ISSN: 2476-8642 (Print)
ISSN: 2536-6149 (Online)
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Annals of Health Research

VOLUME 6, NO. 4
OCT. - DEC. 2020

IN THIS ISSUE

PUBLISHED BY THE MEDICAL
AND DENTAL CONSULTANTS ASSOCIATION
OF NIGERIA, OOUTH, SAGAMU, NIGERIA.
www.mdcan.oouth.org.ng

Annals of Health Research
Volume 6, Issue No 4: 421-431
December 2020
doi:10.30442/ahr.0604-07-105

ORIGINAL RESEARCH

Prevalence and Factors Associated with Comorbid Depression and Anxiety Among Older Adults in South-western Nigeria: A Community-Based Study

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Abstract

Background: Depression and anxiety are common mental disorders that frequently occur in the elderly. When they co-exist, it is known as comorbid depression and anxiety.
Objective: To assess the prevalence and factors associated with comorbid depression and anxiety symptoms among older adults in western Nigeria.
Methods: This is a community-based, cross-sectional descriptive survey conducted among 328 consenting older adults. The Geriatric Depression Scale-Short Form (GDS-SF) and Generalized Anxiety Disorder-7 (GAD-7) questionnaires were administered to assess depressive and anxiety symptoms. Socio-demographic information was obtained using a separate questionnaire.
Results: The mean age of the participants was 70.1 years (SD = 9.2). Sixty per cent of the respondents were females and 58% were married. The prevalence of comorbid depression and anxiety was 6.0% (2.4% in men and 6.6% in women) and 13% had depression-only while 19.9% had anxiety-only. Socio-demographic factors significantly associated with comorbid depression and anxiety included living alone (p = 0.001) and being not married (p = 0.028). However, only living alone (p = 0.015, OR = 1.79, 95% CI = 1.41- 25.36) independently predicted comorbid depression and anxiety symptoms among older adults.
Conclusion: Although the prevalence rates of "depression only" and "anxiety only" were higher among older adults, comorbid depression and anxiety was also prevalent in later life and living alone is a significant predictor. Therefore, there is a need to increase the recognition and treatment of comorbid depression and anxiety in older adults.

Keywords: Aging, Anxiety, Depression, Comorbid depression and anxiety, Geriatrics, Prevalence.

Introduction

Globally, the population of older adults has been increasing at an exponential rate and the proportion of this increase in Africa is one of the fastest in the World. [1] In Nigeria, the older adult population, defined as people aged 60 years and above, is increasing, [2, 3] from 6.4 million in 2005

to a projected population of 12 million in 2025 and 26 million by the year 2050. [3] Moreover, between 2012 and 2017, the number of older adults living in Nigeria increased by about 600,000 and they accounted for about 4% of the total population of 191 million with an estimated growth rate of 2.5%. [4, 5] The increase in the proportion of Nigerian older adults aged 60 years and above may be due to improvement in their standard of living and reduction in the mortality rate. [4] One of the challenges of the older adult population is health problems which include non-communicable diseases such as cardiovascular diseases (hypertension), endocrine diseases (diabetes mellitus) and mental disorders (depression and anxiety). [6, 7]

Among older adults, depression and anxiety are the most common mental disorders (CMDs) and often not recognized in the primary care setting. [7, 8] Among the community-dwelling older adults, the prevalence rates of depression ranges from 2.7% to 53.1% [9-12] while that of anxiety ranges from 1.2% to 27.7%. [4, 13, 14] Therefore, these CMDs pose serious public health problems that are associated with grave consequences in terms of excessive mortality, disability and suicide. [9] Depression can impair an older adult's ability to function and enjoy life and can contribute to poor health outcomes and high cost of health care. [15] Conversely, anxiety, in the older adults, has been associated with increased frequency of incontinence and falling, [16] as well as increased general functional impairment or disability. [17]

When depression and anxiety co-exist in the same individual, it is referred to as comorbid depression and anxiety. The prevalence rates of comorbid depression and anxiety have been reported to vary from 4.3% to 20.5% among community-dwelling older adults. [4, 18, 19] The older adult suffering from comorbid depression and anxiety have higher severity of functional impairment than those suffering from depression-only or anxiety-only. [17] Comorbid depression and anxiety in the elderly is associated with increased functional impairment, poor quality of life, symptom severity of medical illness and increased likelihood of suicide. [20]

Indeed, there is a need for geriatric screening of depression and anxiety and their comorbidity in the community. Most of the previous studies conducted in Nigeria on mental disorders among the older adults assessed depression [21, 22] and anxiety [7] separately and did not evaluate the effect of comorbid depression and anxiety. There is a dearth of information on the prevalence of comorbid depression and anxiety among community-dwelling older adults in Nigeria. A recent study on loneliness among retirees in the northern part of Nigeria reported the prevalence of comorbid depression and anxiety as 20.5%. [4] Therefore, the present study aimed at determining the prevalence and factors associated with comorbid depression and anxiety symptoms among a sample of the community-dwelling older adult population in Ile-Ife, south-west Nigeria.

Methods

Study setting

This study was conducted in Ife Central Local Government Area (LGA) of Ile-Ife. Ile-Ife is an ancient Yoruba city located in Osun State, South-western Nigeria. Ife Central LGA has a population of 167,254 people (84, 653 males and 82, 601 females). Geographically, Ife Central LGA lies on longitude 4°32'E and Latitude 7°33'N with an area of 111km^2. This area is made up of 11 wards characterized by streets and settlements. Farming, trading, artisanship and public service are the main occupations of the local inhabitants of Ile-Ife. Ife Central LGA was purposively chosen for this study as it has both urban and rural communities.

Study design

The study used a descriptive cross-sectional design.

Sample size determination

The sample size was determined using the formula for estimating population proportions ($n= z^2pq/D^2$), where "n" is the minimum required sample size, "z" is the standard normal deviation, usually set at 1.96 and corresponding to 95% confidence level, and "p" is the proportion of the population with the desired factor (obtained from a previous study). This was taken as 26.3% of elderly Nigerians with depressive symptoms in Lagos, Nigeria. [22] The sample size was calculated as 297.8 but was increased to 328 (10% added to make up for possible incomplete data).

Ethical considerations

Ethical approval for the study was obtained from the Health Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife (IPHOAU/12/692). Permission to conduct the research was also obtained from Ife Central Local Government Authority, Ile-Ife, Nigeria. Written informed consent was obtained from respondents and they were assured of the confidentiality of the information provided.

Subject / Selection of Subjects

The study was conducted among the elderly in who met the inclusion criteria which included age of 60 years and above and residence within Ife Central LGA in the preceding two years. Individuals within that age group who were critically ill and could not comprehend or respond to questions asked were excluded. The consenting participants were selected using a multi-stage sampling technique from the wards, through streets to households. Forty-one houses were randomly selected from the streets in each ward. At the last stage, an eligible respondent was recruited from one household in a house based on the study criteria. Simple random sampling technique (balloting method) was used to select the respondents when there was more than one eligible respondent. Also, if there were no eligible respondents in the house, another house was chosen from the list of houses in the street. Overall, 41 respondents were selected from each of the selected wards.

Research Instruments: Data were collected using an interviewer-assisted method and standardized scales for measuring depression and anxiety were used to determine comorbid depression and anxiety among the elderly.

Self-designed questionnaire: Socio-demographic parameters were obtained using a questionnaire designed by the researchers. The questionnaire contained questions on age, marital status, religion, the highest level of education, living conditions, family structure, employment status, living unit and length of stay at the current address.

Geriatric Depression Scale: The Geriatric Depression Scale Short Form (GDS-SF) was used to assess depressive symptoms. The GDS-SF is the shorter version of Geriatric Depression Scale Long Form [23] which was developed in 1986 and consisted of 15 questions extracted from the Long Form GDS which had the highest correlation with depressive symptoms in validation studies. [24] It is a brief, 15-item questionnaire in which participants are required to respond with "yes" or "no" about how they felt over the past week. Of the 15 items, 10 indicate the presence of depression when answered positively, while the remaining 5 questions (1, 5, 7, 11, 13) indicate depression when answered negatively. Symptom severity value were 0 to 4 (normal), 5 to 8 (mild depression), 9 to11 (moderate depression) and 12 to 15 (severe depression). The GDS-SF and its Yoruba translation have been used in Nigeria by some researchers. [2, 25, 26] Also, it has been validated and used for assessing depressive symptoms among the elderly in both the community and at the primary health care

setting. At the recommended cut-off score of 5, the pooled sensitivity of GDS-SF was 0.89 and the specificity was 0.77. [27]

Generalized Anxiety Disorder Scale (GAD-7): The GAD-7 scale was used to assess the presence of anxiety and its severity among respondents. Although it was primarily designed as a screening tool for generalized anxiety disorder, it also assesses three other common anxiety disorders – panic disorder, social anxiety disorder, and post-traumatic stress disorder. [28] This tool has also been validated for measuring anxiety disorders among various groups. [28] The GAD-7 consists of seven questions with response categories of 'not at all', "several days," "more than half the days," and "nearly every day'' which are scored 0, 1, 2 and 3 respectively. The total scores range from 0 to 21 and symptom severity values are 0 to 4 (minimal), 5 to 9 (mild), 10 to 14 (moderate), and 15 to 21 (severe).[28] A Nigerian study reported Cronbach's alpha 0.85 as the reliability coefficient for this scale. [29]

For this study, ***c***omorbid depression and anxiety was determined when respondents scored above the cut-off score for depression (GDS-SF score ≥ 5) and anxiety (GAD ≥5). The respondents were divided into four groups: respondents with no anxiety and depression, respondents with comorbid depression and anxiety, respondents with anxiety only and respondents with depression only.

Data Collection

The questionnaire was interviewer-administered, where the interviewer read the questionnaire in Yoruba or English languages depending on the preference of the respondent. Five trained research assistants, who were postgraduate students with satisfactory proficiency in English and Yoruba languages, conducted the interview. Before conducting the interview, the assistants were trained on the research instruments and how to interview the participants for a period of two days. The inter-rater reliability, using the Kappa coefficient, among the research assistants was 0.85. The research assistants had continuous access to the researcher both physically and through the phone to sort out relevant issues in the course of data collection. Privacy was also ensured during the interview as much as possible. The entire data collection lasted for a period of four weeks.

Data analysis and management

Data were entered into and analysed using IBM-SPSS software 20.0 version. Descriptive statistics such as proportions and frequencies of socio-demographic variables and comorbid depression and anxiety were determined. Bivariate analysis using Chi-Square and Fishers' Exact tests were conducted to determine the association between comorbid depression and anxiety and sociodemographic parameters. The variables that were significantly associated with comorbid depression and anxiety on bivariate analysis were entered into the binary logistic regression model to identify socio-demographic factors that independently predicted comorbid depression and anxiety. All tests were conducted as 2-tailed while the level of statistical significance was set at $p< 0.05$.

Results

Sociodemographic Characteristics of the respondents

A total of 328 respondents were recruited but 12 were removed for reasons of incomplete data thus, 316 were eventually analysed giving a response rate of 96.3%. The mean age of the respondents was 70.1±9.2 years and 152 (48.1%) were within the 60 to 69 years age group. One hundred and eighty-nine (59.8%) were females and 182 (57.6%) were married. One hundred and sixty-six (52.5%) had polygamous family settings; 181 (57.3%) lived with their spouses while 70 (22.1%) lived alone. Most of the respondents (96.2%; n = 304) were Yoruba and 242 (76.6%)

were Christians. One hundred and eighty (57.0%) currently lived in a shared flat while 172 (54.4%) had lived at their current abode for 20 years or less. One hundred and fifty-three (48.4%) were self-employed and 129 (40.8%) had no formal education (Table I).

Prevalence of comorbid depression and anxiety, depression and anxiety

Overall, 193 (61.1%) had no symptoms of depression or anxiety while the prevalence rate of comorbid depression and anxiety was 6.0% (19/316) (with 2.4% among males and 6.6% among females). The prevalence rates of isolated depressive and anxiety symptoms were 13.0% (41/316) and 19.9% (63/316) respectively.

Association between socio-demographic characteristics and comorbid depression and anxiety

As shown in Table II, a higher proportion of the respondents who were widowed or divorced (14%) had comorbid depression and anxiety compared with respondents who were married (5%) and the difference was statistically significant ($\chi^2 = 4.832$, $p = 0.028$). There was also a significant association between living conditions and comorbid depression and anxiety in the elderly ($\chi^2 = 14.829$, $p<0.001$); the proportion of the elderly living alone (24%) with comorbid depression and anxiety was significantly higher than the proportion of the elderly living with people (5%). There were no significant associations between comorbid depression and anxiety and other socio-demographic parameters.

Predictor of comorbid depressive and anxiety symptoms

Table III shows that living alone was significantly associated with the presence of comorbid depression and anxiety ($p = 0.015$, OR= 1.79, 95% CI= 1.41- 25.36). This indicated that the older adults that lived alone were about two times more likely to have comorbid depression and anxiety than those living with their family, spouse or relatives.

Discussion

This study showed that both depression and anxiety were very common among this cohort of community-dwelling elderly. The prevalence rate of comorbid depression and anxiety in the present study is comparable to 8% reported in a community-based study conducted among elderly subjects aged 90 years in the Netherlands using the GDS-SF and Anxiety Screening Questionnaire. [19]

The finding of this study is also consistent with the results of a Longitudinal Aging Study Amsterdam (LASA) study, which reported that the prevalence rates for co-existing depression and anxiety varied from 4.3% to9.5%. [18] However, this observation is different from the findings of Schoevers, *et al.* [30] that reported a higher prevalence of co-occurring depression and generalized anxiety disorders among elderly patients. Also, a Nigerian study conducted among community-living retirees using Depression Anxiety and Stress Scale reported a higher prevalence of comorbid depression and anxiety. [4]

The variation in the prevalence rates observed across studies may be attributed to the differences in methodology concerning the age of the study population, the culture, values and environmental peculiarities. It may also be due to the differences in the instruments used for measuring the depressive and anxiety symptoms.

Table I: Socio-demographic characteristics and living conditions of the 316 respondents

Parameters	*Frequency*	*Percentage*
Age Groups (Years)		
60-69	152	48.1
70-79	101	32.0
≥80	63	19.9
Sex		
Male	127	40.2
Female	189	59.3
Marital status		
Married	182	57.6
Widowed	128	40.5
Single, Divorced/Separated	6	1.9
Family structure		
Monogamy	150	47.5
Polygamy	166	52.5
Living condition		
Alone	70	22.1
With spouse	181	57.3
With children/grandchildren	31	9.8
With friends/relatives	34	10.8
Years lived in current residence		
<20 years	172	54.4
21-40 years	95	30.1
≥40 years	49	15.5
Ethnicity		
Yoruba	304	96.2
Others	12	3.8
Religion		
Christian	242	76.6
Islam	70	22.1
Traditional worshippers	4	1.3
Level of education		
No formal education	129	40.8
Primary	89	28.2
Secondary	58	18.3
Tertiary	40	12.7
Occupational status		
Unemployed	41	13.0
Employed	74	23.4
Self-employed	153	48.4
Retired	48	15.2
Types of housing unit		
Single room apartment	62	19.6
Shared flat	180	57.0
Others	74	23.4

Table II: Association between sociodemographic characteristics and comorbid depression and anxiety

Characteristics	*Comorbid depression and anxiety n = 19*	*No anxiety and no depression n = 193*	*Total n = 212*	*Statistics*
Age Group (years)				
60-69	9 (47.4)	101 (52.3)	110	$\chi^2 = 0.171$
≥ 70	10 (52.6)	92 (47.7)	102	p = 0.680
Gender				
Male	5 (26.3)	78 (40.4)	83	$\chi^2 = 1.443$
Female	14 (73.7)	115 (59.6)	129	p = 0.230
Marital Status				
Married	7 (36.8)	121 (62.7)	128	$\chi^2 = 4.832$
Not married	12 (63.2)	72 (37.7)	84	p= **0.028**
Family structure				
Monogamous	7 (36.8)	97 (50.3)	104	$\chi^2 = 1.246$
Polygamous	12 (63.2)	96 (49.7)	108	p = 0.264
Living condition				
Alone	10 (52.6)	31 (16.1)	41	$\chi^2 = 14.829$
With people	9 (47.4)	162 (83.9)	171	p = **0.001**
Years lived in residence				
≤ 20 years	10 (52.6)	107 (55.4)	117	$\chi^2 = 0.814$
> 20 years.	9 (47.4)	86 (44.6)	95	p = 0.055
Ethnicity				
Yoruba	18 (94.7)	183 (94.8)	201	Fisher's p = 1.000
Others	1 (5.3)	10 (5.2)	11	
Religion				
Christianity	17 (89.5)	144 (74.6)	161	Fisher's p = 0.148
Islam and Others	2 (10.5)	49 (25.4)	51	
Level of Education				
Not educated	7 (36.8)	73 (37.8)	80	$\chi^2 = 0.007$
Educated	12 (63.2)	120 (62.2)	132	p = 0.933
Occupational Status				
Unemployed	7 (36.8)	52 (26.9)	59	$\chi^2 = 0.844$
Employed	12 (63.2)	141 (73.1)	152	p = 0.358
Housing Unit				
Single room	6 (31.6)	32 (16.6)	38	$\chi^2 = 2.645$
Others (shared flats, flats or duplexes)	13 (68.4)	161 (83.4)	174	p = 0.104

Table III: Binary logistic regression analysis of factors associated with comorbid depression and anxiety

Variables	*B*	*SE*	*Wald*	*p-value*	*OR*	*95%CI*
Marital status						
Married (Ref)					1	
Not married	-0.04	0.749	0.003	0.957	0.961	0.222-4.167
Living conditions						
Living with family (Ref)					1	
Living alone	1.788	0.737	5.878	0.015	5.976	1.408-25.360

SE – Standard Error; OR – Odd Ratio; CI – Confidence Interval

Although the proportion of the elderly females who had comorbid depression and anxiety was higher than that of males, the findings from the present study concur with the report of no significant association between gender and co-occurring depression and anxiety symptoms among the elderly in the USA. [31] In the present study, marital status was significantly associated with the occurrence of comorbid depression and anxiety among the elderly. The elderly who were widowed/divorced or never married had higher rates of comorbid depression and anxiety than those who were married. This implies that being married or living with people provides some form of social support which may reduce the occurrence of comorbid depression and anxiety among the elderly. This is in agreement with the report of a significant association between marital status and depressive and anxiety symptoms in a study on the co-occurrence of anxiety and depressive disorders in a cohort of older people in England. [32] However, the findings of the present study were in contrast with reports of a lack of significant association between marital status and comorbid depression and anxiety in previous studies conducted among the elderly in Amsterdam and the USA. [30, 31, 33] Also, living alone among the elderly was significantly associated with comorbid depression and anxiety. Moreover, the odds of having comorbid depression and anxiety for the elderly who lived alone were double the odds of those living with someone. This finding is consistent with the findings reported by Kvaal, *et al*. [32] Living alone is related to loneliness which is a risk factor for depression and anxiety among older adults. [34] Loneliness is a distressing feeling related to the perception that one's social needs are not fulfilled by the extent of one's social networks. [4] Possible causes of loneliness among Nigerian older adults are the breaking down of the traditional family support systems, bereavements, rural-urban migration as well as international migration of family members. [35]

The conduct of the study in a community which is predominated by one ethnic group in Nigeria may be a limitation to the study because it may not be generalizable to the entire older adult population of Nigeria. Moreover, the non-assessment of the levels of cognitive function of the older adults in the present study may also be a limitation as this makes it impossible to exclude the effect of dementia among the respondents.

Conclusion

This study provided information on comorbid depression and anxiety among older adults in a Nigerian community. The study also revealed

that depression and anxiety as well as their comorbidity are highly prevalent among Nigerian older adults and that loneliness is a single factor that predicted older adult comorbid depression and anxiety. Therefore, there is a need for targeted interventions aimed at providing supports for older adults, most especially those who are lonely, widowed, divorced or never being married. Therefore, government agencies, non-governmental agencies, religious organizations and other stakeholders should be involved in developing strategies that will promote social supports and opportunities for social interactions among Nigerian older adults. This, sequentially, may reduce the risk of comorbid depression and anxiety among them. Further research is recommended to establish other determinants of comorbid depression and anxiety among older adults using a longitudinal study design.

Acknowledgement: All the older adults who graciously participated in this study are appreciated; without their generous support and commitment, this research would not have been possible.

Authors Role: AA and AOC conceived the study while OIO and EOA contributed to the study design. AA and AOC did the literature review and analysed the data. OIO and EOA participated in data interpretation. All the authors participated in the drafting of the manuscript. All the authors approved the final version of the manuscript.

Conflict of Interest: None declared.
Funding: Self-funded.
Publication History: Submitted 29 August 2020; **Accepted** 03 November 2020

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