

RESEARCH BRIEF

The Predictive Strength of the Physician Assistant College Admissions Test (PA-CAT) Scores to 2023 Cohort Complete Program Performance at Miami-Dade College Physician Assistant Program

Miami-Dade College: Class of 2023 Report
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(1) Miami-Dade College

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Miami Dade College Physician Assistant Program
Medical Campus
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Mission:

The mission of the Miami Dade Physician Assistant Program is to educate and train students from a culturally diverse background to become competent primary care physician assistants who will serve the medically underserved patients in urban and rural communities in Florida. The program also promotes academic excellence, high professional standards, and the development of lifelong learners.

Director: Avril Nimblett-Clarke, DMSc, MS, PA-C



Dr. Nimblett-Clarke serves as the Program Director and Chairperson of the Physician Assistant program. She holds a Bachelor of Science degree in Physician Assistant Studies from Howard University and a Master and Doctoral degree in Educational Leadership from A.T. Still University. She has more than 20 years of clinical experience as a Certified Physician Assistant. Her primary clinical practice areas are general pediatrics, adolescent medicine, and sickle cell research. She has also held the roles of Assistant Professor and Academic Coordinator. On a national level, she has served as a facilitator for the Physician Assistant Education Association (PAEA) New Faculty Skill Workshop mentoring new faculty. She is a member of the PAEA leadership committee, where she continues to contribute to a platform of building excellence in leadership among Physician Assistant faculty. Dr. Nimblett-Clarke is passionate about student success and is committed to growing a community of servant leaders.” Dr. Nimblett-Clarke was awarded the 2021 Capstone Award of Excellence from A.T. Still University for her capstone project, “Classroom Assessment Techniques in Physician Assistant Education: Improving Learning Gains.”

Scott Massey, PhD, PA-C

With over three decades of experience in PA education, Dr. Scott Massey is a recognized authority in the field. He has demonstrated his expertise as a program director at the esteemed Central Michigan University and as the research chair in the Department of PA Studies at the University of Pittsburgh. Dr. Massey's influence extends beyond practical experience; he has significantly contributed to accreditation, assessment, and student success. His innovative methodologies have guided numerous PA programs to ARC-PA accreditation and have improved program outcomes. His predictive statistical risk modeling has enabled schools to anticipate student results. Dr. Massey has published articles related to predictive modeling and educational outcomes. He has also conducted longitudinal research in stress among graduate Health Science students. His commitment to advancing the PA field is evident through participation in PAEA committees, councils, and educational initiatives.

Rajat Chadha, PhD

Dr. Rajat Chadha, with a PhD in Education from Indiana University, Bloomington, is an expert psychometrician with more than 14 years of extensive experience working on multiple significant projects. Dr. Chadha has worked as a psychometrician in high-stakes certification for physicians in the United States. He has also worked on predictive risk modeling for Physician Assistant programs and has published book chapters and peer-reviewed articles in leading journals.

Additional Information

If you would like to ask questions about the research brief, access to the full research study, or express interest in participating in future research studies, reach out to:

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Research Brief: The Predictive Strength of the Physician Assistant College Admissions Test (PA-CAT) Scores to Class of 2023 Complete Program Performance at Miami-Dade College Physician Assistant Program

Abstract

The current research study investigated the relationship between PA-CAT scores and overall performance in the PA program for the class of 2023 (n = 53) at Miami-Dade College.

Results indicate that the PA-CAT composite score has a statistically significant ($p < .05$) positive correlation with performance in two Physical Diagnosis courses; one Clinical Anatomy and Physiology course; one Clinical Diagnostic Imaging course; Clinical Medicine I; Pathophysiological Basis of Disease I; Electrocardiography; Pharmacology I; Pharmacotherapeutics; Clinical Pharmacotherapeutics; first-semester GPA; second-semester GPA; combined cumulative GPA; and the didactic Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT). These findings suggest that the PA-CAT is a useful predictor of performance in the didactic year of the PA program.

Undergraduate science GPA has a statistically significant ($p < .05$) positive correlation with first-semester GPA, combined cumulative GPA, and didactic PACKRAT. PA-CAT composite score is a stronger predictor of all these compared to undergraduate science GPA alone. Moreover, PA-CAT composite score in addition to undergraduate science GPA provided stronger prediction of first-semester GPA, combined cumulative GPA, and didactic PACKRAT than undergraduate science GPA alone.

Physician Assistant College Admissions Test (PA-CAT)

The PA-CAT is a specialized, discipline-specific assessment consisting of 240 test items designed to measure knowledge and application in nine prerequisite science subjects necessary for success in the demanding Physician Assistant (PA) curriculum. The PA-CAT has been developed specifically for use by PA educators and their admissions departments as part of a holistic admissions process. As of June 21, 2023, the assessment has been administered to 2,979 examinees since its first administration on May 1, 2020. One composite scaled score based on all items comprising the assessment and three subject scaled scores (Anatomy & Physiology, Biology, and Chemistry) are reported for each examinee. The reliability of PA-CAT composite scaled scores is very high (0.937), indicating that the PA-CAT composite scaled scores are very dependable. This means that it is highly likely that the PA-CAT examinees with higher scaled scores have greater knowledge and application skills in the prerequisite science subjects.

Relationship between PA-CAT Composite Score and Performance in Physician Assistant Program

The relationship between PA-CAT composite score and performance in the PA program at Miami-Dade College was investigated by calculating the Pearson correlation coefficient and the associated statistical significance. These are discussed next, along with the interpretation of the strength of the relationship in terms of the size of the correlation coefficient.

Correlation Coefficient

Correlation coefficient quantifies the degree of relationship between two variables. Its value can range from -1 to +1. A positive value implies that when one variable increases, the other tends to increase. A negative value implies that when one variable increases, the other tends to decrease. A value of 0 implies that there is no discernible linear relationship between the variables.

The knowledge of the relationship between two variables can be useful in predicting one variable based on the other, especially if one variable is observed before the other. At Miami-Dade College, PA-CAT composite score has a positive correlation with performance in multiple courses, first-semester GPA, second-semester GPA, combined cumulative GPA, and didactic PACKRAT. Students with higher PA-CAT composite scores are expected to perform better in these compared to students with lower PA-CAT composite scores.

Statistical Significance

Statistical significance is determined using the *P* value, the probability of observing a correlation coefficient by chance if the actual coefficient is 0. For example, if the *P* value associated with a correlation coefficient is 0.082, the probability of observing this or a higher absolute correlation coefficient by chance is 8.2% ($8.2 / 100 = 0.082$), given that the actual coefficient is 0. A correlation coefficient is statistically significant if the *P* value is lower than the probability that the decision makers consider too low to be by chance only. This threshold value is referred to as significance level, or alpha. One of the most common conventional alpha values used in educational settings is 0.05, also referred to as 5% significance level. When more conservative decision-making is desired, a lower alpha value of 0.01 (1% significance level) is used.

The correlation of PA-CAT composite score with performance in the PA program is statistically significant at the 5% significance level for several variables.

Size of the Correlation Coefficient

A higher absolute correlation coefficient indicates a stronger relationship between two variables and better prediction of one variable based on another. There are general guidelines on the interpretation of the strength of relationships (Cohen, 1988; Cohen, 1992) in terms of the size of correlation coefficient. A correlation coefficient of around 0.100 is considered small, 0.300 is considered medium, and 0.500 or greater is considered large.

Correlation coefficients between PA-CAT composite score and PA program performance variables, *P* values associated with the coefficients, and the interpretation of the size of the relationship are reported in Table 1. Correlation coefficients that were not statistically significant at the 5% significance level are not presented in this report for brevity.

The size of the correlation coefficient of PA-CAT composite score with Clinical Anatomy and Physiology at Miami-Dade College is large. In other words, PA-CAT composite score is very useful in predicting the performance of applicants in this course. The size of the correlation coefficient of PA-CAT composite score with Clinical Diagnostic Imaging is medium. PA-CAT composite score is useful in predicting the performance of applicants in this course. The relative usefulness of PA-CAT composite score in predicting Clinical Anatomy and Physiology is higher than the usefulness of predicting the performance in Clinical Diagnostic Imaging. Other correlation coefficients in the table can be interpreted similarly.

The scatter plots showing the relationship between PA-CAT composite score and PA program performance variables are presented in Appendix A.

Table 1: Correlation between PA-CAT Composite Score and PA Program Performance

	Correlation with PA-CAT Composite score	P value	Statistically Significant (5% level)?	Size of the Correlation Coefficient
PAS 1800C: Physical Diagnosis I	0.471	$p < 0.001$	Yes	Medium
PAS 1803: Clinical Anatomy and Physiology	0.584	$P < 0.001$	Yes	Large
PAS 1831: Clinical Diagnostic Imaging	0.424	$p = 0.002$	Yes	Medium
PAS 1801C: Physical Diagnosis II	0.344	$p = 0.012$	Yes	Medium
PAS 1811C: Clinical Medicine I	0.304	$p = 0.027$	Yes	Medium
PAS 1813: Pathophysiological Basis of Disease I	0.339	$p = 0.013$	Yes	Medium
PAS 1822L: Electrocardiography	0.318	$p = 0.020$	Yes	Medium
PAS 1823: Pharmacology I	0.308	$p = 0.025$	Yes	Medium
PAS 3075: Pharmacotherapeutics	0.297	$p = 0.031$	Yes	Medium
PAS 3070: Clinical Pharmacotherapeutics	0.281	$p = 0.042$	Yes	Medium
Semester 1 GPA	0.458	$p < 0.001$	Yes	Medium
Semester 2 GPA	0.384	$p = 0.005$	Yes	Medium
Combined Cumulative GPA	0.420	$p = 0.002$	Yes	Medium
Didactic PACKRAT	0.338	$p = 0.013$	Yes	Medium

Value of PA-CAT Composite Score Relative to Undergraduate Science GPA in Predicting First-Semester GPA, Combined Cumulative GPA, and Didactic PACKRAT

Undergraduate science GPA is statistically significantly correlated with semester 1 GPA ($r = 0.306$), combined cumulative GPA ($r = 0.327$), and didactic PACKRAT ($r = 0.277$). Undergraduate science GPA is not correlated with any other variable.

To assess the value of PA-CAT composite score relative to undergraduate science GPA in predicting first-semester GPA, combined cumulative GPA, and didactic PACKRAT, three sets of regression analyses were performed for each of the three predicted variables: 1) PA-CAT composite score as the only predictor; 2) undergraduate science GPA as the only predictor; and 3) both PA-CAT composite and undergraduate science GPA as predictors.

Table 2 lists the percentage of variance in the three predicted variables explained by predictor variable(s) in the regression analyses. A percentage of 100 means that all variation in the predicted variable is explained by the predictor variable(s). A percentage of 0 means that the predictor variable(s) does not

explain any variation in the predicted variable. The higher the percentage of variance explained by the predictor variable(s), the stronger the prediction.

In the case of first-semester GPA, PA-CAT composite score (21.0%) on its own explains a greater percentage of variance in first-semester GPA compared to undergraduate science GPA (9.3%) alone. The percentage of variance explained by PA-CAT composite score and undergraduate science GPA together (26.9%) is 2.9 times the percentage of variance explained by undergraduate science GPA alone (9.3%). This demonstrates that PA-CAT composite score in addition to undergraduate science GPA provided stronger prediction of semester 1 GPA than undergraduate science GPA alone.

The percentage of variance explained in combined cumulative GPA by PA-CAT composite score and undergraduate science GPA together (24.9%) is 2.3 times the percentage of variance explained by undergraduate science GPA alone (10.7%).

The percentage of variance explained in didactic PACKRAT by PA-CAT composite score and undergraduate science GPA together (16.7%) is 2.2 times the percentage of variance explained by undergraduate science GPA alone (7.7%).

Table 2: Percentage of Variance in Predicted Variables Explained by Predictor Variable(s)

Predictor Variable(s)	Predicted Variable		
	First-Semester GPA	Combined Cumulative GPA	Didactic PACKRAT
PA-CAT composite score	21.0	17.6	11.4
Undergraduate science GPA	9.3	10.7	7.7
PA-CAT composite score, undergraduate science GPA	26.9	24.9	16.7

Limitations

A limitation of this research study is that the findings are based on a small sample (n = 53) from a single cohort at one PA program, which may not be generalizable to other cohorts at the same institution or to other PA programs.

Appendix A: Scatter plots – Relationship between PA-CAT Composite Score and PA Program Performance







