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Concordance of Self- and Proxy-Rated Worry and Anxiety Symptoms in Older Adults with Dementia

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Abstract

We compared the psychometric performance of two validated self-report anxiety- symptom measures when rated by people with dementia versus collaterals (as proxies). Forty-one participants with mild-to-moderate dementia and their respective collaterals completed the Geriatric Anxiety Inventory, the Penn State Worry Questionnaire-Abbreviated, and a structured diagnostic interview. We used descriptive and nonparametric statistics to compare scores according to respondent characteristics. Receiver operating characteristic (ROC) curves were calculated to establish the predictive validity of each instrument by rater type against a clinical diagnosis of an anxiety disorder. Participant and collateral ratings performed comparably for both instruments. However, collaterals tended to give more severe symptom ratings, and the best-performing cut-off scores were higher for collaterals. Our findings suggest that people with mild-to-moderate dementia can give reliable self-reports of anxiety symptoms, with validity comparable to reports obtained from collaterals. Scores obtained from multiple informants should be interpreted in context.

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Keywords

worry; anxiety; elders; dementia; self-ratings; proxy ratings

1. Introduction

Anxiety may be more common in people who are cognitively impaired than in those who are not (Hwang, Masterman, Ortiz, Fairbanks & Cummings, 2004). Rates of anxiety disorders in people with dementia range from 5% to 21% (Chemerinski, Petracca & Manes, 1998; Skoog, 1993). Comorbid anxiety and dementia are associated with impairments in activities of daily living, increased risk of nursing home placement, and poorer quality of life than dementia alone (Seignourel, Kunik, Snow, Wilson & Stanley, 2008). Given the high prevalence of anxiety disorders and their negative effects, understanding anxiety within the context of dementia is important.

A common concern in the assessment of anxiety in people with dementia is that they may not be able to accurately self-report their symptoms. Measurement of constructs that are primarily assessed through self-report (e.g., quality of life, depression) must be adapted for people with dementia. This often entails heavy reliance on symptom ratings provided by collaterals (i.e., those who report symptoms as proxies for the affected person, based on observation of his or her symptoms). Because most measures of anxiety for this population are developed as self- or clinician-administered instruments (for review, see Edelstein et al., 2008; Seignourel et al., 2008), the reliability and validity of these measures when completed by a collateral are unknown.

It is unclear to what extent proxy ratings of anxiety are comparable to self-reports of people with dementia. Studies of this population suggest that collaterals' interpretations of other psychological symptoms, such as those related to depression, tend to be more severe than patient self-report (Burke et al., 1998). Collaterals' ratings of patient anxiety are poorly correlated with self-reports in patients with Alzheimer's disease (Gibbons, Teri, Logsdon & McCurry, 2006) and Parkinson's disease (McKinlay et al., 2008). A limitation of these studies is that caregivers and patients completed different measures of anxiety, introducing method variance, and, thus, making it difficult to compare scores directly.

Divergent ratings between collaterals and persons with dementia may be influenced by several factors. Concordance between self- and collateral reports may be higher for more easily observed signs and symptoms (e.g., frequent crying, decreased activity, fear-related avoidance) than for symptoms with fewer outward representations (e.g., decreased energy, feeling sad, worry, somatic symptoms) (Snow, Cook, Lin, Morgan & Magaziner, 2005a). Furthermore, collaterals vary in their degrees of observance of even more obvious symptoms; this may be a function of time spent in direct contact with the person (Bassett, Magaziner & Hebel, 1990), the nature of the collateral's relationship to the affected person, and even the collateral's mood (Karlawish, Casarett, Klocinski & Clark, 2001).

In addition to the question of agreement between self- and collateral ratings, a key unanswered question is whether validated anxiety measures more accurately predict clinically significant anxiety when completed by collaterals versus people with mild-to-moderate dementia. The use of proxy raters presumes that this is the case; however, supporting data are lacking.

In sum, the use of collaterals as proxies to report distress symptoms in people with dementia is a common practice, but the validity of such proxy assessments for anxiety assessment is

unclear. Studies to date have established some degree of disagreement between self- and proxy reports of anxiety, but they have not addressed the magnitude of disagreement or differences in predictive validity between informant types. The overall goal of this study was to compare the performance of anxiety rating scales when completed by people with dementia versus a proxy (collateral). Specific aims were to:

1. Compare the internal reliability of two previously validated measures of anxiety when completed by people with dementia (hereafter referred to as "participants") versus collaterals;
2. Determine the magnitude and agreement of anxiety scores rated by participants and collaterals;
3. Identify predictors of the degree of agreement between participant and collateral scores;
4. Compare the sensitivity and specificity of anxiety symptom scores provided by participants versus collaterals for a "gold standard" diagnosis assigned by a trained clinician.

2. Methods

2.1 Participants

The sample for the present study consisted of participants from both an open (pilot) trial and from a randomized controlled trial of a behavioral treatment for anxiety in older adults with dementia (Stanley et al., in press). Participants were recruited from neurology, geriatrics, and psychiatry clinics and dementia care day centers and screened by telephone for the presence of anxiety symptoms. Initial eligibility criteria included age ≥ 50, documented diagnosis of dementia in the participant's medical record, ability to speak English, and the presence of a willing collateral (a person who spent at least 8 hours per week in face-to-face contact with the participant) who agreed to participate in assessments and facilitate participation in treatment. A collateral-reported composite score of 4 or greater on the Neuropsychiatric Inventory (Cummings et al., 1994) anxiety- symptom scale was required to establish the presence of anxiety symptoms. Participants were required to be on stable doses of any current psychotropic medications (i.e., no changes in the past month).

After telephone screening, interested persons were invited to participate in a pre-treatment assessment to establish additional inclusion criteria. A research clinician (a master's- or doctoral-level trainee in clinical psychology) administered the Washington University Clinical Dementia Rating scale (CDR; Hughes, Berg, Danziger, Coben & Martin, 1982) to determine the severity of dementia symptoms and the Mini-International Neuropsychiatric Inventory (MINI; Sheehan et al., 1998) to establish diagnostic criteria for psychiatric disorders. Clinicians' ratings took into account information from both the participant and the collateral. The assessment data were then reviewed by our multidisciplinary study team, consisting of experts in geriatric anxiety and dementia. Psychologists, psychology trainees, a psychiatrist, and a social worker reviewed all data from the initial assessment to establish a consensus diagnosis. CDR and MINI interviews were audio recorded, and a second clinician rated a subset of 11 interviews from the randomized trial to assess interrater reliability. Raters had perfect agreement (kappa = 1.0) on the CDR. Kappas for the MINI primary diagnosis were 1.0 for depression, 0.79 for generalized anxiety disorder, and 0.61 for other anxiety disorders. Participants were required to have mild-to-moderate dementia (i.e., overall CDR score of 0.5, 1, or 2). Although full criteria for an anxiety disorder were not required for inclusion, participants were excluded for a current primary diagnosis of major depression, substance abuse within the last month, evidence of current psychosis or bipolar disorder, or recent history of aggressive behavior.

Two hundred sixteen potential participants were screened by telephone, and 76 consented to the baseline assessment. Of these, 8 withdrew, 26 did not meet inclusion criteria on assessment, and 1 was lost to follow-up. The final study sample consisted of 41 collateral-participant dyads who met inclusion criteria and agreed to participate. Collaterals were spouses (n = 20), adult children (n = 18), and significant others (n = 3). This study was approved by the local institutional review board. A trained research assistant obtained informed consent from all participants and collaterals.

2.2 Procedure

During the baseline assessment, a trained interviewer administered the Geriatric Anxiety Inventory (GAI)[23] and the Penn State Worry Questionnaire - Abbreviated (PSWQ-A; Hopko et al., 2003) to participants by reading aloud each item and asking the participant to answer from a printed list of response choices displayed in large, bold font. Collaterals self-administered these two instruments and responded based on their perceptions of the participants' symptoms.

2.3 Measures

2.3.1. Geriatric Anxiety Inventory (GAI)—The GAI (Pachana et al., 2007) is a 20-item questionnaire developed to assess symptoms of generalized anxiety (such as fearfulness, worry, and physiological symptoms) in older adults. Items refer to experiences during the past week, worded as statements to which the respondent agrees or disagrees. Higher scores indicate greater anxiety. Pachana et al. reported high internal consistency (α = .91) in a sample of 452 community-dwelling older adults. The developers also reported excellent 1-week test-retest reliability in a clinic-based sample of older adults with psychiatric disorders (r= .91). The GAI was significantly correlated with NPI anxiety severity and NPI anxiety distress scores in a sample of 100 memory clinic patients, most of whom were diagnosed with dementia (Byrne, Pachana, Arnold, Chalk & Appadurai, 2008).

2.3.2 Penn State Worry Questionnaire-Abbreviated (PSWQ-A)—The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger & Borkovec, 1990) is a widely used self-report measure of worry symptoms. An abbreviated and simplified version of the PSWQ has been validated specifically for use in older adults (PSWQ-A). The PSWQ-A retained 8 of the original 16 PSWQ items and eliminated all reverse-coded items. Higher scores indicate greater anxiety. PSWQ-A and PSWQ scores were highly correlated (r= .92) in a sample of 160 treatment-seeking older adults with generalized anxiety disorder. In the same sample, test-retest reliability was moderate (r= .63); and internal consistency was high (α = .87).

2.4 Data Analyses

2.4.1 Descriptive Statistics—We first computed descriptive statistics for demographic variables, diagnoses, and instrument scores. Cronbach's alphas were calculated to evaluate internal consistency reliability, and intraclass correlations were used to quantify the overall level of agreement between participant and collateral scores on the GAI and PSWQ-A. We then computed difference scores on both measures within each dyad by subtracting the participant's score from the collateral's score and subsequently used non-parametric tests (Wilcoxon-Mann-Whitney U) to determine whether mean participant-collateral difference scores varied as a function of collateral or participant gender, the type of the dyadic relationship (i.e., spouse versus adult child), or living situation (i.e., collateral living with patient versus living separately).

2.4.2 Diagnostic Accuracy—To separately test the abilities of the GAI and PSWQ-A to detect anxiety disorders when completed by either patients or collaterals, four receiver operating characteristic (ROC) curves were calculated. For the purpose of these analyses, the MINI consensus diagnosis (i.e., presence of any anxiety disorder diagnosis, including Anxiety Disorder Not Otherwise Specified) was considered the gold standard (Maruish, 2004). Psychometric indices included the area under the curve (AUC), sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). Cut-off scores for each instrument by each informant were defined by the maximum sum of sensitivity and specificity, as these measures (unlike the PPV and NPV) are not affected by prevalence rates for anxiety. Three chi-square tests were used to examine differences in the AUC within and between measures, using the %roc macro in SAS (Gonen, 2007). One chi-square test evaluated participant versus collateral AUCs on the GAI, a second one evaluated participant versus collateral AUCs on the PSWQ-A, and a third compared the AUCs for all four scores. All analyses were performed using SAS Version 9.2 (SAS Institute, Inc., Cary, North Carolina).

3. Results

3.1 Participant and Collateral Characteristics

Participant demographics, clinical characteristics, and self-report measure scores are summarized in Table 1. Participant-reported GAI scores were within 1 standard deviation of scores reported in a sample of memory clinic patients Byrne et al., 2008). Participant-reported PSWQ-A scores were within 1 standard deviation of scores reported in a sample of community-dwelling older adults without cognitive impairment (Crittendon & Hopko, 2006) but lower than scores obtained from a sample of older adults diagnosed with generalized anxiety disorder (Hopko et al., 2003). The most common psychiatric diagnosis was generalized anxiety disorder, followed by anxiety not otherwise specified. Thirteen (31.7%) patients, despite reporting some symptoms of anxiety, did not meet criteria for a formal diagnosis.

3. 2 Agreement and Internal Consistency of Participant and Collateral Ratings of Anxiety

GAI scores were omitted for one dyad because of missing responses from the collateral. Item analysis of the GAI and PSWQ-A revealed high internal consistency, regardless of rating by participant or collateral (Cronbach alphas were .92 for GAI-Participant, .85 for GAI-Collateral, .84 for PSWQ-A-Participant, and .89 for PSWQ-A-Collateral). Overall agreement between participants and collaterals on these measures was modest (ICCs of .418 for GAI and .417 for PSWQ-A). Collaterals' ratings exceeded those of participants' by an average of 2.4 points on the GAI and 5.5 points on the PSWQ-A.

3.3 Predictors of Agreement

The magnitude of discrepancy between participant and collateral ratings did not differ significantly as a function of collateral gender, relationship type (spousal versus filial), or living arrangement for either the GAI (Table 2) or the PSWQ-A (Table 3). However, GAI scores were more discrepant from collateral scores when the participant was female, $z = -2.2$, $p = .03$.

3.4 Sensitivity and Specificity of Participant and Collateral Scores

Table 4 provides results of the ROC analyses, including the sensitivity, specificity, PPV, and NPV associated with all cut-points. Both scales performed better than chance at predicting a diagnosis of anxiety disorder, regardless of whether they were completed by the participant or the collateral (AUCs > .50). The AUCs for the GAI were .691 (SE = .08) and .809 (SE = .

07), reflecting ratings by participants and collaterals, respectively. Similarly, the AUCs for the PSWQ-A were .691 (SE = .08) and .774 (SE = .08), reflecting ratings by participants and collaterals, respectively. Though numerically distinct, AUCs did not significantly differ by instrument or by respondent type. The two AUCs for the GAI were equivalent ($\chi^2(1) = 1.55$, $p = .21$), as were the two AUCs for the PSWQ-A ($\chi^2(1) = 1.20$, $p = .27$). Additionally, there were no differences in the AUCs across all four ratings ($\chi^2(3) = 1.99$, $p = .58$). However, on both instruments the best performing cut-off scores were lower for participants than for collaterals. The cut-point on the GAI that maximized the sum of sensitivity and specificity was 8 for participants and 10 for collaterals. The best performing cut-point for the PSWQ-A was 17 for participants and 22 for collaterals.

4. Discussion

Collaterals frequently serve as proxies to rate self-report psychological symptoms on behalf of persons with dementia, with unclear ramifications for the validity of the assessment. We studied the performance of two previously validated anxiety-symptom scales when completed by older adults with dementia versus collaterals. Participant and collateral reports were equally, modestly “accurate” in predicting a clinical diagnosis of an anxiety disorder, although collaterals provided more severe ratings of anxiety symptoms overall, and the threshold for detecting a diagnosis was lower for participant scores. With a larger sample size the differences in the predictive validity of participant versus collateral scores may have reached statistical significance, as AUCs were numerically higher for collaterals on both instruments. We did not find evidence to suggest that the internal consistency of the PSWQ-A and GAI differed for collaterals or participants; thus, it is unlikely that differences in instrument performance are attributable to inconsistent responding by either collaterals or participants.

We also examined sources of systematic variation in participant-collateral concordance. Collateral and collateral-participant relationship characteristics did not predict score concordance. Unexpectedly, the participant’s gender was related to GAI score concordance such that male participants were significantly more concordant with collaterals than female participants; but it is likely that gender, living arrangement, and relationship type were confounded. Other variables not examined in this study, such as the participant’s health status, caregiver strain (Burke et al., 1998), caregiver anxiety and depression (Karlawish et al., 2001), relationship quality, and deficit awareness (Snow et al., 2005b) may also have influenced participant-collateral concordance.

Our findings are generally consistent with the observation that collaterals tend to attribute lower ratings of quality of life and emotional well-being to people with dementia than do those affected (Arlt et al., 2008; Chopra, Sullivan, Feldman, Landes & Beck, 2008; Conde-Sala, Garre-Olmo, Turró-Garriga, López-Pousa & Vilalta-Franch, 2009; Logsdon et al., 1999). However, the reasons for this are not straightforward. Previous research suggests that people with dementia and collaterals bring different perspectives and biases to assessment of subjective states. For instance, in reporting quality-of-life outcomes, collaterals appear to emphasize qualitatively different aspects of the dementia experience, focusing primarily on cognitive and functional status; whereas people with dementia focus more on mood and pain (Snow et al., 2005b). Similarly, it is likely that participants and collaterals in the present study were influenced by different priorities or biases in interpreting the participants’ symptoms. Our findings may have been influenced by the distribution of dementia severity within our sample, with the majority of participants falling into the mild to moderate range of cognitive impairment and none with severe dementia.

4.1 Conclusions

In conclusion, our study demonstrates that both participants with dementia and collaterals can complete anxiety symptom rating scales reliably with relatively minor modifications, and these have comparable validity for detecting a clinical diagnosis of an anxiety disorder. Collateral ratings appear to have relatively little incremental predictive value over self-ratings, although additional research with larger samples is necessary to confirm this finding. Despite comparable performance, self- and proxy-reported symptom scores are not interchangeable and should be interpreted in the context of who is reporting and, in the case of collaterals, the nature of their relationship to the person with dementia. Thus, if proxy or collateral ratings of anxiety symptoms are used in the assessment of a person with mild-to-moderate dementia, we recommend that they be interpreted as supplements, rather than replacements, for self-reports. Given the potential for divergent information between people with dementia and proxy informants, we recommend that clinicians collect data from both parties to detect clinically significant anxiety in this population.

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Table 1

Demographics, Clinical Characteristics, and Self-Report Measures of Participants and Collaterals

Variable	Participant n=41	Collateral n=41
Age, *mean (SD)*	79.0 (9.1)	62.5 (12.7)
Female, *n (%)*	23 (56.1)	33 (80.5)
Race, *n (%)*		
White	29 (70.7)	31 (75.6)
African American	8 (19.5)	8 (19.5)
More than one race	1 (2.4)	-
Other	3 (7.3)	2 (4.9)
Ethnicity, *n (%)*		
Hispanic/Latino	6 (14.6)	8 (19.5)
Not Hispanic/Latino	31 (75.6)	30 (73.2)
Missing/unknown	4 (9.8)	3 (7.3)
Highest level of education, *n (%)*		
11th grade or less	10 (24.4)	3 (7.3)
High school diploma or equivalent	20 (48.8)	23 (56.1)
College degree	5 (12.2)	7 (17.1)
Graduate degree	6 (14.6)	8 (19.5)
Relationship to participant, *n (%)*		
Spouse	---	20 (48.8)
Sibling	---	1 (2.4)
Adult child	---	18 (43.9)
Paid collateral	---	1 (2.4)
Other	---	1 (2.4)

Variable	Participant	Collateral
Living arrangement, *n (%)*		
Living with participant	---	29 (70.7)
Not living with participant	---	12 (29.3)
Clinical Dementia Rating scale, *n (%)*		---
0.5 (Very mild)	3 (7.3)	---
1.0 (Mild)	20 (48.8)	---
2.0 (Moderate)	18 (43.9)	---
Psychiatric Diagnoses, *n (%)*		
Any anxiety disorder	26 (63.4)	---
Generalized anxiety disorder	20 (48.8)	---
Anxiety not otherwise specified	4 (9.8)	---
Panic disorder	1 (2.4)	---
Posttraumatic stress disorder	1 (2.4)	---
Any mood disorder	2 (4.9)	---

Variable	Participant n=41	Collateral n=41
Major depression	0 (0.0)	---
Other, non-bipolar mood disorder	2 (4.9)	---
No diagnosis	13 (31.7)	---
Self-report measures, *mean (SD)*[a]		
GAI	5.8 (5.7)	8.4 (5.2)
PSW Q-A	17.7 (6.9)	23.2 (8.3)

[a]Collateral scores for Geriatric Anxiety Inventory and Penn State Worry Questionnaire-Abbreviated refer to the participant. One collateral did not provide complete data for the Geriatric Anxiety Inventory.

GAI = Geriatric Anxiety Inventory; PSWQ-A = Penn State Worry Questionnaire - Abbreviated

Table 2

Participant and Collateral Means and Standard Deviations on the GAI for each Demographic Category and Relationships between Demographic Variables and Participant-Collateral Discrepancies on the GAI

		Participant (P) GAI	**Collateral (C) GAI**	***C-P discrepancy on the GAI***		
Predictor	*n*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	z^a	*P*
Participant Gender						
Male	18	8.5 (5.7)	8.6 (6.4)	0.1 (5.5)	−2.2	0.03
Female	22	3.9 (4.8)	8.2 (4.2)	4.3 (4.9)		
Collateral Gender						
Male	7	0.6 (1.1)	5.9 (4.6)	5.3 (5.1)	1.4	0.17
Female	33	7.1 (5.6)	8.9 (5.3)	1.8 (5.5)		
Relationship Type[b]						
Spousal	19	7.2 (6.3)	8.7 (6.1)	1.5 (6.4)	1.1	0.29
Filial	18	4.3 (4.6)	8.2 (4.3)	3.9 (4.7)		
Living Arrangement						
Living together	28	6.4 (5.9)	8.5 (5.5)	2.1 (5.8)	0.2	0.85
Living separately	12	5.1 (5.1)	8.1 (4.8)	3.0 (5.0)		

GAI = Geriatric Anxiety Inventory

[a] Wilcoxon-Mann-Whitney *U* tests of between-group differences in discrepancies between participants and collaterals. One $GAI_{collateral}$ score was omitted due to missing data.

[b] Three dyads whose relationship belonged in neither category (n = 3) were excluded from this analysis.

Table 3

Participant and Collateral Means and Standard Deviations on the PSWQ-A for each Demographic Category and Relationships between Demographic Variables and Participant-Collateral Discrepancies on the PSWQ-A

		Participant (P) PSWQ-A	**Collateral (C) PSWQ-A**	***C-P discrepancy on the PSWQ-A***		
Predictor	*n*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	z^a	*p*
Participant Gender						
Male	18	19.3 (7.1)	23.0 (8.5)	3.7 (7.3)	−1.7	0.09
Female	23	16.3 (6.7)	23.3 (8.3)	7.0 (6.0)		
Collateral Gender						
Male	8	12.4 (3.5)	15.9 (6.7)	3.5 (7.0)	−1.1	0.28
Female	33	18.9 (7.0)	25.0 (7.7)	6.1 (6.7)		
Relationship Type[b]						
Spousal	20	17.3 (7.9)	20.6 (8.0)	3.3 (6.0)	1.7	0.09
Filial	18	18.1 (6.4)	25.2 (7.3)	7.1 (6.3)		
Living Arrangement						
Living together	29	17.4 (7.7)	22.2 (7.7)	4.8 (6.5)	1.0	0.32
Living separately	12	18.3 (4.9)	25.7 (9.5)	7.4 (7.2)		

PSWQ-A = Penn State Worry Questionnaire-Abbreviated

[a] Wilcoxon-Mann-Whitney *U* tests of between-group differences in discrepancies between participants and collaterals.

[b] Three dyads whose relationship belonged in neither category (n = 3) were excluded from this analysis.

Table 4

Sensitivity, Specificity, Positive Predictive Value (PPV), and Negative Predictive Value (NPV) for Central Ranges of Participant and Collateral scores on the GAI and PSWQ-A predicting Any Anxiety Diagnosis (N = 41)

GAI - Participants											
Cutoff ≥	**4**	**5**	**6**	**7**	**8**[a]	**9**	**10**	**11**	**12**	**13**	**14**
Sensitivity	0.62	0.62	0.62	0.58	0.58	0.42	0.38	0.38	0.45	0.23	0.15
Specificity	0.60	0.67	0.73	0.93	0.93	0.93	0.93	1.00	1.00	1.00	1.00
PPV	0.73	0.76	0.80	0.94	0.94	0.92	0.91	1.00	1.00	1.00	1.00
NPV	0.47	0.50	0.52	0.56	0.56	0.48	0.47	0.48	0.47	0.43	0.41
GAI – Collaterals											
Cutoff ≥	**4**	**5**	**6**	**7**	**8**	**9**	**10**[a]	**11**	**12**	**13**	**14**
Sensitivity	0.92	0.92	0.77	0.73	0.69	0.62	0.62	0.58	0.38	0.35	0.31
Specificity	0.43	0.57	0.64	0.64	0.79	0.86	0.93	0.93	0.93	0.93	0.93
PPV	0.75	0.80	0.80	0.83	0.86	0.89	0.94	0.94	0.91	0.90	0.89
NPV	0.75	0.80	0.60	0.59	0.58	0.55	0.57	0.54	0.45	0.43	0.42
PSWQ-A- Participants											
Cutoff ≥	**13**	**14**	**15**	**16**	**17**[a]	**18**	**19**	**20**	**21**	**22**	**23**
Sensitivity	0.77	0.73	0.73	0.65	0.62	0.58	0.50	0.46	0.46	0.46	0.34
Specificity	0.33	0.47	0.60	0.60	0.73	0.73	0.73	0.73	0.73	0.80	0.93
PPV	0.67	0.70	0.76	0.74	0.80	0.79	0.76	0.75	0.75	0.80	0.90
NPV	0.45	0.50	0.56	0.50	0.52	0.50	0.46	0.44	0.44	0.46	0.45
PSWQ-A – Collaterals											
Cutoff ≥	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**[a]	**23**
Sensitivity	0.92	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.81	0.81	0.69
Specificity	0.20	0.20	0.47	0.47	0.47	0.53	0.53	0.60	0.73	0.73	0.73
PPV	0.67	0.67	0.75	0.74	0.74	0.77	0.76	0.79	0.84	0.84	0.82
NPV	0.60	0.60	0.78	0.70	0.70	0.73	0.67	0.69	0.69	0.69	0.58

[a]Cut-off that maximizes the sum of sensitivity and specify.

GAI = Geriatric Anxiety Inventory; PSWQ-A = Penn State Worry Questionniare; PPV = positive predictive value; NPV = negative predictive value