RESEARCH

Pharmacy Student Absenteeism and Academic Performance

Levita Hidayat, PharmD, Sandeep Vansal, PhD, Esther Kim, PharmD, Maureen Sullivan, PharmD, Rebecca Salbu, PharmD

Touro College of Pharmacy, New York

Objectives. To assess the association of pharmacy students' personal characteristics with absenteeism and academic performance.

Methods. A survey instrument was distributed to first- (P1) and second-year (P2) pharmacy students to gather characteristics including employment status, travel time to school, and primary source of educational funding. In addition, absences from specific courses and reasons for not attending classes were assessed. Participants were divided into "high" and "low" performers based on grade point average.

Results. One hundred sixty survey instruments were completed and 135 (84.3%) were included in the study analysis. Low performers were significantly more likely than high performers to have missed more than 8 hours in therapeutics courses. Low performers were significantly more likely than high performers to miss class when the class was held before or after an examination and low performers were significantly more likely to believe that participating in class did not benefit them.

Conclusions. There was a negative association between the number of hours students' missed and their performance in specific courses. These findings provide further insight into the reasons for students' absenteeism in a college or school of pharmacy setting.

Keywords: absenteeism, attendance, professionalism, academic performance, survey

INTRODUCTION

Nationwide, new pharmacy curricula are being developed to incorporate advances in classroom technology and information access to provide more opportunities for interactive and real-world learning. With the ever-increasing use of innovations in the classroom, establishing the impact of student attendance on their performance in large lecture-based courses has become increasingly difficult. Historically, the literature suggests that undergraduate students who spend more time in the classroom perform better academically than students with high rates of absenteeism.[1-3] However, more recent studies suggest that this relationship may be weaker than previously reported and that student performance may depend on several other influencing factors and not be entirely contingent on attendance. Several external influencing factors such as employment, faculty member behaviors and perceived expectations, increased accessibility to information and advances in technology, and even apathy among students regarding the value of lecture attendance are believed to also impact student performance.[4-7] Academic

performance appears to be determined by a combination of internal and external factors in the life of a learner, the influence of and impact from which fluctuate often and substantially. To date, few studies have been done to evaluate these factors among pharmacy students.[8,9]

Two studies were identified that assessed pharmacy students and rates of absenteeism. One study conducted an evaluation of several characteristics and their influence on student reasons to attend or not attend class and concluded that teacher behavior and test schedules impacted class attendance the most. The authors recommended that faculty members increase students' motivation for attending class by modifying their class schedules, testing patterns, and personal behaviors.[8]

Another study of pharmacy students evaluated their characteristics and motivations for attending large lectures. The most common reasons reported for attending these lectures included that students desired to take their own notes and that the instructor highlighted key information on which to focus. The author concluded that instructors should highlight key concepts during lectures to encourage active note taking and to create a more interactive learning experience.[9]

To our knowledge, no studies examining the association between academic performance of pharmacy students with various characteristics and reasons for absenteeism

Corresponding Author: Levita Hidayat, PharmD, Touro College of Pharmacy, 2090 Adam Clayton Powell, Jr Blvd, Suite 603H, New York, NY 10027. Tel: 1-626-841-9242. E-mail: Levita.Hidayat@touro.edu

have been conducted. Because of an increasingly high rate of student absences and the potential negative impact this may have on professionalism, this study was conducted to assess the multi-factorial nature of student absenteeism on academic performance in a pharmacy program. The primary objective of this study was to assess various external influences, such as part-time employment, marital and family status, and travel time, and their impact on absenteeism. The secondary objective was to assess the association of academic performance with various student characteristics and reasons for absenteeism.

METHODS

This study was conducted with students enrolled in a 4-year doctor of pharmacy (PharmD) program at the Touro College of Pharmacy in New York City. Students complete the classroom-based component of the program during the first 2 years, followed by introductory practice experiences in the summer after their second year, and then participate in year-round advanced practice experiences for the remaining 2 years. Innovative teaching methods are used to provide a comprehensive curriculum in an abbreviated period of time. The classroom lecture part of the curriculum can be generally categorized into (1) therapeutics courses, (2) pharmaceutical and biomedical science courses, (3) public health courses, and (4) electives. This study was conducted in spring 2011, during which time P1 students were enrolled in 18 credit hours and P2 students were enrolled in 19 credit hours.

Survey Instrument Design

A modified survey instrument based on 2 published studies on student class attendance[8,9] was developed. The survey instrument solicited the following information from participants: gender, marital status, highest degree earned, current employment status, average travel time to the school (< 30 minutes, 30 to 60 minutes, 60 to 120 minutes, and >120 minutes), and primary source of educational funding.

Survey items regarding absences from class were divided into 4 course categories: biomedical sciences, public health, therapeutics, and electives. Both biomedical science (3- and 4-credit courses) and therapeutics courses (5-credit courses) pertained to P1 and P2 pharmacy students. However, the public health courses (3-credit course) pertained only to P1 pharmacy students and the elective courses (3-credit course) pertained only to P2 pharmacy students. Absences from class were assessed in terms of number of hours in 4-hour increments (ie, 0 to 4 hrs, 5 to 8 hrs, 9 to 12 hrs, >12 hours) missed from each course to aid students' in recalling missed days. Because class schedule and lectures vary depending on

the courses undertaken and the number of credit hours required, a student may find it easier to recall entire days or half days missed rather than tallying the hours missed for 1 course spread over several days of the week. This was also important due to differences between P1 and P2 students in the number of credit hours per course, semester, and year.

The survey questions pertained only to courses taken during the spring 2011 semester. At the time of the study there was no college-wide attendance policy and individual instructors' methods of noting and reinforcing attendance varied.

Survey Administration

The survey instrument was distributed to 90 P1 and 76 P2 pharmacy students at the same time as their final examination but on a separate piece of paper. The completed survey instruments and examinations were collected at the end of the 2-hour class. This method prevented students from submitting more than 1 survey instrument. This process also encouraged higher rates of participation because the students knew the instructor would see whether they submitted the survey instrument along with their completed examination. No extra credit or any other incentive was offered or given for completion of the survey instrument. The college's institutional review board granted exempt status to the survey and use of student data.

Data Analysis

Following distribution and collection of the survey from all participants, data were organized and compiled. The numbers of absences assessed were initially divided into multiple categories (0 to 4 hours, 5 to 8 hours, 9 to 12 hours, > 12 hours). However, these categorizations were populated with small numbers, insufficient for appropriate statistical analysis so the variables were collapsed into 2 categories. Because the median of this distribution was 8 hours, absences were categorized as 0 to 8 hrs or > 8 hours.

Cumulative GPA for the spring 2011 semester was analyzed as a measure of academic performance and its relationship to student absenteeism was assessed. Data are presented as median (25% interquartile range [IQR]-75% IQR). The average student GPA for the spring 2011 semester was 3.1 (2.7-3.5). The median GPA was then used to define high performers vs. low performers. High performers were defined as students with a cumulative semester GPA above the median (> 3.1) and low performers were defined as students with cumulative semester GPA at or below the median (≤ 3.1).

Respondents were categorized into absences from 2 types of course, biomedical science courses and therapeutics

courses, as both types were applicable to P1 and P2 students. Demographic data and GPA for all respondents were analyzed for their relationships to class attendance. Attitudes toward and reasons for attendance were also analyzed for all respondents.

The study objectives were analyzed through univariate and bivariate analysis. Chi-square or Fisher's exact test was performed for all categorical variables, and the student t test was performed for all continuous variables. A p value of < 0.05 was established to indicate significance. Statistical analyses were performed using GraphPad Prism, version 4 (San Diego, CA).

RESULTS

One hundred sixty survey instruments were distributed and a 100% response rate was achieved (Table 1). Of the completed survey instruments, 25 (15.6%) were excluded due to missing data. Of the 135 (84.3%) completed survey instruments, 75 (55.6%) were from P1 students and 60 (44.4%) were from P2 students. Based on 2011 spring semester GPA, 56 (41.4%) of the respondents were categorized as low performers and 79 (58.5%) were categorized as high performers.

Similar rates of absenteeism were observed among first- and second-year students, with 16 (11.9%) P1 students in biomedical sciences courses and 20 (14.9%) P2 students in therapeutics courses missing more than 8 hours of class, respectively (Table 1). Absences from public health courses that pertained only to the P1 students were low, with only 6 (8%) students missing more than 8 hours of class. Absences from the elective courses, which pertained to only P2 students, were similar with 8 (13.3%) students missing more than 8 hours of class.

A negative association was found when we assessed performance (GPA) with number of hours absent from the therapeutics. Sixteen (21.3%) low performers missed more than 8 hours of class compared to 4 (6.7%) high performers who missed more than 8 hours of class ($p = 0.03$). However, a similar association between absences and performance among students enrolled in the biomedical science course was not found.

Low performers reported having absences due to unforeseen circumstances more frequently than high performers (34.7% [n = 26] vs. 15.0% [n = 9], respectively; $p = 0.009$). Students reported various reasons for absences (Table 2) however, only 2 factors influencing attendance were associated with low academic performance. Low performers were more likely to miss class when class was scheduled before or after an examination ($p = 0.02$) and low performers were more likely to report that participating in class did not benefit them ($p = 0.02$).

Almost 36% (n = 48) of students reported being employed at least part-time during the 2011 spring semester (all respondents (mean $\pm$ SD), 16.2 $\pm$ 7.7 hours/week). Neither employment status nor other student characteristics such as gender, highest degree earned, average transit time, or funding for education differed when low vs. high performers were compared (Table 1).

Students agreed that technology did not influence absenteeism (all respondents median [25% IQR-75% IQR] 2(1-4) and 3 (1-4) for videotaped class lectures and posted class materials on Blackboard, respectively). Student attitudes toward attendance were not associated with performance (Table 2). Students agreed that class attendance was associated with professionalism (median response [25%IQR-75%IQR], 4 (3-5)).

DISCUSSION

This is the first study to explore the association between pharmacy student absenteeism and academic performance, demographics, and reasons for absenteeism. Our finding of similar rates of absenteeism in biomedical science (P1) and therapeutics courses (P2) (Table 1) differs from findings reported in a study by Fjortoft.[8] Variables that were not examined in this study, such as unannounced quizzes, random attendance points, or other in-class activities that influence student attendance, may explain this discrepancy in study findings, as would institutional and curricular differences. The lack of influence of students' demographics on the number of absences in either the biomedical science or therapeutics courses (data not shown) is consistent with previously published studies[8,9] and suggest that pharmacy educators should not assume that certain student characteristics, eg, married vs. single, directly translate into degrees of absenteeism.

The negative association between the number of absences and performance in the therapeutics courses (5 credits, Table 1) and the lack of such an association with regard to the biomedical science courses (3 and 4 credits, P1 and P2 respectively) may be explained by the difference in the number of credits and the associated impact on GPA. Students' misguided perception of the direct relevance of the course material, such as with basic science courses, to their applicable knowledge upon graduation may also be another reason for the inconsistency. Students' may have perceived the basic sciences as being less relevant as compared to the clinical sciences and this is importance to students if they have to make a choice about class attendance. It would be interesting to further investigate this possible reason, among others, for absenteeism with regard to specific courses.

Unforeseen circumstances (defined as medical emergency, death in the family, court subpoena, traffic/transportation delay, or personal illnesses) contributed

Table 1. Demographics of First- and Second-Year Pharmacy Students Who Participated in a Survey to Identify Factors Associated With Class Attendance, Median (Range)

Variable	All Respondents, No. (%), n = 135	Low Performers,[a] No. (%), n = 75	High Performers,[a] No. (%), n = 60	Difference Between High vs. Low Performers, *P*
Gender				
Male	57 (42.4)	36 (48)	21 (35)	0.16
Female	78 (57.8)	39 (52)	39 (65)	
Marital status[b]				
Single	111 (82.2)	61 (81.3)	50 (83.3)	0.82
Married	24 (17.8)	14 (18.7)	10 (16.7)	
Highest degree earned				
Bachelors or equivalent	127 (94.1)	70 (93.3)	57 (95)	0.73
Masters or equivalent	8 (5.9)	5 (6.7)	3 (5)	
Employment for spring 2011[c]				
No	85 (63)	46 (61.3)	39 (65)	0.72
Yes	48 (35.5)	28 (37.3)	20 (33.3)	
Other	2 (1.5)[c]	1 (1.3)	1 (1.7)	
Average travel time				
< 30 minutes	57 (42.2)	30 (40)	27 (45)	0.32
30-60 minutes	38 (28.2)	19 (25.3)	19 (31.7)	
61-120 minutes	30 (22.2)	18 (24)	12 (20)	
> 120 minutes	7 (5.2)	6 (8)	1 (1.7)	
Other	3 (2.2)[c]	2 (2.7)	1 (1.7)	
Education paid by				
You/family	16 (11.9)	7 (9.3)	9 (15)	0.71
Student's loan	74 (54.8)	41 (54.7)	33 (55)	
Financial aid	6 (4.4)	4 (5.3)	2 (3.3)	
Combination	39 (28.9)	23 (30.7)	16 (26.7)	
Absences from biomedical sciences courses				
0-8 hours	119 (88.1)	63 (84)	56 (93.3)	0.11
>8 hours	16 (11.9)	12 (16)	4 (6.7)	
Absences from Therapeutic courses				
0-8 hours	115 (85.1)	59 (78.7)	56 (93.3)	0.03
>8 hours	20 (14.9)	16 (21.3)	4 (6.7)	
Absences due to unforeseen circumstances				
0-25%	100 (74)	49 (65.3)	51 (85)	0.009
>25%	35 (26)	26 (34.7)	9 (15)	

[a] definition of performers: high performer-students with GPA >3.1; low performer-students with GPA ≤3.1; only 1 student has a GPA of <2.0.
[b] 11(8%) married with children (1-3 children); 4(3%) single with children; one respondent did not specify their marital status.
[c] Number of hours (mean±SD): all respondents, 16.2 ± 7.7 hours.

significantly to students' absences (Table 1) from class, with low performers being more likely than high performers to report this as a reason for their absences. This difference may be explained by greater attempts by or willingness of the high performers to attend classes.

The majority of students, whether low or high performers, agreed that attendance is linked with professionalism (Table 2). However, no significant difference in attitude toward attendance was found between low performers and high performers. Low performers were more likely than high performers to miss class before or after an examination and more likely to believe that participating in class did not benefit them. This association could be explained by the low performers' lack of preparedness for the examination. They may not attend a class in order

Table 2. Reasons Associated With Students' Absenteeism

Variable	All Respondents[a] (n = 135)	Low Performers[a] (n = 75)	High Performers[a] (n = 60)	*P*[b]
Attendance influences my performance	3 (3-4)	4 (3-4)	3 (3-5)	0.56
Attendance has a tight correlation with professionalism	4 (3-5)	4 (3-5)	4 (4-5)	0.55
There was a 2 or more hour break before or after class	3 (1-3)	3 (1-3)	3 (1-3.5)	0.89
Class was before or after an examination	3 (2-4)	3 (2-5)	3 (2-4)	0.02
The academic day was too long	2 (1-3)	2 (1-3)	2 (1-3)	0.93
Class was early in the morning class	2 (1-3)	2 (1-3)	2 (1-3)	0.24
Class handouts were all inclusive, no new information was presented in class	2 (1-3)	3 (2-3)	2 (1-3)	0.15
The class was easy, I didn't need to attend	2 (1-3)	2 (1-3)	2 (1-2)	0.67
I perceived the class content to be irrelevant to pharmacy	2 (1-2)	1 (1-2)	2 (1-2)	0.83
Class content was redundant	2 (1-3)	2 (1-3)	2 (1-3)	0.56
No points were awarded (ie, quiz, attendance, or graded activities)	2 (1-3)	2 (1-3)	1.5 (1-3)	0.44
Taking my own notes is not important to me	2 (1-3)	2 (1-3)	1 (1-3)	0.26
I do not ask questions in class	2 (1-3)	2 (1-3)	2 (1-3)	0.49
I do not feel participating in class benefits me	2 (1-3)	3 (1-3)	2 (1-3)	0.02
Class lectures were videotaped or recorded	2 (1-4)	2 (1-4)	2 (1-3.5)	0.41
Presented materials were posted on Blackboard	3 (1-4)	3 (1-4)	3 (1-4)	0.73
Faculty member read directly from their materials	3 (2-4)	3 (3-4)	3 (2-4)	0.21
Faculty member did not demonstrate the relevance of information to solving real problems	3 (2-3)	3 (2-3)	3 (1-3)	0.76
My perception of faculty member level of expertise	2 (1-3)	2 (1-3)	2 (1-3)	0.61
Faculty member lacked enthusiasm	2 (1-3)	2 (1-3)	2 (1-3)	0.62
Faculty member lacked clarity and organization in teaching	2 (1-3)	3 (1-3)	2 (1-3)	0.53
Faculty member did not care about class attendance	2 (1-3)	2 (1-3)	2 (1-3)	0.76

[a] Numbers denote median (25% interquartile range [IQR]-75% IQR).
[b] Man-Whitney U test was performed to measure the comparison between low vs. high performers; based on 5-point Likert scale;
5 = everytime, 4 = almost everytime, 3 = occasionally, 2 = almost never, 1 = never.

to gain more time to study for the examination and may have studied for long hours just prior to an examination and become too fatigued to attend lecture the following day. Another reason for absenteeism in low performers may be their perception that participating in class does not benefit them. The insights gained from this study may be helpful in further guiding the appraisal of benefits that students receive from attending class. Like a previously published study,[11] our study found no association between use of technology-enhanced materials (eg, videotaped lectures and online posts) and student absenteeism.

As concluded by earlier studies, there may be an association between class attendance and performance because instructors use class time to convey information to students that they may not focus on in textbooks or find in online posts.[11,12] Such classroom interaction may include the instructor conveying expertise and knowledge from clinical experience that extends beyond the textbook. A study in an undergraduate business school found that the teaching process and the teaching style and personality of the teacher were the main factors influencing attendance.[6] The study also found that the relationship between student and teacher appeared to be a significant factor in the breadth and depth of student involvement in the learning process and outcomes.

Based on the student perceptions on attendance and professionalism found in this study, creating a "culture of attendance" may be the first step to foster maturity, accountability, and professionalism in pharmacy students.[12] Educators should understand that student absenteeism is a multifaceted occurrence and that mandating attendance may not necessarily improve student academic performance. Further research into student absenteeism and

performance in association with classroom lecture efficiency, faculty member effectiveness, and faculty-student interactions is needed.

One of the limitations of this study is that it was based on student self-reporting; thus, recall bias about the number of absences is likely. We only assessed specific courses and their associations with student absenteeism, characteristics, reasons, and performance. A more comprehensive evaluation would lead to more accurate assessment of classroom lecture efficiency, faculty member effectiveness, and faculty-student interaction. Although we were able to evaluate the different reasons for not attending classes between low and high performers, we did not investigate the reasons for absenteeism and instructor reinforcement of attendance policies for individual courses. Finally, the study was performed only in a single pharmacy institution and therefore the results may not be translatable to other colleges or schools with different curricula or educational policies.

CONCLUSION

Pharmacy student absenteeism from class is a growing concern and it has become increasingly difficult to establish the impact of attendance in large lecture courses. A negative association was found in specific courses between the number of hours of a course students missed and their course performance in this study. When compared to high performers, low performers were more likely to miss class if it was before or after an examination and/or if they did not feel their presence in class affected their performance. The findings in our study further the understanding of the reasons for students' absenteeism in a college or school of pharmacy setting. Finally, the findings in our study have implications for educational policies, professionalism, and attitudes towards class attendance.

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