

Psychometric Assessment Of Anxiety Syndromes In Dementia Of Different Types

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Abstract

The lack of generally accepted criteria for assessing anxiety frequency and severity, the resulting methodological problems, as well as the insufficient knowledge of its clinical manifestations makes relevant the development of algorithms for its detection and assessment, as well as the creation of psychometric tools for this remain urgent tasks of gerontopsychiatry. In this article the review of advantages and disadvantages of the scales used is given. Scoring systems, based on symptoms and signs occurring two weeks prior to the interview; assessment scale for anxiety states in dementia patients; and rules for the psychometric assessment of anxiety in dementia are presented. Conditions and rules for the further development of specialized scales are discussed and recommendations given. The authors have proposed a more reliable and clinically valid system for quantifying each of the symptoms. This considers the degree of influence of the symptom on the behavior of the subject, the frequency of occurrence of the symptom (daily or not every day), its stability (throughout the day or only part of it), which makes it possible to more accurately assess the clinical significance of each component of the anxiety syndrome.

Keywords: psychometric tools, gerontopsychiatry, non-cognitive mental disorders, anxiety disorder, dementia assessment scale

Introduction

The problems of assessing anxiety and anxiety syndromes in dementia become apparent already at the first stages of the patient's examination, when it is necessary to quickly identify and correctly interpret this type of mental pathology. According to the Commission's report The Lancet (2018), "only 41% of patients admit with anxiety that they have mental health problems" [1], that is, it is not always recognized by patients of different profiles, regardless of their age and cognitive status.

In dementia, identifying and measuring the severity of anxiety is even more difficult because it is often mixed with the symptoms of concomitant somatic diseases [2], and when dementia deepens, it hides behind severe psychopathological disorders [3].

According to another point of view, the progression of dementia is accompanied by a change in the frequency of anxiety: first, its manifestations increase in frequency, and then decrease [4-6].

The imperfection of the existing qualification criteria for acute psychoses proceeding with anxiety, subacute and chronic anxiety states partly explains the fact that the severity of the condition, the psychotic stage of a painful episode are often assessed not clinically but psychometrically for the sake of unifying the obtained results, and at the same time, very often there are used scales that not appropriate for dementia, for example, The Brief Psychiatric Rating Scale - BPRS [7] or the Goldberg Scale of Anxiety - GADS [8].

Unsolved problems of psychometric assessment of anxiety states in dementia

Over the past 20 years, in attempts to group non-cognitive psychopathologic symptoms observed in dementia (Behavioral and Psychological Symptoms in Dementia - BPSD), researchers have identified so-called clusters. For example, Harwood identified five clusters, one of which is worry-anxiety complex[9], Frisoni divided all BPSD into three groups: those that were associated with the affective sphere, psychotic and "frontal" symptoms[10], Craufurd believed that in choreic dementia, three clusters should be distinguished: depressed, apathetic, and symptoms of emotional irritability / lability[11]. Aalten divided all BPSD in dementia into those associated with pathology of affects (80%), hyperactivity (60%) and "psychosis" (37%)[12].

These studies made it possible to outline the circle of non-cognitive psychopathology symptoms developing in patients with dementia [13-15]. As a result, it was found that in these patients, anxiety symptoms occurred in more than 70% and depended on nosology, stage of the disease and other unclear reasons [16]. Anxiety syndromes in dementia often resemble generalized anxiety disorder (GAD), but the origin of these symptoms, their nosological affiliation can be clarified only in 1-5% of cases [5], the nature of the rest remains unclear, i.e. e. these conditions cannot be qualified using ICD-10 criteria. It turns out that in these cases the categorical approach does not give the desired results, therefore, perhaps, in the last 10-15 years, the dimensional approach dominates in research.

Psychometric tools that help assess anxiety in patients of different ages, including the elderly, have been developed for a long time, and many of them are well known (Hamilton Anxiety Rating Scale — HAM-A [17], The Geriatric Anxiety Inventory — GAI [18]). Their anxiety and associated symptoms assessment is difficult in cases of cognitive failure in patients has been assumed or became apparent. That is, the approach implemented, for example, in the scale (HAM-A) [17], turned

out to be inappropriate for the elderly, suffering from dementia, since its correct use provides for the patient's preserved ability to both insight and self-report.

The possibilities of anxiety assessing with specialized scales

Currently, there are few scales specially designed for screening and assessing anxiety in dementia [14; 19; 20]. At the same time, there is a sufficient number of scales that assess the entire range of BPSD in dementia of late age but they are either not sensitive enough to screen for anxiety, or assess it apart from other associated disorders. With the help of such scales, it is possible to identify positive and negative non-cognitive symptoms, to assess the degree of their maladaptive influence, but none of them allows considering the severity of the condition and complex relationships between the anxiety complex and symptoms secondary to it [13, 15, 21-23].

The ADAS-noncog scale [21] reflects four symptoms associated with anxiety: wandering, general motor restlessness, absent-mindedness, and changes in appetite. The scale for assessing the mental state of elderly patients with dementia allows screening and assessment of symptoms associated with anxiety, such as impaired concentration, irritability, anxious motor restlessness, asthenia [13].

With the help of BEHAVE-AD [15], it is possible to assess anxiety and anxiety in Alzheimer's disease, both generalized and fixed, as well as fears (for example, fear of being alone or fear of doing everyday activities), wandering or repeating aimless behavioral activities. Five subscales are generated by the Interpersonal Sensitivity Measure (ISM): concerning interpersonal sensitivity: separation anxiety, interpersonal awareness, timidity and fragile inner self, need for approval [49].

The PBA scale was developed by Craufurd to assess non-motor disorders in Huntington's chorea, including accompanied by dementia. The authors found anxiety and excitability in half of the cases. In the list of symptoms, anxiety and associated irritability in the first (extended) version of the PBA-HD scale is in second place after depressive symptoms, and in the short version (PBA-S) - in third, after depression and suicidality [11].

The most frequently used scale in Europe [24], which allows assessing (among other BPSDs) anxiety symptoms in dementia, is the neuropsychiatric inventory — NPI [14]. This tool is highly appreciated by experts, it is used in the form of adapted Russian-language versions, which, like the versions of the above other scales, have not yet been validated in Russia. Using NPI, it is necessary to evaluate anxiety separately from other symptoms, although a lot of them are either associated with it or are its direct expression.

Disadvantages of the scales used

A significant drawback of many scales currently in use is that symptoms are often grouped by external similarity, without considering their syndromic affiliation. For example, in the NPI scale "elation" (high spirits) is combined with "euphoria" (euphoria), "depression" (depression) - with "dysphoria" (dysphoria).

Moreover, the division of delusions into residual, small-scale persecution, or jealousy is not provided (although in the proposed list of the NPI scale they are indicated). NPI and BEHAVE-AD are based on a limited sources information number (either from a nurse interview or from examination data), the assessment of the frequency and symptoms severity is largely subjective. The recommended retrospection period in this can be up to 4 weeks. Other psychometric tools such as the neurobehavioral rating scale - NRS are cumbersome and time consuming to use [22].

Problems of using highly specialized scales

In 1999 Shankar et al. have developed the Rating Anxiety in Dementia (RAID) scale [20] that in fact was an adapted version of HAM-A. This makes it possible to consider and evaluate all the conventional symptoms of anxiety in dementia (see below RAID test list).

Rating Anxiety in Dementia

Rating should be based on symptoms and signs that occurred two weeks prior to the interview. No score should be given in case symptoms result from physical disability or illness. The total score becomes the sum of items from 1 to 18 (Table 1). A score of 11 or more suggests significant clinical anxiety [20].

Unlike NPI and BEHAVE-AD, RAID testing can use a wider range of information sources, but this tool does not allow separate assessment of somatic and psychic anxiety. In addition, as practice has shown, the specificity of this instrument turned out to be insufficient, and the assessment of the severity of symptoms on the basis of the "more / less" principle makes this approach too subjective. The 2-week observation period taken into account does not allow timely detection of the ongoing changes in the anxiety state. But RAID remains the best psychometric scale of anxiety in dementia. It is distinguished by good internal consistency and is convenient even for those raters who do not have any clinical experience. At present, it is widely used [25-26].

If we talk about the recently developed special narrowly targeted scale - the anxiety in cognitive impairment and dementia scales - ACID [19], then it was created and tested on groups including both dementia and non-dementia patients. It was expected that it will be able to be used by raters without special training. The instrument is not designed to cover all aspects of mental status and

does not allow the separation of disorders into leading and secondary. This scale is characterized by excessive sensitivity, which significantly reduces its practical value. Unfortunately, research in this direction has not been carried out in recent years. The main attention of researchers is directed to the development of psychometric tools that allow assessing the quality of life of caregivers of demented patients [27-29], the level of social functioning of patients with different degrees of cognitive deficit are developing a fundamentally different approach, within which the state of patients with dementia is assessed from the standpoint of positive psychology ("hope, resilience, a sense of independence and social engagement") [30-31].

Obligate rules for the psychometric assessment of anxiety in dementia

The principles and rules that obligate for the construction of specialized psychometric instruments and the conditions for their use have been developed since the early 2000s. It is known, such scales should include a small number of items in order to shorten testing time as much as possible. Some researchers point out that a number of limitations must be considered when testing anxiety in dementia.

First of all, this concerns the impossibility of using self-questioners. According to Gibbons et al., only 26% of demented patients (the data refer to cases of dementia in Alzheimer's disease) can themselves report anxiety and worry [32]. The popular self-questionnaire Goldberg Anxiety Quiz, based on GADS [8] or the scale itself, is applied without taking into account the cognitive status of the subjects. An example of using this tool has been presented in the Tsatali with coauthors research about anxiety in Alzheimer's disease [33]. The Worry Scale designed to assess anxiety in initial Alzheimer's disease, provides for self-reporting, includes an assessment of phenomena that are not necessarily associated with anxiety, for example, personal reactions to ongoing changes [34].

Another mistake is the misapplication of well-known tools designed to work in general practice, but used to assess anxiety in dementia elderly. McCracken has used The Pain Anxiety Symptoms Scale (PASS) in these cases. Researches of Diefenbach et al. and Bakkaneet et al. demonstrated Geriatric Anxiety Inventory (GAI) was acceptable for people with cognitive decline in case of anxiety symptoms were definitely associated with cognitive status [36-37].

Hamilton Anxiety Rating Scale (HAM-A) is an effective and accurate tool for measuring the severity of anxiety syndrome [17]. The scale is suitable for assessing different aspects of the anxiety state before, during and after therapy. But the approach taken in HAM-A is not applicable to the elderly with dementia, as this tool is intended for cases with an already established diagnosis of anxiety disorder. The assessment is largely based on subjective complaints, and on what the subject

can note in himself. In these cases, its correct use is impossible due to the loss of patients' ability to insight and self-report.

Therefore, Malaraet al. and Kassem et al. rightly emphasize that self-questioning and non-adapted tools can be used only before the onset of dementia and with mild cognitive decline, and special scales should be used to test anxiety in dementia [38-39].

Another important feature of testing concerns the sources of information used and the requirements for the rater. Mograbiet al. have found the assessment of anxiety from the report of the nurse is less sensitive and more subjective than when receiving data from direct testing by a specialist [40]. Samaras et al. pointed out certain mistakes made in this case [41].

In the trial of The Hospital Anxiety and Depression Scale, despite a preliminary psychiatric conclusion allowing targeted testing, the scale by non-specialists using failed to confirm acceptable sensitivity even in non-demented elderly. Has been shown the directly observing specialist and the informant were equally effective in detecting existing disorders (not only anxiety). But at the same time, they assessed the frequency of disorders in different ways [42-43]. It can be concluded in order to obtain results, testing should be carried out by the specialist who performed the preliminary assessment.

Conditions and rules for the further development of specialized scales

One of the directions of researches is the construction of psychometric tools that would be useful in the early stages of Alzheimer's disease. Along with this, it is necessary to develop and use scales that partially overlap each other in order to be able to carry out many-sided validation of such instruments. There is data about approach that allows assessing the mental state of a dementia patient at the time of examination («technology-based 'in-the-moment' measurement») [44-46]. Screening for BPSD should separately assess symptoms of a different nature, such as hypothyria and dysphoria, hypertension and euphoria or complacency.

Assessment of anxiety should be done in conjunction with symptoms that are highly likely to be associated with it (agitation, repetitive activities, insomnia, irritability, hypothyria, eating disturbances).

When assessing the behavior and mental state of the patient, all available information from the maximum possible number of sources should be taken into account (medical documentation, observation diaries, reports from nurses, relatives, examinations by physicians). Of particular diagnostic value are the data obtained during direct observation, physical examination and when interviewing the patient.

It is desirable that the rating scale provide for the possibility of separate assessment of the somatic and mental symptoms of anxiety.

It is necessary to improve the methods of quantitative assessment of anxiety states, in order to make it more objective.

The retrospective evaluation period should be no more than a week in order to minimize the loss of relevant information and increase the reliability of the measurements.

When constructing a scale, duplication should be avoided in assessing particular components of an anxious syndrome in order to avoid overestimation and to keep the specificity of the psychometric instrument at an acceptable level.

Typical manifestations of anxiety in dementia, which must be considered in psychometric instruments developing

The mood of patients with dementia in most cases is characterized by variability, instability and almost always colored by irritability. This is consistent with the position of those authors who note mood lability / irritability as one of the forms of anxious mood [17, 39].

Some studies in recent years has shown that as the disease progresses, anxiety takes on specific and immediate, "objective" forms. For example, anxious tension is more and more manifested in the form of muscle and less and less perceived as internal, as is noticeable when examining an anxious stressed patient, in whom an increased muscle tone of the chest, abdomen, arms, legs, and neck can be detected [46].

In 2016-2017 Russian gerontopsychiatrists have developed, tested and validated a new tool (Table 2) - the Assessment Scale for anxiety in dementia (ASAD) [47-48]. In its creating, all the features of identifying and assessing anxiety in patients with different types of dementia were taken into account.

The scale includes 21 points and makes it possible to assess the severity and acuity of post psychotic and chronic anxiety syndromes, psychic and somatic symptoms of anxiety detected in observation (items 1-4), physical, neurological examination (items 5-10) and in personal conversation (items 11-21), to consider the effect of the main dementing process on the clinic of anxiety. It will take about 10 minutes for the professional to conduct a psychometric assessment of anxiety and related BPSD.

Conclusion

The frequency of anxiety symptoms and conditions that occur in older people with dementia determines the interest in them of clinicians, practitioners and researchers.

Diagnostic difficulties that arise in everyday medical practice are due to the complexity and ambiguity of the picture of many mental disorders developing in the context of dementia, including the variability and variety of manifestations of anxiety.

Problems in the study of this non-cognitive mental pathology in dementia can be explained by the insufficient study of its age characteristics, the features caused by the underlying disease, as well as the still unresolved issues of the syndrome of anxiety conditions, concerning, in particular, their structure and dynamics. Anxiety is often hidden behind the facade of concomitant somatic diseases, can be interpreted as a subclinical emotional reaction in response to various factors.

The need for auxiliary diagnostic psychometric tools is dictated by the fact that signs of anxiety in dementia can be difficult for quantitative assessment, differential diagnosis and are always accompanied by a whole range of psychopathological symptoms associated with it.

Assessment of the severity and clinical significance of anxiety is necessary to qualify the stage of an acute episode of dementia, identify the hierarchy of symptoms, and then qualify the anxiety syndrome.

The currently scales are either overly sensitive or haven't sufficient discriminant validity for havepossible to differentiate assessment of complex anxiety states in different sides.

Because of this, the development and implementation of convenient psychometric tools suitable for both primary diagnosis and assessment of therapeutic dynamics remains an urgent scientific task.

REFERENCES

1. Patel V, Saxena S, Lund C, Thornicroft G, Baingana et al. The Lancet Commission on global mental health and sustainable development. *Lancet*. 2018;392(10157):1553–1598.
2. Balsamo M., Cataldi F., Carlucci L., Fairfield B. Assessment of anxiety in older adults: a review of self-report measures. *ClinInterv Aging*. 2018;13:573–593.
3. Shakhmatov NF. *Mental aging*. Moscow: Medicine, 1996:129–135.
4. SeignourelPJ, Kunik ME, Snow L, Wilson N, Stanley M. Anxiety in dementia: a critical review. *Clin Psychol Rev*. 2008;28(7):1071–82.
5. Sysoeva VP. Anxiety states in old age: dis. ... Cand. of Medical Sciences. 2015.
6. Kolykhalov IV. Non-cognitive mental disorders in Alzheimer's disease: epidemiological, clinical-psychopathological, prognostic and therapeutic aspects: abstract dis. ... Dr. med. Sciences. 2017;47.
7. Overall JE, Gorham DR. The Brief Psychiatric Rating Scale. *Psychological Reports*. 1962;10:799–812.

8. Goldberg D, Bridges K, Duncan-Jones P, Grayson D. Detecting anxiety and depression in general medical settings. *British medical journal*. 1988;297(6653):897–899.
9. Harwood DG, OwnbyRL, Barker WW, Duara R. The behavioral pathology in Alzheimer's Disease Scale (BEHAVE-AD): factor structure among community-dwelling Alzheimer's disease patients. *Int J Geriatr Psychiatry*. 1998;13(11):793–800
10. Frisoni GB, Rozzini L, Gozzetti A, Binetti G, Zanetti O, Bianchetti A, Trabucchi M, Cummings JL Behavioral syndromes in Alzheimer's disease: description and correlates. *Dement GeriatrCognDisord*. 1999;10(2):130–8.
11. Craufurd D., Thompson JC, Snowden JS. Behavioral changes in Huntington Disease. *Neuropsychiatry NeuropsycholBehav Neurol*. 2001;14(4):219–26.
12. Aalten P, van Valen E, Clare L, Kenny G, Verhey F. Awareness in dementia: a review of clinical correlates. *Aging Ment Health*. 2005;9(5):414–22. Review.
13. Bukatina EE, Grigorieva IV, Smirnov OR. A scale for assessing the mental state of elderly patients with dementia. *Social and Clinical Psychiatry*.1992;2(4):29–37.
14. Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi D.A., Gornbein J. The neuropsychiatric inventory: Comprehensive assessment of psychopathology in dementia. *Neurology*. 1994;44(12):2308–2314.
15. Reisberg B, Auer SR, Monteiro IM. Behavioral pathology in Alzheimer's disease (BEHAVE-AD) rating scale. *International Psychogeriatrics* 1996;8(3):301–308.
16. SeignourelPJ, Kunik ME, Snow L, Wilson N, Stanley M. Anxiety in dementia: a critical review. *Clin Psychol Rev*. 2008;28(7):1071–82
17. Hamilton M. The assessment of anxiety states by rating. *The British journal of medical psychology*. 1959;32(1):50–55.
18. Johnco C, Knight A, Tadic D, Wuthrich VM, Psychometric properties of the Geriatric Anxiety Inventory (GAI) and its short-form (GAI-SF) in a clinical and non-clinical sample of older adults. *Int. Psychogeriatr*.2015;27(7):1089–97
19. Gerolimatos LA, Ciliberti CM, Gregg JJ, Nazem S., Bamonti P.M., Cavanagh C.E., Edelstein B.A. Development and preliminary evaluation of the anxiety in cognitive impairment and dementia (ACID) scales. *IntPsychogeriatr*. 2015;27(11):1825–38.
20. Shankar KK, Walker M, Frost D. The development of a valid and reliable scale for rating anxiety in dementia (RAID). *Aging & Mental Health*. 1999;3(1):39–49
21. Rosen WG, Mohs RC, Davis KL. A new rating scale for Alzheimer's disease / *The American journal of psychiatry*.1984;141(11):1356–1364.

22. Levin HS, High WM, Goethe KE et al. The neurobehavioural rating scale: assessment of the behavioural sequelae of head injury by the clinician. *Journal of neurology, neurosurgery, and psychiatry*. 1987;50(2):183–193.
23. Halek M, Holle D, Bartholomeyczik S. Development and evaluation of the content validity, practicability and feasibility of the Innovative dementia-oriented Assessment system for challenging behaviour in residents with dementia. *BMC Health Serv. Res.* 2017;17:554.
24. Paulino Ramirez Diaz S, Gil Gregório P, Manuel Ribera Casado J, Reynish E, Jean Ousset P, Vellas B, Salmon E/ The need for a consensus in the use of assessment tools for Alzheimer's disease: the Feasibility Study (assessment tools for dementia in Alzheimer Centres across Europe), a European Alzheimer's Disease Consortium's (EADC) survey. *Int J Geriatr Psychiatry*. 2005;20(8):744–8.
25. Snow AL, Huddleston C, Robinson C, Kunik ME, Bush AL, Wilson N, Calleo J, Paukert A, Kraus-Schuman C, Petersen NJ, Stanley MA. Psychometric properties of a structured interview guide for the rating for anxiety in dementia. *Aging Ment Health*. 2012;16(5):592–602.
26. Goyal AR, Bergh S, Engedal K, Kirkevold M, Kirkevold Ø. Norwegian version of the rating anxiety in dementia scale (RAID-N): a validity and reliability study. *Aging Ment Health*. 2017;21(12):1256–1261.
27. Chang C-C, Su J-A, Lin C-Y. Using the Affiliate Stigma Scale with caregivers of people with dementia: psychometric evaluation. *Alzheimers Res Ther*. 2016;8:45.
28. Page TE, Farina N, Brown A, Daley S, Bowling A, Basset T, Livingston G, Knapp M, Murray J, Banerjee S. Instruments measuring the disease-specific quality of life of family carers of people with neurodegenerative diseases: a systematic review. *BMJ Open*. 2017;7(3)
29. Brown A., Page TE., Daley S., Farina N., Basset T., Livingston G., Budgett J., Gallaher L., Feeney Y., Murray J., Bowling A., Knapp M., Banerjee S. Measuring the quality of life of family carers of people with dementia: development and validation of C-DEMQOL. *Qual Life Res*. 2019;28(8):2299–2310.
30. Budgett J, Brown A, Daley S, Page TE, Banerjee S., Livingston G, Sommerlada A. The social functioning in dementia scale (SF-DEM): Exploratory factor analysis and psychometric properties in mild, moderate, and severe dementia. *Alzheimers Dement (Amst)*. 2019;11:45–52.
31. Stoner CR, Orrell M, Long M, Csipke E, Spector A. The development and preliminary psychometric properties of two positive psychology outcome measures for people with dementia: the PPOM and the EID-Q. *BMC Geriatr*. 2017;17:72.

32. Gibbons LE, Teri L, Logsdon RG, McCurry SM. Assessment of anxiety in dementia: an investigation into the association of different methods of measurement. *J Geriatr Psychiatry Neurol.* 2006 Dec;19(4):202–8.
33. Tsatali M, Papaliagkas V, Damigos D, Mavreas V, Gouva M, Tsolaki M. Depression and anxiety levels increase chronic musculoskeletal pain in patients with Alzheimer's disease. *Curr Alzheimer Res.* 2014;11(6):574–9.
34. LaBarge E. A preliminary scale to measure the degree of worry among mildly demented Alzheimer disease patients / E. A. LaBarge. *Physical & occupational therapy in geriatrics.* 1993;11(3):43–57.
35. McCracken LM. A short version of the Pain Anxiety Symptoms Scale (PASS-20): preliminary development and validity / L. M. McCracken, L. Dhingra. *Pain research and management.* 2002;7(1):45–50.
36. Diefenbach GJ, Bragdon LB, Blank K. Geriatric anxiety inventory: factor structure and associations with cognitive status. *Am J Geriatr Psychiatry.* 2014;22(12):1418–26.
37. Bakkane BA, Hartberg CB, Selbæk G, Engedal K. Symptoms of Anxiety in Older Adults with Depression, Dementia, or Psychosis: A Principal Component Analysis of the Geriatric Anxiety Inventory. *Dement Geriatr Cogn Disord.* 2016;42(5-6):310–322.
38. Malara A, De Biase GA, Bettarini F, Ceravolo F, Di Cello S, Garo M, Praino F, Settembrini V, Sgrò G, Spadea F, Rispoli V. Pain Assessment in Elderly with Behavioral and Psychological Symptoms of Dementia. *J Alzheimers Dis.* 2016;50(4):1217–25.
39. Kassem AM, Ganguli M, Yaffe K, Hanlon JT, Lopez OL, Wilson JW, Ensrud K, Cauley JA. Anxiety symptoms and risk of dementia and mild cognitive impairment in the oldest old women. *Aging Ment Health.* 2018;22(4):474–482.
40. Mograbi DC, Ferri CP, Stewart R, Sosa AL, Brown RG, Laks J, Morris RG. Neuropsychological and behavioral disturbance correlates of unawareness of memory impairment in dementia: a population-based study. *J Geriatr Psychiatry Neurol.* 2015;28(1):3–11.
41. Samaras N., Herrmann FR, Samaras D, Lang PO, Canuto A, Forster A, Hilleret H, Gold G. The Hospital Anxiety and Depression Scale: low sensitivity for depression screening in demented and non-demented hospitalized elderly. *Int Psychogeriatr.* 2013;25(1):82–7.
42. Zigmond, AS, Snaith RP. The hospital anxiety and depression scale // *Acta Psychiatrica Scandinavica.* 1983;67(6):361–370.
43. McCann JJ, Gilley DW, Hebert LE et al. Concordance between direct observation and staff rating of behavior in nursing home residents with Alzheimer's disease. *The journals of gerontology. Series B, Psychological sciences and social sciences.* 1997;52(2):63–72.

44. Bazin N, Fremont P. Alzheimer type dementia: is early diagnosis significant? *Presse Med.* 2000;22-29(15):871-5.
45. Teng EL, Manly JJ. Neuropsychological testing: helpful or harmful? *Alzheimer Dis AssocDisord.* 2005;19(4):267–71.
46. Smirnov OR. Mental and somatic anxiety in the elderly with dementia. *Social and Clinical Psychiatry.* 2010;20(4):26–30.
47. Smirnov OR. An Assessment Scale for Anxiety States in Dementia Patients. *Doctor.Ru.* 2017;1(130):49-54.
48. Smirnov OR, Kazmin SA, TokarskayaSV, Sveshnikov PA. Validation of an assessment scale of anxiety states in dementia. *Mental health.* 2017;8:40–47.
49. Slanbekova, GK, Chung, MC, Karipbaev, BI et al. Posttraumatic Stress and Interpersonal Sensitivity: Alexithymia as Mediator and Emotional Expressivity as Moderator. *Psychiatr Q.* 2019;90:249–261 <https://doi.org/10.1007/s11126-018-9612-5>

Tables:

Table 1. Scoring systems (0 – Absent, 1: Mild or intermittent, 2: Moderate, 3: Severe, U: Unable to evaluate)

Worry	1	Worry about physical health
	2	Worry about cognitive performance (falling memory, getting lost when goes out, not able to following conversation).
	3	Worry over finances, family problems, and physical health of relatives
	4	Worry associated with false belief and/or perception
	5	Worry over trifles (repeatedly calling for attention over trivial matters).
Apprehension and vigilance	6	Frightened and anxious (keyed up and on the edge).
	7	Sensitivity to noise (exaggerated startle response).
	8	Sleep disturbance (trouble falling or staying asleep).
	9	Irritability (more easily annoyed than usual, short tempered and angry outbursts).
Motor tension	10	Trembling
	11	Motor tension (complain of headache, other body aches and pains).
	12	Restlessness (fidgeting, cannot sit still, pacing, wringing hands, picking clothes).
	13	Fatigue ability, tiredness

Autonomic	14	Palpitations (complain of heart racing or thumping).
hypersensitivity	15	Dry mouth (not due to medication), sinking feeling in the stomach.
	16	Hyperventilating, shortness of breath (even when not exerting).
	17	Dizziness or lightheadedness (complains as if going to faint).
	18	Sweating, flushes or chills, tingling or numbness of fingers and toes.
Phobias: (fears which are excessive, that do not make sense and tend to avoid-like afraid of crowds, going out alone, being in a small room, or being frightened by some kind of animals, heights, etc.).		
Describe.		
Panic attacks: (feelings of anxiety or dread that are so strong that think they are going to die or have a heart attack and they simply have to do something to stop them, like immediately leaving the place, phoning relatives, etc.) Describe.		
Total score:		

Table2.An assessment scale for anxiety states in dementia patients [47]

	clinical significance	presence/influence on behavior	frequency	stability	severity
					3+4
					2x5
1-a) Anxiouswandering / fussing					
2-a) Insomnia					
3-a) agitation recurrence					
4-a) dysphoria post-deliria					
5-b) Vegetative Symptoms - Dryness / Sweating					
6-b) Cardiovascular symptoms - tachycardia / blood pressure instability, episodes of extrasystole					
7-b) Respiratory symptoms - rapid breathing					
8-b) Genitourinary Symptoms - Increased urinary incontinence / urinary discomfort					
9-b) MuscleSymptoms - Tremors					
10-b) Anxioustension - stiffness					
11-c) Intellectual impairment - difficulty concentrating due in part to anxiety					
12-c) Anxious mood - mood instability / irritability					
13-c) complacencyincongruent					

14-c) euphoria post-deliria or frontal				
15-c) Asthenia - increased fatigue, exhaustion				
16-c) apathy post-deliria				
17-c) apathy primary				
18-c) hypothimia secondary				
19-c) hypothimia primary (depression of unknown etiology, presumably present in the past and / or before the onset of acute psychosis)				
20-c) delusion of theft				
21-c) delusion residual				
Total score				

clinical significance	presence/ influence on behavior	frequency	stability	severity
	0 - absent	every day (2	all day (2 points)	frequency
influence	1 - noted, does not affect	points)		plus
multiplied by	2 - affects behavior, but		part of the day (1	stability
severity	does not determine	not every day (1	point)	
	3 - defines behavior	point)		
