



Reliability and Validity of Persian Version of the Rating Anxiety in Dementia Questionnaire

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Quantitative Study

Abstract

Background: Due to the importance of anxiety and its common symptoms with other physical and mental diseases in elderly patients, valid screening measures are needed. Based on this need, the present study attempted to assess the reliability and validity of the Persian version of the Rating Anxiety in Dementia (RAID).

Methods: This research was a cross-sectional study on the development and localization of instruments, conducted on 209 patients with dementia referring to psychiatry clinics of the elderly in Isfahan, Iran, with the convenience sampling method. The procedures for RAID localizations were translated and back-translated in 2021 using central and distributive tendencies and inferential statistical methods, internal consistency of the scale and exploratory factor analysis (EFA) were tested. To conduct the statistical calculations, SPSS software was used.

Results: 209 participants with a mean age of 52.6 ± 13.3 were selected. Seventy-eight participants were men (37.3%), and 126 were women (60.3%). The Cronbach's alpha coefficient was found to be 0.89. Based on the varimax rotation, in the five-factor model (according to principal component analysis, irritability, tension, anxiety, worry, weakness), questions 2 and 11 were removed for weak factor loading, and eigenvalue was explained by 66.2% variance. The convergent validity between Mini-Mental State Examination (MMSE) scale and RAID was positive ($r = 0.25$, $P = 0.002$).

Conclusion: The findings confirmed the validity and reliability of the Iranian version of RAID as an appropriate instrument for screening anxiety in elderly patients with dementia.

Keywords: Reliability; Anxiety; Dementia; Questionnaire

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Introduction

Dementia is a non-curable and progressive disease that significantly affects the quality of life of those afflicted by it (Barrios, Narciso, Guerreiro, Maroco, Logsdon, & de Mendonca, 2013). This syndrome inflicts a vast financial and clinical burden on health systems worldwide and every year, following the increase in the age of the communities and the growing rate of dementia diagnosis, the rate of dementia increases (Corrada, Brookmeyer, Paganini-Hill, Berlau, & Kawas, 2010). The prevalence of anxiety varies in patients with dementia. This variation can be explained to some extent by the different features of the samples, the diagnostic criteria used for diagnosing anxiety, and the screening instruments used for diagnosing anxiety in this group of patients (Goyal, Bergh, Engedal, Kirkevold, & Kirkevold, 2017).

Diagnosing anxiety in patients with dementia is complicated for several reasons. First, these symptoms appear simultaneously in dementia and anxiety. Second, it is difficult to differentiate between the symptoms of anxiety and depression. Third, the effect of the source of information makes it even more difficult. Finally, there is a lack of valid and appropriate rating scales for diagnosing anxiety in Iranian patients with dementia (Seignourel, Kunik, Snow, Wilson, & Stanley, 2008).

Anxiety symptoms usually negatively affect people with dementia (Calleo et al., 2011), and short neurology and psychiatry questionnaires are a means of diagnosing these symptoms (Goodarzi et al., 2019). A brief search on the databases reveals few valid instruments for screening anxiety in patients with dementia. Few of them include an evaluation of the experiences of the patients themselves. Geriatric Anxiety Inventory (GAI) is also a self-report scale that can be used in a structured interview for assessing anxiety in the elderly. Cronbach's alpha for the 20-item GAI was 0.91 among normal older adults and 0.93 in the psychogeriatric sample. Therefore, it is difficult to use it for patients with severe dementia (Scanlon, 2017). In addition, the sensitivity of other instruments such as Penn State Worry Questionnaire (PSWQ) and GAI is lower than that of Rating Anxiety in Dementia (RAID). PSWQ (with a coefficient of 0.93 for the entire group) (Meyer, Miller, Metzger, & Borkovec, 1990) and GAI are self-rating or proxy rating scales (Goodarzi et al., 2019). Besides, in the systematic review in 2019, only three instruments were identified that were validated against the gold standard. This lack of validity can be attributed to the lack of agreed-upon criteria for diagnosing anxiety disorders in individuals with dementia. Despite that, there are valid instruments that need to be considered for use in assessing anxiety in all stages of dementia, including RAID, which was introduced by Shankar et al. in 1999. Drawing on numerous data sources, including the patient's personal experiences, we realized that the RAID scale could be regarded as one of the most appropriate instruments for assessing anxiety in patients with dementia (Seignourel et al. 2008; Shankar, Walker, Frost, & Orrell, 1999). In numerous studies on anxiety in patients with dementia, the RAID scale has been used (Seignourel et al., 2008), but few have examined its reliability and validity (Seignourel et al., 2008; Snow et al., 2012; Twelftree & Qazi, 2006).

This questionnaire has been validated in three studies. It has been exclusively developed to assess anxiety in individuals with dementia based on the existing criteria for anxiety such as Diagnostic and Statistical Manual of Mental Disorders-Third Edition-Revised (DSM-III-R), Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV), international diagnostic criteria (version 10), and the current anxiety measurement instruments. For RAID, sensitivity ranges from

85% to 90%, and specificity ranges from 56% to 79%. The sensitivity of this instrument is ideal for diagnosis and higher than other instruments. However, the RAID specificity has a higher dimension; the Norwegian version has the lowest (i.e., 56%), and the English version has the highest (i.e., 67%-79%) value. The difference in the specificity of this disease in different studies can be attributed to the fact that these three articles have used different populations; the Norwegian study was based on those who lived under long-term care, and the other two studies in England were focused on inpatients and the patients referring to specialized clinics. Therefore, further studies in different cultures and locations are suggested (Sharifi et al., 2016).

Anxiety, like depression, is prevalent in patients with dementia. On the other hand, the overlap of its symptoms with medical problems, psychosis, and mood disturbance makes it challenging to diagnose anxiety. Therefore, the diagnosis of anxiety is necessary for patient management, a better understanding of the disease from other disorders, and providing an appropriate treatment plan. It should be noted that there is no specific tool for assessing anxiety in patients with dementia in Iran. Due to the growing population of Iran towards aging, the need for further studies to manage these patients is strongly felt, and in this regard, the need to access appropriate tools to diagnose emotional and behavioral problems in these patients is a priority to pay attention to the problems of the elderly.

The main object of this study was to evaluate the reliability and validity of the Persian version of the RAID.

Methods

Research design: This research was a cross-sectional study on the development and localization of instruments.

Participants: The participants included 209 patients with dementia referring to psychiatry clinics of the elderly in Isfahan, Iran.

The inclusion criteria included being afflicted by dementia and aged 60 years or more, having the DSM-V criteria based on American Psychiatric Association, willingness to participate in the study, and the ability to speak in Persian. The exclusion criterion included being afflicted by schizophrenia.

After briefing all the participants on the study objectives and procedure, they were assured of their voluntary participation. The data were collected from October 2020 to January 2021. Convenience sampling was also used to select the patients.

The study was approved by the Ethics Committee of Isfahan University of Medical Sciences (approval no.: IR.MUI.MED.REC.1399.568).

Procedure

Translation: After obtaining permission from the scale developer, cross-cultural adaptation using a "forward-backward" procedure was applied to translate the original version of RAID into Persian according to Beaton et al. guidelines (Beaton, Bombardier, Guillemin, & Ferraz, 2007). Two translators, who had M.Sc. degrees in speech-language pathology, synthesized two initial translations and resolved any inconsistencies. The synthesized Persian version of the RAID was then back-translated into English by two bilingual translators and a native English speaker unfamiliar with the original English version.

Data collection: After obtaining the required licenses from the university and obtaining the required permissions, the sample population was selected using the convenience Sampling method from the elderly afflicted by dementia, who had been referred to the related psychiatry centers for the elderly affiliated with Isfahan

University of Medical Sciences. The demographic information included age, gender, marital status, level of education, occupational status, social status, and duration of the disease, and the information related to the RAID questionnaire and the Mini-Mental State Examination (MMSE) scale was collected via interviews. Furthermore, considering the conditions of many of the patients, the questionnaire could not be administered in groups and was filled in by the researcher or a conscious caretaker. We did not have the pretest and content validity. Convergent validity between RAID and MMSE was calculated. All processes were revised by the expert panel committee.

Measures

RAID: RAID includes 20 items (18 questions with 4-score items which are classified into five categories and two separate questions) and has been developed to be used for patients with dementia. Some of the items are related to worry (e.g., worry about dry mouth, financial affairs). The remaining items are related to sleep disorder, irritability, and a few physical symptoms (e.g., palpitations, dry mouth, and shortness of breath). The last two items, which deal with phobias and panic attacks, are not included in the total score. The information related to the disease symptoms in the previous two weeks is obtained from the existing resources, including patient information, taking care of the patient, clinical observations, and medical records. The treating physician determines a score for every patient drawing on all the existing sources of information. A general score is obtained by adding up the scores for the first 18 items. This scale has medium to high inter-rater and test-retest reliability and has good internal consistency. In addition, RAID scores are higher for patients with symptoms consistent with the DSM-IV criteria for generalized anxiety disorder (GAD) and show a sensitivity of 0.90 and specificity of 0.79 (Shankar et al., 1999). Considering the small sample size of the study (i.e., 38) and the fact that the present study's findings are based on one single study (i.e., Shankar et al., 1999), the results should be interpreted with caution. RAID is not related to all anxiety measurement scales but some of them, and their correlation is 0.16-0.62 (Beaton et al., 2007; Fillenbaum, Heyman, Wilkinson, & Haynes, 1987). The correlation between this scale and the Cornell Scale for Depression in Dementia (CSDD) varies from 0.66 to 0.69.

MMSE: The MMSE and the Blessed Orientation-Memory-Concentration (BOMC) test, a six-item derivative of the Blessed Information-Memory-Concentration (BIMC) test, were each administered to 36 patients with a clinical diagnosis of Alzheimer's disease (Sharifi et al., 2016). In 24 patients, both tests were re-administered a month later. The correlation between the MMSE and BOMC was -0.83 with a test-retest correlation of 0.89 (MMSE) and 0.77 (BOMC). Factor analysis indicated that the multiple MMSE cognitive components could be explained by two factors, which accounted for 66% of the variance (Morris, 1993).

This study used both descriptive, to indicate the central and distributive tendencies, and inferential statistical methods. Exploratory factor analysis (EFA) was used to investigate and verify the sub-scales of the scale. Cronbach's alpha was calculated for all questions. A Cronbach's alpha value higher than 0.70 points to this questionnaire's high internal consistency (Taber, 2018). To conduct the statistical calculations, SPSS software (version 24, IBM Corporation, Armonk, NY, USA) was used.

Results

Demographics: We had 209 participants with a mean age of 52.6 ± 13.3 . Seventy-eight participants were men (37.3%), and 171 were women (61.1%). The demographic information related to the study participants is summarized in table 1.

Table 1. Demographics of participants' characteristics

Variable	n (%)
Sex	
Women	171 (61.1)
Men	78 (37.3)
Missing	5 (2.4)
Severity of dementia	
Grade 1	87 (46.4)
Grade 2	82 (39.2)
Grade 3	30 (14.4)

Consistency: The Cronbach's alpha coefficient was 0.89, indicating this questionnaire's excellent fit in the Iranian population. The total Cronbach's alpha coefficient was calculated for the factors of this questionnaire and found to range from 0.45 to 0.85 (Table 3). A Cronbach's alpha value higher than 0.70 points to this questionnaire's high internal consistency (Taber, 2017) (Table 2).

Convergent validity: The convergent validity between MMSE scale and RAID was significant ($r = 0.25$, $P = 0.002$). Therefore, these two scales had a positive correlation.

EFA: Before performing the EFA, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were used to evaluate the adequacy of the sample size. The measurement indices of KMO were 0.83 in the one-factor and two-factor models, and the Bartlett's Sphericity Test was significant, showing the need to perform factor analysis in this study. Based on the varimax rotation, in the five-factor model (according to principal component analysis), questions 2 and 11 were removed for weak factor loading (Table 3). The number of factors decided with parallel analysis is likely to be observed in the same way as seen on the screen plot presented in figure 1.

Discussion

The present study examined the reliability and validity of the RAID questionnaire in the elderly afflicted by dementia. The results indicate that this questionnaire has a good fit for the Iranian population. The Cronbach's alpha coefficient was found to be 0.89. Based on the varimax rotation, in the five-factor model (according to principal component analysis), questions 2 and 11 were removed for weak factor loading, and the eigenvalue was explained by 66.2% variance.

Table 2. Cronbach's alpha, mean, and standard deviation (SD) of questions

Questionnaire items	Mean \pm SD	Cronbach's alpha if item deleted
Q1	0.60 \pm 0.80	0.896
Q2	1.20 \pm 0.80	0.887
Q3	1.90 \pm 0.90	0.892
Q4	0.80 \pm 0.80	0.896
Q5	1.05 \pm 1.02	0.893
Q6	1.07 \pm 0.80	0.889
Q7	1.80 \pm 0.90	0.893
Q8	1.80 \pm 0.90	0.889
Q9	1.70 \pm 0.90	0.890
Q10	1.50 \pm 1.02	0.884
Q11	0.80 \pm 0.90	0.889
Q12	1.60 \pm 0.80	0.889
Q13	0.90 \pm 0.80	0.892
Q14	0.80 \pm 0.90	0.891
Q15	0.70 \pm 0.90	0.892
Q16	0.80 \pm 0.90	0.895
Q17	0.80 \pm 0.90	0.897
Q18	0.60 \pm 0.70	0.898

SD: Standard deviation

Table 3. Rotated component matrix (extraction method: principal component analysis)

Questions	Factors				
	Irritability	Tension	Anxiety	Worry	Weakness
Worry over physical health				0.621	
Worry about family problems/finances	0.649				
Worry associated with false beliefs/perceptions				0.677	
Worry over trifles				0.606	
Frightened and anxious			0.700		
Sensitivity to noise	0.672				
Sleeplessness	0.725				
Irritability	0.740				
Trembling	0.696				
Restlessness	0.607				
Fatigue ability		0.783			
Palpitations			0.755		
Dry mouth/sinking feeling		0.751			
Shortness of breath		0.645			
Dizziness					0.691
Sweating flushes					0.591
Eigenvalue (%)	19.500	33.700	46.030	57.060	66.200
Cronbach's alpha	0.850	0.710	0.700	0.580	0.450

The factor analysis results also showed that the RAID scale included factors that covered a wide range of anxiety symptoms and enjoyed high construct validity. These findings support the psychometric features and validity of the RAID questionnaire in patients with dementia. It seems that this questionnaire not only has good psychometric features but also is an excellent practical instrument for diagnosing dementia anxiety. In addition, due to the short length of the questionnaire, it can be administered in quite a short time. This questionnaire can also be used in research projects. Psychotherapists and researchers can use different validated instruments to measure the level of dementia anxiety. The questionnaire assessed in the present study can also be used for this purpose.

A few studies have been done about instruments used to measure anxiety in dementia. The RAID is one of the most frequently evaluated instruments and has the highest level of evidence in terms of quality of measurement properties (content validity, structural validity, and hypothesis testing).

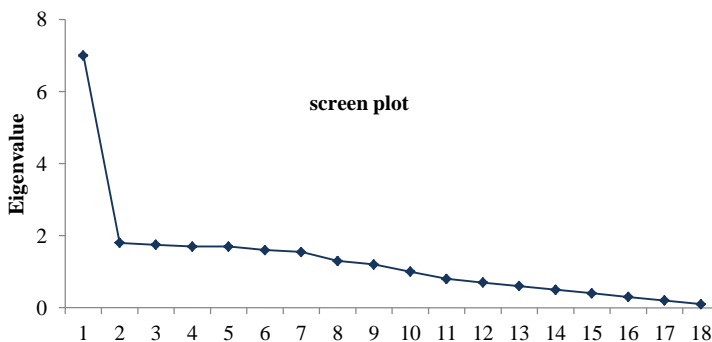


Figure 1. The screen plot of factor analysis for the Iranian version of Rating Anxiety in Dementia (RAID)

The methodological quality of RAID has been assessed in four studies by Snow et al. (2012), Twelftree and Qazi (2006), and Shankar et al. (1999). All four studies evaluated construct validity through hypothesis testing. The RAID showed positive moderate-high correlations with other observer-rated anxiety scales [Clinical Anxiety Scale (CAS), The State-Trait Anxiety Inventory (STAI), and GAI-collateral]. In this study, the factor analysis indicated that the RAID scale comprised five factors, all of which made a contribution to the variance. 16 items on the RAID scale were components of the five factors. Items 2 and 11 were removed (from the scale) because of the 66.2% variance; however, one of the most common concerns in patients with mild cognitive impairment (MCI) and early-stage dementia is worry about cognitive performance and tension related to decreasing cognitive performance. This would indicate that all items are necessary and cover a wide range of anxiety signs and symptoms, along with having good construct validity.

Up to now, there has been no research related to this issue in Iran. However, in a study that was conducted by Bandari et al. (2016) for the validity and reliability of the GAI in Iran, the validity of irritability and anxiety factors in the Iranian population was close to irritability and anxiety in RAID. Although RAID does not replace the need for proper clinical assessment, the score could be a helpful guide in the assessment and management of individual patients.

Despite various factors that contribute to mental health (Bagherian, Ahmadzadeh, & Baghbanian, 2009), anxiety has always been considered a fundamental concept in all periods of human life, and due to its overlap with physical symptoms, particularly in the elderly, it is usually ignored. What makes working with these patients difficult is the way the symptoms of anxiety are differentiated from the dementia symptoms, the distinction between anxiety and irritation and depression, and whether the sources of information used for evaluating anxiety in dementia patients, particularly in extreme cases, are valid (Calleo et al., 2011). So far, few studies have been carried out on anxiety in patients with dementia. Considering the importance of anxiety in dementia, clinical experts are attempting to assess this issue. Therefore, it is essential to develop an instrument with an acceptable clinical reliability and validity level. The instrument examined in the present study included a RAID questionnaire administered to the elderly suffering from dementia, who were referred to psychotherapy clinics for the elderly. Cronbach's alpha was used as the criterion for assessing the reliability of the present scale, which pointed to the relatively high reliability of the instrument used and indicated the stability and reliability of the instrument used for identifying anxiety in patients with dementia. These findings were consistent with Shanker et al. (1999).

This questionnaire is the only questionnaire concerning the anxiety of patients with dementia. The closest study to this study is probably related to the validity and reliability of anxiety in the elderly in Iran, which was conducted by Bandari et al. in 2016 and has good validity and reliability.

The present study was constrained by some limitations. One of the limitations was the small sample size. Another limitation was that when the patients had severe dementia, the caretaker filled in the questionnaire, and the caretaker's biases might have influenced the answers. Many of the patients could not express their feelings or identify their symptoms. They may even provide different answers to one behavior or question due to the mood swings caused by cognitive problems. Therefore, it is suggested that future studies use a larger sample from different cultural backgrounds.

Conclusion

Overall, it can be concluded that the dementia anxiety questionnaire is a reliable and valid instrument for patients who have dementia in the Iranian population.

Conflict of Interests

Authors have no conflict of interests.

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