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INTRODUCTION or ABSTRACT

The tremendous increased interest in the Physician Assistant (PA) profession over the past several years has resulted in a significant increase the number of applications to PA programs and placed a greater burden on PA program's to identify individuals capable of successfully completing the rigorous training.

PA programs have traditionally utilized a variety of objective, cognitive measures including undergraduate grade point averages (GPA), science pre-requisite scores and the Graduate Record Examination (GRE) score as the cognitive variables to assess an applicant. The use of the GRE score, however as an entrance exam, has steadily decreased over the last decade possibly due to conflicting data regarding its usefulness as a predictor of graduate success on the Physician Assistant National Certifying Examination (PANCE). GPA scores are not necessarily comparable across institutions, leaving admissions committees without a standard measure against which to evaluate applicants' likelihood for success. A PA specific admissions examination that measures basic science knowledge would offer admission committees a standardized measure to objectively compare applicants.

PURPOSE

The purpose of this research study was to pilot the PA-CAT exam with first semester PA students and compare their scores to key performance markers including 1) didactic year GPA and 2) didactic year mock certifying exam scores.

MATERIALS & METHODS

The PA-CAT exam (versions 1, 1.1, 1.2, and 2.0), consisting of 180 questions covering 12 subject areas, was securely administered to interview candidates and recently matriculated students from 12 distinct PA programs within the United States. Scaled scores from 408 examinees were obtained by item measures and person measures and Rasch analysis using Winsteps 4.3.4. The reliability of the scaled scores and overall exam were determined using the Person measure reliability index. To identify statistically significant associations, a multivariate multiple regression analysis was performed between the PA-CAT scaled scores (dependent variable) and the PA Program didactic year GPA and PACKRAT exam scores (independent variables) from the same subjects.

RESULTS

Table 1: Descriptive Statistics

	PA-CAT Scaled Score	Didactic GPA	PACKRAT
Mean	503	3.59	128
SD	21	0.31	20
Median	504	3.62	127
Percentiles			
5	469	3.07	95
25	490	3.33	115
75	517	3.87	141
95	538	4.00	164
Minimum	425	2.73	66
Maximum	561	4.00	187

Figure 1: Distribution of PA-CAT Scaled Scores

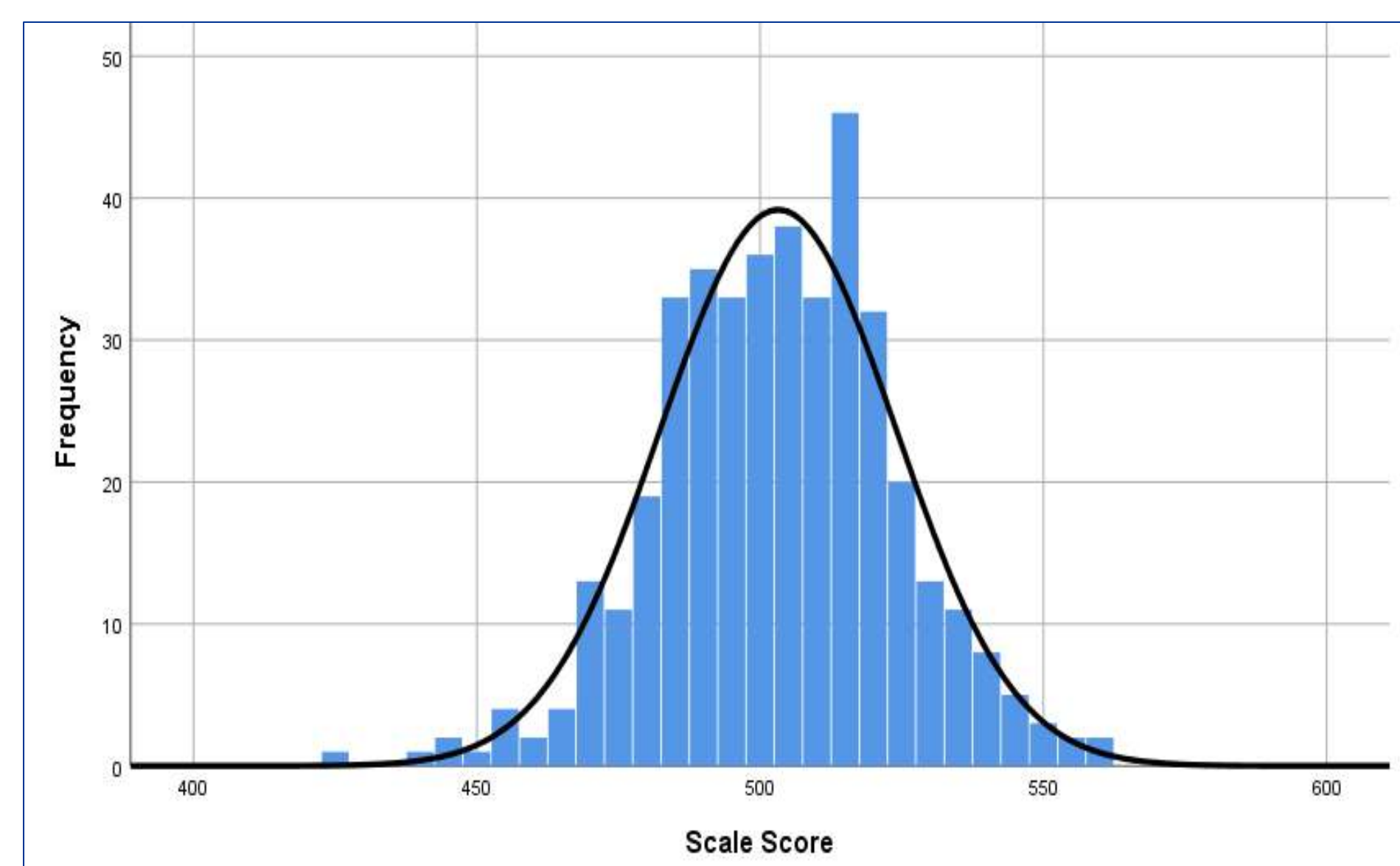


Figure 2: Distribution of PACKRAT Scores

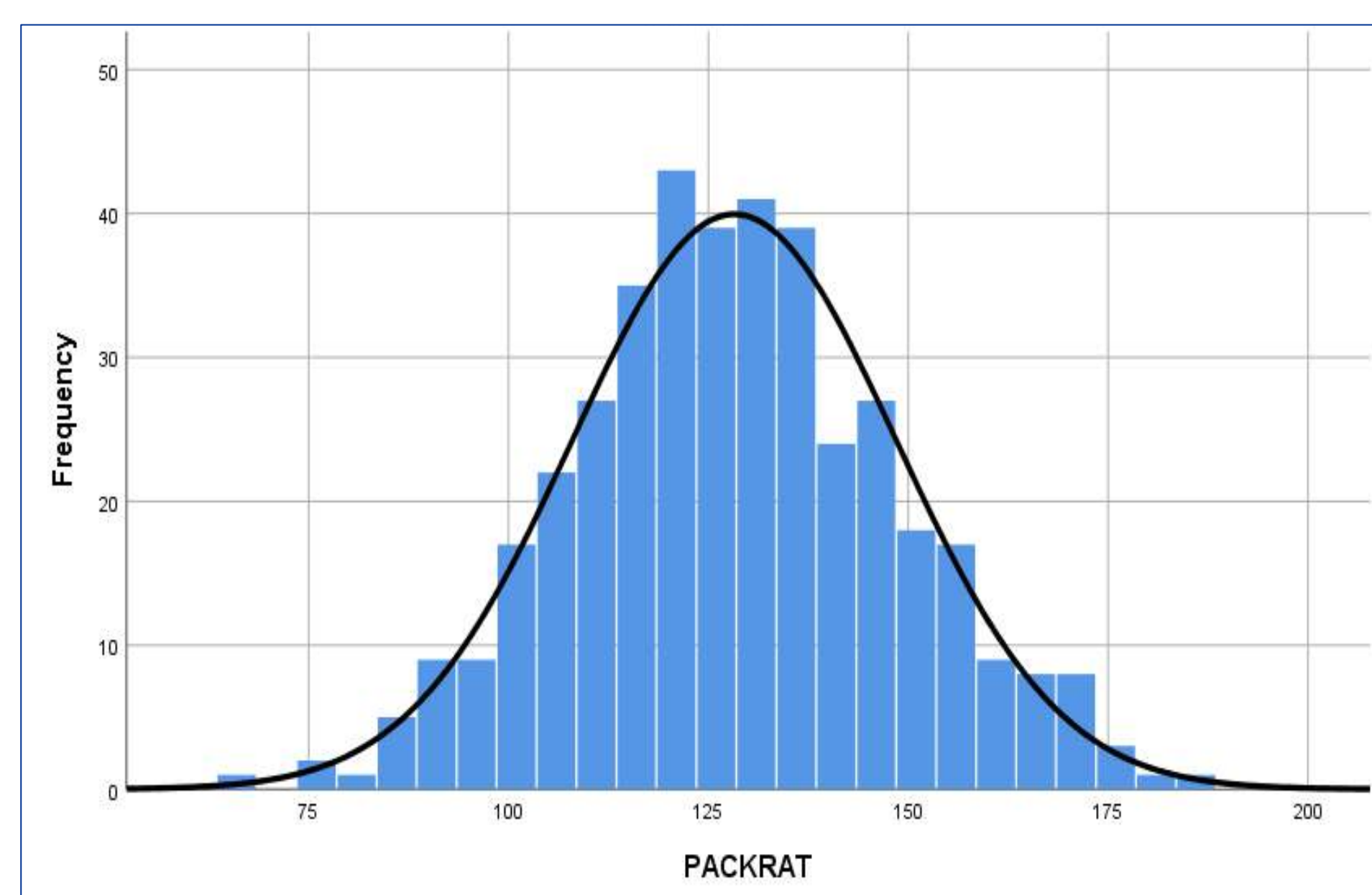


Table 2: Reliability of Scaled PA-CAT Scores

	Reliability of scale scores
All items (PA-CAT)	0.83
Subject Group 1: Anatomy, Physiology	0.69
Subject Group 2: General Biology, Microbiology, and Genetics	0.67
Subject Group 3: General Chemistry, Organic Chemistry, Biochemistry	0.43

RESULTS

Table 3: PA-CAT Correlation Coefficients

	Didactic GPA	PACKRAT scores
Didactic GPA	1	
PACKRAT scores	0.46**	1
Scaled Score: PA-CAT	0.24**	0.52**
Scaled Score: Subject Group 1 (Anatomy and Physiology)	0.19**	0.46**
Scaled Score: Subject Group 2 (General Biology, Microbiology, and Genetics)	0.25**	0.39**
Scaled Score: Subject Group 3 (Gen Chemistry, Organic Chemistry, and Biochemistry)	0.13*	0.37**

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 4: Program-specific PA-CAT Correlation Coefficients

Correlation coefficient	Sample Size
0.30	36
0.40**	43
0.41**	43
0.43*	26
0.46*	19
0.48*	28
0.48	16
0.51**	93
0.54**	77
0.61	9
0.66**	16
Median = 0.48	

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 5: Predictive Variance PA-CAT on PANCE

Correlation between PACKRAT and:	Correlation Coefficient	% of variance in PACKRAT explained:
PA-CAT scale scores	0.52	27.0
Undergraduate GPA	0.19	3.4
Undergraduate science GPA	0.12	1.2
PA-CAT scale scores, Undergraduate GPA, Undergraduate science GPA	0.54	29.1

Table 6: Predictive Variance PA-CAT on Didactic GPA

Correlation between didactic GPA and:	Correlation Coefficient	% of variance in didactic GPA explained:
PA-CAT scale scores	0.24	5.7
Undergraduate GPA	0.14	1.7
Undergraduate science GPA	-0.01	0.0
PA-CAT scale scores, Undergraduate GPA, Undergraduate science GPA	0.35	11.4

DISCUSSION

This is the first study to investigate the correlations between scores on the PA-CAT and key performance indicators during the didactic phase of PA education. The moderate correlation to the PACKRAT® is promising as it is known to be predictive of PANCE success. PA educators utilize a variety of cognitive and non-cognitive data sources to make admissions decisions. A common practice is to quantify all data points into an admission score. Utilization of the PA-CAT scaled score and comparison percentile could provide a stronger comparison of basic science knowledge between candidates than using the cumulative GPA, science GPA or GRE. These GPA and GRE scores are not consistent in identifying science knowledge when used in the selection of students.

CONCLUSIONS

Early results from this research study demonstrates there is a statistically significant relationship between the PA-CAT and both PA program didactic year GPA and PACKRAT exam. These relationships were determined to be stronger than prerequisite science and prerequisite undergraduate GPA. The limitations of this study included the inability to administer the exam to the intended population of applicants to PA programs. Further study is needed to determine if the exam can be generalized to the entire PA applicant pool thereby providing a valid instrument for admissions decisions.

REFERENCES

- Brown G, Imel B, Nelson A, Hale LS, Jansen N. Correlations Between PANCE Performance, Physician Assistant Program Grade Point Average, and Selection Criteria. *The Journal of Physician Assistant Education*. 2013;24(1):42-44. doi:10.1097/01367895-201324010-00006.
- Butina M, Wyant AR, Remer R, Cardom R. Early Predictors of Students at Risk of Poor PANCE Performance. *The Journal of Physician Assistant Education*. 2017;28(1):45-48. doi:10.1097/jpa.000000000000107.
- Donnon T, Paolucci EO, Violato C. The Predictive Validity of the MCAT for Medical School Performance and Medical Board Licensing Examinations: A Meta-Analysis of the Published Research. *Academic Medicine*. 2007;82(1):100-106. doi:10.1097/01.acm.0000249878.25186.b7.
- Wilson MA, Odem MA, Walters T, Depass AL, Bean AJ. A Model for Holistic Review in Graduate Admissions That Decouples the GRE from Race, Ethnicity, and Gender. *CBE—Life Sciences Education*. 2019;18(1). doi:10.1187/cbe.18-06-0103.

Conflict of Interest

Two authors are paid researchers for Exam Master. The manuscript was written by the authors without Exam Master planning, oversight, editing, review, financial support, or approval.