Associations between anxiety and functional disability in older adults: a cross-sectional study

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Abstract

Objective: to estimate the prevalence of anxiety in older adults and its association with different levels of functional disability in a small town in the state of Paraiba, Brazil. *Method: a* cross-sectional analytical study was carried out of 233 randomly-selected older users of the Family Health Strategy program. Data were collected using the World Health Organization Disability Assessment Schedule 2.0 and the Geriatric Anxiety Inventory. Results were analyzed using descriptive and bivariate statistics adopting a significance level of $p < 0.05$. *Results*: Overall, 48.1% of the participants had some degree of self-reported anxiety, with significantly higher levels among women (mean rank = 128.11; $p = 0.002$). An association was also found between severe anxiety level and severe disability level ($p < 0.001$). *Conclusion*: the high prevalence of different degrees of geriatric anxiety and its association with severe functional disability indicates the coexistence of psycho-emotional and motor alterations. These findings suggest the need to break the chain of underdiagnosis and strengthen the implementation of specialized interventions in the field of gerontology and geriatrics.

Keywords: Aging. Aged. Anxiety Disorders. International Classification of Functioning, Disability and Health.

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INTRODUCTION

Geriatric Anxiety is emerging as one of the most important health issues in aging, with a prevalence of 15-52% worldwide[1]. Although anxiety occurs across virtually all stages of life, anxiety disorders tend to be more severe in late life and are commonly associated with a disability outcome in older adults[2]. Anxiety is one of the leading causes of work-related and social absence[2] and constitutes a risk factor predisposing individuals to limitations comparable to or more severe than well-established chronic diseases[2,3].

The aging process is accompanied by a gradual natural decline in function among older individuals, reducing their capacity for adaptation and rendering them less able to carry out activities of daily living involving self-care, acquiring new skills and interaction in society[1,4]. However, when aging is associated with psycho-emotional disorders and pre-existing comorbidity, there is a greater degree of frailty and impairment of autonomy and independence, making older individuals more susceptible to dysfunction and disability[4,5].

Thus, functioning can be defined as a dynamic relationship which encompasses all structures of the body, activities performed, health status, environmental factors, and the people around the individual, while disability denotes difficulty or limitation in performing everyday activities in some domain of life within the expected timeframe for humans[6].

Hence, maintaining psycho-emotional wellbeing and functional capacity in late life represents a core concern in the field of aging, given its implications can have a direct impact on the older individual, their family and the community. Moreover, these disorders increase the risk of death in the older population, and lead to higher rates of hospitalization and burden for the public health system.

This scenario reveals the need to identify scientific evidence elucidating the existence of a relationship between aging, anxiety and functional capacity. This knowledge can help support the provision of quality specialized care to the older population, especially by conceptualizing the coexistence of anxiety-related symptoms with functional (dis)ability.

A search of the main national and international literature databases (Literatura Latino-Americana e do Caribe em Ciências da Saúde - LILACS, Scientific Electronic Library Online (SciELO); and Cumulative Index to Nursing and Allied Health Literature – CINAHL) revealed the availability of a greater volume of studies on other common mental disorders than for anxiety in the older population, and a dearth of evidence on anxiety disorders in this group and their implications for life and health, particularly within smaller towns in the Northeast region of Brazil[7,8].

Therefore, the objective of the present study was to estimate the prevalence of anxiety in older people and its association with different levels of functional disability in a small town located in the state of Paraíba, Brazil.

METHOD

A cross-sectional analytical study was conducted of a representative sample of older users of 5 Primary Health Units in the urban zone of Cuité, a small town located in Western Curimataú, Paraíba state, Brazil.

The sample size was determined using the public domain software OpenEpi version 3.0. The parameters were: the universe of the older population of the urban zone of the town (N= 2,486)[9]; mean estimated prevalence of anxiety-related disorders in the older population, P = 22.0% (0.22)[10]; a 95% level of confidence; and a sample error of 5%, giving an estimated sample size "n" of 233 participants, allowing for 6 losses and refusals. Participants were selected randomly in a systematic proportional fashion for each Primary Health Unit. The 3 criteria for participant inclusion were: age ≥60 years; living in the catchment area of the Primary Health Units at which they were registered users; attaining the cognitive performance cut-off of 10 points on the Mini-Mental State Exam (MMSE) for the items orientation for time (date of interview) and for place (address of residence), irrespective of educational level[11]. Individuals that had communication deficits precluding data collection, or who could not be found at home after 2 visits, were excluded from the study.

The data collection process took place between April and May 2021, following study approval by

the Research Ethics Committee of the University Hospital Alcides Carneiro (Permit no. 4.487.662), in compliance with the ethics and scientific precepts set forth in Resolutions 466/2012 and 510/2016 of the National Board of Health. Participant identification and recruitment entailed compiling a list of home addresses of all older users registered at each Primary Health Unit from medical records. The data collection was carried out by the lead researcher, the assistant researcher and 3 previously-trained students enrolled at the Center for Studies and Research in Aging and Quality of Life (NEPEQ) of the Federal University of Campina Grande (UFCG). In view of the COVID-19 pandemic, all health and biosafety rules prevailing in Brazil were adopted, with distancing of 1.5 meters and use of personal protective equipment by researchers.

Data were gathered using the following instruments: I) Sociodemographic questionnaire collecting information on the variables sex, skin color/race, marital status, religion, family income, living arrangement, functional literacy and occupational status; II) Geriatric Anxiety Inventory (GAI) to assess symptoms indicative of anxiety in the older population[12] and comprising 20 dichotomous items, with scores tallied and categorized as follows: 0-10 indicates absence of anxiety; 11-15, mild/moderate anxiety; and 16-20, severe anxiety, as per its translation and transcultural adaptation in the Brazilian version[13]; and III) World Health Organization Disability Assessment Schedule (WHODAS 2.0) comprising a generic assessment instrument for health and disability applicable in both general population and clinical settings covering 6 life domains of functioning: Domain 1: Cognition (understanding & communicating); Domain 2: Mobility (moving & getting around); Domain 3: Self-care (hygiene, dressing, eating & staying alone); Domain 4: Getting along (interacting with other people); Domain 5: Life activities (domestic responsibilities, leisure, work & school); and Domain 6: Participation (joining in community activities). The 12-item version of the scale used in the present study yields a score of 0-48 points, where 0-1 points indicates "none", 2-5 "mild", 6-11 "moderate"; and ≥12 points "severe" disability[14].

The data were analyzed and statistics expressed descriptively and in bivariate fashion as simple measures of absolute and relative frequency, with mean as the measure of central tendency. Subsequently, analysis of inferential statistics was performed to correlate the outcome variable (anxiety level) and exposure variables (sociodemographic characteristics and functioning level). For treatment of the bivariate statistic, Fisher´s Exact test was applied to determine the association between categorical variables, while the Mann-Whitney U test and Kruskal-Wallis test were used for group comparisons with the outcome variable. Non-parametric tests were used for skewed normal distribution of data, as measured by the Kolmogorov-Smirnov test. Associations were deemed statistically significant for $p < 0.05$.

RESULTS

Of the 233 participants, there was a predominance of individuals that were young older adults aged 60-74 years (59,7%), female (60.5%), married (54.1%), brown (56,2%), Catholic (70.4%), retired (89.7%), illiterate (57.9%), receiving a monthly income of 2-3 minimum wages (51.1%) and living with spouse only (28.3%). Comparison of total score on the GAI against groups of socioeconomic variables showed statistical significance only for the sex variable ($p = 0.002$), whose mean rank indicated that anxiety was more prevalent in women (mean rank = 128.11) (Table 1).

The findings regarding the anxiety level self-reported by the participants are presented in Table 2. According to the stratified total GAI scores, 51.9% of the participants had no anxiety, 18.9% mild/moderate, and 29.2% severe anxiety. Thus, at least 48.1% of the study sample had some degree of anxiety.

Correlating the occurrence of anxiety levels with functioning classification revealed a statistically significant association ($p < 0.001$) between anxiety and disability, with severe level of anxiety associated with severe level of disability (Table 3). Levels of disability reported were 9.87% (none), 33.05% (mild), 22.75% (moderate) and 34.33 (severe).

Table 1. Comparison of total score on GAI according to sociodemographic variables among older users of Primary Health Units. Cuité, Paraíba state, Brazil, 2021 (n=233).

Variables	Total score on GAI		
	n (%)	Mean rank	Sig. p-value
Age group[B]			
60-74 years (youngest-old)	139 (59.7)	115.08	0.851
75-89 years (middle-old)	82 (35.2)	120.37	
≥90 years (oldest-old)	12 (5.2)	116.17	
Sex[A]			
Male	92 (39.5)	99.98	**0.002***
Female	141 (60.5)	128.11	
Skin color/Race[B]			
White	70 (30.0)	107.79	0.233
Brown	131 (56.2)	122.77	
Yellow	02 (0.9)	31.25	
Black	29 (12.4)	119.12	
Indigenous	01 (0.4)	115.50	
Marital status[B]			
Single	36 (15.5)	101.78	0.059
Married	126 (54.1)	111.65	
Divorced/separated	16 (6.9)	128.59	
Widowed	55 (23.6)	135.84	
Religion[B]			
None	18 (2.6)	101.28	0.710
Catholic	164 (70.4)	118.22	
Protestant/Evangelical	43 (18.5)	119.57	
Judaism	01 (0.4)	58.50	
Other	06 (2.6)	102.75	
Functional literacy[A]			
Yes	98 (42.1)	119.10	0.684
No	135 (57.9)	115.47	
Family income[B]			
1 m.w.	112 (48.1)	116.85	0.932
2-3 m.w.	119 (51.1)	116.84	
≥4 m.w.	02 (0.8)	134.75	
Living arrangements[B]			
Spouse and children	39 (16.7)	108.32	0.230
Children only	23 (9.9)	129.04	
Trigenerational	21 (9.0)	134.95	
Intragenerational	11 (4.7)	141.09	
Spouse only	66 (28.3)	104.24	
Grandchildren only	05 (2.1)	174.90	
Alone	50 (21.5)	114.96	
Spouse, children, son/daughter-in-law	10 (4.3)	120.10	
Other	08 (3.4)	122.38	

to be continued

Continuation of Table 1

Variables	Total score on GAI		
	n (%)	Mean rank	Sig. p-value
Occupational status[B]			
Retired	209 (89.7)	117.12	
Farmer	19 (8.2)	119.34	0.399
Civil servant	03 (1.3)	143.50	
Other	02 (0.9)	42.50	

[A] - Mann-Whitney U test. [B] - Kruskal-Wallis test* - Statistical significance (p-value < 0.05); m.w - minimum wage.

Table 2. Classification of anxiety level on GAI among older users of Primary Health Units. Cuité, Paraíba state, Brazil, 2021 (n=233).

Variables	Participants	
	n (%)	
No anxiety	121 (51.9)	
Mild/moderate anxiety	44 (18.9)	
Severe anxiety	68 (29.2)	
Total	**233**	**100.0%**

Table 3. Association between categories of anxiety and disability levels among older users of Primary Health Units. Cuité, Paraíba state, Brazil, 2021 (n=233).

Disability level (WHODAS)	Anxiety Level (GAI)			Sig.
	None	Mild/Moderate	Severe	*p-value*[A]
None	17	05	01	< 0.001*
Mild	49	16	12	
Moderate	28	09	16	
Severe	27	14	39	

[A] – Fisher´s Exact Test * - Statistical significance (p-value < 0.05)

DISCUSSION

The present study sought to estimate the occurrence of anxiety in older individuals and its association with different levels of functional disability in a small town located in the interior of Paraíba state. The first hypothesis was that there is a high prevalence of anxiety in older people, given the underdiagnosis of the condition, especially in the primary care setting. The second hypothesis was that there is an association among anxiety, functional disability and socioeconomic status of older people. Thus, the study findings confirmed both these hypotheses upon showing that 48.1% of participants had some degree of self-reported anxiety and that a severe level of the disorder was significantly associated with severe level of functional disability.

Anxiety can be characterized as a condition that is deleterious for the health of older individuals, reducing their quality of life and promoting a decline in health[15]. Multiple conditions associated with the aging process can directly contribute to the development of the disorder. Consequently, these conditions present signs and biases for assessment of anxiety in aging, including a loss or reduction of self-esteem, limitations in activities of daily living,

loss of friends and relatives, decreased physical independence, increase in chronic diseases, and lack of social support[16]. The prevalence of anxiety in this age group can vary by as much as 52%, with rates gradually increasing with age[10,15].

Despite the high prevalence widely reported in the scientific literature, obstacles to the diagnosis and screening of anxiety in the older population remain. Effective detection of anxiety disorders in older individuals is hampered by its pathological aspects that are easily confounded with natural conditions of biopsychosocial aging, common emotional disorder, cognitive decline, or comorbidities induced by the aging process. Thus, when symptoms are not differentiated, the assessment, diagnostic conclusion and therapeutic management of this condition are neglected[16].

Neglect by the individual has also been reported in the scientific literature in health care. A study of older people in 5 general practices in the United Kingdom showed that those with higher levels of severity of anxiety normalized their symptoms as part of their health issues and functional difficulties associated with late life. These individuals also proved reluctant to seek health services, further hampering their diagnosis and treatment[17].-

In the present investigation, the assessment of level of severity found that 29.2% of participants had severe anxiety, exceeding the 16.28% rate reported by a study conducted in Maceió, Brazil[18]. Consistent with the data cited, symptoms such as restlessness, muscle tension, poor concentration and sleep disturbances, commonly associated with the more severe clinical form of anxiety, greatly increase the risk of limitations in physical functioning, social participation, and in activities of daily living of older people. These symptoms are regarded as independent risk factors for the onset of disabilities in this age group[2]. -

Numerous conditions can lead to the high prevalence of severe anxiety in the older population, principally related to factors such as increased burden of diseases and hospitalizations, low level of physical work, substance use (e.g. alcohol or tobacco), late diagnosis of anxious disorder, or poor therapeutic treatment[5].

It is important to mention the epidemiological scenario in which study participants were assessed, amid the pandemic caused by COVID-19. The evidence shows that the COVID-19 pandemic, and resultant physical distancing, can act as potential stressors for the development and exacerbation of psychoemotional issues in older people, whereby factors such as loneliness due to lockdowns, fear of catching the disease, prevention of saying goodbye to those who died, economic strain and uncertainty over future, led to an increase in anxiety symptoms of up to 20% in this population[19,20].

When examined in terms of gender, geriatric anxiety was more prevalent and severe in women than in men. This finding corroborates the results of a multi-center study conducted in Germany, Italy, the United Kingdom, Spain and Israel showing that women had significantly higher levels of anxiety, being 3 times more likely to develop an anxiety disorder[21].

Overall, the literature reports a higher prevalence of health issues and psychoemotional disorders in females[22]. This gender difference might be explained by factors historically associated with females, who had lower access to education, fewer formal work opportunities, lower levels of income, greater social pressure and household burden, contributing to less protection, security and well-being in late life[21].

Moreover, symptoms indicative of anxiety in older women may manifest as symptoms associated with underlying problems in their lives, including hormone syndromes, post-traumatic stress disorder, sexual aggression, domestic violence or other adverse experiences, commonly related to gender and older age group[22]. This strata of the population should, therefore, receive special care and attention from professionals and be extensively evaluated and treated at the different levels of the healthcare network.

Consistent with the results reported, the aging process, together with the myriad of physiological and pathological changes experienced by the older population across the life span, culminate in a growing level of dependence, functional impairment and declines in physical, cognitive and psychological capacity, directly influencing the development of common mental disorders such as anxiety[23,24].

Furthermore, this implies that anxiety acts as a driver of frailty and vulnerability in the older population, and can be regarded as a strong determinant for increased level of disability in late life[1].

In this respect, the study results confirm the association between level of self-reported anxiety and level of disability among the older adults assessed, where severe level of anxiety was associated with severe level of disability. These findings corroborate a study performed in a small town located in the interior of the Brazilian state of Bahia, in which older people with anxiety or depression had a higher prevalence of impairment in carrying out activities of daily living, greater clinical-functional vulnerability, low social engagement and greater disability processes[25].

The presence of functional deficits or disabilities are often reported in studies investigating geriatric anxiety, characterized as a form of symptom or consequence of the impairments secondary to the disorder[15]. The authors emphasize that anxiety-related changes contribute to lower social participation, impaired autonomy and a worsening of limitations for performing activities of daily living, factors which may debilitate older individuals in everyday life[22]. In addition, symptoms of the disorder can interact with other pre-existing diseases, exacerbating cognitive and functional deficits that accompany the aging process, becoming more severe and debilitating over time[2].

Another factor impacting level of disability in older individuals with anxiety is the increase or onset of comorbidities resulting from the disorder[24]. The literature shows that anxious older patients are more predisposed to physical disturbances, including visual deficits, falls, hypertension, gastrointestinal problems, besides cardiovascular changes, factors which may contribute to increased levels of disability and vulnerability. Moreover, older people with anxiety tend to have inadequate treatment and impaired self-care, factors which further impact the functioning and quality of life of this group[26]..

Although no statistically significant association was found between age group and total GAI score in the present study, severe anxiety appears to be a precursor of cognitive decline and of severe disability in older adults[27]. This relationship can be explained by the neurobiological changes promoted by the disorder, compounded by long-term use of benzodiazepines for treatment of the condition, which can render patients more susceptible to developing neurodegenerative conditions such as Alzheimer´s disease or vascular dementia. Early evidence of these risk factors has been reported by other meta-analyses performed in the last 5 years[28-30].

It is also noteworthy that anxiety disorders are associated with avoidance behaviors which, in turn, can result in a higher degree of social isolation and substantially lower levels of physical activity, both representing risk factors for the development of disability conditions in this age group[27].

However, it should be pointed out that, although some authors hold there is complex interaction between anxiety and clinical-functional decline among older individuals, the cause-effect relationship has not yet been fully elucidated. Thus, both emotional disorders and pathological anxiety may be consequences of physical diseases and, conversely, chronic anxiety may lead to a decline in health and increase in morbimortality, resulting in a greater degree of disability[31].

The present study has some limitations which should be taken into account when interpreting the results, including its cross-sectional design which, besides precluding any conclusions regarding cause and effect relationships between variables, introduces the risk of reverse causality bias among the outcomes and exposure elements. Another noteworthy point is the scarcity of national output on the topic. Perhaps, owing to the underdiagnosis of the disorder, there is consequent under-reporting of data in the national literature. This lack of previous reports hampers meaningful comparisons against the results of the present study that encompass the diverse range of cultural, social and demographic aspects in Brazil.

Notwithstanding the limitations outlined, a major strength of the study lies in the relevance of the topic amid a dearth of studies addressing this issue in the national literature. Lastly, the results found can help inform public policy-making and

enhance the multiprofessional care delivered to the older population, aiding screening, identification, diagnosis and early therapeutic management of geriatric anxiety.

CONCLUSION

Valuable evidence was found confirming the relationship between sociodemographic profile, levels of geriatric anxiety and different degrees of functional disability of the older adults assessed. Overall, 48.1% of the sample were shown to have some level of geriatric anxiety, with greater severity identified among women. Comparison of performance on the WHODAS and the GAI revealed a significant association between severe level of disability and severe level of anxiety.

Taken together, these results indicate the need for planning and implementation of specialized interventions in the field of geriatrics and gerontology, along with the devising of public policies that incorporate the practice of routine assessment of biopsychosocial aspects concerning the health of older people, given that both anxiety and disability are largely preventable conditions.

The negative impacts of anxiety and disability can be attenuated by screening and early detection, allowing effective individualized care, a reduction in complications and promotion in the quality of life of the older population. To this end, primary care professionals should be trained so as to develop their competencies and skills in the identification, management and proper treatment planning for these health conditions, besides broadening the scope of actions addressing psychoemotional and motor dimensions, with subsequent referral to specialist services when necessary.

Finally, further trials exploring the complexity of the relationship between geriatric anxiety and clinical-functional disability are warranted to maximize the empirical contribution of studies in this area and support the underpinnings, integrality and longitudinality of health care for the older population.

AUTHORSHIP

- Patrício A. Costa – conception and design or data analysis and interpretation; article writing or critical review; approval of the draft to be published; and responsible for all aspects of the study, ensuring issues involving accuracy or completeness of any part of the work.
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- Matheus F. Nogueira – conception and design or data analysis and interpretation; article writing or critical review; approval of the draft to be published; and responsible for all aspects of the study, ensuring issues involving accuracy or completeness of any part of the work.

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