



Development of an Instrument to Measure Academic Resilience Among Student Pharmacists



Christina Spivey, PhD; Marie Chisholm-Burns, PharmD, MPH, MBA; Erin Sherwin, BS; Jennifer S. Williams, PharmD; Stephanie J. Phelps, PharmD, BCPS
University of Tennessee Health Science Center College of Pharmacy, Memphis, Knoxville, and Nashville, Tennessee, USA

Introduction

- Academic resilience** has received attention in the education literature as a possible determinant of student success.
 - Defined as a noncognitive factor describing a student’s ability to overcome adversity and improve academic performance.
- Previous studies in non-pharmacy student populations demonstrate that students with more resilience are better able to manage school pressures than those with less resilience.
- Per a review of the literature (PubMed and Google Scholar, years unlimited), there was no existing valid and reliable scale designed to measure academic resilience in student pharmacists.

Objective

- To develop a valid and reliable academic pharmacy resilience scale adapted for use in the didactic portion of the curriculum.

Methods

- To develop academic resilience scale for student pharmacists:
 - Conducted literature search of existing resilience scales, narrowed to existing academic resilience measures.
 - Selected Cassidy’s Academic Resilience Scale (ARS-30)¹ for adaptation (Cronbach’s alpha=.90, evidence of construct validity).
- Original ARS-30 had 3 subscales: (a) perseverance, (b) reflecting and adaptive help-seeking, and (c) negative affect and emotional response.
- ARS-30 vignette (Figure 1) adapted to portray an adverse scenario a student pharmacist in the didactic curriculum might face.
 - 30 items of ARS-30 revised to capture responses of student pharmacists to this vignette.
 - 5-point Likert scale used to assess response to each item (1=Likely to 5=Unlikely).
 - 10 items reverse-scored.
- Assessed convergent validity using the reliable and valid 8-item Short Grit Scale (Grit-S), which has 2 subscales, (a) perseverance of effort and (b) consistency of interest.
 - 5-point Likert scale used to assess level of response (1=Not like me at all to 5=Very much like me).
 - 4 items reverse-scored.

- Survey administered to P1, P2 and P3 students (n=544) at the beginning of Fall 2017 semester.

Figure 1. Vignette

You received an ‘F’ on your most recent pharmacy course exam. The grades for two other recent exams in the same course were lower than you would want. You are concerned these grades will jeopardize your academic standing and progression in the short-term, as well as your long-term goal of getting a residency after graduation. The feedback you have received from your instructors is quite critical, such as reference to ‘lack of understanding’ and ‘poor preparation,’ but also includes suggestions to improve your exam performance.

- Statistical Analysis:
 - Demographics and total and subscale scores summarized using descriptive statistics.
 - Negatively-worded items were reverse-scored.
 - Scale dimensionality examined using exploratory factor analysis.
 - Principal components analysis used as extraction method.
 - Varimax selected as rotation method.
 - Scree plot to determine number of meaningful factors.
 - Items were considered to load on a factor if factor loading was >0.5 on that factor and <0.4 on any other factor.
 - Confirmatory factor analysis conducted to assess Grit-S construct validity.
 - Scale reliability estimated using Cronbach’s alpha.
 - Alpha level was set at .05.

Results

- 457 (84%) students participated; participants were 62.9% female and 69.7% white, with mean age of 24.3 years ± 3.3.
- In exploratory factor analysis, 4 factors/subscales identified (Table 1).
 - 14 items deleted because they failed to load on any factor.
 - Remaining 16 items (Table 2) included in the **Academic Pharmacy Resilience Scale (APRS-16)**.
 - Total score range from 16-80, with higher scores indicating greater resilience.
- Four factors of the APRS-16:
 - Negative affect and emotional response**: 5 items, scores ranging from 5-25.
 - Reflecting and adaptive help-seeking**: 5 items, scores ranging from 5-25.
 - Adaptive thought processes**: 3 items, scores ranging from 3-15.
 - Perseverance**: 3 items, scores ranging from 3-15.

Table 1. Mean (SD) and Median Student Scores, Score Ranges, and Cronbach’s Alpha of the APRS-16, Grit-S^a and Respective Subscales

	Mean (SD)	Median	Score Range	Cronbach’s Alpha
APRS-16	59.7 (8.9)	60	34-80	.84
Factor 1: Negative Affect and Emotional Response	13.1 (4.7)	13	5-25	.82
Factor 2: Reflecting and Adaptive Help-Seeking	21.7 (3.1)	22	9-25	.75
Factor 3: Adaptive Thought Processes	12 (2.3)	12	5-15	.65
Factor 4: Perseverance	13 (2.1)	14	5-15	.61
Grit-S	3.7 (.55)	3.6	1.9-5	.74
Consistency of Interest (Grit-S Subscale)	3.3 (.75)	3.3	1-5	.75
Perseverance of Effort (Grit-S Subscale)	4 (.58)	4	1.5-5	.61

^aFor the Grit-S, possible total and subscale scores range from 1 to 5, with higher scores indicating greater grit.

- Construct validity of the Grit-S confirmed in the confirmatory factor analysis, as both subscales had significant factor loadings (p<.001) and model fit indices were acceptable.
- In convergent validity analysis, the APRS-16 and its subscales were significantly, positively associated with the Grit-S and its subscales (p<.001). See Table 3.

Table 2. Mean (SD) and Median Student Scores^a of APRS-16 Items

	Mean (SD)	Median
1. I would begin to doubt my chances of success in the PharmD program. ^b	2.9 (1.3)	2
2. I would probably get depressed. ^b	2.8 (1.3)	2
3. I would be very disappointed. ^b	1.7 (.99)	1
4. I would begin to think my chances of getting the job or residency I want were poor. ^b	2.6 (1.1)	2
5. I would feel like everything was ruined and going wrong. ^b	3.1 (1.3)	3
6. I would try to think of new solutions.	4.4 (.72)	5
7. I would use my past successes to help motivate myself.	4.4 (.85)	5
8. I would set my own goals for achievements.	4.4 (.74)	5
9. I would seek encouragement from my family and friends.	4.2 (1.2)	5
10. I would try to think about my strengths and weaknesses to help me work better.	4.3 (.88)	4
11. I would see the situation as a challenge.	4.1 (.89)	4
12. I would do my best to stop thinking negative thoughts.	3.8 (1.1)	4
13. I would see the situation as temporary.	4 (.95)	4
14. I would just give up. ^b	4.6 (.83)	5
15. I would change my career plans. ^b	4.2 (.98)	5
16. I would not change my long-term goals and ambitions.	4.2 (1)	5

^aItem scores range from 1 to 5, with higher score indicating greater resilience.
^bIndicates reverse-scored items.

Table 3. Correlations between the APRS-16, Grit-S, and Respective Subscales

	Grit-S	Consistency of Interest (Grit-S Subscale)	Perseverance of Effort (Grit-S subscale)
APRS-16			
Pearson’s r	.46	.33	.45
p value	<.001	<.001	<.001
APRS-16 Factor 1: Negative Affect and Emotional Response			
Pearson’s r	.37	.28	.33
p value	<.001	<.001	<.001
APRS-16 Factor 2: Reflecting and Adaptive Help-Seeking			
Pearson’s r	.31	.20	.33
p value	<.001	<.001	<.001
APRS-16 Factor 3: Adaptive Thought Processes			
Pearson’s r	.36	.20	.42
p value	<.001	<.001	<.001
APRS-16 Factor 4: Perseverance			
Pearson’s r	.30	.25	.24
p value	<.001	<.001	<.001

Implications

- Development of a valid and reliable measure of academic resilience in student pharmacists was a necessary first step in developing a better understanding of this critical noncognitive factor.
- Evidence supports the reliability and validity of the APRS-16.
- Future studies should investigate the relationship between academic resilience and academic outcomes among student pharmacists, as well as the impact of interventions to promote resilience and success in this population.