Original Article

Absenteeism among undergraduate medical students and its impact on academic performance: A record-based study

Sayeli Mitra, Paramita Sarkar[1], Suchetana Bhattacharyya, Rivu Basu[2]

Abstract:

BACKGROUND: Student absenteeism is a major concern for undergraduate medical education training in India. Regular class attendance helps students have a proper understanding of the topic of discussion. This study explores the pattern of absenteeism among medical students and whether absenteeism is associated with their academic performances.

MATERIALS AND METHODS: A record-based, cross-sectional study was done by reviewing departmental attendance registers, item cards and marks obtained in exam by 190 students in the community medicine department who had passed their 3rd professional part 1 examination in 2018. The data was entered and analyzed using SPSS version 16. A descriptive analysis summarizes the pattern of absenteeism and their marks obtained in the semester and professional exam of community medicine. The primary outcome indicator was the 3rd professional exam marks. The correlation between class absenteeism and other predictors and exam result was analyzed. Regression analysis was done to predict dependence of outcome variable on class attendance and formative examination marks.

RESULTS: Overall, female students had better class attendance than male students. There was a positive correlation of lecture class attendance $(r = 0.369)$ and marks obtained in the 6th semester exam $(r = 0.717)$ with the final exam result. Further regression analysis showed final marks had a higher dependence on the 6th semester examination score $(B = 0.669)$ when compared to lecture class attendance $(B = 0.051)$.

CONCLUSION: Although lecture class attendance is an important predictor of final result, this study showed that the 6th semester marks were a better predictor. This may be due to multiple factors (alternate source of learning, student's motivation, etc.) which require further exploration.

Keywords:

Absenteeism, academic performance, medical students, records, undergraduate

Department of Community Medicine, R. G. Kar Medical College and Hospital, Kolkata, West Bengal, India, [1]Senior Resident, Under CMOH Coochbehar, West Bengal Health Service,West Bengal, India, [2]Department of Community Medicine, Bankura Sammilani Medical College and Hospital, Bankura, West Bengal, India

Address for correspondence:
Dr. Rivu Basu, Associate Professor, Department of Community Medicine, Bankura Sammilani Medical College and Hospital, Bankura, West Bengal, India.
E-mail: rivubasu83@gmail.com

Introduction

The undergraduate medical education training in India requires great commitment motivation and academic interest on the part of the students. Following the undergraduate medical curriculum of India, lecture, practical, tutorial, and clinical classes are being arranged in different medical colleges for the overall learning of the students. Till date, lecture and classroom discussion is one of the most important modes of learning for students, and regular class attendance is a key for academic performance. Lecture classes not only impart in-depth knowledge to the entire group of students but also ensures uniformity of the teaching experience. Physical presence and mental attentiveness on the part of the students are crucial for

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learning to occur.[1] Regular class attendance not only helps students have a proper understanding of the topic of discussion but also provides them with an environment for good professional socialization, which later on helps medical students to develop professional skills, behavior, attitudes, and values that are an integral part to a successful doctor.[2–4] Despite the strict rules, student absenteeism at lectures is a major concern in universities worldwide.[5–7]Several studies have been conducted to explore reasons for absenteeism, which showed lack of subject matter interest, poor teaching strategies, unfavorable learning environment class and examination schedule, quality of teaching materials, assessment methods, lifestyle-related pressures and poor relations with lecturers.[4,8–10]Lecture contents have become more accessible in the form of slides, videos, audios over the internet for self-learning purpose, which may contribute to the absenteeism.[11–16] A growing trend among students has been observed for skipping scheduled classes in academic institutions It is a general thinking that students having regular class attendance have better academic performances. Many studies have revealed that there is a positive correlation between overall academic performance and attendance.[17–19] Class attendance is a reliable predictor associated with better outcomes in terms of improving cumulative grade point average of the students who do best.[20–22] Attendance is more important for enhancing grades. Attending clinical and tutorial-based class events have a positive correlation with overall examination score.[23]A recent meta-analysis suggests that the attendance in learning activities is a more valid predictor of academic achievement than other predictors, including scores on established entrance tests such as the scholastic aptitude test (SAT), grade point average (GPA), learning styles, and study skills.[24] This study aims to find out the effect of attendance of lecture and practical classes and the marks of formative evaluation on the final examination marks of students.

Materials and Methods

Study design and setting
This is a record-based, corss-sectional, descriptive study which was conducted in the community medicine department of a tertiary medical college in Kolkata. The study was conducted over a period of one-and-a-half months after obtaining institutional ethical clearance.

Study participants and sampling
Of an academic batch of 194 students, data of 190 students were available for all records. Hence, the study was conducted by reviewing records of 190 students who had appeared in their 3rd professional part 1 examination in 2018.

Data collection tool and technique
A proforma was used for data collection. Class attendance (lecture, project and practical) was collected from the attendance register of the community medicine department for this academic batch. Final examination score in the subject of community medicine was obtained by reviewing the marksheets of the third professional MBBS examination held under the West Bengal University of Health Sciences. Records of items appeared and marks obtained in semester examinations were obtained from item cards of the students.

Attendance of the students was studied in several parts: lecture class attendance; practical class attendance in the 4th semester and 6th semester; and project class attendance in the 4th semester.

Attendance of students in various classes were expressed in terms of percentages of total classes in respective categories (lecture, practical, project) for uniformity of analyses. The 3rd and 4th semester examination were each of 50 marks and 6th semester examination were of 100 marks. Altogether, students were to appear in 16 items, the records of which was obtained from item cards. Marks obtained by students in the 3rd professional part 1 examination in the subject of community medicine was considered as the outcome variable.

The attendance data and marks scored by the 190 students were analyzed statistically and dependence of final exam marks on attendance and semester marks was sought via regression analysis. Significance was obtained at $P < 0.05$. Data were entered into Microsoft Excel spreadsheets (Microsoft Corporation, USA) and analyzed using appropriate statistical methods through the Statistical Package for the Social Sciences (SPSS) version 16.

Ethical consideration
Ethical permission was taken from Institutional Ethics Committee. Utmost care was taken to maintain the confidentiality of the data and to not disclose any student's identity. Consent was taken from the study participants before reviewing their academic records and attendance.

Results

Out of 190 students, 63 were female and 127 were male students. The mean (SD) attendance in lecture classes expressed in percentage was 55.66%(±12.66) for female students and 52.42%(±15.84) for male students. Project class attendance expressed in percentage for female students was 68.14%(±15.72) and male students 63.25%(±17.85). The 4th semester practical attendance and 6th semester practical attendance for female students was

30.18%(±20.04) and 53.82%(±12.89), whereas for male students, it was 27.05%(±18.81) and 53.85%(±15.45), respectively. The average number of items attended as well as the marks (mean ± SD) has been described in Table 1.

Assumptions for linear regression were tested before modeling.[25] Here, the dependent variable (total marks in final exam) was continuous and normally distributed by Kolmogorov-Smirnov test ($P > 0.05$). Collinearity diagnostics were checked to rule out multicollinearity. Variance inflation factor (VIF) was found to be 0.10 in all cases. Hence, multicollinearity was excluded. Two outlier values were detected and the dataset was made free of the outliers. The model was checked for homoscedasticity. The ANOVA test was found to be significant with a P value 0.00 and F-value of 53.188. R2 change predicted from this model was 0.704.

Overall, female students had better class attendance as compared to male students. Final marks obtained in the 3rd professional examination composed of theory and practical marks. Marks obtained by students in formative assessment was found to be significantly correlated to total marks obtained in the final exam and also to theory marks obtained in the final examination. The 6th semester exam marks showed a

strong positive correlation ($r = 0.717$) with final exam marks and also with marks obtained in the theory exam ($r = 0.680$) [Table 2].

Positive correlation ($r = 0.369$) was also obtained between lecture class attendance and total marks in the final exam. The number of items appeared by the students also significantly correlated ($r = 0.450$) to total marks in the final exam. Attendance in practical classes in the 6th semester was weakly correlated ($r = 0.245$) to practical marks in final examination, while that of 4th semester showed a moderate positive correlation ($r = 0.332$).

Multivariable regression analysis was done to predict the dependence of total marks obtained in the 3rd professional exam on independent variables. Here, all the variables that showed a significant correlation with the outcome variable (total marks obtained in the 3rd professional examination) were considered [Table 3].

The dependence of final exam marks on the predictor variables is shown by the following regression equation.

Marks = 0.267 × 3rd semester marks + 0.152 × 4th semester marks + 0.669 × 6th semester marks + 0.035 × project class attendance+ (−0.080)×4th semester practical class attendance+ (−0.005)×6th semester practical class attendance + 0.051 × lectureclass attendance + 0.124 × number of items attended + 78.025 ($R = 0.839; r^2 = 0.704; F = 53.188; P < 0.0001$).

Discussion

This was a cross-sectional, record-based study where we aimed to explore whether class attendance and formative assessment scores were related to the final examination marks obtained by one academic batch of students. The findings from our study suggested that lecture class attendance had a positive moderate correlation with final marks. This finding was consistent with many other studies conducted in recent years.

In a study conducted by Khan YL *et al.*,[26] a positive Pearson's product-moment correlation was found among professional assessment scores and class attendance ($r = 0.397$). Similarly, in a study by Dhaliwal,[1] comparison of the attendance with the marks scored in each term showed that higher attendance correlated significantly with better marks. In addition, this study also highlighted that while learner absenteeism might contribute to low achievement, the reverse was also possibly true, where low achievers were more likely to be absent in classes.[1] In another study, Yusoff MSB found significant associations between academic performances and absenteeism scores among first year

Table 1: Class attendance and marks obtained by students

	Mean±Std. Deviation	
	Female n_1=63	Male n_2=127
Lecture class attendance in %	55.66±12.66	52.42±15.84
Project class attendance in %	68.14±15.72	63.25±17.85
4th semester practical attendance in %	30.18±20.04	27.05±18.81
6th semester practical attendance in %	53.82±12.89	53.85±15.45
Total items appearing out of 16	15.00±1.49	14.60±1.95
3rd semester marks (Total marks=50)	26.14±8.74	20.61±9.76
4th semester marks (Total marks=50)	21.67±6.43	16.39±6.35
6th semester marks (Total marks=100)	54.75±9.69	50.57±9.76
Final marks in 3rd professional examination (Total marks=200)	139.89±10.30	133.88±11.38

Table 2: Table showing correlation between total marks obtained in final exam and different independent variables

	Pearson's correlation®		
	Total	Theory	Practical
6th semester marks	0.717*	0.680*	
3rd semester marks	0.572*	0.490*	
4th semester marks	0.518*	0.426*	
Total items appeared	0.450*	0.362*	
Lecture class attendance	0.369*	0.259*	
Project class attendance	0.363*		0.085
4th semester practical attendance	0.247*		0.332*
6th semester practical attendance	0.396*		0.245*

*P<0.05 (two-tailed)

Table 3: Multivariable regression showing association between different factors and final marks obtained by students in professional examination

Predictors of final marks	B (95% CI)	Beta	Sig.
(Constant)	78.025 (70.064-85.986)		0.000
3rd semester marks	0.267 (0.133-0.401)	0.231	0.000
4th semester marks	0.152 (−0.028-0.333)	0.092	0.098
6th semester marks	0.669 (0.545-0.793)	0.571	0.000
Project class attendance	0.035 (−0.030-0.100)	0.054	0.290
4th semester practical class attendance	−0.080 (−0.141-(−0.019))	−0.137	0.010
6th semester practical class attendance	−0.005 (−0.094-0.085)	−0.006	0.920
Lecture class attendance	0.051 (−0.034-0.136)	0.068	0.235
Items attended	0.124 (0.025-0.223)	0.126	0.014

medical students; independent t analysis showed that, in all examinations, students who passed the examinations had significantly lower absenteeism scores than those who had failed ($P < 0.001$).[27]

However, in a study by Eisen *et al.*,[28] conducted on second-year medical students enrolled in an introductory dermatology course, class attendance was not associated with improved academic performance in said course. Students who preferred to learn by watching online videos demonstrated a higher level of performance than others. No statistically significant relationship was observed between class attendance and performance on the final examination on multivariate analysis. Some studies have also disputed the role of regular class attendance for better academic performance by emphasizing the importance of prior CGPA, motivation and a score in the SAT for better academic performance.[29] In our study also, it was observed that formative examination scores had a higher positive correlation with final examination scores. On further multivariable regression analysis, final examination marks showed a higher dependence on formative examination marks rather than class attendance.

Limitations and recommendations

This study was conducted on the basis of records of one single academic batch considering their academic performance and class attendance for a particular subject. We were also unable to address any existing relationship between academic assessment and psychological distress due to examination, along with its impact on learning and performance among medical students. Quality of teaching materials, assessment methods, educational environment of the class, lifestyle-related pressures, extracurricular activities and the popularity of specific mentors for each course could not be considered while designing the study, as this was purely record based. Instead of lecture classes, large group discussions and small group discussions may help in better interaction among students and teachers. Innovative methods in discussion, interactive discussion, and gamification may further help in this process.

Conclusion

In summary, our findings revealed that medical undergraduate students' better performance in professional assessment exams has a negative correlation with absenteeism and is positively associated with high attendance percentage. But the better predictor of academic outcome was formative examination scores (6th semester marks) obtained by undergraduate students rather than lecture class attendance.

Declaration of study participants

The authors certify that they have obtained all appropriate consent forms from students. In the form the students(s) has/have given his/her/their consent for his/her/their academic performance and class attendance information to be reported in the journal. The students understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Ethics approval

The study was approved by the Institutional Ethics Committee.

Conflicts of interest

There are no conflicts of interest.

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