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Anxious symptoms and cognitive function in non-demented elderly adults: an inverse relationship

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Abstract

Objective—The goals of this study were to determine the relationship between anxious symptoms and cognitive functioning in a non-demented, community-dwelling elderly sample (N = 48), and to determine the effect of depressive symptoms upon this relationship.

Methods—Anxious and depressive symptoms were assessed using Symptom Checklist 90-Revised. Cognitive functioning was assessed with the Repeatable Battery for the Assessment of Neuropsychological Status.

Results—Results indicated that while both cognitive functioning and anxious symptoms were within normal limits in this sample, anxious symptoms showed a significant, inverse relationship with global cognitive function [r(47) = −.400, p = .005]. In addition, specific relationships were noted between severity of anxious symptoms and visuospatial/constructional ability as well as immediate and delayed memory. With regard to the secondary objective, both anxiety and depressive symptoms together accounted for the highest level of variance [R^2 = .175, F(2, 45) = 4.786, p = .013] compared to anxiety [R^2(47) = .160, p = .005] and depression [R^2(47) = .106, p = .024] alone. Nevertheless, neither anxious nor depressive symptoms emerged as a unique correlate with cognitive ability [r(47)= −.278, p = .058; r(48)= −.136, p = .363, respectively].

Conclusion—This study demonstrates that subthreshold anxiety symptoms and cognitive functioning are significantly related even among generally healthy older adults whose cognitive ability and severity of anxious symptoms are within broad normal limits. These findings have implications both for clinical care of elderly patients, as well as for cognitive research studies utilizing this population.

Keywords

anxiety; cognitive function; elderly

Introduction

Until recently, research on the effects of psychopathology on cognition in elderly adults has focused primarily on depressive symptoms. While depression has proven to have negative effects on cognitive function (Chodosh, Kado, Seeman and Karlamangla, 2007; Wilson, de Leon, Bennett, Bienias and Evans, 2004), the analogous relationship of anxiety with cognitive ability has been less thoroughly researched. To date, studies show accumulating evidence of cognitive dysfunction in persons with anxiety disorders (Bannon *et al.*, 2008; Johnsen and Asbjornsen, 2008; Johnsen and Asbjornsen, 2009; Mantella *et al.*, 2007; Schultz *et al.*, 2005; Haikal and Hong, 2010; Beekman *et al.*, 1998).

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The current literature establishes that cognitive dysfunction has been associated with *diagnosed* anxiety disorders including Obsessive Compulsive Disorder (OCD; Bannon *et al.*, 2008), Post Traumatic Stress Disorder (PTSD; Johnsen and Asbjornsen, 2008; Johnsen and Asbjornsen, 2009), Generalized Anxiety Disorder (GAD; Mantella *et al.*, 2007), and Phobic Anxiety (Schultz *et al.*, 2005) with GAD being the most prevalent among elderly adults (Beekman *et al.*, 1998). The summation of this literature suggests that cognitive dysfunction, while evident, manifests differently in varying types of anxiety. For example, in OCD, cognitive facilitation and inhibition are most associated with anxiety (Bannon et al., 2008), while PTSD is mostly related to verbal and delayed memory (Johnsen and Asbjornsen, 2008; Johnsen and Asbjornsen, 2009). Phobic anxiety is less definitive suggesting that phobic anxiety is associated with overall cognitive ability (Schultz et al., 2005) and in GAD, the short-term and delayed memory functions are primarily related to cognitive function (Beekman et al., 1998).

One significant limitation of the existing literature is that it tends to focus on younger adults. Of the literature reviewed, one study, closest in relationship to the current study, did assess cognition and anxiety in an elderly sample. Wetherell *et al.* (2002) assessed self-reported state (current) versus trait (chronic) anxiety symptoms and their relationships to cognitive function in a healthy elderly sample. The neuropsychological battery used in that study consisted of tests of verbal reasoning, knowledge, visuospatial skills, perceptual speed and attention. The authors demonstrated a linear inverse relationship between state anxiety and cognition in this sample. This linear relationship is a unique finding compared to the inverted U relationship seen between state anxiety and cognition in previous studies (Bierman, EJM, Comijs, HC, Jonker, C et al., 200; Bierman, EJM, Comijs, HC, Jonker, C et al., 2008). Briefly, the inverted U ideology suggests that an optimal level of anxiety is necessary to obtain peak cognitive function. Nevertheless, no definitive conclusions could be made regarding trait anxiety in Wetherell et al.'s study. This non-significant finding of trait anxiety and cognitive decline may be due to a relatively low incidence of late-life anxiety disorders. Additionally, Wetherell *et al.*'s sample was comprised of only twin adults, who may systematically differ from single-birth individuals, limiting the generalizability of these findings.

An additional limitation to the existing literature is that is concentrates on formerly diagnosed anxiety disorders. Elliman and colleagues (2007) however, examined young adults ages 18–31 without formally diagnosed anxiety disorders. In a cross-sectional study, they found that even sub-clinical levels of anxious symptoms were associated with lower levels of cognitive performance, specifically related to sustained attention. Their findings suggest that even subclinical levels of anxiety may negatively impact cognitive ability. While this study did find a relationship between sub-clinical levels of anxious symptoms and cognitive ability, it cannot be generalized to the aging population and it lacks depression as a covariate. Additionally, it lacks a thorough neuropsychological battery. Given that depression is highly associated with anxiety (Lowe, Spitzer, Williams, Mussell, Schellbert and Droenke, 2008) and sub-clinical depressive symptoms alone have been associated with cognitive impairment (Chodosh et al., 2007; Wilson et al., 2004) it is important to assess the relationship of both variables with cognitive function.

It has been suggested that the current criteria for anxiety disorders do not adequately classify anxiety in the elderly population (Pachana *et al.*, 2007); Flint (1994) proposed that anxiety manifests itself differently in elderly persons compared to younger adults and consequently may not be adequately measured. Flint advised that if diagnosed anxiety must interfere with daily living, then the elderly may be under-diagnosed as their daily living activities tend to become more limited. Parallel to Flint's theory, research has suggested that "subthreshold" anxiety symptoms are more prevalent in an aging population than diagnosed anxiety

disorders (Beekman *et al.*, 1998; Forsell and Winbald, 1998; Smalbrugge *et al.*, 2005). Given that anxiety symptoms present on a spectrum ranging from mild to severe, it is vital to assess less severe symptoms to better determine at what point anxiety has a significant relationship with cognitive function.

Objective

Given that subthreshold anxiety symptoms are more common in a normal elderly population than anxiety diagnoses (Beekman *et al.*, 1998; Forsell and Winbald, 1998; Smalbrugge *et al.*, 2005), the present study was designed primarily to characterize the association of anxious symptoms and cognitive functioning in a sample of relatively healthy, community-dwelling older adults. Since previous studies have found an association between subclinical levels of anxiety in young adults (Elliman, Green, Rogers and Finch, 1997), we hypothesized that there exists a significant inverse relationship between severity of anxious symptoms and level of cognitive functioning in a normal aging, non-demented sample of elderly adults.

A secondary objective of the current study was to determine if depressive symptoms played an active role in the relationship of anxiety with cognition. Lowe and colleagues (2008) found an independent effect of diagnosed anxiety in participants with comorbid depression on daily functioning. Even though daily functioning is not equivalent to cognitive function, they are closely related. Therefore, we hypothesized that anxiety will share a significant relationship with global neuropsychological function, independent of depressive symptoms.

Methods

Participants

The study sample was comprised of 48 cognitively intact participants (35 women, 13 men; Mean age = 69 years, SD = 8; Mean education = 15 years, SD = 3). All participants were healthy comparison participants in a larger, ongoing study on vascular disease and cognition conducted at the University of Iowa Hospital and Clinics. To meet inclusion criteria as healthy comparisons, participants were required to be between the ages of 55 and 90. Exclusion criteria included diagnosis of atherosclerotic vascular disease, history of myocardial infarction, percutaneous transluminal coronary angioplasty, placement of coronary artery stent, or peripheral vascular disease, organ transplant, chronic heart failure, known history of stroke, dementia, learning disability, diagnosis of schizophrenia or bipolar disorder, other diagnosis of neurological disorder that may affect cognitive functioning, and history of head injury with loss of consciousness for more than 30 minutes.

At the time of evaluation, 28 participants endorsed at least some anxious symptoms and 27 endorsed at least some depressive symptoms. Nine participants were taking psychopharmaceuticals. Of those nine, seven participants were taking antidepressants, one participant was taking an anticonvulsant and one was taking an anxiolytic medication. Five of those participants who were taking psychopharmaceuticals had current or past care from a psychiatrist for anxious or depressive symptoms. However, none of the participants identified themselves as having active symptoms that they deemed to be significant problems at the time of enrollment. This research was approved by the University of Iowa Institutional Review Board. All participants provided written informed consent prior to participation.

Anxiety, Depression and Neuropsychological Assessment

Anxious and depressive symptoms were measured using the Anxiety and Depression sub-scales of the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994). This self-report questionnaire consists of 90 items that ask about psychological symptoms. The Anxiety Sub-

scale has been shown to be a valid indicator of anxious symptoms (Koeter, 1992; Steer and Ranieri, 1993; Cameron and Hudson, 1986). The Depression Sub-scale of the SCL-90-R has also been shown as a valid measurement of depressive symptoms (Clark and Friedman, 1983; Steer, Clark and Ranieri, 1994). Each participant was instructed to indicate how much they have been distressed by each symptom or problem in the past seven days. Scores range from zero (not at all) to four (extremely) for each item. The SCL-90-R provides a T-score, corrected for gender, for nine psychiatric domains, including anxiety and depression.

Cognitive functioning was assessed with the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS; Randolph, 1998). This 30-minute assessment includes 12 subtests that are represented by five age-corrected index scores testing a range of cognitive abilities: immediate memory, visuospatial/constructional, language, attention and delayed memory. These five scores are used to calculate a Total Scale Score for overall neuropsychological capability that is also corrected for age. The SCL-90-R was administered just prior to cognitive assessment for all participants.

Statistical Analysis

The SCL-90-R Anxiety T-scores, SCL-90-R Depression T-scores, RBANS Total Scale scores, as well as RBANS Index and subtest scores, were non-normally distributed, and thus, non-parametric analyses were employed to minimize the effect of non-normal distribution and outliers. In order to use covariates, all variables were ranked to allow for non-parametric analyses. Spearman's correlations were calculated between SCL-90-R Anxiety Scale T-score and RBANS Total Scale Score. After it was apparent that anxiety levels were significantly associated with RBANS Total Scale Score, follow-up Spearman's correlations were calculated to further characterize the relationships among severity of anxiety and the five RBANS Index Scores. In addition, partial correlations were calculated to demonstrate the relationship of the 12 individual RBANS subtests scores with anxiety.

Age, education and gender were not used as covariates in the primary analyses for several reasons. Age had already been adjusted for RBANS Total Scale Scores and was not correlated with SCL-90-R Anxiety T-scores. Age was used as a covariate only in follow-up correlations involving the 12 RBANS subtests because, unlike the RBANS Total Scale Score and Index Scores, the individual subtest scores are not age-corrected. Education, while correlated with the RBANS Total Scale Score, did not significantly affect the main outcome described below. Gender was not correlated with RBANS Total Scale Score but was already adjusted in SCL-90-R Anxiety T-scores.

To investigate whether the relationship between anxiety and cognition was independent of depressive symptoms, a multiple regression model was developed. In this model, SCL-90-R Depression T-scores, and SCL-90-R Anxiety T-scores were entered as independent variables, and RBANS Total Scale Score was the dependent variable. A follow-up bivariate and a partial correlation were conducted between cognitive ability and depressive symptoms. The partial correlation controlled for anxious symptoms.

Results

Descriptive statistics for RBANS and SCL-90-R Anxiety scores are shown in Table 1 and indicate that, as a group, participants were within normal limits with regard to cognitive functioning and severity of anxious symptoms.

As shown in Table 2, anxious symptoms (SCL-90-R Anxiety Scale score) were significantly and directly associated with depressive symptoms (SCL-90-R Depression Scale score) [$r(47) = .581$, $p \leq .000$]. Anxious symptoms were also significantly but inversely associated with

global neuropsychological functioning (RBANS Total Scale Score) [r(47) = −.400, p = .005]. Additionally, anxious symptoms were significantly and inversely associated with the RBANS Immediate Memory and Visuospatial/Constructional Index scores, and with four of the RBANS subtest scores that assess immediate and delayed story recall, ability to copy a geometric figure, and ability to judge and match the angles of lines ($p < .05$ for all). Given that nine participants were taking psychotropic medication, analyses were run both with and without those participants. All significant correlations between RBANS tests and anxiety symptoms with inclusion of medicated participants remained significant when medicated participants were excluded.

Results of the secondary objective assessing anxious and depressive symptoms' relationship to cognition were less clear. A multiple regression analysis of the relationship between anxious symptoms, depressive symptoms and cognitive ability indicated that, together, both anxious symptoms and depressive symptoms were significantly associated with RBANS Total Scale Score [R^2 = .175, F(2, 45) = 4.786, p = .013]. While neither anxious symptoms nor depressive symptoms emerged as a statistically significant correlate of global neuropsychological functioning, the relationship between neuropsychological functioning and anxiety, controlling for depression narrowly missed significance, whereas its relationship with depressive symptoms, controlling for anxiety did not [r(47)= −.278, p = .058; r(48)= −.136, p = .363, respectively]. However, the regression model did account for a higher amount of variance than either Spearman's correlation between cognitive function and anxiety [R^2(47) = .160, p = .005] and cognitive function and depression [R^2(47) = .106, p = .024].

Discussion

The aims of this study were two-fold. First, we assessed whether normal levels of anxiety were correlated with lower levels of neuropsychological function in a cognitively intact sample of elderly adults. Additionally, we sought to determine if anxiety had an independent relationship on global cognitive function, controlling for depressive symptoms.

With regard to the primary aim, our findings suggest that even within normal limits, elevated anxiety symptoms are related to poorer global cognitive functioning as measured by RBANS Total Scale Score. Additionally, we found that visuospatial/constructional ability was the cognitive function most strongly correlated with anxiety symptoms, though significant relationships were also detected in measures of immediate and delayed memory

Although the significant relationship noted was of a moderate magnitude, it is intriguing that this relationship exists among healthy, relatively normal, aging adults. These findings, in addition to Wetherell *et al.*'s findings, suggest that both lower levels of verbal and visual processing are inversely associated with elevated anxiety symptoms. Importantly, the inverted U relationship of anxiety symptoms and cognitive function, established between state anxiety and cognitive function (Bierman, EJM, Comijs, HC, Jonker, C et al., 200; Bierman, EJM, Comijs, HC, Jonker, C et al., 2008) seems not to apply in the context of the current study. This could be because that relationship changes in older age, as Flint (1994) suggested. It is also likely that the Anxiety scale of the SCL-90 is measuring a combination of both state and trait anxiety.

Although the mechanism involved in the relationship between anxiety and cognition remains unclear, Eysenck and Calvo (1992) proposed the Processing and Efficiency Theory which suggests that anxiety precedes cognitive dysfunction. Their theory posits that working memory is interrupted by anxiety, leading to poorer cognitive performance overall. Elliman et al. (2007) applied and tested this theory in a sample of young adults ages 18–31. They

found that with a processing-intensive measure of sustained attention in participants with low, medium and high levels of anxiety that participants with higher levels of anxiety did more poorly than those with low levels. The current study did not include a specific measure of working memory. However, it is plausible that anxiety-related disruption in working memory could lead to subsequent difficulty on other tasks including those involving visuospatial processing and memory.

The high comorbidity of anxiety with depression (Lowe et al., 2008) raises the question of whether anxious symptoms have an independent effect on global neuropsychological function or if depressive symptoms drive the relationship, leading to our secondary objective. In the current study sample, the multiple regression analysis suggests that anxious symptoms may have an association with global cognitive function separate from that of depressive symptoms; however the association did not reach the level of statistical significance. Given the strong relationship between depressive and anxious symptoms, this non-significant finding was not surprising. We propose however, that given the recruitment of a larger sample and/or measurement of anxious and depressive symptoms with more sensitive instruments, this relationship would resolve to the level of significant. Nevertheless, the regression model, incorporating both anxious and depressive symptoms in relation to cognitive ability accounted for a higher level of variance than either independent variable alone. This result suggests that while anxiety's relationship may or may not be independent from depression, accounting for both variables yields a stronger outcome.

The present study demonstrates that it is clinically relevant to consider subclinical levels of anxiety when assessing cognitive functioning in older adults. While these levels of anxiety may not require treatment, they may be correlated with early stages of cognitive decline or poor test performance. It is important for physicians to recognize this relationship given the possibility that cognitive dysfunction could be partially associated with anxious symptoms, even when those anxious symptoms are not necessarily severe. Furthermore, in patients whose level of anxiety does require treatment, effective treatment for the anxiety symptoms may reverse cognitive changes. Implications of this research should encourage clinicians to be more aware of subthreshold anxiety symptoms and their association with lower levels of cognitive performance in older adults.

The current findings also have additional implications for research. As a matter of protocol, researchers frequently control for depressive symptoms in cognitive performance studies, but this practice has not been typically expanded to include measures of anxiety symptoms in most studies. Our findings demonstrate that anxiety is an important variable to take into consideration when conducting research studies on cognitive performance in the elderly. Lower levels of cognitive performance may be at least partially associated with anxiety, in addition to depressive symptoms, in studies of Mild Cognitive Impairment, Alzheimer's disease, vascular dementia or other conditions that involve cognitive decline.

The present study is limited by small sample size. Additionally, the use of the SCL-90-R subtest for anxiety and depression limited the type and range of anxious and depressive symptoms that could be measured. Furthermore, due to the use of the SCL-90-R Anxiety Scale and the fact that extensive historical information regarding anxiety was not obtained, we were not able to ascertain whether state versus trait anxiety is more closely associated with cognitive functioning in our sample. A further limitation was that nine participants were taking psychopharmaceuticals. However, as noted above, an identical pattern of significant results was obtained both with and without inclusion of these participants.

Future research should employ more sensitive and specific measures of anxiety, along with additional historical information regarding participants' duration, type, and severity of

anxious symptoms. Additionally, longitudinal study would allow for determination of the relationship between anxious symptoms and cognitive decline across time. Nonetheless, the current findings are intriguing in that they reveal a significant relationship between anxious symptoms and cognitive functioning in generally healthy, cognitively intact elderly individuals who are experiencing subclinical levels of anxiety.

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References

1. Bannon S, Gonsalvez CJ, Croft RJ. Processing impairments in OCD: it is more than inhibition! Behav Res Ther. 2008; 46:689–700.10.1016/j.brat.2008.02.006 [PubMed: 18456243]
2. Beekman A, Bremmer M, Deeg D, Van Balkom A, Smit J, De Beurs E, Van Dyck R, Van Tilburg W. Anxiety disorders in later life: a report from the longitudinal aging study Amsterdam. Int J Geriat Psychiatry. 1998; 13:717–726.10.1002/(SICI)1099-1166(1998100)13:10<717::AID-GPS857>3.0.CO;2-M
3. Bierman EJM, Comijs HC, Jonker C, Beekman AT. Effects of anxiety versus depression on cognition in later life. Am J Geriatri Psychiatry. 2005; 13:686–693.
4. Bierman EJM, Comijs HC, Jonke C, Beekman AT. Anxiety symptoms and cognitive performance in later life: Results from the longitudinal study Amsterdam. Aging & Ment Health. 2008; 12:517–523.
5. Cameron OG, Hudson CJ. Influence of exercise on anxiety level in patients with anxiety levels. Psychosomatics. 1986; 27:720–723. [PubMed: 3774945]
6. Chodosh J, Kado DM, Seeman TE, Karlamangla AS. Depressive symptoms as a predictor of cognitive decline: MacArthur studies of successful aging. Am J Geriat Psychiatry. 2007; 15:720–723.
7. Clark A, Friedman M. Factor structure and discriminant validity of the SCL-90 in a veteran psychiatric population. J Pers Assess. 1983; 47:396–404. [PubMed: 6620108]
8. Derogatis, LR. SCL-90-R: Administration, scoring and procedures manual. National Computer Systems; Minneapolis: 1994.
9. Elliman N, Green M, Rogers P, Finch G. Processing-efficiency theory and the working-memory system: Impairments associated with sub-clinical anxiety. Pers Indiv Differ. 1997; 23:31–35.
10. Eysenck M, Calvo M. Anxiety and Performance: The processing Efficiency Theory. Cognition Emotion. 1992; 6:409–434.
11. Flint A. Epidemiology and comorbidity of anxiety disorders in the elderly. Am J Psychiatry. 1994; 151:640–649. [PubMed: 8166303]
12. Forsell Y, Winbald B. Feelings of anxiety and associated variables in a very elderly population. Int J Geriat Psychiatry. 1998; 14:454–458.10.1002/(SICI)1099-1166(199807)13:7<454::AID-GPS795>3.0.CO;2-D
13. Ganguli M, Snitz B, Vander Bilt J, Chang D. How much do depressive symptoms affect cognition at the population level? The Monogahela-Youghiogheny Healthy Aging Team (MYHAT) study. Int J Geriat Psychiatry. 2009; 24:1277–1284.10.1002/gps.2257
14. Haikal M, Hong RY. The effects of social evaluation and looming threat on self-attentional biases and social anxiety. J Anxiety Disord. 2010; 24:345–352.10.1016/j.janxdis.2010.01.007 [PubMed: 20176459]
15. Johnsen GE, Asbjornsen AE. Consistent impaired verbal memory in PTSD: a meta-analysis. J Affect Disord. 2008; 111:74–82.10.1016/j.jad.2008.02.007 [PubMed: 18377999]
16. Johnsen GE, Asbjornsen AE. Verbal learning and memory impairments in posttraumatic stress disorder: the role of encoding strategies. Psychiatry Res. 2009; 165:68–77. [PubMed: 19058857]
17. Koeter M. Validity of the GHW and the SCL anxiety and depression scales: A comparative study. J Affect Disorders. 1992; 24:271–280. [PubMed: 1578083]

18. Lowe B, Spitzer RL, Williams JBW, Mussell M, Schellbert D, Droenke K. Depression, anxiety and somatization in primary care: syndrome overlap and functional impairment. Gen Hosp Psychiat. 2008; 30:191–199.

19. Mantella R, Butters M, Dew MA, Mulsant B, Begley A, Tracey B, Shear MK, Reynolds C III, Lenze E. Cognitive impairment in late-life generalized anxiety disorder. Am J Geriatric Psychiatry. 2007; 15:673–679.10.1097/JGP.0b013e31803111f2

20. Pachana A, Byrne G, Siddle H, Koloski N, Harley E, Arnold E. Development and validation of the Geriatric Anxiety Inventory. Int Psychogeriatrics. 2007; 19:103–114.10.1017/S1041610206003504

21. Randolph, C. Repeatable Battery for the Assessment of Neuropsychological Status. The Psychological Corporation; San Antonio: 1998.

22. Schultz S, Moser D, Bishop J, Ellingrod V. Phobic anxiety in late-life in relationship to cognition and 5HTTLPR polymorphism. Psychiatr Genet. 2005; 15:305–306. [PubMed: 16314764]

23. Smalbrugge M, Pot A, Jongenelis K, Beekman A, Eefsting J. Prevalence and correlates of anxiety among nursing home patients. J Affect Disorders. 2005; 88:145–153.10.1016/j.jad.2005.06.006 [PubMed: 16122811]

24. Steer R, Clark D, Ranieri W. Symptom dimensions of the SCL-90-R: A test of the tripartite model of anxiety and depression. J Pers Assess. 1994; 64:525–536. [PubMed: 8027915]

25. Steer R, Ranieri W. Further evidence for the validity of the Back Anxiety Inventory with psychiatric outpatients. J Anxiety Disord. 1993; 7:195–205.

26. Wetherell JL, Reynolds C, Gatz M, Pedersen N. Anxiety, cognitive performance, and cognitive decline in normal aging. J Gerontol B Psychol Sci Soc Sci. 2002; 57:246–255.10.1093/geronb/57.3.P246

27. Wilson RS, de Leon CFM, Bennett DA, Bienias JL, Evans DA. Depressive symptoms and cognitive decline in a community population of older persons. J Neurol Neurosur Ps. 2004; 75:126–129.

Table 1

Demographics of study sample

	Mean	Range	Standard Deviation	Percentile
RBANS Total Scale Score	103.54	80–134	13.10	61
RBANS Immediate Memory index score	99.88	65–129	14.75	50
RBANS Visuospatial/Constructional index	103.90	75–131	14.421	61
RBANS Language index score	100.73	82–125	11.95	53
RBANS Attention index score	104.71	82–135	15.58	63
RBANS Delayed Memory index score	103.83	84–127	10.34	61
SCL-90-R Anxiety T-score	45.23	37–67	8.02	32

Note. Percentile scores were obtained from the relevant test manuals. Higher percentile scores for RBANS scores indicate better cognitive functioning. A higher percentile score for the SCL-90-R Anxiety score indicates more severe anxiety.

Table 2

Relationships of the Symptom Checklist-90-Revised Anxiety scores with the Symptom Checklist-90-Revised Depression scores and the Repeatable Battery for the Assessment of Neuropsychological Status Index and sub-test scores

Test Names	Correlation Coefficient	p
SCL-90-R Depression T-Score	.581	**<.000**
RBANS Total Scale Score	−.400	**.005**
RBANS Immediate Memory Index Score	−.284	**.050**
List Learning raw score	−.200	.179
Story Memory raw score	−.317	**.030**
RBANS Visuospatial/Constructional Index Score	−.515	**<.000**
Figure Copy raw score	−.352	**.015**
Line Orientation raw score	−.431	**.002**
RBANS Language Index Score	−.138	.348
Picture Naming raw score	.139	.350
Semantic Fluency raw score	−.100	.502
RBANS Attention Index Score	−.122	.407
Digit Span raw score	−.038	.800
Coding raw score	−.170	.254
RBANS Delayed Memory Index Score	−.305	**.035**
List Recall raw score	−.170	.252
List Recognition raw score	−.097	.515
Story Recall raw score	−.287	**.050**
Figure Recall score	−.168	.260

Note: Index Score names are bolded, with the names of the subtests that contribute to each Index Score listed beneath them. Subtest scores are raw scores and, therefore, their correlations with SCL-90-R Anxiety score were adjusted for age.