RESEARCH ARTICLE

Major and sub-threshold depression and quality of life of displaced older persons: Community based cross sectional study in Nigeria

Margaret Isioma Ojeahere[1] [a], Bolanle Ola[2], Christopher Piwuna[1], Suwa Goden Goar[1], Tolulope Afolaranmi[1], Richard Uwakwe[3]

[1] Jos University Teaching Hospital, [2] Department of Behavioural Medicine, Lagos State University College of Medicine, [3] Faculty of Medicine, Nnamdi Azikiwe University

Journal of Global Health Neurology and Psychiatry

Introduction

This study examined major and subthreshold depression, their relationships with sociodemographic/risk factors and quality of life (QOL) of internally displaced older persons in a rural community in north central Nigeria.

Methods

A community-based, cross-sectional study conducted among 200 older adults in Riyom, Nigeria. The respective modules of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) and WHOQOL-BREF were used to conduct face to face interviews to assess major and subthreshold depression and QOL respectively. Data were analysed using SPSS version 23. Descriptive statistics and logistic regression analysis were performed using 95% confidence interval to analyse the significant relationships between depression, socio-demographic/risk factors, and QOL. Probability value of < 0.05 was considered statistically significant.

Findings

The prevalence of lifetime major and sub-threshold prevalence of depression were 58.5% and 12.5% respectively. The factors significantly associated with increased odds for major depression were average monthly income, history of traumatic event (s) and having a confidant to talk with after the event (s) with (OR=1.839, CI=1.364-2.480, p= 0.001); (OR=9.860, CI=1.025- 94.876, p= 0.048) (OR= 4.570, CI=1.783- 11.718, p= 0.002) respectively while access to health care and having a confidant after the event (s) similar to major depression (OR= 5.105, CI=1.037- 25.133, p= 0.045); (OR= 0.276, CI=0.088- 0.862, p= 0.027) respectively were found significantly associated for sub-threshold depression.

Conclusions

The prevalence of major and sub-threshold depression among internally displaced older persons in a Nigerian rural community were high and there were significant relationships with sociodemographic factors and QOL. While there is a need for more studies, intervention studies in internally displaced older persons would need to consider low socioeconomic status, social support, and traumatic events with substantial impairment in QOL in addressing the burden of major and sub-threshold depression among these growing populations.

a Corresponding author:
Margaret Isioma Ojeahere
Department of Psychiatry, Jos University Teaching Hospital, Jos, Nigeria
Margaret.ojeahere@gmail.com
+234 8095043641

1.0 INTRODUCTION

The last two decades have documented changing demographic patterns as never witnessed before with an increasing number and proportion of older persons (aged 60 years and older) across the world.[1] By the year 2025, the world will record 1.2 billion people aged 60 years and older and by 2050, it is estimated to increase to over 2 billion with 80% of this population living in low- and middle-income countries.[1-3] In sub-Saharan Africa, the rise in the number of older persons is predicted to be the second fastest rate after Eastern and South-Eastern Asia.[4] Nigeria has the largest aging population in sub-Saharan Africa and is projected to increase from over 9 million in 2016 to 26 million by 2050.[5-7]

However, in the last four decades, the northern part of Nigeria has suffered recurrent armed conflicts with consequent impact on people of all age groups including older persons.[8] In north central Nigeria, Plateau state was one of the states badly affected in the early years of these conflicts and within this state, Riyom Local Government Area (L.G.A) was one of the worst hit communities.[9] The effect of armed conflicts and its attendant consequences on an individual or group can lead to mental health conditions such as depression among others.[10]

Depression is a public health concern of global dimensions and presently the leading cause of disability worldwide and a major contributor to the overall global burden of disease.[1,11] About 5.0% of adults across the world suffer from depression,[12] and among older persons it is prevalent as one of the common mental disorders in old age.[13] In older persons, the global prevalence of depression ranges from 7.2 to 20%.[14,15] This wide range might represent problems with a threshold cut-off for clinical depression in several studies. Apart from this, there is accumulating evidence of subthreshold forms of depression among the older persons which are associated with functional impairments and based on these studies, several authors have argued that categorical approach to clinical depression could be difficult to apply in older persons who have co-occurring health problems.[16-18] In view of this, dimensional approach to depression recognition among the elderly is suggested to reduce the gap of older persons with depression who do not receive medical care because they fall short of clinical diagnosis.[16]

Depression or its symptoms has been identified as a disabling condition that increases the risk of mortality and negatively influences quality of life (QOL).[19] The concept of QOL as defined by World Health Organisation (WHO) refers to 'individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns'.[20] Late life is a period fraught with frailty, structural and functional deficits heightened by the normal aging process and

deteriorating health conditions. Geriatric depression amplifies these disabilities, and if left unattended may become chronic with consequent health and socioeconomic losses impacting negatively on their QOL.[13,21]

Literature examining depression in late life and QOL of the older persons are increasing but few studies have been conducted on internally displaced older persons in rural communities in Africa. Largely understudied is sub-threshold depression among these persons who have experienced catastrophic events especially in sub-Saharan Africa. While this study estimated the prevalence of major and sub-threshold depression among this population, it also tested the alternative hypothesis that full and sub-threshold depression would have negative effects on the QOL of internally displaced older adults. Thus it builds on the existing evidence that late life depression has negative association with QOL.

2.0 METHODS

2.1 Study design and sample

A community based cross sectional study was conducted among older persons in Riyom Local Government Area of Plateau state, Nigeria. Participants were recruited using a multistage sampling technique, comprising the selection of a L.G.A; community; houses, and eligible participants. The study population comprised internally displaced older adults aged 60 years and above who reside in Riyom L.G.A since the onset of the first major ethno-religious crises in Plateau state in 2002 and who gave their consent to participate in the study. Of the 216 participants recruited for the study, only 200 completed the study. Sample size determination was done to calculate the minimum number of participants to be studied. The minimum sample size was determined using the Leslie Kish formula ($n = (Z_a^2 pq)/d^2$),[22] and using a prevalence of 13.0% from a similar study done in Nigeria.[23]

Z_a = Level of confidence [the standard normal deviate set at 1. 96 which corresponds to the 95% confidence level], d = level of precision (5%), $q = 1 - p$

$$n = (1.96^2 \times 0.13 \times 0.87)/0.05^2 = 174$$

In adjusting for non- response, poor response, and incomplete response, 15% of the calculated value was added, which gave $n = 200$ as the minimum number of participants to be recruited for the study to give the desired power and effect size subsumed in the Kish formula.

The study was approved by the Jos University Teaching Hospital's Institutional Health Research Ethical Committee with reference number: JUTH/DCS/ADM/127/XIX/6597. Permission was obtained from the LGA chairman and the community head of the selected community. Informed consent was obtained before commencement of the study.

2.2 Measures

Details of data collection and procedure of the study have been described elsewhere in a previous study.[24] Participants who gave their consent for the study but were not literate enough to append their signatures were required to thumbprint as appropriate. Comprehensive explanation of the study was proffered, respect for their rights were recounted, and confidentiality was assured for the participants. Areas were mapped and visits were made to potential participants by the five interviewers who had been trained in the administration of the questionnaires [Composite International Diagnostic Interview (CIDI),[25] and the WHO quality of life questionnaire (WHOQOL-BREF)] and their scoring systems.[26] Face to face interviews were carried out, the meetings were verbally done and each lasted an average of 75 minutes. Participants with depression or other psychological problems received brief psychological intervention during the study. Furthermore, severe cases identified during the study were referred to treatment centres such as Jos University Teaching Hospital and Vom Christian Hospital for subsequent management.

2.2.1 THE DEPRESSION MODULE OF THE COMPOSITE INTERNATIONAL DIAGNOSTIC INTERVIEW (CIDI)

A structured clinical interview designed with the property of generating diagnosis according to the International Classification of Diseases 10th Revision (ICD 10) of the World Health Organization and the Diagnostic and Statistical Manual 4th Edition (DSM IV) of the American Psychiatric Association and designed for use across cultures.[27,28] It was developed for people with different educational /cultural backgrounds and intelligence. The CIDI has been shown to have good validity, good test- retest reliability, inter-rater agreement, and acceptable degrees of concordance for the detection of depression and has been validated and used by researchers in different countries, Nigeria inclusive.[25,29] The English and Hausa version of the WMH-CIDI were used for participants who speak English and Hausa (a language widely spoken and understood by residents of northern Nigeria) respectively.

2.2.2 WHO QUALITY OF LIFE QUESTIONNAIRE (WHOQOL-BREF)

The WHOQOL-BREF is a 26- item questionnaire,[26] which is a short version of the WHOQOL-100 scale.[30] It consists of four domains: *Physical Health* (7 items), *Psychological* (6 items), *Social Relationships* (3 items), *Environment* (8 items) and *Global QOL* (2 items).[26] The different domains in the WHOQOL-BREF encompasses different areas of daily life and provides the basis for evaluating the perception of individual's satisfaction in relation to their objective and subjective living conditions. It is a self -rating instrument but can also be interviewer-administered. The scores can range from zero to 100, with higher scores representing better QOL. It has been shown to have excellent psychometric properties and a valid measure of QOL in the older adults.[26] The

WHOQOL-BREF has been vaildated and adapted for use in several Nigerian studies.[31–33] The Hausa version of the WHOQOL-BREF used in this study has been used previously in studies carried out in northern Nigeria.[24]

2.3 Statistical analysis

The Statistical Package of Social Sciences Version 23 (SPSS-23) was used for the statistical analysis.[34] Non-numeric variables such as gender, age group, occupation, marital status etc. were presented using frequency tables in frequency and percentage. Logistic regression analysis was used to determine on one hand, independent significant associations between major and sub-threshold depression, socio-demographic/risk factors, and on the other hand, to compare the difference in means of domains of QOL between presence and absence of full and sub-threshold depression. Probability value (p-value) of less than 0.05 was considered statistically significant. Adjusted odds ratio and 95% confidence interval were used as point and interval estimate respectively.

3.0 Findings

The study had a 92.6% response rate. The age range was 60-104 years and the age group 60-69 years had the highest prevalence (61.0%) compared to other age groups. Females constituted 60.0% of the study population with a male to female ratio of 0.6:1. Majority of the participants (89.0%) were farmers and over half (68.0%) of the participants had no formal education. The average monthly income of participants ranged between ₦0 to ₦20,000 ($0 to $50) (equivalent to 2USD, using the exchange rate of 400 Nigerian naira to one USD as at the time of data collection), with less than half (45.5%) earning an average monthly income of ₦800.00 ($2).

As shown in Table 2, logistic regression shows the relationship between sociodemographic/ risk factors and lifetime major and subthreshold depression. Lower monthly income, history of trauma, and having a confidant after the event had increased odds of having major depression (OR=1.839, CI=1.364–2.480, p=0.001); (OR=9.860, CI=1.025– 94.876, p=0.048); (OR=4.570, CI=1.783–11.718, p=0.002) respectively. Whereas, having someone to talk to afterwards and access to health care had increased likelihood of having subthreshold depression (OR= 5.105, CI=1.037–25.133, p=0.045); (OR=0.276, CI=0.088–0.862, p=0.027) respectively.

There were more participants with poor QOL than those with good QOL across the four domains as shown in below in Figure 1. The study showed that more than half (57.5%) participants had poor physical QOL. Similarly, 71.5%, 53.0% and 54.5% participants had poor psychological, social, and environmental QOL respectively.

Table 1. Socio-demographic characteristics of participants (n=200).

Sociodemographic variables	Frequency (n=200)	Percentage (%)
Age group (years)		
60-69	122	61.0
70-79	41	20.5
80-89	28	14.0
90-99	6	3.0
100+	3	1.5
Gender		
Male	80	40.0
Female	120	60.0
Ethnicity		
Berom	199	99.5
Others	1	0.5
Profession Type		
Farmer	178	89.0
Civil servant	11	5.5
Forces	7	3.5
Others	4	2.0
Marital Status		
Married	112	56.0
Separated	3	1.5
Widowed	85	42.5
Educational Qualification		
No formal education	136	68.0
Primary education	39	19.5
Secondary education	16	8.0
Tertiary education	9	4.5
Average Monthly Income (₦)		
0-800	91	45.5
801-5600	42	21.0
5601-10400	30	15.0
10401-15200	32	16.0
15201-20000	5	2.5
Religion		
Christianity	199	99.5
Islam	1	0.5

Table 3 shows that lower mean scores were seen across the four domains for participants who were found to have poor QOL in this study. These suggest that more participants were more likely to be dissatisfied in all the QOL domains. Statistically significant differences in the mean scores of poor and good QOL were demonstrated with p=<0.001 across the domains.

As shown in Table 4 below, higher scores were seen in participants without, compared to those with depression. Significant relationships were seen in the social and environmental domains for major depression with p= <0.001 for each. Participants with major and subthreshold depression have some impairment in the social, environmental, and physical domains of QOL.

Table 2. Logistics regression showing relationship between sociodemographic/putative risk factors and lifetime major and subthreshold depression.

| Socio-demographic/Risk Factors	Lifetime Major Depression		Sub-threshold Lifetime Depression	
	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Age	1.147(0.809-1.627)	0.442	0.654(0.417-1.027)	0.065
Gender	1.320(0.642-2.714)	0.450	0.669(0.241-1.854)	0.439
Marital status	1.012(0.851-1.203)	0.896	0.673(0.317-1.426)	0.301
Educational qualification	0.859(0.543-1.359)	0.515	1.236(0.951-1.605)	0.113
Average monthly income	**1.839(1.364-2.480)**	**0.001**	1.043(0.532-2.043)	0.902
Profession type	1.493(0.808-2.758)	0.201	1.087(0.704-1.679)	0.706
Previous history of trauma	**9.860(1.025-94.876)**	**0.048**	1.478(0.016-1.125)	0.899
Previous history of psychiatric disorder	0.482(0.135-1.729)	0.263	1.265(0.235-6.816)	0.784
Family history of psychiatric disorder	1.667(0.606-4.587)	0.323	1.529(0.397-5.883)	0.537
Directly witnessed or experienced traumatic event	1.161(0.424-3.182)	0.772	1.291(0.286-5.834)	0.740
Happened to close relatives	1.240(0.405-3.792)	0.706	0.398(0.092-1.719)	0.217
Informed about traumatic event (TE)	0.914(0.361-2.316)	0.850	1.072(0.272-4.230)	0.921
Nature of trauma	1.042(0.840-1.292)	0.711	0.893(0.665-1.199)	0.451
Someone to confide in	**4.570(1.783-11.718)**	**0.002**	**0.276(0.088-0.862)**	**0.027**
Blamed, victimized after TE	0.528(0.131-2.128)	0.369	1.281(0.204-8.051)	0.791
Medical illness after TE	1.763(0.448-6.943)	0.418	0.241(0.043-1.357)	0.107
Access to medical care	0.314(0.084-1.176)	0.085	**5.105(1.037-25.133)**	**0.045**

Confidence interval = CI
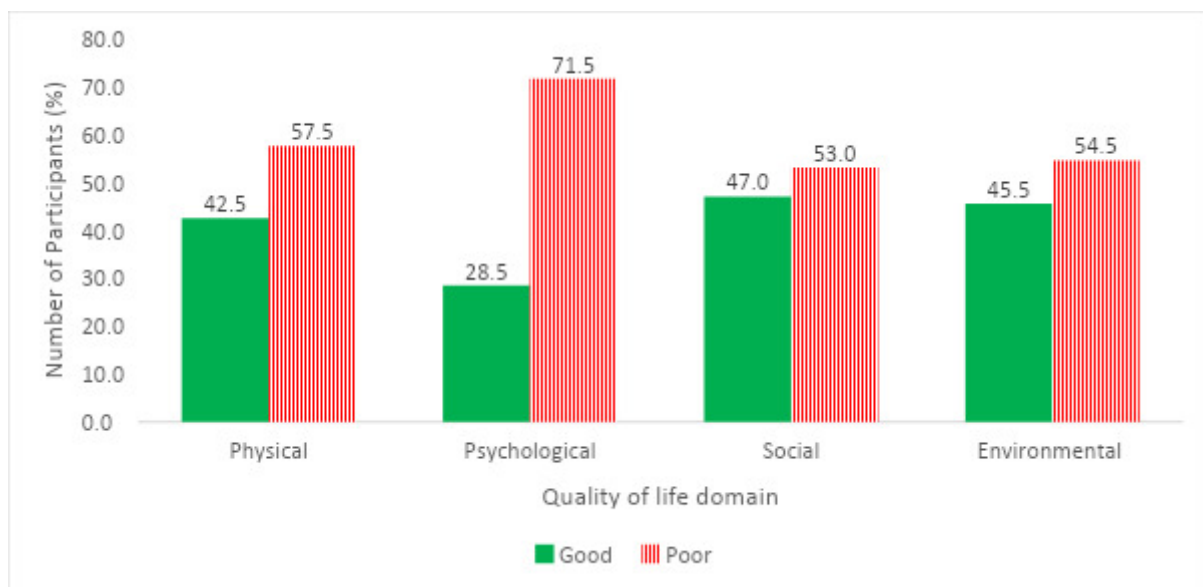
Figure 1. Bar chart showing the quality of life of participants across the four domains.

Quality of Life = QOL

4.0 DISCUSSION

In this study, the prevalence of major depression among older persons was 58.5% and an additional 12.0% was found for subthreshold depression. The present study reported higher prevalence of depression compared to results

Table 3. Comparison of the mean scores of participants with good and poor quality of life.

Domain	Poor (Mean ±SD)	Good (Mean ±SD)	t-test	p-value
Physical	22.4±7.5	49.3±9.6	22.233	<0.001
Psychological	47.6±9.3	69.1±6.3	16.101	<0.001
Social	41.4±9.6	68.3±10.8	18.540	<0.001
Environmental	29.3±6.4	54.5±8.9	23.237	<0.001

Table 4. Comparison of the mean scores of the quality of life of participants with and without major and sub-threshold depression.

Quality of life domains	Lifetime Major depression				Lifetime Sub-threshold Depression			
	Present (n=117)	Absent (n=83)	χ^2	p-value	Present (n=24)	Absent (n=176)	χ^2	p-value
Physical								
Poor	71(60.7)	44(53.0)	1.169	0.280	19(79.2)	96(54.5)	5.239	0.022
Good	46(39.3)	39(47.0)						
Psychological								
Poor	87(74.4)	56(67.5)	1.131	0.288	18(75.0)	125(71.0)	0.164	0.686
Good	30(25.6)	27(32.5)			6(25.0)	51(29.0)		
Social								
Poor	75(64.1)	31(37.3)	13.951	<0.001	13(54.2)	93(52.8)	0.015	0.903
Good	42(35.9)	52(62.7)			11(45.8)	83(47.2)		
Environmental								
Poor	76(65.0)	33(39.8)	12.433	<0.001	10(41.7)	99(56.3)	1.811	0.178
Good	41(35.0)	50(60.2)			14(58.3)	77(43.8)		

χ^2 = Chi-Square value

p-value set at less than 0.05 = significant

from previous studies on late life depression in Nigeria which ranged from 1.1% to 44.7%.[35,36] The observed disparity in the prevalence of late life depression in the present study in comparison to previous findings both locally and in other countries can be explained by the repeated exposure of the participants to mass violence spanning two decades, neglect and failed promises by the government to support them and bring to book the perpetrators of these massacres, inappropriate shelter, and limited access to adequate health care facilities. On the other hand, the present study was lower than the 81.1% prevalence reported in a meta-analysis by Zenebe et al with the range of 7.7% to 81.1%.[1,37,38] Difference in sample size, instruments, methods, and cultural factors may have contributed to the higher prevalence recorded by Ashe et al in India.[38] Comparable prevalence was seen for subthreshold depression with a range of 15% to 27% seen amongst older persons in community settings, however our finding was lower than the 53% reported in South Africa.[39,40] Additionally, the use of the Geriatric Depression Scale, a screening tool may have contributed to the variations in results.

Findings from our study supports amassing evidence that both major and subthreshold depression are more common in older persons in rural settings than documented.[41,42] Participants who earned N800 ($2) or less were more

likely to have depression compared to those who earned more or were in the higher income groups. This is consistent with previous findings which support positive associations between low socioeconomic status and depression.[43,44]

All the participants in this study earned less than ₦20,400 ($51) monthly which is below the poverty line of $1.90 a day (approximately $57 per month) stipulated by the World Bank, consequently putting them in a disadvantaged position socioeconomically. Participants with lower income had a higher likelihood of depression compared to other income groups in the present study. Additionally, findings from our study show that having someone to confide in, was a common factor associated with both major depression and subthreshold depression. While a history of trauma and low income was associated with major depression; poor access to health care was associated with subthreshold depression. The experience of witnessing their homes and communities destroyed with majority of their younger populations murdered, heightened by the loss of their means of livelihood, subsequent displacement leading to their dependence on strangers and extended family for support coupled with the frustration of unavailable health services may lead to a sense of reduced relevance in the society, low self-esteem, negative view of self and the future.[45,46] On the one hand, socioeconomic stability has been found to be protective against depression,[43,47] having a meaningful source of income furnishes individuals with a sense of purpose and boosts self-esteem.

Depression in the geriatric population is known to be significantly associated with negative outcomes.[40] QOL among the older adult is an important area of concern which reflects the health status and well-being of this vulnerable population. The QOL in this study was generally poor across all domains and these suggest that participants in this study were dissatisfied in the four domains related to QOL. This study highlighted findings that participants without depression had higher scores across the domains translating to better QOL than those with depression. Significant relationships were found with major depression in the social and environmental domains and in the physical domain for subthreshold depression. Older persons in this study reported dissatisfaction with their immediate environment viz a viz the increasing security challenges, death of their loved ones particularly as it has affected their support system worsened by the increased structural and functional deficits and emergence of medical comorbidities associated with advancing age. Furthermore, their poor living conditions, inadequate nutrition, absence of basic amenities, dilapidated health care center and the difficulty in accessing better health facilities are plausible suggestions for the significant relationships in the social, environmental, and physical domains for participants with major and subthreshold depression.

The findings above in this study are consistent with numerous studies which support the negative relationship between QOL and depression locally,[19,31,32] and comparable to reports which highlights the presence of depression as an

important factor in estimates of poor QOL in other countries.[13,19,42,48] However, these local and international findings deviate from results by Akosile et al conducted among older persons in Nigeria where good QOL yet high prevalence of depression was reported among participants.[33] Possible suggestions for the disparity in results were the use of convenience sampling technique, higher number of participants who had formal education and were gainfully employed compared to participants in the present study.

The community-based nature of this research among internally displaced older persons, an otherwise unreachable population was considered a strength. In addition, this study is one of the few studies from sub-Saharan Africa that assessed sub-threshold depression in older persons. However, this study is not without limitations. The cross-sectional nature of the survey precludes drawing up any causal relationships between depression, socio-demographic/ risk factors and QOL. Participants were limited to a conflict-ridden community in Nigeria, therefore further studies may be required locally and globally to determine generalization among older persons. Furthermore, it is possible that recall bias, forgetfulness as a normal aging process and cultural factors may have led to an underestimation of depression in this study.

Conclusion

For too long, research on mental health conditions from sub-Saharan Africa among traumatised persons have focused on children and younger adults and very few have examined the effect on older persons. Moreover, sub-threshold form of depression has been overlooked among this subset of the population while emphasis has been on major depression mostly. Consequently, symptoms suggestive of this phenomenon are usually wrongly attributed to the attendant problems of aging. If not explored, they may go unnoticed or discounted. The present study highlights a high prevalence of major and subthreshold depression among traumatized older persons and substantial impairment in the domains and significant interference in the QOL of those with both major and subthreshold depression. It also underpins the need for more longitudinal research on sub-threshold depression among older persons, highlights the need for a higher index of suspicion by clinicians, the additional need to focus on improving the detection of sub-threshold depression in older persons, particularly those that have suffered traumatic events; and the potential importance of interventional studies on major and minor depression to consider risks factors identified.

Authors' contribution: MIO, BO, CGP, GSG, TA, RU are co-investigators and contributed to the design and draft of the study. MIO led the write up of this manuscript. MIO, and RU conceptualised the manuscript, with input from all authors. MIO, RU, BO and TA designed the study and wrote the statistical analysis plan, with input from all authors. MIO drafted the first version of the manuscript. All authors read, drafted, and critically revised the whole report. BO acts as guarantor for the manuscript.

REFERENCES

1. Zenebe Y, Akele B, W/Selassie M, Necho M. Prevalence and determinants of depression among old age: a systematic review and meta-analysis. *Ann Gen Psychiatry*. 2021;20(1):55. doi:10.1186/s12991-021-00375-x

2. Rudnicka E, Napierała P, Podfigurna A, Męczekalski B, Smolarczyk R, Grymowicz M. The World Health Organization (WHO) approach to healthy ageing. *Maturitas*. 2020;139:6-11. doi:10.1016/j.maturitas.2020.05.018

3. World Health Organization. *The Global Network for Age-Friendly Cities and Communities: Looking Back over the Last Decade, Looking Forward to the next. World Health Organization, 2018*. WHO. Ageing and health; 2021. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

4. United Nations. *World Population Ageing 2019*. https://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2019-Highlights.pdf

5. Velkoff VA, Kowal PR. Aging in Sub-Saharan Africa: The Changing Demography of the Region. In: Cohen B, Menken J, eds. *National Research Council (US) Committee on Population*. Aging in Sub-Saharan Africa: Recommendation for Furthering Research. National Academies Press (US); 2006:2. https://www.ncbi.nlm.nih.gov/books/NBK20301/

6. Akintayo-Usman NO, Usman SO. Comparative analysis of ageing in Nigeria and United Kingdom using life course approach: the implication for the Nursing profession in Nigeria. *Pan Afr Med J*. 2021;38(411). doi:10.11604/pamj.2021.38.411.22272

7. National Bureau of Statistics. *National Bureau of Statistics. Demographic Statistics Bulletin May 2017*.; 2018:219-228. https://www.nigerianstat.gov.ng/

8. McLoughlin G, Bouchat CJ. *Nigerian Unity in the Balance*. Strategic Studies Institute and U.S. Army War College Press; 2013. http://www.jstor.org/stable/resrep11545,

9. Assessment Capacities Project [ACAPS]. *ACAPS Briefing Notes: NIGERIA Displacement in Plateau State*.; 2018. https://www.acaps.org/sites/acaps/files/products/files/180713_start_nigeria_plateau_displacement_-_update_1.pdf,

10. Makwana N. Disaster and its impact on mental health: A narrative review. *J Family Med Prim Care*. 2019;8(10):3090. doi:10.4103/jfmpc.jfmpc_893_19

11. World Health Organization. *Depression*.; 2021. https://www.who.int/news-room/fact-sheets/detail/depression

12. Institute of Health Metrics and Evaluation. Global Health Data Exchange (GHDx). http://ghdx.healthdata.org/gbd-results-tool?params=gbd-api-2019-permalink/d780dffbe8a381b25e1416884959e88b

13. Hussenoeder FS, Jentzsch D, Matschinger H, et al. Depression and quality of life in old age: a closer look. *Eur J Ageing*. 2020;18(1):75-83. doi:10.1007/s10433-020-00573-8

14. World Health Organization. *Mental Health of Older Adults*.; 2017. http://www.who.int/mediacentre/factsheets/fs381/en/

15. Luppa M, Sikorski C, Luck T, et al. Age- and gender-specific prevalence of depression in latest-life – systematic review and meta-analysis. *J Affect Disord*. 2012;136(3):212-221. doi:10.1016/j.jad.2010.11.033

16. Schwarzbach M, Luppa M, Hansen H, et al. A comparison of GP and GDS diagnosis of depression in late life among multimorbid patients – results of the MultiCare study. *J Affect Disord*. 2014;168:276-283. doi:10.1016/j.jad.2014.06.020

17. Biella MM, Borges MK, Strauss J, Mauer S, Martinelli JE, Aprahamian I. Subthreshold Depression Needs A Prime Time In Old Age Psychiatry? A Narrative Review Of Current Evidence. *Neuropsychiatr Dis Treat*. 2019;15:2763-2772. doi:10.2147/ndt.s223640

18. Rodríguez MR, Nuevo R, Chatterji S, Ayuso-Mateos JL. Definitions and factors associated with subthreshold depressive conditions: a systematic review. *BMC Psychiatry*. 2012;12(181):1471-1244. doi:10.1186/1471-244x-12-181

19. Sivertsen H, Bjørkløf GH, Engedal K, Selbæk G, Helvik AS. Depression and Quality of Life in Older Persons: A Review. *Dement Geriatr Cogn Disord*. 2015;40(5-6):311-339. doi:10.1159/000437299

20. The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med*. 1995;41(10):1403-1409. doi:10.1016/0277-9536(95)00112-k

21. Xiang X, Yang Y, Cheng J, An R. The Impact of Late-Life Disability Spectrum on Depressive Symptoms: A Fixed-Effects Analysis of Panel Data. *J Gerontol B Psychol Sci Soc Sci*. 2021;76(4):810-819. doi:10.1093/geronb/gbaa060

22. Kish L. Survey Sampling. *Am Polit Sci Rev*. 1965;59(4):1025-1025. doi:10.1017/s0003055400132113

23. Akinsulore A, Adeseiye OC, Oloniniyi IO, Esimai OA. Prevalence and Factors Associated with Comorbid Depression and Anxiety Among Older Adults in South-western Nigeria: A Community-Based Study. *Annals of health Research*. doi:10.30442/ahr.0604-07-105

24. Ojeahere MI, Uwakwe R, Piwuna CG, et al. Assessment of full and subsyndromal PTSD and quality of life of internally displaced older adults in northern Nigeria. *Aging and Health Research*. 2021;1(4):100040. doi:10.1016/j.ahr.2021.100040

25. Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13(2):93-121. doi:10.1002/mpr.168

26. Skevington SM, Lotfy M, O'Connell KA, WHOQOL Group. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Qual Life Res*. 2004;13(2):299-310. doi:10.1023/b:qure.0000018486.91360.00

27. *The International Classification of Diseases 10th Revision (ICD 10) of the World Health Organization.2010*. https://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf

28. American Psychiatric Association. *Text Revision. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. American Psychiatric Association; 2000. https://www.worldcat.org/title/diagnostic-and-statistical-manual-of-mental-disorders-dsm-iv-tr/oclc/43483668

29. Gelaye B, Williams MA, Lemma S, et al. Diagnostic validity of the composite international diagnostic interview (CIDI) depression module in an East African population. *Int J Psychiatry Med*. 2013;46(4):387-405. doi:10.2190/pm.46.4.e

30. Angermeyer MC, Holzinger A, Matschinger H, Stengler-Wenzke K. Depression and Quality of Life: Results of a Follow-Up Study. *Int J Soc Psychiatry*. 2002;48(3):189-199. doi:10.1177/002076402128783235

31. Ola BA, Adewuya AO, Ajayi OE, Akintomide AO, Oginni OO, Ologun YA. Relationship between depression and quality of life in Nigerian outpatients with heart failure. *J Psychosom Res*. 2006;61(6):797-800. doi:10.1016/j.jpsychores.2006.04.022

32. Gureje O, Kola L, Afolabi E, Olley BO. Determinants of Quality of Life of Elderly Nigerians: Results from the Ibadan Study of Ageing. *Afr J Med Sci*. 2008;37(3):239-247. https://pubmed.ncbi.nlm.nih.gov/18982816/

33. Akosile CO, Mgbeojedo UG, Maruf FA, Okoye EC, Umeonwuka IC, Ogunniyi A. Depression, functional disability and quality of life among Nigerian older adults: Prevalences and relationships. *Arch Gerontol Geriatr*. 2018;74:39-43. doi:10.1016/j.archger.2017.08.011

34. *SPSS Notes version 23.0*.; 2017. http://research.bmh.manchester.ac.uk/biostatistics/teaching/statisticalsupport/SPSSnotes.pdf

35. Gureje O, Uwakwe R, Oladeji B, Makanjuola VO, Esan O. Depression in adult Nigerians: results from the Nigerian Survey of Mental Health and Well-being. *J Affect Disord*. 2010;120(1-3):158-164. doi:10.1016/j.jad.2009.04.030

36. Awunor NS, Ntaji MI, Edafiadhe EW, Erhabor PO, Eferakorho AO, Ijirigho B, et al. Prevalence and Predictors of Depression among the Elderly in a selected Rural Communities in Delta State, Nigeria. *Journal of Community Medicine and Primary Health Care*. 2018;30(1):122-130. https://www.ajol.info/index.php/jcmphc/article/view/168672

37. Haseen F, Prasartkul P. Predictors of depression among older people living in rural areas of Thailand. *Bangladesh Med Res Counc Bull*. 2011;37(2):51-56. doi:10.3329/bmrcb.v37i2.8434

38. Ashe S, Routray D. Prevalence, associated risk factors of depression and mental health needs among geriatric population of an urban slum, Cuttack, Odisha. *Int J Geriatr Psychiatry*. 2019;34(12):1799-1807. doi:10.1002/gps.5195

39. Park JH, Kim KW, Kim MH, et al. A nationwide survey on the prevalence and risk factors of late life depression in South Korea. *J Affect Disord*. 2012;138(1-2):34-40. doi:10.1016/j.jad.2011.12.038

40. Padayachey U, Ramlall S, Chipps J. Depression in older adults: prevalence and risk factors in a primary health care sample. *South African Family Practice*. 2017;59(2):61-66. doi:10.1080/20786190.2016.1272250

41. Yang JJ, Cai H, Xia L, et al. The Prevalence of Depressive and Insomnia Symptoms, and Their Association with Quality of Life Among Older Adults in Rural Areas in China. *Front Psychiatry*. 2021;12:727939. doi:10.3389/fpsyt.2021.727939

42. Uwakwe R, Modebe I. Disability and Care-Giving in Old-Age in a Nigerian Community. *Int Journal of Clinical Practice*. 2007;10(1):58-65. https://pubmed.ncbi.nlm.nih.gov/17668717/

43. Freeman A, Tyrovolas S, Koyanagi A, et al. The role of socio-economic status in depression: results from the COURAGE (aging survey in Europe). *BMC Public Health*. 2016;16(1098):12889-12016. doi:10.1186/s12889-016-3638-0

44. Lorant V, Croux C, Weich S, Deliège D, Mackenbach J, Ansseau M. Depression and socio-economic risk factors: 7-year longitudinal population study. *Br J Psychiatry*. 2007;190(4):293-298. doi:10.1192/bjp.bp.105.020040

45. Beck AT. *Depression: Clinical Experimental, and Theoretical Aspects*. Harper and Row; 1967. doi:10.7326/0003-4819-68-2-502

46. Steger MF, Kashdan TB. Depression and everyday social activity, belonging, and well-being. *J Couns Psychol*. 2009;56(2):289-300. doi:10.1037/a0015416

47. Lee MJ, Hasche LK, Choi S, Proctor EK, Morrow-Howell N. Comparison of major depressive disorder and subthreshold depression among older adults in community long-term care. *Aging Ment Health*. 2013;17(4):461-469. doi:10.1080/13607863.2012.747079

48. Deepa Rasquinha M, Balakrishna Acharya YT. Relationship between depression and quality of life among institutionalized elderly. *International Journal of Scientific Reaserch*. 2(10):1-3. doi:10.36106/ijsr