Cognitive Test Anxiety (CTA) in Health Professions Students

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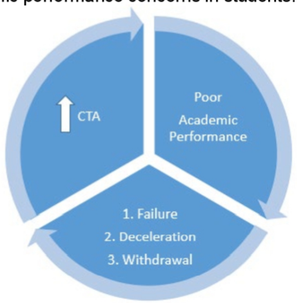
INTRODUCTION

High-test anxious students can have:
- 3-12% in GPA
- 4-15% in exam performance
- 25% variance in high-external pressure situations such as the SAT in comparison to 12% during no-external pressure, such as the MCQ quizzes

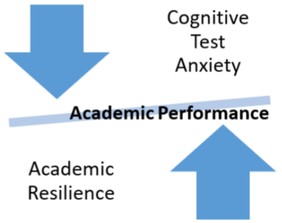
Health Professions Education:
- 22% variance has been seen in the United States Medical Licensing Examination (USMLE) Step-1 scores

Ultimately, high cognitive test anxiety can lead to academic performance concerns in students.



PURPOSE

To investigate the distribution and relationship between cognitive test anxiety (CTA), academic resilience (AR), and the demographics of physician assistant (PA), nurse practitioner (NP), and physical/occupational (PT/OT) students.



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METHODS

- Descriptive, quantitative, cross-sectional study design
- Convenience sample of PA (65), NP (118), and PT/OT (26) students from seven universities across the United States were invited to participate in the study.
- Participants completed two validated surveys, Cognitive Test Anxiety Scale-2 (CTAS-2) (24 questions) and Academic Resilience Scale (ARS-30) (30 questions), along with demographic-related questions. Responses were analyzed using one-way ANOVA, linear regression, and multiple linear regression in SPSS 27
- Permission was granted to conduct the study from the Institutional Review Board (IRB) at Simmons University

Figure 1: Sample of Cognitive Test Anxiety Scale 2 (CTAS-2)

1	I lose sleep over worrying about examinations.	1	2	3	4
2	I worry more about doing well on tests than I should.	1	2	3	4
3	I get distracted from studying for tests by thoughts of failing.	1	2	3	4
4	I have difficulty remembering what I studied for tests.	1	2	3	4
5	While preparing for a test, I often think that I am likely to fail.	1	2	3	4

Figure 2: Sample of Academic Resilience Scale (ARS-30)

You have received your mark for a recent assignment and it is a 'fail'. The marks for two other recent assignments were also poorer than you would want as you are aiming to get as good a degree as you can because you have clear career goals in mind and don't want to disappoint your family. The feedback from the instructor for the assignment is quite critical, including reference to 'lack of understanding' and 'poor writing and expression', but it also includes ways that the work could be improved. Similar comments were made by the instructors who marked your other two assignments.

If **you** were in the situation described above how do you think **you** would react?

		Strongly Agree 1	2	(✓) 3	4	Strongly Disagree 5
1.	I would not accept the instructors' feedback	☐	☐	☐	☐	☐
2.	I would use the feedback to improve my work	☐	☐	☐	☐	☐
3.	I would just give up	☐	☐	☐	☐	☐
4.	I would use the situation to motivate myself	☐	☐	☐	☐	☐
5.	I would change my career plans	☐	☐	☐	☐	☐

RESULTS

TABLE 1: Descriptive Statistics of Final Sample

Student Type	**N (%)**
Physician Assistant (PA)	65 (31.1)
Nurse Practitioner (NP)	118(56.5)
Physical/Occupational Therapists (PT/OT)	26(12.4)
Total	**209**
Race	**N (%)**
White	175 (83.7)
Black	14 (6.7)
Asian	12 (5.8)
Other	8 (3.8)
Hispanic	**N (%)**
No	199(93.4)
Yes	9 (4.2)
Gender	**N (%)**
Male	24 (11.5)
Female	185(88.5)
Age (years)	**M(SD)**
Physician Assistant (PA)	27.2 (4.6)
Nurse Practitioner (NP)	33.5 (7.5)
Physical/Occupational Therapists (PT/OT)	25.3 (2.6)
Total	30.5 (7.1) Range-22-56

Table 2: Prevalence of CTA and AR among Health Professions Students

	Physician Assistant	Nurse Practitioner	Physical/Occupational Therapist	Total
CTA				
Low CTA (23-43)	29	43	6	78
Moderate CTA (44-66)	31	40	15	86
High CTA (>67)	5 (8%)	35 (30%)	5 (19%)	45 (22%)
Total	65	118	26	209
AR				
Low (<110.5)	29	56	17	102
Average (110.5-114.5)	8	11	1	20
High (>114.5)	28 (43%)	51(43%)	8 (31%),	87 (42%)
Total	65	118	26	209

Table 3: CTAS-2 scores (CTA) and ARS-30 scores (AR) among Health Professions Students

	N	M(SD)	F (2, 206)
CTA			
PA	65	45.98 (13.09)	6.37*
NP	118	54.18 (18.29)	
PT/OT	26	56.22 (14.02)	
Total	209	51.90 (16.76)	Range (24-93)
AR			
PA	65	111.48 (15.09)	0.85
NP	118	109.59 (16.93)	
PT/OT	26	106.77 (11.97)	
Total	209	109.83 (15.83)	Range (53-146)

*Note: * p <.01; used Tukey Post-Hoc test*

Table 4: Pearson Correlation Analysis between CTA, AR, GPA, and Confidence Levels

	CTA	AR	Current Self-reported GPA	Confidence Level
Standardized CTA	1	-.38**	-.33**	-.38**
Standardized AR	-	1	.03	.36**
Current GPA	-	-	1	.21*
Confidence Level	-	-	-	1

*** Correlation is significant at the 0.001 level (2-tailed)*
** Correlation is significant at the 0.01 level (2-tailed)*

Table 5: Demographic differences in CTA and AR scores among PA, NP, and PT/OT students

	CTA M(SD)	AR M(SD)
Program Year (N)		
Year 1 (74)	50.91 (15.37)	110.64(15.87)
Year 2 (84)	51.86(17.38)	108.49 (16.43)
Year 3 (50)	53.82(17.78)	110.44(14.71)
F (2, 205) =	0 .454	0.430
Age (N)		
<30 (112)	49.75(14.19)	108.04(16.03)
=/>30 (96)	54.22(19.12)	111.93(15.49)
F (1, 206) =	3.726	3.128
Gender (N)		
Male (24)	46.04(17.15)	109.29(18.13)
Female (185)	52.66(16.60)	109.90(15.56)
F (1, 207) =	3.349	0.031
Race (N)		
White (175)	50.57(15.97)	109.55(15.72)
Non-White (34)	58.76(19.17)	111.24(16.54)
F (1, 207) =	7.009*	.320

*Note: *significant at the p<.01 using Bonferroni correction*

Figure 3

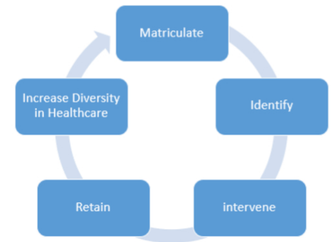
Linear Regression equation: B =1.68x10^{-15}-+(-.38xAR); F(1,211)=34.95, p<.001, R^2=.142)

DISCUSSION

- PA students had significantly lower levels of CTA than the NP and PA/PT students.
- CTA was statistically significantly higher for health professions students who were Non-white.
- When higher levels of CTA were present, self-reported current GPA tended to be lower.
- When CTA was higher, confidence levels of passing their licensure exam tended to be lower.
- When levels of AR were higher, confidence levels of passing their licensure exam also tended to be higher.
- To conclude, even though a statistically significant inverse relationship was found between CTA and AR, no moderation effect was detected in the study

CONCLUSIONS

- CTA is prevalent, with moderate (41%) to high CTA (22%) present in health professions education and can impact academic performance.
- A clear label of "high cognitive test anxiety" helps categorize individuals who can be referred for academic and mental health support.
- There may be differences in the student population who gravitate to different health professions or the curriculum.
- An inverse relationship between CTA and AR, interventions to decrease CTA and increase AR may improve students' academic success.
- Matriculation and retention rates among underrepresented minorities have been a significant challenge in healthcare professions. CTA could be a potential reason for attritions rates and should be studied further.

RECOMMENDATIONS

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