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# Evidence of Validity of the Geriatric Anxiety Scale for Use among Medically Ill Older Adults

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## Abstract

**Introduction:** This study examined the psychometric properties of the Geriatric Anxiety Scale (GAS) in a sample of medically ill older adults. Method: Data were collected from older adults (*N* = 38; *M* age = 69.9 years) with at least one chronic physical health condition, who completed the GAS, the Beck Anxiety Inventory (BAI), the Geriatric Anxiety Inventory (GAI), the Patient Health Questionnaire (PHQ-9), and the RAND 36-Item Health Survey (SF-36). Results: Regarding validity, the GAS total score was significantly and positively correlated with the BAI (*r* = .73), as were the subscales: Cognitive (*r* = .73), Affective (*r* = .66), and Somatic (*r* = .61). The GAS total score was also significantly and positively correlated with the GAI (*r* = .82), as were the subscales: Cognitive (*r* = .85), Affective (*r* = .80), and Somatic (*r* = .60). These correlations were in the expected directions, thus providing strong evidence of convergent validity. Regarding relationships with depression, the GAS total score was significantly correlated with the PHQ-9 (*r* = .84), as were its subscales: Cognitive (*r* = .80), Affective (*r* = .83), and Somatic (*r* = .66). These correlations indicate that those who reported more anxiety symptoms also reported more depressive symptoms. Regarding relationships with subjective health status, the GAS total score was significantly correlated with the SF-36 total scale (*r* = -.68), as were the subscales: Cognitive (*r* = -.60), Affective (*r* = -.62), and Somatic (*r* = -.65). These correlations indicate that those who endorsed more symptoms of anxiety also rated their overall subjective health status as poorer. Discussion: These data provide evidence of strong psychometric properties of the GAS for use with medically ill older adults.

**Keywords: Anxiety; Assessment; Validity; Geriatric Anxiety Scale**

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## Introduction

The Geriatric Anxiety Scale [1] is an increasingly popular self-report assessment measure of anxiety designed specifically for use with older adults. The GAS has accumulated a wealth of evidence of reliability and validity in diverse community and clinical samples of older adults [1-4]. The purpose of this study was to examine the preliminary psychometric properties of the GAS in a sample of medically ill older adults, as anxiety is a common problem among people with chronic medical challenges, especially those in later life [5]. Unfortunately, anxiety among older individuals in medical settings is highly prevalent but largely undetected and under-treated [6-8]. Sadly, the impacts of excessive anxiety in later life are extensive, including poor quality of life, excess disability, cognitive impairments, elevated health care costs, and psychiatric comorbidity, especially with depression [5,9]. Taken together, these factors highlight the need for appropriate and brief assessment tools to be administered routinely in medical settings. Such assessment tools provide the opportunity to coordinate appropriate treatment and to maximize the well-being of older adult patients.

## Method

### Participants and procedure

Data were collected from older adults (*N* = 38; *M* age = 69.9 years, *SD* = 8.0 years, range = 60 to 90 years, 82% female) with at least one chronic physical health condition (*M* number of self-reported health conditions = 3.36, *SD* = 1.67, range = 1-7), including high blood pressure, high cholesterol, heart disease/history of heart attack, diabetes, arthritis, hypothyroidism, Parkinson's disease, multiple sclerosis, and Lyme disease. Participants were recruited from a variety of sources, including primary care clinics for seniors, a local Senior Center, an intensive outpatient day treatment center for medically frail older adults, and an independent living section of an assisted living facility.

**Table 1:** Correlations among Demographic Variables, GAS, GAI, BAI, PHQ-9, and SF-36 total Scale Scores.

| | Sex | Edu | GAS | Cognitive | Affective | Somatic | GAI | BAI | PHQ-9 | SF-36 |
|---|---|---|---|---|---|---|---|---|---|---|
| Age | -.17 | .05 | -.18 | -.18 | -.14 | -.15 | -.13 | .17 | -.26 | -.15 |
| Sex | - | -.05 | -.15 | -.11 | -.13 | -.2 | -.17 | -.03 | -.11 | .42* |
| Education (years) | - | - | -.17 | -.18 | -.18 | -.09 | -.19 | -.23 | -.26 | .09 |
| GAS Total | - | - | - | .94** | .93** | .87** | .82** | .73** | .84** | -.68** |
| GAS Cognitive | - | - | - | - | .87** | .71** | .85** | .73** | .80** | -.60** |
| GAS Affective | - | - | - | - | - | .68** | .80** | .66** | .83** | -.62** |
| GAS Somatic | - | - | - | - | - | - | .61** | .61** | .67** | -.66** |
| GAI | - | - | - | - | - | - | - | .70** | .83** | -.57** |
| BAI | - | - | - | - | - | - | - | - | .71** | -.60** |
| PHQ-9 | - | - | - | - | - | - | - | - | - | -.73** |

**Note:** Edu: Education (Years); GAS: Geriatric Anxiety Scale; GAS Cognitive: GAS Cognitive subscale; GAS Affective: GAS Affective Subscale; GAS Somatic: GAS Somatic Subscale; GAI: Geriatric Anxiety Inventory; BAI: Beck Anxiety Inventory; PHQ-9: Patient Health Questionnaire; SF-36: RAND 36-Item Health Survey; Sex coded 0: female; 1: male.
*$p < .05$, **$p < .01$.

Participants anonymously completed the research packet consisting of several self-report measures.

### Measures

**Geriatric Anxiety Scale (GAS):** The GAS [1] is a self-report measure of anxiety symptoms designed for use with older adult populations, which includes a total score and 3 subscale scores, measuring cognitive, affective, and somatic symptoms. The measure contains 25 self-report items used for scoring, as well as 5 additional items that assess common topical concerns of anxiety among older adults (for example, worry about becoming a burden to one's children). Participants are asked to rate symptoms of anxiety by indicating how often they have experienced each symptom during the past week on a Likert-type scale that ranges from 0 (*not at all*) to 3 (*all of the time*). Possible total scores range from 0 to 75, with higher scores indicating the presence of more severe anxiety. The GAS has demonstrated high internal consistency of scale scores and strong evidence of validity for the quantitative assessment of anxiety symptoms in diverse community and clinical samples of older adults [1-4].

**Beck Anxiety Inventory:** The BAI [10] is a self-report measure of anxiety intended for use with adults. It contains a list of 21 symptoms which are rated from 0 (*not at all*) to 3 (*severe*). Possible scores range from 0 to 63, with higher scores indicating more severe anxiety. Although the BAI is not an elder-specific measure, it has evidence of adequate psychometric properties in older adult samples [11,12].

**Geriatric Anxiety Inventory**: The GAI [13] is a 20-item self-report elder-specific assessment tool for anxiety. Participants are asked to respond yes or no to statements regarding their experience with anxiety during the past week. Internal consistency of scale scores is high, as is its convergent validity with other measures [13]. Possible scores range from 0 to 20 with higher scores indicating the presence of more severe anxiety.

**Patient Health Questionnaire (PHQ-9):** The PHQ-9 is a self-report measure of depressive symptoms, based on DSM diagnostic criteria for major depressive disorder [14]. Respondents indicate how often they experienced each symptom over the previous two weeks on a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Higher total scores indicate greater severity of depression, with possible scores ranging from 0 to 27. The PHQ-9 has demonstrated good reliability and validity among the general population [15].

**RAND 36-Item Health Survey 1.0 (SF-36):** The SF-36 is a self-report questionnaire measuring self-perceived health and functional status [16]. It contains 36 items assessing eight domains of health: 1) limitations in physical activities due to health problems; 2) limitations in social activities due to physical or emotional problems; 3) limitations in role obligations due to physical health problems; 4) pain; 5) mental health; 6) limitations in role activities due to emotional problems; 7) vitality; and 8) general perceptions of health. Possible scores for each variable range from 0 to 100, and higher scores indicate better health. The SF-36 is widely used in epidemiological research, and the measure has demonstrated adequate psychometric properties in older adult samples [17].

## Results

### Reliability analyses

The reliability of the GAS total scale in this sample was excellent (Cronbach's $\alpha = .94$). Reliability values of the GAS subscale scores were excellent to good (Cognitive = .89, Affective = .87, Somatic = .79).

### Validity

To test the convergent validity of the GAS in this sample, correlations were calculated among the GAS, BAI, and GAI (Table 1). As can be seen in the table, the GAS total score was significantly and positively correlated with the BAI ($r = .73$, $p < .001$, 53% variance shared), as were the subscales: Cognitive ($r = .73$, $p < .001$, 53% variance shared), Affective ($r = .66$, $p < .001$, 44% variance shared), and Somatic ($r = .61$, $p < .001$, 37% variance shared). The GAS total score was also significantly and positively correlated with the GAI ($r = .82$, $p < .001$, 67% variance shared), as were the subscales: Cognitive ($r = .85$, $p < .001$, 72% variance shared), Affective ($r = .80$, $p < .001$, 64% variance shared), and Somatic ($r = .60$, $p < .001$, 36% variance shared). These correlations were in the expected directions, providing strong evidence of convergent validity.

To examine the relationship with depression, correlations were calculated between the GAS and the PHQ-9 (see Table 1). The GAS total score was significantly correlated with the PHQ-9 ($r = .84$, $p < .001$, 71% variance shared), as were the subscales: Cognitive ($r = .80$, $p < .001$, 64% variance shared), Affective ($r = .83$, $p < .001$, 69% variance shared), and Somatic ($r = .66$, $p < .001$, 44% variance shared). These

correlations indicate that those who reported more anxiety symptoms also reported more depressive symptoms.

To assess the degree to which GAS scores were related to subjective health status, correlations were calculated among the GAS and the SF-36 total score (Table 1). On the SF-36, lower scores reflect poorer subjective health. As expected, the GAS total score was significantly negatively correlated with the SF-36 total scale ($r$ = -.68, $p$ < .001, 46% variance shared), as were the subscales: Cognitive ($r$ = -.60, $p$ < .001, 38% variance shared), Affective ($r$ = -.62, $p$ < .001, 40% variance shared), and Somatic ($r$ = -.65, $p$ < .001, 42% variance shared). These correlations indicate that those who endorsed more symptoms of anxiety also rated their overall subjective health status as poorer.

## Discussion

The reliability of the GAS and its subscales ranged from good to excellent in this sample of medically ill older adults. The GAS demonstrated strong convergent validity in its relationships to other measures of anxiety and mental health, and demonstrated significant overlap with a measure of depression. The GAS also demonstrated significant overlap with a measure of subjective health status, indicating that those with elevated anxiety symptoms are likely to also rate their health more poorly. These data provide evidence of strong psychometric properties of the GAS for use as a screening tool with medically ill older adults.

Of course, screening for anxiety symptoms is only the first step toward prevention, intervention, and treatment. For example, once elevated levels of anxiety are detected, respondents may benefit from low barrier early intervention strategies and self-help interventions, to help them manage anxiety more effectively and to prevent the development of clinical anxiety disorders. Likewise, older patients with significant anxiety in the context of medical issues may benefit from behavioral health services that are increasingly integrated into primary care and other medical settings (Behel & Rybarczyk [18]. Indeed, for any of these interventions to occur, there exists a pressing need for better and more accurate assessment and screening of anxiety symptoms among physically ill older adults. The present study suggests that the GAS may be of value in this endeavor, and further research appears warranted, with larger and more diverse samples of medically ill older adults.

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