance has consistently demonstrated a relationship with cognitive ability and academic performance in students.<sup>3</sup> Studies on the effect of mandatory attendance policies within medical schools are sparse, though one study indicated that a mandatory attendance policy increased attendance without a corresponding increase in academic outcomes in Basic Sciences lectures.<sup>7</sup>

Our study aligns with multiple previous studies, revealing a statistically significant positive correlation between attendance and internal assessment marks in both theory and practicals. Group A showed a stronger correlation compared to Group B, suggesting that beyond a certain point (here being 75% in theory and 80% in practicals), increased attendance may not significantly impact scores. With an increase in the mean attendance percentage, mean marks also increased. (Tables 1 and 2) According to Richard P. Deane et al., attendance at OBG clinical and tutorial-based activities positively correlated with overall examination scores.<sup>1,8-11</sup> Additionally, Sangeeta M. and Varalakshmi K. L., in their study in the Department of Anatomy, concluded that there is a significant positive correlation between class attendance and academic achievement.<sup>2</sup> Our study supports their findings. Concerning gender (Tables 3, 4, 5 and 6), in contrast to a study by Sangeeta M. and Varalakshmi K.

**Table 1:** Correlation between attendance vs marks in theory combined

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.25	64	41	<0.01
B	0.22	84	45	<0.01

**Table 2:** Correlation between attendance vs marks in practical combined

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.2	65	56	<0.01
B	0.02	89	57	<0.01

**Table 3:** Correlation between attendance vs marks in theory among males

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.4	64	41	<0.01
B	0.4	84	47	<0.01

**Table 4:** Correlation between attendance vs marks in practical among males

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.3	65	54	<0.01
B	-0.4	87	57	<0.01

**Table 5:** Correlation between attendance vs marks in theory among females

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.03	65	40	<0.01
B	0.1	84	45	<0.01

**Table 6:** Correlation between attendance vs marks in practicals among females

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.07	66	58	<0.01
B	0.2	91	57	<0.01

**Table 7:** Table G correlation between attendance vs marks in theory among hostelers

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.22	62	38	<0.01
B	0.25	84	45	<0.01

**Table 8:** Table G correlation between attendance vs marks in practicals among hostelers

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	0.32	62	55	<0.01
B	-0.08	89	57	<0.01

**Table 9:** Table G correlation between attendance vs marks in theory among non-hostelers

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	-0.2	69	46	<0.01
B	0.2	85	45	<0.01

**Table 10:** Table G correlation between attendance vs marks in practicals among non-hostelers

Group	Correlation coefficient: attendance vs marks	Mean		P value
		Attendance	Marks	
A	-0.050	69	57	<0.01
B	0.15	89	58	<0.01

L., who found male students less likely to attend classes,<sup>2</sup> our study did not show much difference in the average attendance percentage between theory and practicals. Hamidi Al Shenawni et al. concluded that no significant difference was observed in academic performance between female and male students.<sup>12</sup> In our study, males scored slightly better in theory, while females excelled in practicals. However, a positive correlation between class attendance and academic achievement was maintained. Among males, a stronger positive correlation was noted between attendance and scores obtained compared to their female counterparts, with the exception being Group B males (above 80% attendance in practicals), showing a significant negative correlation. This could be due to differences in hours of self-learning among students in addition to regular classes in this group. However, this does not undermine the importance of strict attendance rules in medical colleges, as the mean attendance in this group was approximately 87%. We also explored the difference between hostelers and non-hostelers (Tables 7, 8, 9 and 10), discovering that, contrary to common notions, non-hostelers were, on average, more regular in classes than hostelers, positively reflecting in their average scores. This might be attributed to parental pressure among non-hostelers to attend classes regularly. In hostelers, positive correlation was noted in both theory and practicals, except in Group B hostelers, where a weak negative correlation was observed. Non-hostelers displayed varied results among different groups, warranting further study, especially considering a majority of non-hostelers being from the open merit category. NEET scores need to be considered before drawing conclusions. Class attendance was not associated with improved academic performance in a dermatology course. Those who preferred to learn by watching online videos demonstrated a higher level of performance than those who did not prefer this method.<sup>13</sup> The most frequently cited reason for attending classes was social expectation (96%), whereas the least cited was learning well in a classroom-type setting (65%). The top reasons cited by students for not attending classes were the availability of lectures online (35%), a preference for individual study outside the classroom setting (26%), and the inconvenience of traveling to class (24%). Multivariate analysis found no statistically significant relationship between class attendance and performance on the final examination (estimate -0.074, standard error 0.12;  $p = 0.54$ ), after adjusting for sex, age, Medical College Admission Test (MCAT) score, having children at home,

and reason for attending class. Those who preferred to learn by watching online videos scored significantly higher on the final examination (prefer online videos:  $87 \pm 5.5$ ; neutral:  $86 \pm 5.9$ ; do not prefer online videos:  $82 \pm 2.6$  [ $P = 0.049$ ]).<sup>14,15</sup> Our study is not without limitations, as only a few known confounding factors were taken into consideration, such as gender and accommodation, unlike factors like cognitive ability, cultural, social, and economic conditions of students, which were ignored.

## 5. Conclusions

This study concludes that there is a significant positive association between attendance and the performance of students in both theory and practical aspects of physiology among Phase 1st MBBS students.<sup>1–4</sup> The correlation is stronger below the NMC guidelines for minimum attendance. This finding aligns with the study by BS Subramaniam et al., which revealed that the implementation of an attendance policy improves exam performance by 7%.<sup>4</sup> Additionally, Goyal et al. conducted the Assessment of Competency Based Medical Internship Training with the 'Cumulative Grade Points Average System'.<sup>11</sup> Therefore, a strict attendance monitoring system should be implemented in medical colleges, and parents should regularly be informed about their ward's absenteeism, especially for hostelers. Moreover, online classes have not significantly impacted this relationship.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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