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GENERALIZED ANXIETY DISORDER SEVERITY SCALE (GADSS) VALIDATION IN OLDER ADULTS

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Abstract

Objectives—The Generalized Anxiety Disorder Severity Scale (GADSS) is a validated measure of Generalized Anxiety Disorder symptom severity. Given the high prevalence of Generalized Anxiety Disorder (GAD) in the elderly and the need for a validated scale to assess GAD severity in this age group, we examined the psychometric properties of the GADSS in the elderly.

Design, Setting, Participants—We examined a sample of 134 elderly subjects (age 60 and above) who met diagnostic criteria for current GAD, 33 healthy elderly comparison subjects (age 60 and above) and 186 younger subjects (age 18 to 60) diagnosed with GAD.

Results—The GADSS had a high internal consistency in the elderly subjects (raw Cronbach's alpha =0.76). Pearson correlations showed a significant positive correlation between GADSS, Hamilton Rating Scale for Anxiety and Penn State Worry Questionnaire. Pearson correlations showed an inverse significant correlation between GADSS and the Medical Outcome Study SF-36. There was no correlation between GADSS and Mini Mental State Examination or Cumulative Illness Rating Scale for Geriatrics.

Conclusions—The results showed a good convergent, concurrent and discriminant validity of the GADSS when used for elderly with GAD. We conclude that GADSS is a valid measure of GAD symptom severity in older adults.

Keywords

Generalized Anxiety Disorder; Elderly; Severity Scale

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Conflict of interest

Carmen Andreescu, Bea Belnap, Bruce Rollman, Patricia Houck, Caroline Ciliberti and Sati Mazumdar do not have any potential conflict to acknowledge. M. Katherine Shear has received research support from Forest Pharmaceuticals. Eric J. Lenze has received research support from OrthoMcNeill and Forest Pharmaceuticals.

INTRODUCTION

Epidemiologic studies of community-living elderly have found that generalized anxiety disorder (GAD) is common, with a prevalence of 3–7%, which is comparable to prevalence estimates in the general adult population (1,2). Furthermore, GAD in elderly is associated with impairments in quality of life (3,4), cognitive impairment (5,6), increased health care utilization (3), and poorer functional recovery after disabling medical events (e.g. stroke)(3,7).

The bimodal distribution in age of onset in GAD – with a second peak after age 50 (8,9) - suggests a specific geriatric pathway leading to the development of late-life GAD (10). Late-life GAD represents probably more than a geriatric version of middle-age GAD, having its own unique phenomenological as well as neurobiological profile conditioned by the vascular and degenerative changes affecting the aging brain (11,12). Thus, elderly GAD patients report more frequent and uncontrollable worry, different worry content, higher prevalence of most associated symptoms, and more distress or impairment than normal controls, and they have a different pedigree of discriminative associated symptoms than younger adults with GAD (more muscle tension and sleep disturbance and less fatigue and difficulty concentrating, the latter two probably confounded by other age-associated conditions) (10,11). While late-onset GAD has a considerable symptomatic overlap with depressive disorders (13), little is known about the link between chronic anxiety and cognitive decline or medical comorbidities such as COPD or cardiovascular disease. Elderly persons with late-life GAD have a three-time increased risk of health-related activity limitation, compared to normal controls (3), which was on par with the disability associated with late-life major depressive disorder (2). The neuropsychological impairments in late-life GAD also represent a relevant area of research for the elderly, given their vulnerability to worsening cognition from numerous causes. Recent studies reported impaired short-term memory, decreased attention and impaired learning (5,14,15). So far, the accumulated evidence points toward a bidirectional causal relationship between late-life anxiety and cognitive impairment: one direction suggests that impaired cognitive performance increases anxiety (16), and the other one suggests that chronic anxiety states such as GAD may increase the risk for CNS damage (17), due to chronically elevated cortisol or blood pressure (18), or excessive benzodiazepines prescription (19).

As such, psychotherapy and pharmacotherapy studies are needed in older GAD population, but the late-life GAD treatment field is still in its infancy(20). Also, given the high comorbidity of GAD with late life depression (21) and the negative impact of anxiety symptoms on the treatment of late life depression (22), it is important to measure the extent of “comorbid” GAD symptoms in studies of late life depression.

The Generalized Anxiety Disorder Severity Scale (GADSS) is the only published scale that specifically measures symptom severity in GAD (23). However, the published data regarding its psychometric properties included only subjects younger than 60 (23). Between 25% (24) and 46% (25) of the elderly persons with GAD report onset of their illness after the age of 60. Also, elderly persons may have a qualitatively different phenomenological expression of anxiety than younger persons (11). Thus, we carried out a study to compare the psychometric properties of the GADSS in elderly persons with the psychometric properties of the GADSS in a younger adult sample.

We hypothesized that GADSS will prove to be a valid and reliable scale to measure symptom severity of GAD in the elderly.

We examined the inter-rater reliability of GADSS scoring in the elderly as well as its internal consistency in the elderly persons. We also determined the convergent, concurrent and discriminant validity of the scale in this population. The purpose of our study is to determine

whether the GADSS has acceptable psychometric properties for measuring severity of GAD symptoms in the elderly persons.

METHOD

The GADSS is a six-item scale developed specifically to assess the severity of GAD symptoms (23). As GAD is centrally defined by difficult-to-control worry, the GADSS begins with a target worry list to identify situations that are the focus of the worry (health, family, finances, social relationships, intimate relationships, work, school, daily activities) (23). It also identifies two target symptoms among the six associated DSM-IV-TR symptoms (restlessness/feeling keyed up, fatigue, difficulty concentrating/mind going blank, irritability, muscle tension, sleep disturbance)(23). After establishing the target worry domain and the associated symptoms, the scale is scored by a clinician on the following six items: frequency of worry, distress due to worry, frequency of associated symptoms, severity and distress of associated symptoms, impairment in work and impairment in social function (23). Each of these items is scored on a 5-point severity scale, ranging from 0=none to 4=very severe (23). We made minimal changes when we adapted the scale for the elderly to evaluate the severity of distress due to worry and of the distress due to associated symptoms. Thus, we altered the scoring anchors in order to differentiate more clearly between moderate, severe and very severe distress. For moderate distress we added the qualifier “does not interfere with activities and relationships”, for severe distress we added: “does interfere with activities and/or relationships” and for very severe distress we added “incapacitating”.

Data were collected from two studies. Elderly GAD subjects (age 60 and over) and healthy comparison elderly subjects were recruited from the “Pharmacotherapy of Late-life Generalized Anxiety Disorder”, a 12-week randomized, double-blind, placebo-controlled trial designed to examine the efficacy of pharmacotherapy with escitalopram in late life GAD. Subjects for this study were recruited from various primary care practices and self-referrals from the community.

Younger subjects (age 18 to 60) were recruited into “Improving Quality of Primary Care for Anxiety Disorders”, a 12-month randomized controlled effectiveness trial designed to evaluate a self-management program’s benefit in treating anxiety disorders in the community. Subjects for this study were recruited from four primary care practices of the University of Pittsburgh Medical Center.

Baseline data from these studies were used for the present analysis. At baseline, elderly subjects were psychotropic-free. Among younger subjects, 145 (77%) took psychotropics in the two years prior to recruitment. Elderly subjects were diagnosed using the Structured Clinical Interview for DSM IV (SCID) (26) and younger subjects were diagnosed using the Primary Care Evaluation of Mental Disorders (PRIME-MD)(27). For the elderly subjects, in addition to the GADSS, the following instruments were used: Hamilton Rating Scale for Anxiety (HRSA) (28), Hamilton Rating Scale for Depression (HRSD) (29), Penn State Worry Questionnaire (PSWQ) (30), the Mini Mental State Examination (MMSE) (31). Burden of medical illness was assessed using the Cumulative Illness Rating Scale for Geriatrics CIRS-G (32) and the health-related quality of life was assessed using the Medical Outcome Study SF-36 (MOS) (33). For the younger subjects, in addition to the GADSS, the following instruments were used: HRSA, the nine-item depression scale of the Personal Health Questionnaire (PHQ-9) (34) as well as the SF-36 (MOS). The statistical difference between demographic and clinical variables in the three groups was analyzed by using a single-factor ANOVA (the F-test statistic) for variables available for all three groups and a Student’s t test for variables available for the elderly group (subjects and comparison).

To determine the convergent validity, we determined the internal consistency construct validity (= the correlation between the GADSS items) and the concurrent validity (= the degree to which the GADSS correlates with other well known instruments measuring anxiety). We performed a factor analysis of the GADSS and we assessed an item-by-total correlation. To determine the concurrent validity we examined the correlation of GADSS scores with the SCID diagnoses of GAD in the elderly subjects, as well as the Pearson r correlation of GADSS with HRSA and PSWQ. To determine the discriminant validity (=the correlation with instruments assessing disorders others than GAD) we used the Pearson r correlation of GADSS with HRSD and PHQ-9. We examined the correlation of GADSS not only with the total HRSD score, but also with the core sub-scale (items 1,2, 3 and 7 corresponding to mood, guilt, suicidal ideation and anhedonia) (35) in an effort to explore further the delineation between instruments assessing depressive symptoms and GADSS. For further examination of the discriminant validity, we determined the correlation of GADSS scores in the elderly subjects with other anxiety disorders (as diagnosed by SCID) comorbid with GAD, with the cognitive status (as measured by MMSE), with the medical comorbidity (as measured by CIRS-G) and with the quality of life assessment (the physical and mental subscale of SF-36).

We determined the inter-rater reliability based on eight videotaped interviews followed by independent ratings produced by each of the four evaluators. The eight-videotaped interviews included both young adult actors as well as elderly GAD subjects from the “Pharmacotherapy of Late-life Generalized Anxiety Disorder” study. The four evaluators were bachelor’s level research specialists with one to two years of experience in administrating the GADSS. Each evaluator independently rated each of the eight tapes.

RESULTS

The demographic and clinical characteristics are presented in table 1. 50 elderly subjects also had other anxiety disorders: Agoraphobia 2, Obsessive-Compulsive Disorder 2, Panic Disorder 23, Post-traumatic stress disorder 5, Social phobia 15, Specific Phobia 23, Anxiety disorder NOS 1. Among younger subjects, 102 subjects had GAD, 27 had Panic Disorder and 76 had GAD with comorbid Panic Disorder.

The GADSS inter-rater reliability (IRR) was tested using an intra-class correlation coefficient. The IRR for the elderly subjects was 0.99 (N=134).

Raw Cronbach’s alpha for the GADSS was 0.76 in both younger and elderly subjects with GAD, indicating an acceptable internal consistency.

Factor analysis produced one factor that accounted for 71 % of the variance. All items achieved a loading ≥0.7. The item-by-total correlations revealed a raw Cronbach’s alpha between 0.69 and 0.73 (r ranging from 0.47 to 0.61) for both younger and elderly subjects.

Pearson correlations showed a significant positive correlation between GADSS and HRSA ($r=0.55$, $N=134$, $p<0.001$) for both elderly and younger subjects, between GADSS and PSWQ for elderly subjects with GAD ($r=0.37$, $N=134$, $p<0.001$), between GADSS and HRSD for the elderly ($r=0.6$, $N= 134$, $p<0.001$) and between GADSS scores and PHQ 9 for the younger subjects ($r=0.51$, $N=186$, $p<0.001$) (see table 2). Of note, there was a stronger correlation between GADSS and total HRSD than between GADSS and core HRSD ($r=0.6$ and 0.45 respectively). We also tested the difference between the GADSS-HRSA correlation and the GADSS-PSWQ correlation (chi-square=4.8, df=1, $p=0.02$) (36). Pearson correlations showed an inverse significant correlation between GADSS and MOS, more pronounced for the mental component ($r= -0.51$, $N=132$, $p<0.001$) than for the physical component ($r= -0.23$, $N= 132$, $p<0.01$) (see table 2). There was no significant correlation between GADSS and MMSE or CIRS-G (see table 2). There was no significant correlation between severity of GADSS score

and the presence of a comorbid anxiety disorder in the elderly subjects with GAD (t=−0.12, def=134, p=0.9). There was no significant correlation between severity of GADSS scores and either age or gender in neither younger nor elderly subjects. ($r<0.05$, $p>0.53$).

CONCLUSION

This study extends findings for the GADSS from younger adults and demonstrates its adequate psychometric properties for assessing the severity of GAD in the elderly. The results show a high internal consistency and inter-rater reliability and a good convergent and divergent validity, supporting the use of the scale in this age group. This study suggests that the GADSS is a valid, reliable instrument for studies that assess the severity of GAD symptoms in the elderly.

In terms of convergent validity, the correlation between GADSS and HRSA was significantly higher than between GADSS and PSWQ. PSWQ uses a more longitudinal approach and explores more ingrained worry patterns (“trait” anxiety), while GADSS evaluates the cross-sectional severity of worry symptoms (“state” anxiety), which might be correlated stronger with the current severity of illness and level of impairment. The significant correlation between GADSS and PHQ-9 or HRSD, including core and non-anxious HRSD items, is not surprising and likely reflects the overlap of anxiety and depression(37), including the high comorbidy of anxiety and depression in late life (21,38) and the probable shared vulnerabilities of these two syndromes (39–42). However, the correlation with the total HRSD score was higher than the correlation with core HRSD, indicating HRSD’s multidimensionality and the weight of anxiety symptoms in the total HRSD (43). It also points toward a more accurate discrimination between the GADSS and core mood symptoms described in the core HRSD subscale. However, given the different reliabilities of the full and core HRSD scales it is difficult to draw a final conclusion regarding these differences.

The lack of significant correlation between GADSS and other anxiety disorders comorbid with GAD is a good indicator for GADSS specificity for generalized anxiety.

Our study has several limitations. We did not include subjects without any psychiatric illness or subjects with other psychiatric illnesses but without anxiety disorders. Also, due to the limited coexistence of other anxiety disorders (especially OCD or PTSD) we can only make limited inferences about the specificity of the measure for OCD and PTSD. However, this is one of the few studies validating a GAD measure for the elderly population. Current anxiety assessment instruments have been designed for a general adult population and their import in the geriatric mental health field is rarely validated (44). Tailoring these measures for the elderly is essential given the different profile of late-life anxiety, including different perceptions and descriptions of symptoms used by the elderly, the clinical particularities including somatic symptoms overlapping in medical conditions and late-life anxiety (11).

In conclusion, we demonstrate that the GADSS can be utilized for measuring GAD symptom severity in the elderly, as it provides an accurate and sensitive measure of symptom severity in this population.

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Table 1

Clinical and demographic characteristics of the subjects

	GAD Elderly Subjects (group A) (N=134)	Comparison Elderly Subjects (group B) (N=33)	GAD General Adult Subjects (group C) (N=186)	t Test ([1])/chi Square ([2])	One way ANOVA (F-test)	df	p value	Pairwise comparison (Tukey post-hoc test)
Demographic								
Age – Mean (SD)	72.1 (8.0)	74.3 (6.2)	43.4 (10.4)		439.98	2,350	0.0001	C<B, A
%Men	35%	33%	27%		2.59	2	0.27	
%White	81%	100%	83%	7.10([2])		2		
Other Anxiety disorders N (%)	50 (37%)	-	103 (55%)					
Education - Mean (SD)	13.8 years (3.0)	14.2 years (2.9)	80% ≥ 12th grade	#	#	#	#	
Clinical measures – Mean (SD)								
GADSS	12.4 (3.1)	1.6 (2.1)	15.3 (3.4)		260.21	2,350	0.0001	A≠B≠C
HRSA	23.0 (4.7)	5.1 (3.9)	28.6 (6.8)		230.78	2,350	0.0001	A≠B≠C
PHQ9	*	*	13.5 (5.3)					
HRSD	12.2 (4.1)	1.8 (2.1)	**	14.18 ([1])		165	0.0001	
MMSE	28.1 (2.0)	29.0 (1.3)	**	2.22 ([1])		160	0.028	
PSWQ	57.4 (12.2)	29.0 (7.6)	**	11.90 ([1])		159	0.0001	
CIRS	9.1 (3.9)	9.3 (3.1)		1.13 ([1])		160	0.26	
MOS MCS	40.8 (8.8)	59.4 (3.7)	28.3 (11.0)		168.12	2,348	0.0001	A<B<C
MOS PCS	41.1 (11.3)	47.5 (7.2)	46.6 (11.8)		10.38	2,348	0.0001	A<B, C

GADSS= Generalized Anxiety Disorder Severity Scale; HRSA= Hamilton Rating Scale for Anxiety; PHQ9= Patient Health Questionnaire, 9-item depression scale; HRSD= Hamilton Rating Scale for Depression; MMSE=Mini Mental State Examination; PSWQ=Penn State Worry Questionnaire; CIRS-G=Cumulative Illness Rating Scale for Geriatrics; MOS MCS= Medical Outcome Stud, mental component scale; MOS PCS= Medical Outcome Study, physical component scale; df= degrees of freedom;

not compared due to different scales used for assessment;

* measure unavailable for the elderly subjects;

** measure unavailable for the younger subjects.

Table 2

Correlation between GADSS and other scales

	Scale	GAD elderly subjects		GAD general adult subjects	
		Pearson Correlation Coefficient (r)	**N**	**Pearson Correlation Coefficient (r)**	**N**
Convergent Validity	HRSA	0.55**	134	0.62**	186
	PSWQ	0.37**	134		
Discriminant Validity	HRSD total	0.60**	134		
	Core HRSD	0.45**	134		
	PHQ9			0.51**	186
	MMSE	0.06	130		
	CIRS	0.17	116		
	MOS - MCS	–0.51**	132	–0.64**	186
	MOS - PCS	–0.23*	132	–0.27**	186

* p <.01;

** p <.001

GADSS= Generalized Anxiety Disorder Severity Scale; HRSA= Hamilton Rating Scale for Anxiety; PHQ9= Patient Health Questionnaire, 9-item depression scale; HRSD= Hamilton Rating Scale for Depression; MMSE=Mini Mental State Examination; PSWQ=Penn State Worry Questionnaire; CIRS-G=Cumulative Illness Rating Scale for Geriatrics; MOS MCS= Medical Outcome Study, mental component scale; MOS PCS= Medical Outcome Study, physical component scale.