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Predictors of poor student performance at a single, Accreditation Council for Pharmacy Education–accredited school of pharmacy

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Abstract

Objectives: This study assesses the extent to which various student demographics and admission criteria predict poor student performance in a Doctor of Pharmacy (PharmD) program.
Methods: Retrospective case-control evaluation of PharmD students enrolled at one public, Accreditation Council for Pharmacy Education–accredited school from 2001 to 2003 for which complete sets of data were available. Poor performers were defined as students who: (1) failed to graduate on time, (2) earned a first through third professional year cumulative grade point average (GPA) <2.7, or (3) received <2.7 on any fourth professional year experiential rotation.
Results: Birth in the United States, each 100-point increase in SAT verbal score, and each 1-point increase in cumulative GPA were found to be associated with decreased odds of student poor performance. Male gender was the only characteristic identified as a positive predictor of poor performance.
Conclusion: This study corroborates previously published studies demonstrating that traditional predictors of academic performance also predict PharmD program performance. The study also identified unique predictors such as birthplace, gender, and verbal SAT scores.

Keywords: Educational assessment; Clinical clerkship; Grade point average; Performance; Predictors

One of the most challenging issues that a school of pharmacy faces is identification of students most capable of successful matriculation through the professional program, as well as entrance into, and safe and effective performance in, the pharmacy profession. Most schools use standard demographic data and assessment examinations in their admissions decisions. Yet, the reliability of these data to predict those most likely to progress through the program without delay or poor performance is often undetermined.

Within the University of Connecticut's program, the students who are unable to progress through the curriculum without repeating a course or who perform poorly during advanced pharmacy practice experiences (APPEs) pose a challenge and concern. Students who receive a failing grade in any pharmacy course are asked to repeat the course, which prolongs their enrollment an additional year and places them into the following year's graduating class. There are a number of downstream effects that result. From a faculty workload perspective, a new academic adviser who can closely monitor the student's progress must be identified. Addition of students into a graduating class creates space issues in both the classroom and laboratory settings. From an experiential perspective, when additional students enter a graduating class, there are challenges to identify sufficient APPE sites.

For certain students, this failing grade may be a brief misstep but for others suboptimal performance will continue. Although the university's expulsion policy requires a student to have two consecutive semesters with a grade point average (GPA) <2.0, the school's policy is stricter. Within the school of pharmacy, any two semesters in which a student maintains a GPA <2.0 lead to expulsion from the program. Even with these stricter criteria, few students face

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expulsion, allowing some students to progress with less than optimal grades and GPA.

Once students reach the fourth professional year, communications skills and critical thinking abilities play a crucial role in performance. Despite attempts to assess these abilities during the didactic portion of the professional program, students with weaker skills continue to progress into the fourth professional year. Preceptors and precepting faculty often express concern about the ability of such students to successfully and safely perform on APPEs and, what is even more concerning, to practice pharmacy after graduation. When these types of concerns are expressed, the experiential education director meets with the preceptor or precepting faculty and the student to address the issues and to formulate a plan to strengthen the student's abilities. Attempting to address these concerns often proves challenging, particularly given that the students are not on the main campus during APPEs and that a new preceptor is assigned monthly. For some students, this may require the experiential education director to adjust the student's rotation schedule to provide more APPE opportunities that are precepted by university faculty rather than by adjunct faculty. This reduces the burden on adjunct faculty while shifting additional work to university faculty.

The specific objective of this study was to assess the extent to which various student demographics and admission criteria predicted poorer student performance in the professional program. Numerous published studies have evaluated a variety of predictive variables against a variety of outcome variables. Outcomes that have been evaluated include coursework GPA,[1–18] experiential GPA,[10,18–21] North American Pharmacist Licensure Examination (NAPLEX) scores,[22] and graduation without delay.[8] Predictors that have been evaluated are even more diverse, including Pharmacy College Admissions Test (PCAT),[1,3,9–11,22] interview scores,[1,10,14,18] prepharmacy grades and GPA,[2,9,12,15,18,22] personality type,[26] California Critical Thinking Skills Test scores,[10,18,22] ACT scores,[2] and prior degrees.[1,2,8,11,16,21–26]

Our criteria for defining performance were based on areas of concern and challenge for our program, including lack of timely progression through the program, low GPA, and weak APPE performance. The APPE portion not only represents one-fourth of the curriculum, but also serves as an opportunity for students to integrate knowledge at the higher levels of Bloom's taxonomy and to partake in patient care while working with the scaffolding provided by the preceptor. Although the results of the study may help guide the admissions process in the future, the overall goal of the study is to identify criteria that will assist faculty and administrators in identifying students earlier in their tenure who may be more likely to perform poorly, particularly during APPEs. Early identification of these students will allow faculty and administrators to intervene early in the student's tenure to provide support.

Methods

The study sample consisted of 161 students enrolled in the Doctor of Pharmacy (PharmD) program during 2001–03 for whom all study variable data were available. Three different graduation years are represented by this sample. Variables used to define poor academic performance were selected to address faculty concerns that pertain to students who perform poorly in the early pharmacy curriculum or on APPE, or who fail to graduate on time because they failed courses in the pharmacy curriculum. Demographic factors and admission criteria (Table 1) were selected based on the availability of data and on a review of current literature.

Definition of poor academic performance was based on failure to graduate on time, cumulative GPA <2.7 during the first 3 years (P1–P3) of the PharmD program, or a grade <2.7 (grade less than C+) on any APPE. Students with delayed graduation had either failed a pharmacy course, requiring them to repeat the course the following year, or had dropped back a year for other academic or personal reasons. It was not always possible to determine why a particular student dropped back a year unless it was because of a poor grade. Cumulative P1–P3 GPA was calculated based on all required and elective courses during those years of the curriculum. For students who repeat a course, the new grade replaces the previous one in the calculation of the GPA. Grades at the university are based on a 4.0 scale.

Available demographic data as maintained by the Associate Dean's office included birthplace, ethnicity, gender, individual prepharmacy course grades, state of residence, military history, number of prepharmacy credits accumulated, SAT scores (cumulative, math, and verbal), prepharmacy GPA, and previous degrees earned. Because of admission requirements at the time of data collection, all students had completed prepharmacy courses at our university. Cumulative prepharmacy GPA was calculated based on all courses taken before enrolling in the school of pharmacy. Prepharmacy requirements are shown in Table 2. Cumulative prepharmacy math-science GPA was calculated based on required science and math courses specified in the prepharmacy curriculum.

Table 1
Demographic and admissions variables available

Birthplace
Ethnicity
Gender
History of military service
Individual prepharmacy course grades
Math SAT score
Number of prepharmacy credits accumulated
Prepharmacy GPA
Prepharmacy science GPA
Previous degree
State of residence
Verbal SAT score