DEPRESSION AMONG ELDERLY INDIVIDUALS ATTENDING PRIMARY CARE CLINIC IN NORTHWESTERN NIGERIA: PREVALENCE, PATTERN, AND ASSOCIATED FACTORS

Akogwu HS[1*], Baamlong ND[2], Grema BA[3], Adebisi AS[4], Falaki FA[5], Kumbet JS[6], Shehu A,[7] Yakubu M,[7] Abubakar A[8]

1. Department of Family Medicine, Federal Medical Centre Gusau, Nigeria
2. Department of Family Medicine University of Abuja Teaching Hospital Abuja, Nigeria
3. Department of Family Medicine, Aminu Kano Teaching Hospital Kano Nigeria
4. Federal Neuropsychiatric Hospital Kware Sokoto, Nigeria
5. Department of Family Medicine, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria
6. Department of Family Medicine, Geriatric Medicine Subdivision Federal Medical Centre Keffi,Nigeria
7. Department of Community Medicine, Federal Medical Centre Gusau, Nigeria
8. Department of Psychiatry, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

Corresponding Author
Name: Akogwu HS
Department of Family Medicine, Federal Medical Centre Gusau, Nigeria
Likitaharrison03@gmail.com

Abstract

Background: Depression represents a major international public health problem for both developed and developing countries. It is associated with increased risk of morbidity, suicide, decreased physical, cognitive and social function, and greater self-neglect which in turn is associated with increased mortality. The aim was to investigate the prevalence, pattern and associated factors of depression among the elderly individuals in a primary care clinic in Northwestern Nigeria

Methodology: The study was a cross-sectional hospital-based study and 391 elderly participants in a primary care clinic of Usmanu Danfodiyo University Teaching Hospital were recruited through systematic sampling technique. Data was collected using pre-tested, structured interviewer-administered questionnaire, Oslo – 3 social support scale and the GDS- 30 was used to screen for depression.Data was analyzed using SPSS version 20. Test of associations was done using Chi- square test and $P < 0.05$ was considered statistically significant.

Results: The prevalence of depression among the elderly was found to be (41.2%) and of these respondents who were depressed, (99.4%) of them had mild depression while (0.6%) had severe depression. Marital status, level of education, occupational status, average monthly income, location of residents, social support,(P -value <0.05) were found to be significantly associated with depression in the elderly.

Conclusion: The prevalence of elderly depression was high in primary care with preponderance of mild depression, the study recommends early screening, detection and treatments of depressive disorder in the elderly by primary care physician.

Keywords: Prevalence, depression, pattern, elderly, primary care.

Introduction

Depression represents a major international public health problem for both developed and developing countries.[1] Depression is a significant public health issue, linked to increased morbidity, suicide, decreased physical, cognitive, and social function, and increased self-neglect, leading to increased mortality.[2,3] Depression has been found to be an independent cause of disability as well as a major contributor to disability from primary physical illness by exacerbating physical deterioration.[1-3] Environmental and physical factors often exacerbate the severity of this psychological condition, particularly affecting the elderly more than other age groups.[2,3]

Depression according to World Health Organization (WHO) is defined as a common mental disorder characterized by sadness, loss of interest, feeling of guilt, or low self- worth, disturbed sleep or appetite, feeling of tiredness and poor concentration.[4] DSM-5 categorizes depressive disorder into different types, including disruptive mood dysregulation disorder, major depressive disorder, persistent depressive disorder, dysthymia, premenstrual dysphoric disorder, substance/medication induced depressive disorder, and nonspecific depressive disorder. The common feature of these disorders includes sad feelings, irritable mood, with or without somatic or psychotic syndromes affecting individual function, with differences in duration, time and aetiology.[5]

The United Nation (UN) defines an elderly person as age 60 years and above,[6] while, according to WHO, high income countries considers age of 65 years or older as "elderly" or older person, however, this does not adapt well to the situation in Africa.[6] The UN's definition of pension benefit age is often arbitrary, particularly in African countries where formal retirement age from formal sector services ranges between 55 and 65 years.[6] In Nigeria, the national demographic health survey (2013) defines elderly persons as those aged 60 years and above.[7]

Depressive disorders are common in older people with prevalence in the community of around 12%.[8] Depression is more common in older, physically ill patients in primary care setting with estimates of 5-58% and mean prevalence of 29%.[9] In addition, depression in later life is more heterogeneous than in younger people, not only in symptoms but also in etiology and prognosis.[10] Identifying depression in older adults in primary care settings can alleviate distress and reduce suicide risk, as it negatively impacts medical outcomes, increases mortality, treatment compliance, and rehabilitation response.[10]

Depression in the elderly is a global issue, with Nigeria having the highest number of elderly people in Africa.[11] In Nigeria, current data indicates that individual aged 60 years and above constitutes 6% of the population.[11] Nigeria's elderly population, over 5 million, is the

largest in Africa, but life expectancy is increasing due to improvements in food security and healthcare.[12] As a result of population projection in Nigeria, the population of the elderly will be 16 million by 2030 and 47 million by 2060.[13] The global rise in older adults raises concerns about societal and health implications, especially in middle-income countries where aging rates are faster than in high-income countries.[14] However, little consideration has been given to issues of old age in sub- Saharan Africa, which remains the world's poorest and youngest region.[14] The increasing older adult population in Africa necessitates increased awareness about chronic health issues like depression, with prevalence varying globally between 10% and 29% depending on cultural context.[15] In Nigeria, similar to global figures, studies showed it is often neglected in this environment as people tend to view it as part of normal ageing process.[16] The number of people aged 60 and above in Africa is projected to rise from 48 million in 2005 to 207 million by 2050.[17]

Depression is a common mental health problem and an increasingly common cause of morbidity and disability in lower income countries.[3,14] It is common among middle age and older adults and can increase the likelihood of negative outcomes when combined with other somatic and mental disorder.[3,14] Depression can affect social roles, daily functioning and is associated with decreased quality of life.[18] Depression negatively affects quality of life and increases medical comorbidity such as cardiovascular disease.[1-3] It is also known that if depression occurs after myocardial infarction, besides worsening quality of life, there is increased morbidity and mortality.[3] Depression in hospitalized patient may lead to greater lengths of stay as well as other negative outcomes.[1,2,3.]

Depression represents one of the most profound human problems currently facing the global health care system and estimate to cover 5.7% of the total burden of disease in 2020. Though occurs at all ages, it is the most common mental disorder in the elderly.[18] The World Health Organization (WHO) has categorized depression as the most disabling clinical diagnosis in the world and estimated that by the year 2020, if the current trend continues the burden of depression will increase to 5.7% of the total disease burden.[18]

Depression prevalence in Kano, Nigeria, is 49.8% among the elderly, with risk factors including low education, chronic medical conditions, and female gender.[19]Also another study in Sokoto North-Western Nigeria, among special population of leprous people showed the prevalence of depression to be 15%.[20]

A Gureje study in Ibadan, Nigeria, revealed a 26.2% lifetime and 7.1% 12-month prevalence of major depression among the elderly, linked to female sex and urbanization.[21] In Osun State, Southwest Nigeria, a hospital based study showed 51.6% of the subjects had one form of depression or the other, with being female, older age group and low educational status being associated with depression. Depression prevalence in Lagos, South-Western Nigeria is 26%, linked to factors like age, long residence, less developed area, and lack of children, with higher social support protective.[23]

A study at UPTH in Nigeria found 28% of elderly 65+ have depression, with factors like age, low social class, education, and widowhood/widowers contributing to high prevalence.[24] The SAGE study in South Africa found a 4% depression prevalence in the past 12 months, linked to functional disability, poor quality of life, and chronic conditions.[25]

Finding from the WHO study on global ageing and adult health reported a prevalence of mild depression of 6.7% and 2.7% in Ghana and South Africa respectively, with higher gender (female) differences only in Ghana.[25] Depression is linked to migration, lack of current work, higher age, and lower quality of life among women in Ghana and men in South Africa.[25] Another study in Eastern Cape Province South Africa showed a prevalence of depressive symptoms of 20.5% in women and 13.5% in men.[26] In Ethiopia, the overall prevalence of depression among old age was 28.5%, of which 61.9% and 48% were female and those between the ages of 70 and 74 respectively.[18] Being female, not married, those with no formal education, living alone, those who had chronic illness, elderly with cognitive impairment as well as substances use were the factors being associated with depression.[19] A Survey carried out in old aged nursing home in Tunisia, revealed a prevalence of depression in the elderly to be 51.4%.[21] A Study done in Egypt in 2009 reported that the point prevalence of depression in the elderly aged 60 and above was 46.6%.[27] A hospital-based study in Malaysia found a 13.9% prevalence of depression in the elderly, while two community-based studies reported a 8% and 6% prevalence in rural and urban communities, respectively.[29]

A study in Chittoor, Andhra Pradesh, found 47% of the elderly suffer from depression, with factors such as female illiteracy, living alone, low socio-economic status, and economic dependency being associated.[30] In a study conducted among elderly nursing home resident in Singapore, the overall point prevalence was found to be 21.1%.[31] The prevalence rate for minor depression in the elderly nursing home residence was 14.4% and 6.7% for major depression.[31] Significant risk factors that were found to be associated with depression were length of stay for more than two years, known history of depression and lack of social contact.[32]Another cross sectional study to screen for depression in elderly medical in-patient from rural area of Norway reported a prevalence of 10%.[32] In the medical research council cognitive function and ageing study in England and Wales, the prevalence of depression was found to be 8.7%,[33] and it was found to be more common in women and was associated with functional disability, co-morbid medical disorder and social deprivation.[33] In the USA, the overall depression prevalence of 11.19% was reported.[34]

Nigeria has the largest number of elderly people over 60 years of age in sub-Saharan Africa, yet there is very little put in place by the government as institutional policies and legislation for the elderly.[6] Most data on depression in Africa, including Nigeria, primarily focus on younger or specific populations, such as individuals living with HIV/AIDS, and do not represent older adults. As the older adult population grows, there is a pressing need for more information on the burden of mental illness, particularly depression, which is likely to become a significant public health challenge.[25] Mental disorder

like depression is common in later life and closely associated with suicide, yet only a small proportion of older adults in need of mental health care receive adequate treatment.[37] Identifying depression prevalence and associated factors in the elderly can inform public health policies, as diagnosis is often challenging due to its prevalence among hospital patients.

Research on depression prevalence and patterns among elderly individuals in Northwestern Nigeria is limited, necessitating further investigation into the factors contributing to this issue.

Methods and Materials

The study was conducted at the Department of Family Medicine of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, North western Nigeria. The Department of Family Medicine of the hospital serves as a primary care clinic within the setting of the tertiary hospital. Patients who need primary care are managed and followed up in the clinic while those who need other specialists care are referred to the respective core specialist clinics in a 2-way referral system for further management. Sokoto, the capital of Sokoto state located in the North-Western part of Nigeria. . The indigenous inhabitants of the state are mainly Hausa and Fulani. Other ethnic group resident in the state includes Zabarmawa, Igbo, Yoruba, Nupe, Ibira, Igala, Idoma and others. Hausa is the commonly spoken language. Farmers form the greater percentage of the population, while the rest are civil servants, traders, and artisans. About 87% of the population lives in the rural areas with Western literacy level being put at 44.9%.[36]

Sample size estimation was determined using the formula for estimating minimum sample size for descriptive studies $n=Z^2\ pq/d^2$ where n=Desired sample size when population is more than 10,000; Z=Standard normal deviate set at 1.96 which corresponds to 95% confidence limit; p=prevalence of elderly depression in a Nigerian family practice population in Aminu Kano Teaching Hospital Nigeria[19] (P=49.8%); q=1.0 – p (q=0.502), d=Desired level of precision was set at 0.05. This gave a sample estimate of 384 patients. The sample was adjusted for finite population of less 10,000 and a response rate (R) of 90% was anticipated to accommodate for non- response, rejection of participation, incomplete or loss of data. This gave a minimum sample estimate of 391 elderly patients

The eligible patients for the study were based on the inclusion criteria and a systematic sampling technique was employed. Elderly patients aged ≥60 years who attend the primary care clinic and who gave informed consent were recruited for the study and those who were not competent to respond to the questionnaire such as critically ill patients, the deaf and dumb were excluded from the study.

The instruments for data collection (Questionnaire which included 20 items, 30-items Geriatric Depression Scale and the Oslo-3item social support Scale), were administered to all participants. The questionnaire (Appendix I) was partially adapted which contained the sociodemographic profile of the study participants which includes age, gender, and marital status, and occupation, level of education, religion/ethnicity, present living arrangement whether living alone, with spouse/children or with others. Location of residence whether they live in a more developed area or less developed area of the community. Also contained in the questionnaire was average monthly income based on the World Bank standard of 1.9 US dollar per day poverty line (monthly 57 US dollar at 365 naira per U.S dollar in 2018 which is equivalent to 20,805 naira per month), availability of care giver and overall social support using the Oslo 3 items social support scale a score of 3 to 8 is poor or low support while a score 9 to 14 is moderate to high support.

Geriatric Depression Scale (GDS)

The Geriatric Depression Scale (appendix ii) is a 30-item self - reported assessment used to identify depression in the elderly. The scale was first developed in 1982 by J.A Yesavage and others.[24,25] It is a self-reported scale for depressive disorder in Geriatric population. It is a brief questionnaire in which participants are asked to respond to the 30 questions by answering either, Yes or No in reference to how they feel on administration i.e., depending on whether the question indicate depression or not. Each question is awarded a score of either 1 or 0 respectively, and a total score of 0 - 9 is considered normal. 10 – 19 indicates mild depression and 20 – 30 indicates severe depression.[41]The GDS may be used in healthy, medically ill, and mild to moderate cognitively impaired adult. The GDS has been used extensively in several countries, in community, acute and long-term care settings, it has been used extensively in the United States as well as in other countries.[23] instrument has been used in Nigeria by a number of authors.[23,24,] The GDS was found to have 92% sensitivity and 89% specificity when evaluated against diagnostic criteria.[23],[37]The validity and reliability of the tool has been supported through both clinical practice and research.[24]It has been validated and used for screening of depression among elderly in both primary health care setting and in the community and had also care practice population. been used in Nigerian primary.[23]

Pre-testing of the study instrument was done at the Family Medicine Clinic of the State specialist hospital. Forty patients were haphazardly selected and used for the pre-testing of the study tool which lasted for 5 days. The pre-testing was done to assess the applicability of the questionnaire and standard tools. All the patients used for the pre-testing of the questionnaire instrument gave valid and reliable responses confirming the clarity and applicability of the questionnaire tools, and questions were interpreted with the same meaning as intended

Data was collected using an interview administered questionnaire. Participants that met the inclusion criteria were interviewed face-to-face at the GOPC following their informed consent. Participants found to have depression according to GDS (score of 20 and above), were referred for further psychiatric evaluation and psychological support while those of (scores 10-19) mild depression was treated in General Out-patient Clinic of the Family Medicine clinic

Data Management

Data was collected, cleaned and entered into the computer and analyzed using statistical packages for social science (SPSS) version 20. Categorical data was presented using graphs charts and tables for frequency and percentage for variables. Chi-square test

was done to compare difference between proportions. The level of significance was set at $p < 0.05$.

Ethical Approval

Approval for the study was obtained from UDUTH Research Ethics Committee with reference UDUTH/HREC/2018/No 719 while informed written and verbal consent was obtained from the study participants before recruitment

RESULTS

Quality of Data

All the 391 questionnaires and other tools administered for this study were adequately completed giving a response rate of 100%.

Sociodemographic characteristics of respondents

As shown on table 1 below, a total of 391 participants were recruited for the study, the age ranges of the respondents were from 60-95 years. Majority of the respondents belonged to the age group of 60-69 years (61.9%) and more than half of the respondents were males (59.6%). A high proportion of respondents (58.31%) belonged to Hausa ethnic group. Over three-quarters of the respondents (84.4%) were Muslims. Majority of the respondents were married (71.1%). The main form of education among respondents was qur'ranic education (49.9%) while only (18.2%) of respondents had a tertiary level of education. Nearly half of the respondents were self-employed (41.4%) and this was closely followed by the unemployed (29.4%). However, more than a third of the participants had their family (40.7%) as their source of finance with majority (73.9%) of the respondents having an average monthly income of ≥ 20,805 naira.

Table 1: Sociodemographic characteristics of respondents

Variables	Categories	Frequency (n = 391)	Percentage %
Age (in years)	60-69	241	61.6
	70-79	115	29.4
	≥ 80	35	9.0
Gender	Female	158	40.4
	Male	233	59.6
Ethnicity	Hausa	228	58.3
	Igbo	20	5.1
	Yoruba	33	8.4
	Others	110	28.2
Religion	Christianity	57	14.6
	Islam	330	84.3
	Traditional	3	0.8
	Others	1	0.3
Marital Status	Single	1	0.3
	Married	278	71.1
	Separated	1	0.3
	Divorced	5	1.3
	Widowed/Widower	106	27.0
Level of Educational	None	46	11.8
	Primary	43	11.0
	Secondary	36	9.2
	Tertiary	71	18.1
	Quranic	195	49.9
Occupational Status	Civil Servant	26	6.7
	Unemployed	115	29.4
	Retired	77	19.7
	Self-employed	162	41.4
	Others	11	2.8
Source of Finance	Family	159	40.7
	Self	154	39.4
	Pension	70	17.9
	Both	8	2.0
Average Monthly Income (naira)	< 20,805	102	26.1
	≥ 20,805	289	73.9

Family Characteristics of respondents:

Majority of the respondents were from extended families (71.1%). More than average (56.5%) of the respondents practiced polygamous type of marriage. Over three-quarter of the respondents (80.1%) had five or more children alive. Majority of the respondents (88.7%) lived with their spouse/children. A high proportion of the respondent's location of residence was in the more developed area of the community (54.4%) while almost average of the respondents (48.6%) had moderate social support.

Table 2: Family Characteristics of respondents

Family characteristics	Categories	Frequency (n = 391)	Percentage %
	Type of Family Nuclear	113	28.9
	Extended	278	71.1
Type of Marriage	Monogamous	170	43.5
	Polygamous	221	56.5
Number of Children alive	None	2	0.5
	1 – 2	21	5.4
	3 – 4	55	14.1
	≥ 5	313	80.0
Living arrangement	Alone	26	6.6
	Spouse/ Children	347	88.8
	With Others	18	4.6
Location of residence	Less developed area	186	47.6
	More developed area	205	52.4
Social support	Low/poor	54	13.8
	Moderate	190	48.6
	High/strong	147	37.6

Prevalence of depression among respondents.

Figure1 below shows that a total of three hundred and ninety-one (391) respondents were assessed.

The prevalence of depression was 41.2% (161).

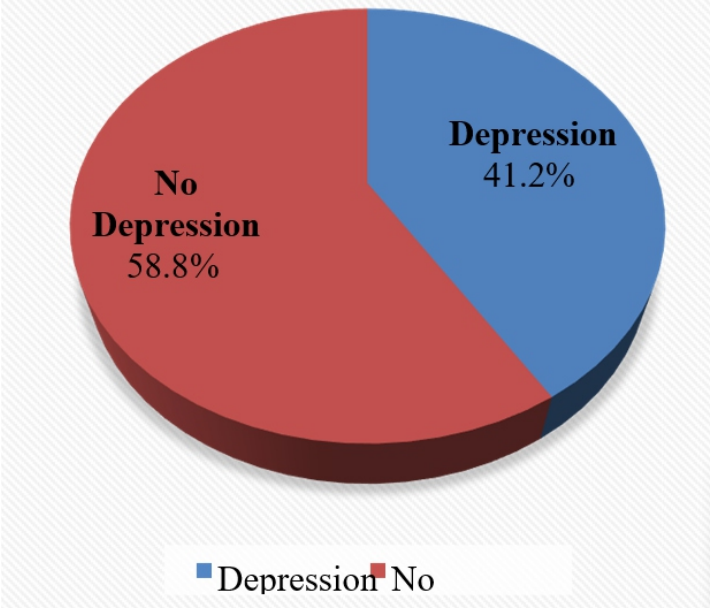

Figure 1: Prevalence of Depression among respondents

Pattern of depression among respondents.

of the 161 respondents who were depressed, 99.4% had mild depression while 0.6% had severe depression as seen in figure 2 below.

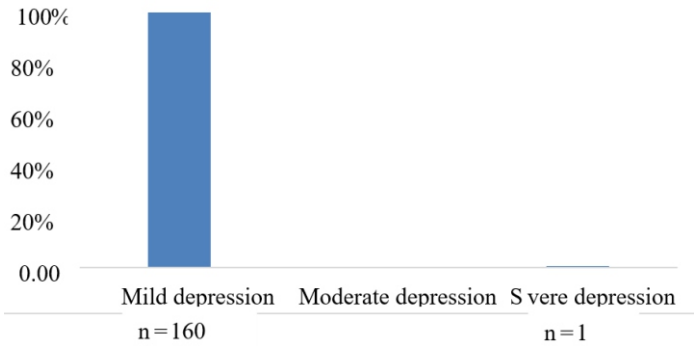

Figure 2: Pattern of Depression among respondents

Relationship between respondents' sociodemographic characteristics and Depression:

Table 4 shows the association between sociodemographic characteristics of respondents and depression. The age, gender, ethnicity, religion, and source of income of the respondents did not show significant association with depression since the p-values were greater than 0.05, while level of education, Occupational status, marital status and average monthly income of the respondents were significantly associated with depression since its p-values were less than 0.05 at 5% level of significance with a 95% confidence limit

Sociodemographic Characteristics		GERIATRIC STATUS No Depression		DEPRESSION Depression		Test statistics (χ^2)	P-value
		Frequency	%	Frequency	%		
Age (in years)	60-69	144	59.8	97	40.2	2.768	0.251
	70-79	70	60.9	45	39.1		
	≥80	16	45.7	19	54.3		
Gender	Female	89	56.3	69	43.7	0.681	0.409
	Male	141	60.5	92	39.5		
Ethnicity	Hausa	125	54.8	103	45.2	3.829	0.281
	Igbo	12	60.0	8	40.0		
	Yoruba	21	63.6	12	36.4		
	Others	72	65.5	38	34.5		
Religion	Christianity	37	64.9	20	35.1	**2.500	0.522
	Islam	191	57.9	139	42.1		
	Traditional	1	33.3	2	66.7		
	Others	1	100	0	0.0		
Marital Status	Single	1	100	0	0.0	**8.887	0.020*
	Married	175	62.9	103	37.1		
	Separated	0	0.0	1	100		
	Divorced	2	40.0	3	60.0		
	Widowed	52	49.1	54	50.9		
Level of Education	None	21	45.7	25	54.3	11.277	0.024*
	Primary	21	48.8	22	51.2		
	Secondary	27	75.0	9	25.0		
	Tertiary	48	67.6	23	32.4		
	Qur'anic	113	57.9	82	42.1		
Occupational Status	Civil Servant	18	69.2	8	30.8	10.308	0.036*
	Unemployed	57	49.6	58	50.4		
	Retired	54	70.1	23	29.9		
	Self-employed	93	57.4	69	42.6		
	Others	8	72.7	3	27.3		
Source of Finance	Family	87	54.7	72	45.3	6.248	0.098
	Self	91	59.1	63	40.9		
	Pension	49	70.0	21	30.0		
	Both	3	37.5	5	62.5		
Average Monthly **Income** (naira)	<20805	46	45.1	56	54.9	10.733	0.001*
	≥20805	184	63.7	105	36.3		

*Statistically significant value, χ^2=chi-square, **=fisher exact

Relationship of respondents Family characteristics of Participants and Depression:

Table 4 shows the association between family characteristics of participants and depression. The type of family, type of marriage, number of children alive and the living arrangement of the respondents were not significantly associated with depression since their p-values are greater than 0.05 while the location of resident and social support was significantly associated with depression since its p-value was less than 0.05 at 5% level of significance with a 95% confidence limit.

Table 4: Relationship between respondents Family Characteristics and Depression

Family Characteristics		GERIATRIC STATUS No Depression		DEPRESSION Depression		Test statistics (χ^2)	P value
		Frequency	%	Frequency	%		
Type of Family	Nuclear	65	57.5	48	42.5	0.111	0.739
	Extended	165	59.4	113	40.6		
Type of Marriage	Monogamous	96	56.5	74	43.5	1.420	0.584
	Polygamous	134	60.6	87	39.4		
Number of children alive	None	1	50.0	1	50.0	**3.042	0.387
	1-2	16	76.2	5	23.8		
	3-4	32	58.2	23	41.8		
	≥5	181	57.8	132	42.2		
Living arrangement	Alone	13	50.0	13	50.0	4.201	0.122
	Spouse/Children	210	60.5	137	29.5		
	With others	7	38.9	11	61.1		
Location of residence	Less developed area	95	51.1	91	48.9	9.706	0.003*
	More developed area	135	65.9	70	34.1		
Social support	Low/poor	11	20.4	43	79.6	59.125	< 0.001*
	Moderate	103	54.2	87	45.8		
	High/Strong	116	78.9	31	21.1		

*Statistically significant value, χ^2=chi-square, **=fisher exact

Discussion

Sociodemographic characteristics of participants

This study was carried out to assess the prevalence and correlates of depression among the elderly attending the general out-patient clinic of Usmanu Danfodiyo University Teaching Hospital Sokoto. The study participants were aged between 60 and 95 years. The mean age was 67.85 years (standard deviation of 7.11 years). This is similar to 69.6 years (standard deviation of 7.9 years) that Adebayo et al found in a 4-year retrospective review of geriatric mental health services in Lagos.[38] This is also similar to the 69.1 years (standard deviation 6.6 years) that Ajayi et al found in Ibadan, Nigeria.[39] These similarities could be because these studies are all in Nigerian urban settings that are cosmopolitan. Awunor et al in Delta State Nigeria, in a community-based study reported a similar finding of 68.3years (standard deviation 7.1 years).[40] Majority of the subjects studied (61.6%) were aged between 60-69 years. This is similar to the (60.5%) reported by Falaki et al in Sokoto Northwestern Nigeria.[41] The similarity may be because both were hospital-based study with similar population characteristics. This is different from the community-based study reported by Olutoki et al (65%) in Lagos,[23] and Sinha et al (70.9%) in India.[42] Gupta et al also found (28.7%) in their study that had a mix of community dwelling and old age home-dwelling older adults in Lucknow city.[43] Onya and Stanley in a

hospital-based study in Port Harcourt Nigeria found that majority of the participants (77.3%) were aged between 65-69 years despite using a cut off of 65 years to define older adults[24] The importance of this, is that this cohort of "active elderly" individuals (i.e,60-69 years) can be targeted for early preventive interventions, which if instituted early may lead an improvement in the quality of life and reduction in illness in the elderly.

More than half of the study participants (59.6%) were males. This is comparable to what Sinha et al (56.3%)[66] found but at variance with studies by Olutoki et al (47%), Onya and Stanley (39.3%), Padayachey et al (29.4%), Girma et al (38.1%).[3,18,23,24,] This could be because of the religious and cultural background of the community where this study was done where females are expected to be at home with the children or are in purdah (seclusion of females for religious or social reasons), also some women may require the permission of their spouses before seeking healthcare no matter how severe.

A majority (68.3%) of the study respondents belong to the Hausa/Fulani tribes. This is probably because Sokoto state, the seat of caliphate is an ancient city and is predominantly Hausa/Fulani ethnic group. A majority of the participants (84.3%) were Muslims. This was expected as Islam is the predominant religion in Sokoto, Northern western Nigeria which is the seat of the defunct Sokoto Caliphate.

Most (71.1%) of the individuals recruited for the study were married. This is similar to what was found in similar studies on depression in older adults by Girma et al (72.1%), Olutoki et al (60.9%), Mohamed et al (72.7%), Gupta et al (78.7%) and Awunor et al (86.8%).[18,23,44,43,40] These studies, despite some being based in the hospital, community, or elderly social clubs and from different cultures of the world had identical findings on marital status. This is probably a reflection of the bisexual nature of man and the fact that the companion of the opposite sex is cherished by most human beings.

Regarding the educational level of the respondents in this study, only about a third (38.4%) of the recruited subjects had formal education. This is comparable to the finding of Onya and Stanley (47.3%) in Port-Harcourt Southern Nigeria and Bhamani et al who reported (33.7%) in Pakistan.[25,65] It is however different from the studies of Olutoki et al (81.4%) in Southwest Nigeria, Awunonor et al (70%) South south Nigeria, Girma et al (69.5%) in Ethiopia, Mohamed et al (100%) in Egypt, and Padayachey in South Africa.[3,18,23,44,40,] Padayachey et al did not list any participant that had no formal education in their study and found that those with post primary education were a majority. This may also be a reflection of the fact that South Africa, Egypt and Southern Nigeria may have accepted western education earlier than Northern Nigeria.

Only (18.2%) of the participants had up to tertiary education. This is probably a reflection of the culture and the fact that western education was not accepted early in northern Nigeria.

Nearly half of the respondents were self-employed (41.2%). Onya and Stanley reported a similar finding of (44.6%) in Southern Nigeria.[24]This is may be due to the cultural and economic realities of the environment of their study where the elderly has to still earn a living and not depend on their children or on the government as most were not in the formal sector.

About (40.7%) of the respondents had their family as their source of finance and majority of the respondents (73.9%) earn an average monthly income of above 20,805 naira based on the World Bank standard of 1.9 US dollar per day poverty line (monthly 57 US dollar at 365 naira per U.S dollar in 2018). The financial support from their children was also included in the earning of some of the participants especially those who had no formal education. They tend to have more children than those who are educated.

Family characteristics of the participants.

Majority (71.1%) of those studied were from extended family set up. This is comparable with what Sengupta and Benjamin in India found in their study where the joint family setting was a majority (87.6%).[46] This is probably the main pattern of family in India. The finding in this study may be due to the culture and communal lifestyle of the Northern Nigeria. A good proportion (56.5%) of the respondents were in polygamous marriages. This may be particularly due to the culture and Islamic religion in Northern Nigeria where it is permissive to have more than one wife.

The majority (80%) of the respondents had five or more children alive. This is comparable to the (98.6%) found by Olutoki et al in Lagos Southern Nigeria.[23] The finding in these two studies may be due to the fact that they value children who are considered as future security and as a source of support. More than half (52.4%) of the respondents lived in a more developed area of the community, whereas Olutoki et al in a mixed urban community study found (98.6%) of respondents to be living in a more developed area of the community[23] This may be due to the location of the health facility where the study was carried out. Majority of the respondents (88.7%) lived with their spouse/children. This is in agreement with the (83.2%), (75%) and (66.1%) found by Padayachey in South Africa, Girma et al in Ethiopia and Mohamed et al in Egypt repectively.[3,19,68] This is in contrast to the (33.4%) Bhamani found in his study in Pakistan.[65] The reason for the varied finding in this study may be because culturally, people of Northern Nigeria tend to live together as a family even in old age so as to be taken care of by their family members.

The majority (86.2%) of the study respondents had moderate to strong social support. This is in agreement to the (86%) Olutoki et al reported in South west Nigeria, (78.1%).[23,] The studies from Japan and Turkey used different instruments to measure social support (Multidimensional scale for perceived social support and the 2-way social support scale respectively). These scales did not grade the social support but most of the participants had high scores. This study utilized the Oslo-3 items social support scale. The findings in this study were probably a reflection of the fact that Africans still value relationships with their parents, they feel obliged to support the elderly and believe in obtaining blessings from them before they pass on.

Pattern of Depression among the respondents

Of all the respondents 161 (41.2%) who were depressed in this

study, nearly all (99.4%) had mild depression. Only 1 (0.6%) of the respondents with depression had severe depression. This is similar to (90.7%) for mild depression and (9.3%) for severe depression Morgan et al found in their study in Uyo.[47]The similarities may be probably due to the fact that both are Nigerian and hospital-based studies. They both used the 30 items GDS. This is in contrast to the lower proportion of mild depression reported by Padayachey et al (31%) and Sinha et al (22%).[3,42] The difference could be because they were community-based studies and cultural differences.

Factors associated with depression among the study respondents

In this study, age was found not to be associated with depression. This could be because of the cosmopolitan nature of the study participants and the fact that many of them were in the early age of older adults (60-69 years). They may still be earning some income in the form of contract employment or giving valuable advice in their various fields of expertise and experience, also physiological and psychological adaptation could have set in. This is similar to what Morgan et al, Padayachey et al found in Southern Nigeria and South Africa respectively .[13] These studies used the 15-item and 30 item GDS and were both community and hospital-based study. This is at variance with what Onya et al in Nigeria found in their hospital-based study[23] This could be because they used an age cut-off of 65 years to define older adults.

Gender was found not to have a significant association with depression in the study respondents. This is similar to what Olutoki et al in Lagos and Awurnor et al Delta Southern Nigeria found in their studies.[23,40] This may be due to the abundance of the extended family type among the study participants which may be supportive and the fact that the studies were Nigerian based. Contrary to the findings in this study, Mohamed et al in Egypt reported that female gender was a predictor of depression in Egypt[44]. Girma et al and Mirkena et al also reported female gender as being associated with depression in Ethiopia.[18,] This was explained by the fact that most elderly women lost their spouses and were widowed and financially dependent both of which are risk factors of elderly depression. Both ethnicity and religion do not have a significant relationship with depression in the study population. Religion plays a role in the development of depression Marital status was found to be significantly associated with depression in this study. Those who were married were less likely to develop depression. This is in agreement with what Onya and Stanley in Nigeria, Padayachey et al in South Africa, Girma et al in Ethiopia, Bhamani et al in Pakistan, Mohamed et al in Egypt and Sengupta in India found in their various studies.[3,18,24,,44,46] Being married confers some social and psychological support.[19] Conversely, Olutoki et al and Cong et al in China reported no association in their studies. [23,52] Level of education was found to be significantly associated with depression in this study. This is similar to the findings by Onya and Stanley, Mohamed et al, Sengupta and Benjamin, Morgan, Awurnor et al and Girma et al [18,23,44,46,49,40] but at variance with the study reported by Padayachey et al, Olutoki et al and Cong et al.[3,23,52] The variation could be because of cultural or study settings. Occupational status was found to be significantly associated with depression among the respondents. This is contrary to previous studies in South Africa, Ethiopia, Southern Nigeria and India. [3,18,23,24,46,40] while these studies were community based, this study was hospital based. The source of finance was not significantly associated with depression in this study. This is similar to what Onya and Stanley reported in their study.[24] Similarity may be due to study settings as both studies were cross-sectional and hospital based. On the other hand, Morgan et al reported significant association in their findings[122] This can explain by the fact that deterioration in financial status is among the most frequently endorsed stressful life event experienced by older adults and older adults who are economically disadvantages are more likely to experience persistent depressive symptoms than those who are not.[2,122] The average monthly income was also found to be significantly associated with depression in the study. Low income may reflect a low socioeconomic status, inadequate family support and poverty which may be a risk for depression.[24] This is in line with previous study by Morgan et al, [122] in Southern Nigeria. Both were Nigerian and hospital-based study This is at variance with the mixed urban community-based study reported by Olutoki et al and the community study by Girma et al in Ethiopia [18,23]

This study found that type of family was not associated with depression in the study participants. This is probably a reflection of the support and companionship that comes from having a family. Sengupta and Benjamin on the hand reported that nuclear family was an independent risk factor for depression in India[45] In this study, type of marriage was not found to be associated with depression among the study participants. The number of children alive was not significantly associated with depression in this study. This is at variance with Olutoki et al where he reported that respondents with no children were more significantly associated with depression in comparison with participants that had one or more children.[23]This could be because having more children may provide more support emotionally, financially, physically and socially. Bhamani et al in Pakistan also reported that increasing number of male children showed significant association with depression.[45]The variation could be cultural reason. Living arrangements in this study was not associated with depression. This is in keeping with previous study by Padayachey et al in South Africa.[3] The finding is different from the studies by Mohamed et al, Mirkena et al and Morgan.[44,49,S] These findings showed living with spouses and children were strongly associated with depression in their studies. This study, though revealed no significant association may suggest that participants maintained active social network. This study found location of residence to be associated with depression Previous community-based studies in South-western Nigeria by Olutoki et al and Sengupta and Benjamin in India also revealed similar findings. [23,46] These studies, similar to the findings in this study revealed that respondents who lived in a less developed area of the community were more likely to develop depression. This may be attributed to the fact that environmental factors play an important role in the determinants of quality of life and depression in the elderly. In this study, low social support was found to have a significant association with depression among the respondents. The higher the respondents

social support ,the lower the risk of being depressed .This is consistent with previous studies by Olutoki et al, Cong et al, Bhamani et al and Sengupta and Benjamin.[23,64,45,46] Studies have shown previously that low social support reduces capacity to manage stress and increases vulnerability to negative emotions and cognition,[2, 24] also low social support was often highly related to decrease in life satisfaction and in turn an increase in depression.[23] Conversely, Mirkena et al in Ethiopia did not report any significant association with social support despite using the Oslo-3 social support scale in this study.[49] The discrepancy may probably be because of socio-cultural differences in the study population .

Conclusion

This study found the prevalence of depression among the elderly to be (41.2%) and of these respondents who were depressed, (99.4%) had mild depression while (0.6%) had severe depression. In the sociodemographic characteristics, marital status, level of education, occupational status and average monthly income had a significant association with depression. While in the family characteristics, location residence and social support had a significant association with depression. This study underscores the need for early screening, detection and treatments of depressive disorder in the elderly by primary care physician especially among elders with risk factors with the view of reducing the morbidity and mortality associated with it. Also, there is increasing need for families to strengthen the social support systems. There is also a need for the government to improve the social welfare of the elderly, provide and sustain free medical and other social services, and with the private sector, put up and/or fund geriatric centres so that the specific needs of the elderly can be addressed

Limitations of the study

The limitations of this study are recognized by the authors. Firstly, the study was hospital-based which may not reflect the true situation in the community, also the GDS is a screening tool for depressive symptom rather than diagnostic instrument for depressive disorder. Despite these limitations, the study provides valuable data on prevalence and some epidemiological factors in the occurrence of elderly depression for consultative and comparative purposes and to the best of our knowledge is the first hospital-based study done in this environment that assessed the prevalence of depression among the elderly individuals aged 60 years and above, as previous studies focused on individuals' adults with medical conditions like HIV, leprosy, hypertension, diabetes, menopause and burns patients

Conflicts of interest

There are no conflicts of interest declared by the authors

Authors' contributions: AHS conceptualized the study, and contributed to the design, data collection, analysis and manuscript writing. BND and GBA contributed to designing the study, research instrument and preparation of the final draft of the manuscript. AAS, FFA, KJS and SA contributed to designing the study and data collection. YM and AA contributed to the review of literature, data analysis and interpretation. YM and AA contributed to the review of the literature and preparation of the final draft of the manuscript. All the authors were involved in the writing of the manuscript at the draft and the revision stages, and have thoroughly read and approved the final version.

References

1. Baiyewu O, Guraje O, Sujuan G, Oguniyi A, Smith-Gamble V, Handrie CH, et al. Prevalence estimates of depression in elderly community-dwelling African Americans in Indianapolis and Yoruba land in Ibadan Nigeria. Int Pscho geriatr 2007; 19 (4): 679-89.
2. Fiske A, Loebach J, Gatz M. Depression in Older Adults. Ann Rev. Clin Psycol 2009; 5:363-89.
3. Podayachey U, Ramlall S, Chipps J. depression in older adults: prevalence and risk factors in a primary health care sample. S Afr Fam Pract. 2017; 59 (2): 61-66.
4. WHO. World health statistics 2015. Geneva: World Health Organization; Available at http: www.euro.who.int/en/health-topics. [Last accessed 26th December, 2019].
5. American Psychiatric Association; diagnostic and Statistical Manual for mental Disorder, 5th ed. Washington DC: American Psychiatric Publishing; 2015.pp1-569.
6. Shofoyeke AD. A survey of care and support for the elderly people in Nigeria. Mediterr J of Social Science 2014; 5 (23): 2556-2559.
7. National population Commission (NPC) [Nigeria], ICF International. Nigeria Demography and Health Survey 2013. Abuja, Nigeria and Rockville, Maryland, USA: National Population Commission (NPC) [Nigeria] and ICF international :2014.
8. Copeland J, Beeckam, Dewey M. Depression in Europe; Geographical Distribution among older people, British Journal of Psychiatry; 174: 312-21. In: Michael D, Adil K, John C. Depression in older people in the general hospital: a systematic review of screening instruments. Age and Aging 2012; 41 (2): 148- 54.
9. Royal College of Psychiatrist, who cares win improving the outcome for older people admitted to the general hospital: Guidelines for the development of basic mental health services for older people, 2005.Available from London http:11www.rcpsch.ac.uk/PDF/who cares win. Last accessed 26th July,2020.
10. Gesinde AO, Iruonage TC. Counseling Services for remediating the biopsychosocial challenges of the Aged in Nigeria. J functional management 2011;3 (1): 89- 98.
11. United NationPopulation Division. World Population Prospects: The 2015 Revision.
12. Skuse D. Care for elderly people with mental illness. International psychiatry. 2010; 7 (2): 1-9.
13. Natashiya KP and Pranitha M. Aging and Health in Africa: International Perspective on Aging. 2013; 4(2): 11- 49.
14. Aboderin IG, Bead JR. older People's health in sub-Saharan Africa. The Lancet 2014; 14 (6736): 8669-8679.

15. Baram A, Chosh MK, Nilamadlah K, Basilo MA. Prevalence of depressive disorders in the elderly. Ann Saud Med 2011; 31(6) 620 – 24.
16. Harding S, Lenguerrand E, Costa G. Trends in mortality by labour market position around retirement ages in three European countries with different welfare regimes. Int J Public Health. 2013; 58 (1): 99-108.
17. Ferraira M. Ageing Policies in Africa. New York: United Nations; 2008 Regional Dimension of Aging Situation. 2016.
18. Girma M, Halilu M, Wakwoya A, Yohannis Z, Ebrahim J. Geriatric depression in Ethiopia: Prevalence and Associated Factors. J psychiatry 2016; 20 (400):2378-5756.
19. Salisu AS, Udofia O. Prevalence and Associated Factors of Depression among general out patient in a tertiary institution in Kano, North -Western Nigeria. O J Psych 2016; 6 (3): 228 – 36.
20. Bakare AT, Yusuf AJ, Habib ZG, ObembeA. Anxiety and Depression: A Study of people with leprosy in Sokoto. North Western Nigeria. J Psych 2015; 51(1):4-9.
21. Gureje O, Kola L, Afolabi E. Epidemiology of major depressive disorder in elderly Nigerian in the Ibadan Study of ageing: a community-based survey. Lancet 2007; 370: (9591) 964- 75.
22. Afolabi MW, Abioye EA, Fatoye FO, Bello IS, Adenuga AO. Pattern of depression among patients in a Nigerian Family Practice Population. S Afri Fam Pract. 2014; 50:63-69.
23. Olutoki MO, Olangugu AT, Adeyemi JD. Correlates of depressive illness among the elderly in a mixed urban community in Lagos Nigeria. J Aging and Mental Health 2013;18 (5):561 – 69.
24. 24 Onya ON, Stanley PC, Risk factors for depressive illness among elderly group. Attitudes at UPTH, Port Harcourt Nigeria IORS-JDMS 2013;5(2): 77 – 86.
25. Peltzerk, Phaswa-Mufuya N. Depression and associated factors in older adults in South Africa. Global Health Action. 2013;6: 1-9.
26. Mzikazu N, Jewkes R, Dunkle KL, Nwabisa PJ; Lan C. Prevalence and factors associated with depressive symptoms among young women and men in Eastern Cape Province, South Africa. J child & Adolesc Ment Health 2013; (1) 43-54.
27. Abdo NM, Eassa S, Abdalla AM. Prevalence of Depression among Elderly and Evaluation of International Counselling Session in Egypt. Am J of Sci.2011; 7: 739 – 40.
28. Imran A, Azidah AK, Asrenee AR, Rosediam M. Prevalence of Depression and its associated factors among elderly patients in Out- patient Clinic University of Sains Malaysia Hospital. Med Journal Malaysia 2009; 164: 134-39.
29. Rashid A, Mannan S, Rohana S. Depression among the elderly Malays living in Malaysia. The Int J of Public Health 2011; 1: 15- 25.
30. Swarnaletha N. The prevalence of depression among the Rural elderly in Chittoor District, Andhra Pradesh India. J. Clin Diag Res 2013; 7: 1356-1360.
31. Wei Wei T, Philip Y, Gerald CHK, Ngan PF, Nan L. Prevalence and risk factors of depression among the elderly in the nursing home residents in Singapore. Age and Ment Health 2013; 17(6): 724- 31.
32. Helvk AS, Skancke RH, Sellback G. Screening for depression in elderly medical inpatient from rural area of Norway: prevalence and associated factors; Int J Geriat Psych. 2010; 25 (2): 150-159.
33. Mc Doughil FA, et al. Prevalence of depression in older people in England and Wales: the MRC CFA study. Psychol med 2007; 37 (12):1787 – 95.
34. David CS, Gwinith GF, Kenneth ML, Guy GP, Brenda LP. Prevalence of depression among older Americans: The Aging Demographic and Memory Study. Int. Psych 2009;21 (5) 879- 88.
35. Raj A. Depression in the elderly: Tailoring Medical Therapy to their special needs.
36. 36. Postgraduate Medicine Online. 20014; 115(6):1-14. National Population Commission, Abuja, Nigeria. Census 2006. Available from: www.population.gov.ng/index.php/statepopulation.Last accessed on 22nd February, 2019.
37. Gregor H. World Psychiatry. The World Psych Associa. 2010; 9 (3): 155- 61.
38. 38. Adebayo RA, Olagunju AT, Olutoki MO, Fadipe B, Oduguwa TO, Lawal RA. A Four-year review of geriatric mental health services in a Lagos based hospital, Nigeria. Ethiop Med J. 2016;54(3):125–34.
39. Ajayi SA, Adebusoye LA, Ogunbode AM, Akinyemi JO, Adebayo AM. Profile and correlates of functional status in elderly patients presenting at a primary care clinic in Nigeria. African J Prim Heal Care Fam Med. 2015;7(1):1–7.
40. Awunor NS, Ntaji MI, Edafiadhe EW, Erhabor PO, Eferakorho OA, Ijirigho B, et al. Prevalence and Predictors of Depression among the Elderly in selected Rural communities in Delta State. J of comm med primary health care.2018;30(1):122-130.
41. Falaki FA, Grema BA, Singh S, Jega RM, Kaoje AA, Arisegi SA. Family functionality among elderly patients with chronic illnesses attending the General Outpatient Clinic of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Int Arch Med. Med. Sci.2019;1(2): 36-43.
42. Sinha SP, Shrivastava SR RJ. Depression in an Older Adult Rural Population in India. MEDICC Rev. 2013;15(4):41–4.

43. Gupta A, Mohen U, Singh SK, Manar MK, Tiwari SC, Singh VK. Screening depression among Elderly in a city of South East Asia. J clin Diagnostic Res JCDR.2015;9(9):1-5.
44. Mohamed EM, Abd-Elhamed MA. Depression among elderly attending geriatric clubs in Assiut City, Egypt. J Am Sci. 2011;7(11):386–91.
45. Bhamani MA, Karim MS, Khan MM. Depression in the elderly in Karachi, Pakistan: a cross sectional study. BMC Psychiatry. 2013;13(181):1–8.
46. Sengupta P, Benjamin A. Prevalence of depression and associated risk factors among the elderly in urban and rural field practice areas of a tertiary care institution in Ludhiana. Indian J Public Health. 2015;59(1):3–8.
47. Morgan UM, Etukumana EA, Abasi-Ubong F. Screening for Depression in the Elderly: Outcome of a Hospital Based Study in Uyo, Nigeria. IOSR J Dent Med Sci. 2017;16(8):20–4.
48. Bhattacharya R, Shen C, Sambamoorthi U. Excess risk of chronic physical conditions associated with depression and anxiety. BMC Psychiatry. 2014;14(10):1–10.
49. Mirkena Y, Reta M, Haile K, Nazzir Z, Sisay M. Prevalence of Depression and associated factors among older adults at ambo town, Oromia region Ethiopia. BMC Psychiatry.2018;18:338-44.
50. De Wit LM, Van Straten A, Van Herten M, Pennina BW, Cuippers P. Depression and body mass index in U-shaped association. BMC Public Health. 2009; 9:14-18.
51. Carey M, Small H, Yoong SL, Boyes A, Bisquera A, Sanson-Fisher R. Prevalence of comorbid depression and obesity in general practice. Br J Gen Pract. 2014;65(638):122–7.
52. Cong L, Dou P, Chen D, Cai L. Depression and associated factors in the elderly cadres in Fuzhou, China: A community-based study. Int J Gerontol. 2015;9(1):29-33.
53. Oladiji JO, Akinbo SR, Aina OF AC. Risk factors of post-stroke depression among stroke survivors in Lagos, Nigeria. Afr J Psychiatry. 2009;12.47–51.