

## Benefit of Taking the Pharmacy College Admission Test (PCAT) as a Factor for Success as a First Year Pharmacy School

Samuel Saryee<sup>1</sup>, Bisrat Hailemeskel<sup>1\*</sup>, Kalkidan Fana<sup>1</sup>, Abishe Djini<sup>1</sup>, Rediet Shewakena<sup>1</sup>, Bereket Mahari<sup>1</sup>, Abel Demissea An Le<sup>1</sup>, Semhar Gebrenegus<sup>1</sup>, Raniya Ali Al-Matari<sup>1</sup> and Moges Abebe<sup>2</sup>

<sup>1</sup>Department of Clinical & Administrative Pharmacy Sciences, College of Pharmacy, Howard University, NW Washington, DC, USA

<sup>2</sup>Department of Biological and Physical Sciences, Saint Augustine's University, NC, USA

**\*Corresponding author:** Bisrat Hailemeskel, Department of Clinical & Administrative Pharmacy Sciences, College of Pharmacy, Howard University, 2300 4th Street, NW Washington, DC 20059 USA

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### Abstract

**Objective:** To evaluate students' opinion on Pharmacy College Admission Test (PCAT) as a factor for predicting success of students in the first year of pharmacy school.

**Methods:** Using a survey, data was collected from 79 students at Howard University College of Pharmacy. Descriptive statistics were used to conclude the characteristics of the student population. A chi-square test was used to conclude the association between categorical variables age, education level, and income with some of the questions in all three parts of the survey.

**Results:** Majority of students believed that taking PCAT as a prerequisite had no or limited effect on success in pharmacy school as a first year pharmacy student. Statistical tests showed there is no strong association between demographic factors such as annual income or age and participating in PCAT.

**Conclusion:** Taking Pharmacy College Admission Test as a pre-request for admission has no or limited impact on the success in pharmacy program as a first professional year student.

**Keywords:** Pharmacy College Admission Test (PCAT), PCAT success, PCAT requirement

### Background

The Pharmacy College Admission Test (PCAT) is a computerized entrance exam used by pharmacy schools in the United States. In 2016, "77% of programs required PCAT" fast forward to 2018 and the percentage drops to "73%" [1]. Today, more and more pharmacy schools are no longer requiring the PCAT for admission. This trend is alarming considering the supposed impact the PCAT has on a person's success rate in pharmacy school. In a study conducted by 11 colleges and pharmacy schools, "PCAT scaled scores and entering GPAs were positively correlated with subsequent GPAs. Regression analyses showed the predictive value of the PCAT scores" [2]. Several studies have shown a correlation with PCAT composite score and mean GPA's of students in pharmacy school.

The Pharmacy College Admission Test was created in 1973 by the American Association of Colleges of Pharmacy (AACP) and The Psychological Corporation (now Pearson) [3]. The test was originally used for admissions purposes in 1974.<sup>3</sup> The exam is used to assess skills of applicants in six different areas; writing, verbal ability, biology, chemistry, reading comprehension, and quantitative ability. Scores are standardized, ranging from 200–600 based on raw scores. Based on performance, a composite score is represented on a percentile scale ranging from 1% -99%. In the 2010-2011 period, it was observed that 33,873 people registered from the exam [4]. Moving forward, a steady decrease was observed. In the 2018-2019 period, it was reported that 16,092 people registered to take the exam, which is less than half of people in the 2010-2011 period [4]. In this study, we will explore current trends of PCAT requirement and the impact of PCAT scores on success among pharmacy students.

## Methods

### Study design and population

The study conducted was a cross sectional study. Study looked at students attending the School of Pharmacy at Howard University (HU) in Washington, DC. Specifically, students in their first year of pharmacy school, from August 2019 to May 2020. All participants were required to be pharmacy school students. Financial incentives were not offered. Study included a sample size of 79 participants and recruitment was done in and around the School of Pharmacy. In the students Drug Informatics class, they were asked to participate in the study to collect data for class research. If a student agreed, they were given a survey to fill out.

### Study variables

For this cross sectional study, primary outcomes were student's opinion on the PCAT's ability to determine success in pharmacy school, student's satisfaction with PCAT as requirement for admission, and if PCAT exposure helped students grow their personal skill sets, such as time management. Covariates for this study include employment status, highest completed education, state of residence before pharmacy school, as well as annual income from employment prior to pharmacy school. Data collected from students was comprised of age, gender, educational background, prior work history, state of residence before pharmacy school, and annual income.

### Data collection

To collect data, a survey was used. Data collection was started after study recruitment and at the start of student's Drug Informatics class. Only one professor was tasked with conducting the surveys. Survey included 16 questions pertaining to student's demographics and input on PCAT's determination on success. First part of the survey looked at a student's demographics and characteristics questionnaire. Part 2, assessed student's opinion on PCAT's ability to determine success in pharmacy school. Part 3, assessed student's satisfaction with PCAT as a requirement for admission. Lastly part 4, assessed if PCAT exposure helped students grow their personal skill sets, such as time management. Scales utilized in the assessing parts 2, 3, and 4 are considered dependable and acceptable as they have been used by other researchers in prior studies.

To assess the first part of the survey, regarding demographics, 8 questions were asked. Question one asked "What is your age in years?", to which there were five answer choices "<20", "21-25", "26-30", "30-35", and ">35". Question two asked "Gender", which had two answer choices "Male" or "Female". Question three asked "Educational Background before entering pharmacy program" with five answer choices "Prerequisites only", "Associates Degree", "BA/BSc", "MSc", and "Doctorate". Question four

asked "Have you worked or had a job before coming to Howard University Pharmacy program" with two answer choices "yes" or "no". Question five asked "If you worked prior to coming to HU, how long have you worked in years?" with five answer choices "Not applicable", "<1", "1-3", "4-5", and ">5". Question six asked "If you worked prior to coming to HU, what kind of work have you had?" with three answer choices "Not applicable", "Health care related job", and "Non-health related job". Question seven asked "State you lived in just before accepting admission to Howard" with four answers choices "Washington, Dc", "Maryland", "Virginia", and "other states". Question eight asked "Annual income from your job if you have worked" with five answer choices "<1000", "1001-15000", "15001-30,000", "30,001-45,000", and ">45,000".

In the survey, questions regarding the PCAT used the Likert scale to assess student's responses to parts 2, 3, and 4. The survey contained eight questions asking participants' thoughts on PCAT's ability to determine success, student's satisfaction with PCAT as a requirement for admission, and if PCAT exposure helped students grow their personal skill sets. For Part two, three questions assessed the student's opinion on PCAT's ability to determine success in pharmacy school. Questions asked "I took PCAT and I believe it has prepared me to have a good background to understand some of the courses in the pharmacy program", "I did not take PCAT because I believe it has no impact on understanding material in pharmacy school", "I believe a good score in PCAT is a factor in being successful in a pharmacy program", and "I did not take PCAT because I think I still will be able to perform well in pharmacy school". For part three, two questions were used to assess student's satisfaction with PCAT as a requirement for admission. Questions asked "I believe all pharmacy schools should require PCAT for admission" and "I believe it is the right decision that Howard no longer requires a PCAT score for admission". For part four, two questions were used to assess if PCAT exposure helped students grow their personal skill sets such as time management. Questions asked "I took PCAT because I believe it maximizes my exposure to a great variety of subject materials. (If you took PCAT for admission)" and "I took PCAT because it helped me master my time management skills. (If you took PCAT for admission)". The questions on the evaluation contained 5 item scales ranging from strongly agree to strongly disagree.

### Statistical analysis

Descriptive statistics incorporating means and frequency proportions were projected to conclude the characteristics of the student population. To quantify the results a chi-square test was performed. A chi-square test was used to conclude the association between categorical age, education level, and income with some of the questions in all three parts of the survey. The first chi-square test was used to conclude association with categorical age and questions "I took PCAT and believe it has prepared me to have

a good background to understanding some of the courses in the pharmacy program”, “I did not take PCAT because I believe it has no impact on understanding material in pharmacy school”, “I believe good score in PCAT is a factor in being successful in a pharmacy program” and “I took PCAT because it helped me master my time management skills (if you took PCAT for admission).” A second chi-square test was used to also conclude the association between categorical education level and questions “I took PCAT and believe it has prepared me to have a good background to understanding some of the courses in the pharmacy program”, “I did not take PCAT because I believe it has no impact on understanding material in pharmacy school”, “I believe good score in PCAT is a factor in being successful in a pharmacy program” and “I took PCAT because it helped me master my time management skills (If you took PCAT for admission).” Lastly, a third chi-square test was used to conclude association between income and questions “I took PCAT and believe it has prepared me to have a good background to understanding some of the courses in the pharmacy program”, “I did not take PCAT because I believe it has no impact on understanding material in pharmacy school”, “I believe good score in PCAT is a factor in being successful in a pharmacy program” and “I took PCAT because it helped me master my time management skills (If you took PCAT for admission).” All statistical analyses were conducted using SPSS version 23.0 and an alpha of 0.05 was used.

## Results

### Descriptive statistics

This study included 79 participants with different gender and ethnicity. Majority of the students earned bachelor of arts / bachelor of science (62%), between the ages 21-25 (60.8%), have had a job before coming to HU (94.9%), have worked for 1-3 years (48.1%), have worked in a healthcare related job (63.3%), are from other states aside from the DMV, and earn an annual income of 1,001-15,000 (32.9%). Majority of the students were female (70.9%). A description of the student demographic is presented on Table 1 below.

Characteristic	N= 79
<b>Age ((N)%)</b>	
1= <20	1.3
2= 21-25	60.8
3= 26-30	24.1
4= 30-35	6.3
5= >35	6.3
<b>Gender ((N)%)</b>	

Male	27.8
Female	70.9
<b>Have you worked or had a job before coming to Howard University Pharmacy Program ((N)%)</b>	
Yes	94.9
No	3.8
<b>If you worked prior to coming to HU. How many years have you worked (in Years) ((N)%)</b>	
Not Applicable	0
<1	0
1-3	48.1
4-5	13.9
>5	32.9
<b>Education Level ((N) %)</b>	
Prerequisite only	11.4
Associate degree	15.2
BA/BSc	62
MSc	7.6
Doctorate	2.5
<b>If you have worked prior to coming to HU. What kind of work have you had? ((N)%)</b>	
Healthcare related job	63.3
Non-health related job	27.8
Not applicable	0
<b>State you have lived in before accepting admission to Howard ((N)%)</b>	
Washington DC	7.6
Maryland	36.7
Virginia	10.1
Other State	44.3
<b>Annual Income from your job if you have worked ((N)%)</b>	
<1000	8
1,001-15,000	26
15,001-3,0000	24
30,001-45,000	10
>45,000	9

**Table 1:** Characteristic of Student Population.

### **Findings on the bivariate associations between Age and students opinion on PCAT**

To statistically determine the strength of association between two categorical variables, a Chi square test was used. After running the Chi square test, it can be concluded that there is no association between age and most of the responses (P value 0.868). Majority of students, 23 students, “Strongly disagreed” with the questions. From those who strongly disagreed, 0 from age below 20, 12 were from the ages 21-25, 4 were from the ages 26-30, 2 were from ages 30-35, and 2 were older than the age 35.

### **Findings on the bivariate associations between Education Level and student's opinion on PCAT**

To statistically determine the strength of association between categorical variables education level and students opinion on PCAT, a Chi test was used. After running the Chi square test, it can be concluded that there is was also no association between the various demographic factors and the responses to most of the survey questions.

However, it can be concluded that there is a strong association between education level and the response “I took PCAT because it helped me master my time management skills (If you took PCAT for admission).” (P value = 0.018). Majority of students, 20 exactly, “Strongly disagreed” with the question. From those who strongly disagreed, 1 student only had an education level of Prerequisite courses only, 3 had associates degrees, 14 have a BA/BSc, 2 had a MSc, and 0 had a Doctorates degree.

### **Findings on the bivariate associations between Annual Income and student's opinion on PCAT**

It can be concluded that there is a strong association between annual income when it comes to participants who believe that a good score in PCAT as a factor for success (P value = 0.034).

## **Discussion**

In the present study, it showed that regardless of age, education level, or annual income majority of the students strongly disagree with the idea that by taking PCAT it has prepared them to have a good background to understand some of the courses in pharmacy school. In addition, of the students that did not take the PCAT, the majority of students neither agree nor disagree that the PCAT has no impact on understanding material in pharmacy school. Secondly, most students do not believe a good score in the PCAT is a factor in being successful in a pharmacy program. Lastly, Majority of students do not agree that the PCAT enhanced their time management skills.

A significant data obtained is a strong association between annual income and the response “I believe a good score in PCAT is a factor in being successful in a pharmacy program.”

Majority of the students strongly disagreed with the question and that may be attributed to their prior annual income. The exact relationship was not found but it is seen that 20 out of the 29 who strongly disagreed earned \$30,000 or less. Second, significant data obtained is a strong association between education level and the response “I took PCAT because it helped me master my time management skills”. Majority of the students strongly disagreed with the question. Again, exact association is unknown, but we can conclude that prior education history might be the reason students disagree. 18 out of the 20 students who strongly disagreed have a Bachelors/Bachelors of science or less. Specifically, a Bachelors/ Bachelors of science, Associates degree, or only did prerequisites required.

Despite all the findings in this study, there are some limitations that went with the research. First, the study only assessed first year students. Although first year students give valid data, their pharmacy school experience is limited to only the first semester of pharmacy school. They have yet to endure a significant portion of the course load of pharmacy school, thus not having a full understanding of PCAT's role in overall success. Secondly, there is no data on an administrators input. An administrator's point of view can better convey trends of student success before and after PCAT requirement removal.

## **Conclusion**

Results of this study indicate that taking the Pharmacy College Admission Test as a pre-request for admission has no or limited impact on success of first year Howard University College of Pharmacy students. Every year, more pharmacy schools are dropping the PCAT as a requirement for admission. Long term effects of this decision have yet to be known, so it is imperative that moving forward, research continues to better understand them.

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