

Assessing critical thinking skills of pharmacy students and its association with students' academic performance

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INTRODUCTION

- An evaluation of critical thinking skills in students have shown that in general, students who study critical thinking tend to do better in their studies, regardless of whether their studies are in the sciences or humanities.¹
- Madden et al found that pharmacy students requiring course remediation had lower North American Pharmacist Licensure Examination (NAPLEX) pass rates than those who did not require remediation, however, they were unable to determine whether this was due to a deficiency in the remediation process or a deficiency in the students' critical thinking skills.²
- This research aims to explore the relationship between students' critical thinking skills and academic performance, measured by remediation rates and Pharmacy Curriculum Outcomes Assessment (PCOA) scores.

METHODS

- The Health Sciences reasoning test with Numeracy (HSRT-N), provided through Insight Assessment (California Academic Press) and Schuhfried Publishing, Inc, was administered to all pharmacy students in their second, third, and fourth year to assess their critical thinking skills.
- Descriptive statistics and multivariate logistics regression analyses were used to evaluate the correlation of critical thinking skills with remediation and PCOA scores.

RESULTS

Table 1:
Participant Demographics (N=142)

Variable	n (%)
Professional Year	
• P4	42 (29.6%)
• P3	55 (38.7%)
• P2	45 (31.7%)
Self-reported number of remediations	
• 0	106 (74.6%)
• 1	31 (21.8%)
• >1	8 (5.6%)
Gender	
• Male	63 (44.4%)
• Female	82 (57.7%)
Race/Ethnicity	
• Black	103 (72.5%)
• Asian	26 (18.3%)
• White	8 (5.6%)
• Hispanic	2 (1.4%)
• Other	6 (4.2%)

Figure 1: Association between Critical Thinking Skills, as measured by the HSRT-N, and student pharmacist remediation in P2, P3 and P4 student pharmacists

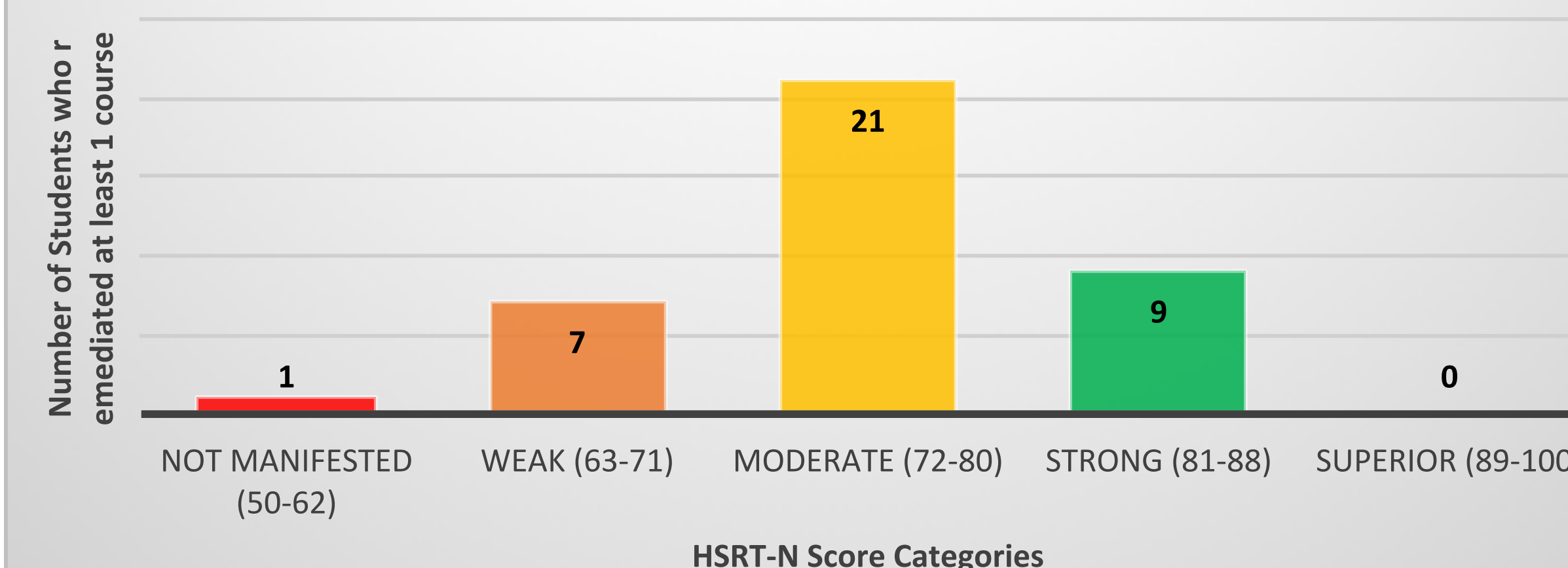


Figure 2: Association between Critical Thinking Skills and PCOA Scores in P2 and P3 Student Pharmacists

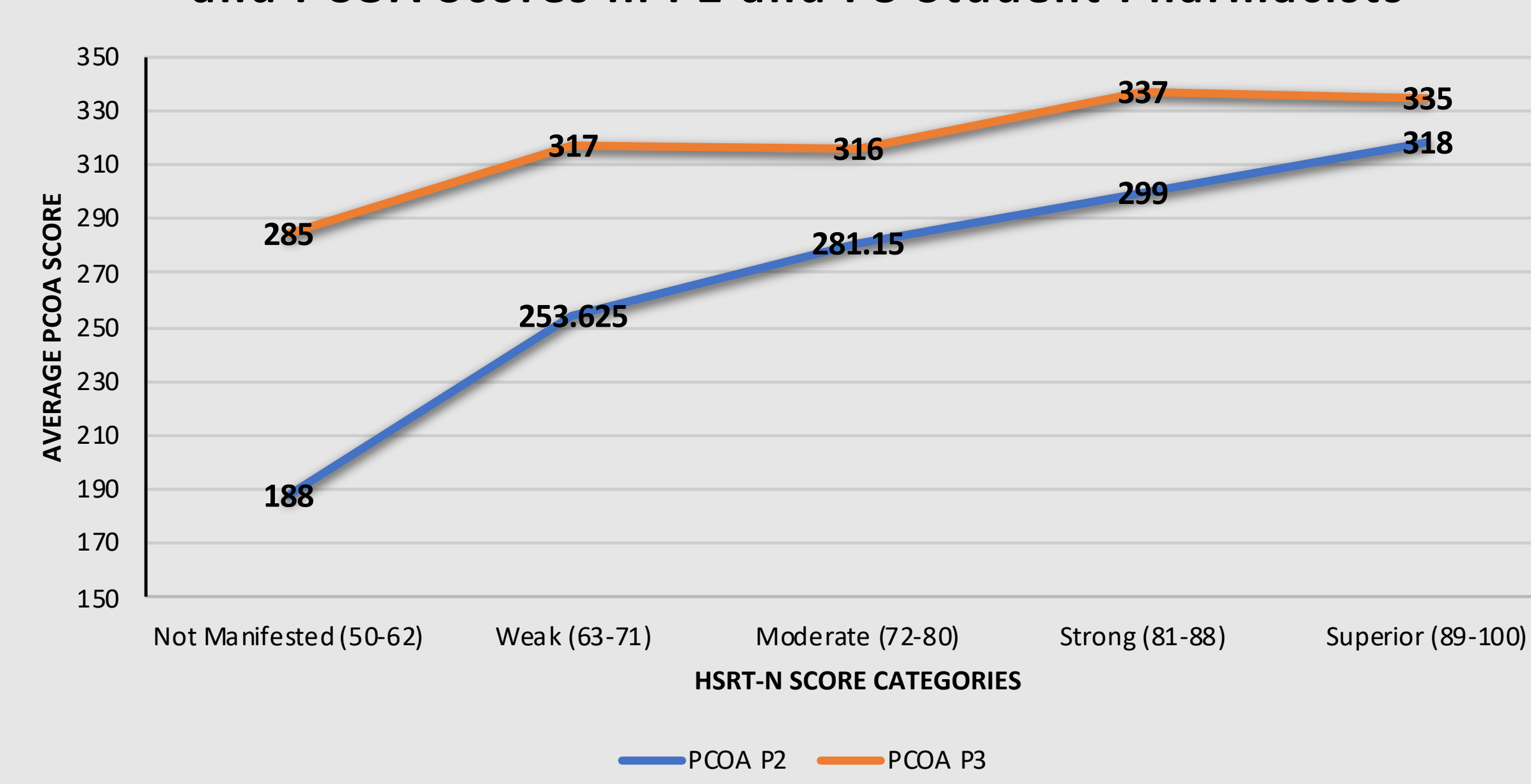


Table 2: Regression results for impact of critical thinking on remediation rates

Variable	Unadjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
First semester GPA	0.05	0.015-0.16	0.04	0.01-0.15
Professional Year				
P2	Reference	Reference	Reference	Reference
P3	1.24	0.47-3.23	2.11	0.64-6.89
P4	2.46	0.943-6.43	3.05	0.92-10.11
Critical thinking score 86 or above	Reference	Reference	Reference	Reference
Critical thinking score lower than 86	5.40	1.31-24.08	5.97	1.03-34.74

REFERENCES

- Cambridge Assessment. Critical Thinking - its role, value and impact upon driving attainment. Available at <http://www.cambridgeassessment.org.uk/insights/role-value-and-impact%20of-critical-thinking-on-attainment/>. Accessed March 29 2018.
- Madden MM, Etzler FM, Schweiger T, et al. The impact of pharmacy students' remediation status on NAPLEX first-time pass rate. Am J Pharm Educ. 2012; 76 (10) Article 191.

CONCLUSION

- Students with superior or strong critical thinking skills, measured by the HSRT-N, appear to perform better on the PCOA than those with moderate, weak, or not manifested critical thinking skills.
- Statistical analysis of the correlation between critical thinking skills and PCOA performance show that every one point increase in critical thinking skills, as measured by the HSRT-N, was predictive of a gain of 1.9 points on the PCOA for second year students ($p < 0.001$).
- Critical thinking skills appear to be a possible predictor of PCOA performance, but not remediation rates.
- Currently, critical thinking skills are not routinely and formally evaluated among pharmacy students.
- Future research exploring the role of critical thinking on student performance will provide additional clarity on the impact of critical thinking skills in pharmacy students performance.