Correlations of Pre-Admission Criteria and Post-Admission Didactic GPA to Physician Assistant National Certifying Examination Results

Brittany Imel, Nick Jansen, Alyssa Nelson
Faculty: Gina R. Brown MPAS, PA-C

Department of Physician Assistant, College of Health Professions

Abstract. *Purpose:* To provide research on possible indicators for success using selected pre-admission criteria and post-admission didactic grade point average (GPA) to see if statistically significant correlations could be found between these and Physician Assistant National Certifying Exam (PANCE) performance. *Methods:* An observational, retrospective cohort study was done utilizing three previous graduating classes of the Wichita State University (WSU) Physician Assistant (PA) program (n=119). Data were analyzed using SPSS 17.0 (Chicago, Il). *Results:* Institution type (four-year versus two-year) for core science prerequisites was moderately associated with first-time PANCE pass rate (r=.269). PANCE scores, but not pass rate, were strongly associated with didactic GPA (r=.665) and program pharmacology GPA (r=.678). A moderate association was demonstrated between PANCE scores and program anatomy GPA (r=.414).
Conclusion: As only one moderate correlation was found between pre-admission criteria and PANCE performance, advice regarding applicant selection criteria is limited.

1. Introduction

The recent changes in U.S. health care system have lead to an increased demand for matriculation and successful graduation of competent physician assistants (PA). Hence, the publicity surrounding the profession has resulted in a bombardment of current PA education programs with student applications. For example, there were 12,216 applicants for 4,200 PA program seats in the 2009-2010 application cycle. This was a 20% increase from the previous year.[1] Unfortunately, programs have not been able to meet this demand and can only offer a limited number of positions; therefore, many students have been turned away despite their qualified application. To ensure the most qualified and successful applicants are selected, admissions criteria need to be reevaluated and supported by evidence based research to ensure that the most competent and highly successful students are selected for admission. Essentially, final student selection is based on subjective criteria of the program's selection committee. Therefore, further objective criteria may aid selection committees in identifying students with the highest probability of success.

The main purpose of this study was to determine if statistically significant correlations exist between PANCE performance and selected pre-admission criteria and post-admission didactic GPA. For the purpose of our research, PANCE performance is defined by PANCE first-time pass rate and score. The results of this study may impact selection criteria for admission to PA programs by enhancing knowledge regarding correlations, (or lack of), between prerequisite GPA, institution type where prerequisites were taken, prior healthcare experience and PANCE performance. Additionally, statistically significant correlations between PANCE performance and post-admission didactic GPA can facilitate effective remediation decisions to better ensure students' success.

2. Experiment, Results, Discussion, and Significance

Participants/Design: This observational, retrospective cohort study consisted of 119 students from the 2007-2009 graduating classes of the WSU PA program in Wichita, Kansas. Admission requirements for these students included receipt of a bachelor degree, program prerequisites (general chemistry I & II with labs, general biology, microbiology with lab, human anatomy and physiology with labs and pathophysiology) with a GPA >3.0, and an overall GPA >3.0), a primary application that included letters of recommendation, a personal essay, a secondary application, and an interview.[2] Participants missing data for more than one prerequisite course were excluded from the research data.

Procedure: The study was approved by the WSU Institution Review Board (IRB). Following IRB approval, the study participants were provided with a randomly assigned identification number to protect their identity. An employee of the PA program performed this task. The document that contained both the participant's name and correlating identification number was kept in a locked file cabinet in the PA office. The employee recorded the following information for each participant: identification number, age, gender, race, certifications, heath care experience, first-time PANCE results, PA program graduation year, PA GPA from anatomy and two semesters of pharmacology, and the overall PA didactic GPA.

Data Analysis: SPSS 17.0 (Chicago, Il) was used to analyze data. Descriptive data are provided as means with standard deviation or frequencies. Correlations were analyzed using a 2-tailed Spearman's rho for non-parametric data and Pearson's *r* for parametric data. Statistical significance was set at $p < .05$. Strength of correlation is defined as weakly positive ($r = 0$ to 0.20), moderately positive ($r = 0.21$ to 0.5), and strongly positive ($r = 0.51$ to 0.99). [3]
Results: Student characteristics can be found in table 1 (n=119).

Table 1: **Characteristics of the Research Participants**

Characteristic	Result
Mean age (years)	30.31 ± 5.70
Undergraduate GPA* (mean ± SD)	
Chemistry 1	3.38 ± .65
Chemistry 2	3.32 ± .65
Biology 1	3.48 ± .65
Microbiology	3.60 ± .51
Anatomy	3.70 ± .50
Physiology	3.63 ± .52
Statistics	3.74 ± .48
Pathophysiology	3.72 ± .50
Didactic GPA (mean ± SD)	
Anatomy	3.48 ± .52
Pharmacology	3.19 ± .56
Cumulative in all courses	3.57 ± .30
Healthcare experience (hours)	**Percentage of total participants**
None	29.4%
Some, but <500	3.4%
500-999	14.3%
1000-1999	22.7%
≥ 2000	30.3%
Location of Pre-requisites	**Percentage of total participants**
Majority at 4 year college	69.7%
Combined 4 year and 2 year	20.2%
Majority at a 2 year college	10.1%
PANCE	
First-time pass rate	95.8%
Score (mean ± SD)	525.43 ± 120.05

*based on a 4.0 scale

There was no association between location of core science prerequisites (four-year college vs. two-year college) and PANCE scores. However, there was a moderate association between location of core science prerequisites and first-time pass rates ($r = .269$, $p = 0.003$). Only 4.2% of students (n=5) did not pass the PANCE the first-time. However, of the students who attended a two-year college for the majority of their core science prerequisites (n=12), 25% did not pass the PANCE on their first attempt.

Location of student's core science prerequisites (four-year college vs. two-year college) and their overall didactic program GPA or program pharmacology and anatomy grades were analyzed; no significant correlations were found. No significant correlations were found between prior healthcare experience or the extent of healthcare experience (in hours) and PANCE scores, first-time pass rate, or didactic GPA. There was no association between PANCE scores and core science prerequisite GPA.

PANCE scores were strongly associated with didactic GPA ($r = .665$) and WSU PA program pharmacology GPA ($r = .678$) and moderately associated with WSU PA program anatomy GPA ($r = .414$). However, there was no correlation with any of these GPA measures and the first-time pass rate.

Discussion/Significance: Due to lack of statistically significant findings, admission requirements cannot be redefined based on this study alone. The recommendation of completing prerequisites at a four-year college may occur in the future with further research studies. This study may however encourage PA programs to implement remediation plans in their didactic curriculums in order to improve their student's PANCE performance.

3. Conclusions

This study demonstrated that PA didactic GPA correlates with performance on the PANCE. Therefore, faculty should aggressively remediate students with less than adequate GPAs in order for those students to be successful in the future. Also, it was found that 25% of students who attended a two year college for all of their PA prerequisite courses at did not pass the PANCE on the first attempt.

4. References

[1] Annual Report and CASPA Data Show Established Trends Continuing.http://paeaonline.org/index.php?ht=d/ContentDetails/i/9656. Updated Nov, 2009. Accessed Nov 17, 2010.
[2] McDaniel D. Physician Assistant. http://webs.wichita.edu/?u=CHP_PA&p=/applicantinformation/. Updated March, 2009. Accessed Nov 17, 2010.
[3] Zou KH, Tuncali K, Silverman SG. Correlation and simple linear regression. *Radiology* 2003; 227(3):617-622.