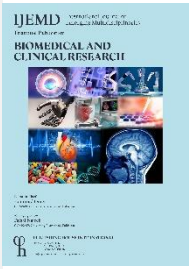
IJEMD-BMCR, 1 (1) (2023), 1 –16 https://doi.org/10.54938/ijemdbmcr.2023.01.1.231

International Journal of Emerging Multidisciplinaries:
Biomedical and Clinical Research

Research Paper
Journal Homepage: www.ojs.ijemd.com
ISSN (print): 2957-8620 ISSN (online): 2960-0731



Influence of Perceived Family Functioning on Depression among Postmenopausal Women in Nigeria

Nimi Stephanie Ekere[1], Tensaba Andes Akafa[2*], Anthonia Okeke[3], Ujah Williams Oche[4]

[1] *Department of Family Medicine, Lagos State University Teaching Hospital, Ikeja, Lagos State, Nigeria.*
[2] *Department of Community Medicine, Faculty of Basic Medical Sciences, College of Health Sciences, Federal University Wukari, Taraba State, Nigeria.*
[3] *Department of Family Medicine, Federal Medical Centre, Keffi, Nasarawa State Nigeria.*
[4] *Department of Human Anatomy, Faculty of Medical Sciences, Bingham University Karu, Nasarawa State, Nigeria.*

**Corresponding author*

Abstract

This was a cross-sectional descriptive survey, designed to determine the influence of perceived family functioning on depression among of post-menopausal women attending the family medicine clinic of a tertiary hospital in Southern Nigeria. An interviewer-administered questionnaire was used to get the respondents' socio-demographic and clinical parameters. Data were analysed to determine: the rate and severity of depression; how some socio-demographic factors related to depression in postmenopausal women, (PMW); whether there was an association between family function and depression among the women. Our survey revealed that 66.7% of PMW had some degree of depression and their sociodemographic factors were important markers for depression. One third of the women had no form of mood disturbance but 5.7% had severe depression necessitating referral to Neuropsychiatry clinic.The participants' family function had statistically significant association with depression ($\chi 2$ =117, p-value = <.001). Women in dysfunctional milieu were more likely to have depressive illnesses than those in functional families. There was also statistically significant strong negative correlation between respondents' family function scores and their depression scores (Spearman's rho = -0.622; sig. (2-tailed = <.001). Using Independent-samples Kruskal-Wallis test, the relationship between family function scores and depression categories was such that women with depression had significantly lower functional scores, when compared with those without depression.

Keywords: Clinical Depression; Family Functioning; Influence; Postmenopausal.

Email addresses: **ekerenimi@gmail.com (N. S. Ekere), akafatensaba@gmail.com (T.A. Akafa), anthonianne@gmail.com (A. Okeke), ujah.william@binghamuni.edu.ng (U.W. Oche)**

1. Introduction

Aging is the natural progression of changes in structure and function that follows the passage of time if there is no disease interruption. Females are born with a fixed number of oocytes unlike their male counterparts. In females, no new gametes are created again after birth throughout their lifetime. These numbers of oocytes peak at around 20 weeks gestation and decline with age. With time, this steady loss of oocytes from atresia or ovulation does not necessarily happen at a constant rate.[1],[2]

With improvements in medical care and increased focus on preventive health care, average life expectancy has increased. As a result, most women can now expect to live at least one third of their lives in the postmenopause.[3] For most Nigerian women natural menopause occurs between the ages of 47 and 55 years.[4]

Menopause is the permanent cessation of menstruation occurring usually between the ages of 45-55 years.[4],[5] It could be natural, premature or artificial. It is natural when it is due to decline in the levels of oestrogen and progesterone; and premature (early) when menstruation stop before the age of 40 years .[5],[6] This may probably be as a result of chronic medical conditions like diabetes or thyroid diseases, genetic factors or smoking.[3],[5] Surgical (Artificial) menopause is menopause occurring as a result of surgical removal of both ovaries or destruction of ovaries by some cancer treatments.[1],[3],[5]

The term menopause refers to a point in time that follows one year after the cessation of menstruation. It is therefore a retrospective diagnosis.[3],[6],[7] The post-menopause describes those years following this point.[3],[7] The average age of women experiencing their final menstrual period is 51.5 years, but cessation of menses due to ovarian failure may occur at any age.[6],[7],[8] Premature ovarian failure refers to cessation of menses before age 40 and is associated with an elevated follicle-stimulating hormone (FSH) level.[1]The older terms perimenopause or climacteric generally refer to the time period in the late reproductive years, usually late 40s to early 50s.[3],[7],[8] Typically, it begins with menstrual cycle irregularity and extends to one year after permanent cessation of menses. The more correct terminology for this time is menopausal transition.[8],[9] This transition develops over a period of 4 -7 years.[1],[7]

The menopausal transition is often marked by somatic, physiologic and psychological symptoms.[7],[9] The somatic symptoms include aches and pains, myalgia, fatigue; the physiologic symptoms include vasomotor symptoms (VMS) of hot flushes and mid-night awakenings, as well as other symptoms such as sleep disturbances, sexual arousal disorders, and urogenital complaints; and psychological symptoms include irritability, anxiety, low libido.[9],[10] This period of transition is also generally characterized by increased vulnerability for psychiatric problems and poor quality of life.[11] Aside the typical symptoms of menopause, some other medical illnesses occurring during this period also serve as important factors in the aetiology of psychiatric illnesses in this population.[11],[12]

It is also well known that every menopausal symptom has effect on quality of life of post-menopausal women, but this effect varies accordingly from region to region, and country to country, with cultural, demographic, genetic and socio-economic factors playing important roles in this variation. [13],[14] All women experience menopause, but each one does so in a unique way, with the above factors each, also influencing a woman's perception of menopause.[7],[14]

During the midlife age of a woman, there is marked increase in depression. [15] Depression here refers to "the state of low mood and aversion to activity that can affect a person's thoughts, behaviour, feelings and sense of well-being".[16] It is characterized by feelings of sadness, anxiety, emptiness, hopelessness,

worthlessness, guilt, irritability, shame or restlessness.[17],[18] Other characteristics of depression include loss of interest in activities that were once pleasurable, loss of appetite or over eating, problems with concentrating, remembering things in detail, or making decisions, committing suicide or attempts to committing suicide, insomnia, excessive sleeping, fatigue, aches, pains, digestion problems and/or reduced energy.[19],[20]

Globally, the number of post-menopausal women has increased tremendously over the years. Presently, in Nigeria, women have higher life expectancy than men.[16] This means that women in their post-menopausal period make up a majority of the elderly population. However, little is known about issues relating to the menopause in Nigeria,[16] and the mental health of these women in particular. For instance, there is virtually no data on the pattern and severity of depressive illnesses among post-menopausal women, the association of family function and depression, and on social and demographic determinants of depressive illnesses among the study population.

Depression, a common and potentially serious disorder of menopause entails more than the occasional bout of sadness and, if not properly managed, can lead to more severe mental disorders and a lessened quality of life.[21],[22]

Ameh et al found that women are susceptible to depression especially when approaching menopause.[11],[23] Women between the ages of 45 to 55 are four times more likely to experience depression than those who are yet to reach this stage of life.[4],[11],[24] The main reason women, especially menopausal women, are more likely to suffer from depression is because of their hormonal imbalance.[25],[26] Depression affects about 25% of women at some point in their lives, a far higher proportion than what obtains among men. [26],[27] Depressive disorders can be a debilitating disease, limiting daily activity as much as severe arthritis or heart disease.[27],[28] It can be long lasting or recurrent, substantially impairing a person's ability to function at work or school, or cope with daily life, and at its most severe form, can lead to suicide.[1],[29]

Menopause has often been believed to contribute to the onset of depression in the midlife, and researches have reported higher prevalence of depressive disorders and symptoms in women as compared to men, a difference that has been distinguished using population studies, hospital admissions, suicide attempts and the prescription of anti-depressant medication.[16],[31],[32]

Depression in post-menopausal women however remains an important public health problem that requires urgent attention.[28],[33]

Depression in the elderly is a prevailing problem of public concern that is causing huge economic costs and family burdens. Dysfunctional families are known to strongly influence geriatric depression.[31],[32] There is an association between depressive symptoms and unhealthy family functioning according to Wang et al study in China.

There is also a deficit of data on the relationship of family dynamics and pattern of depressive illness in the post-menopausal period in our research setting. Therefore, the aim of this study was to determine the rate and severity of depressive illness, and the influence of family function on depression among post-menopausal women (PMW) attending Family Medicine Clinic (FMC) in University of Port Harcourt Teaching Hospital (UPTH).

Method:

This study was a hospital based cross-sectional study conducted among post-menopausal women attending the Family Medicine Clinic in the University of Port Harcourt Teaching Hospital. The population for this study consisted of post-menopausal women attending the FMC. The participants in the study were recruited by systematic random sampling of post-menopausal women attending the FMC. From the hospital record, about 10 post-menopausal women were attended to each day in this clinic. Therefore 5 eligible, consenting women were recruited into the study on each clinic day. The data collection for the study lasted a period of three months, from August to October 2017.

A total of 182 eligible, consenting women were recruited into the study. Data of recruited women were assessed using structured questionnaires to obtain relevant demographic, social and medical histories.

The sample size was determined using sample size estimation for a single proportion,[34] with 95% confidence interval, as follows:

$n = z2pq/d2$

Where, n= Desired sample size

z= The z score of 1.96 which corresponds to 95% confidence level,

p= Likely proportion of PMW patients with depression =12.2%=0.122.34

q=1 - p = 0.88,

d= Degree of accuracy desired = 0.05

n= 3.84 x 0.122x0.88/0.052

n=164.5, n≈165. To allow for possible 10% non-response, final sample size was expanded as follows; n= {165 + [(10/100) x 165]}, n=181.5, n≈182. Therefore, a minimum of 182 subjects were recruited into this study.

Women aged 50 years and over with at least a one-year history of amenorrhea were included in the study; while women who were too ill or had psychiatric co-morbidities such as diagnosed major depression were excluded.

Ethical approval for this study was obtained from the Ethics Committee of the University of Port Harcourt Teaching Hospital before commencement of the study. Subjects with identified depressive illness or any other mental illness were referred to the psychiatrists for evaluation and management. Participants were informed that at any point, they were free to withdraw from the study, without any adverse effects on the quality of medical care available to them from the health facility.

Consenting eligible subjects were recruited and had the interviewer - administered questionnaires to assess their demographic information and depression-related variables using structured questionnaires.

Statistical analysis was performed using the 21st version of Statistical Package for Social Sciences (SPSS), IBM cooperation 2012, Armonk, New York, USA.138 The results of data analysis were presented in tables and charts, as were considered appropriate for data types.

Numerical data were subjected to normality testing using statistical methods (Kolmogorov-Smirnov and Shapiro-Wilk tests) and plots to ascertain their distribution. Normally distributed data were analysed using parametric tests (mean, SD, etc), while skewed data were analysed using the non-parametric data (median, interquartile range, Spearman's rho, etc).

Numerical data were summarised using descriptive statistics, reported as means and standard deviations (if normally distributed) or median and interquartile range (if skewed), and presented in tabular form.

Categorical variables were summarized as frequencies and percentages, and presented in tables or charts as were considered appropriate.

Respondents' family function class was summarised using frequencies and percentages. The Family APGAR was used to determine the family functionality of each respondent. The "Family" is considered as the person(s) with whom the respondents usually live with. For those living alone, family is taken as those with whom s/he has the strongest emotional ties. Five questions on the APGAR, an acronym that stands for Adaptation, Partnership , Growth , Affection and Resolve were formulated to generate data in this regard.

Correlations of family function domains were performed using Spearman's rho, and summarized in a table. Spearman's rho cut-offs used included 0.1-0.29 (weak correlation); 0.3-0.49 (moderate correlation); 0.5 and above (strong correlation). Distribution of respondents' depression scores was presented in a box-plot. The prevalence and severity of depression were summarized as frequency and percentages on a doughnut pie-chart.

Cross-tabulations of some exploratory variables and depression status was done using Pearson's chi-square test of independence or Fisher's exact test, depending on whether the expected cell count was less than 5 in any particular cell; when expected cell count in any cell was less than 5, Fisher's exact count was used, otherwise, Pearson's chi-square test was used.

Correlation between respondents' depression scores and their family function scores was performed using Spearman's rho, and presented as a scatter-plot matrix, with X- and Y-lines to show distributions in each quadrant.

The family APGAR tool consists of five questions and response options ranging from rarely (zero) to almost always (two). The total score is obtained by adding the points for each item, and it relates to the condition of family functioning. We used this to classify the respondents as either having functional or dysfunctional families, using a cut-off of 16 (less than 16 as dysfunction, and 16+ as functional) out of a total maximum score of 20 points.

Independent samples Kruskal-Wallis t-test (a non-parametric test) was used to compare the depression scores of these two categories of family function, after testing for equality of variance between the family scores of the two categories.

Results were reported as mean and standard deviation, and presented in tables; and comparison of the means of these two groups was done. The margin of error for this study was set at p-value < 0.05.

Result:

Table 1 Socio-demographic characteristics of Respondents

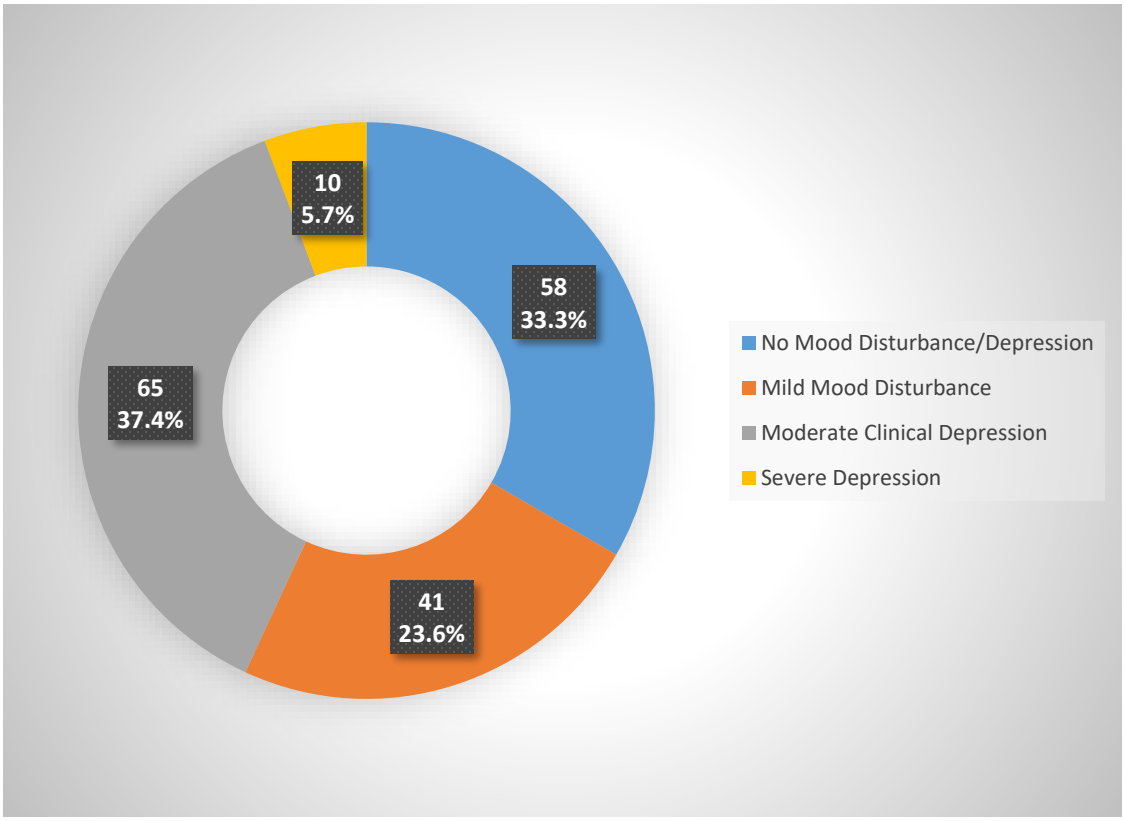
Variable	Frequency	Percentage (%)
Age group (n=174)		
≤60 years	49	26.5
>60 years	125	73.5
Mean age ± SD (years)	58.6	
Marital Status (n=159)		
Single	7	4.4
Married	93	58.5
Divorced	4	2.5
Widowed	55	34.6
Religion (n=178)		
Christian	168	94.4
Muslim	6	3.4
African traditional worshiper	4	2.2
Residence		
Urban	90	52.9
Rural	80	47.1
Highest form of Education received (n=170)		
Non-formal	71	41.8
Primary	34	20.0
Secondary	19	11.1
Tertiary	46	27.1
Occupation (n=176)		
Unemployed/Retired	71	40.3
White collar job	38	21.6
Self-employed/Business	19	10.8
Artisan	48	27.3
Duration of menopause (n=179)		
≤ one year	8	4.5
Over one year	171	95.5

Table 2: Association between Depression, social-demographic status and Family functioning class

Variable	Clinical depression n (%)	Depression No n(%)	Chi-square/ Fisher'sexact test	Sig.(2tail)	95% CI
Age grp (yrs)					
60 & below	7 (15.6)	38 (84.4)	6.080	0.014*	.002, .018
Over 60	44 (35.2)	81 (64.8)			
BMI class					
Normal	22 (23.9)	70 (76.1)	16.71	<0.001*	.000, .017
weight	15 (24.2)	47 (75.8)			
Overweight	10 (83.3)	2 (16.7)			
Obese					
Educatn level					
No formal	23 (32.4)	48 (67.6)	3.994	0.279	.279, .344
Primary	6 (17.6)	28 (82.4)			
Secondary	8 (42.1)	11 (57.9)			
Tertiary	14 (30.4)	32 (69.6)			
Marital status	3 (42.9)	4 (57.1)	1.622	0.891	.869, .954
Single	29 (31.2)	64 (68.8)			
Married	1 (25.0)	3 (75.0)			
Divorced	16 (29.1)	39 (70.9)			
Widowed					
Fam function					
Dysfunctional	10 (100.0)	-	117.000	<.001*	.000, .004
Indeterminate	27 (77.1)	11 (22.9)			
Functional	4 (3.6)	108 (96.4)			

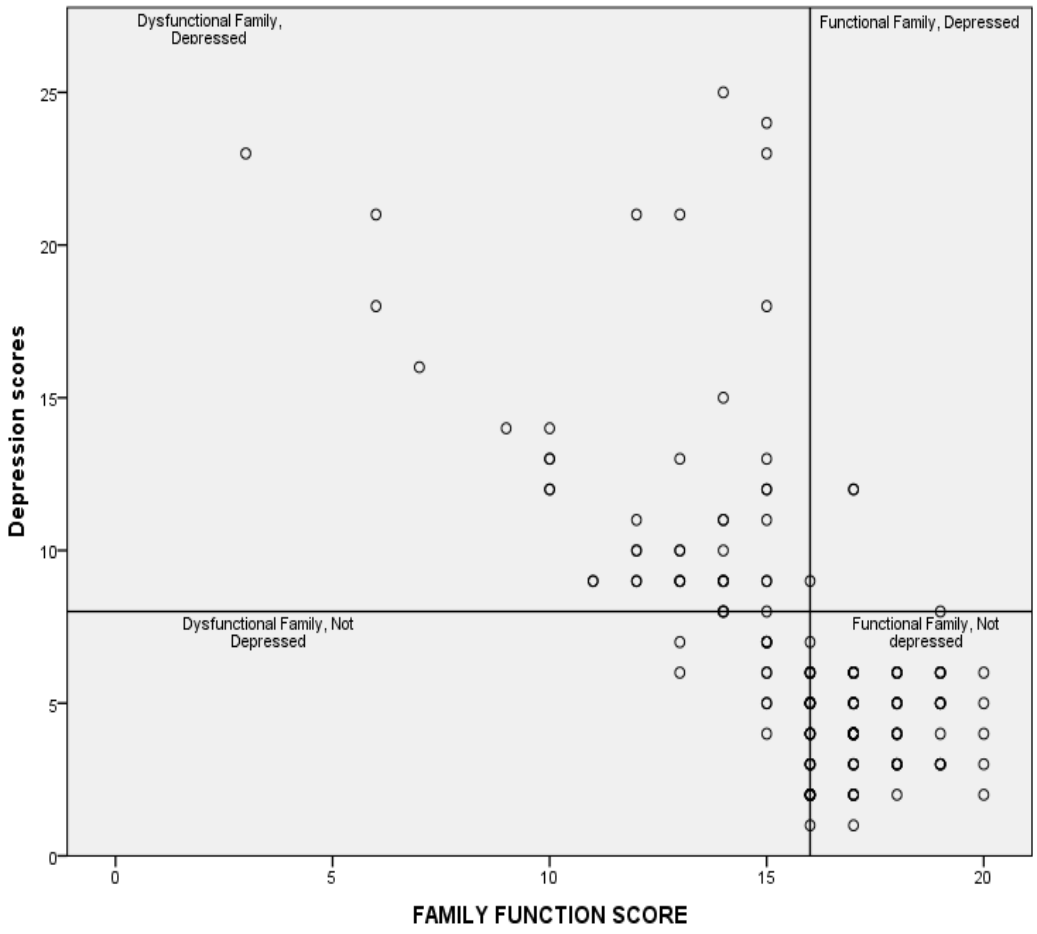
Key: BMI (Body mass index); CI (Confidence interval); n (frequency); * (Statistically significant at margin of error set at <0.05), Family function class, educatn = education.

Figure 1: Rate and severity of depression among Respondents (n=174).



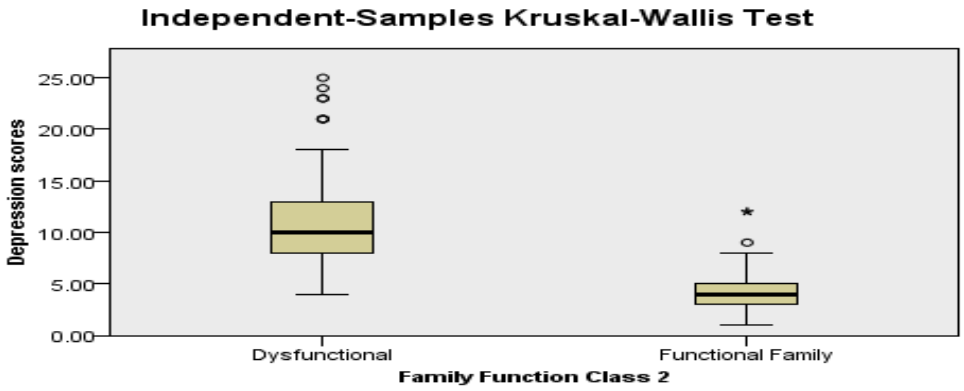
The rate and various severity of depression among the study population is shown in figure 1. A third of the women had no mood disturbance or depression. About one-fifth of them had mild mood disturbance, 37.4% had moderate clinical depression, while 10 (5.7%) had severe depression requiring referral to the Neuropsychiatry clinic. In this study, the rate of clinical depression among the women was 66.7%.

Figure 2: Correlation of respondents' family function scores and depression



The scatter-plot matrix of the respondent's family function score and their depression score are shown in figure 2. There was a significant moderate correlation between respondents' family function score and their depression score (Spearman's rho=-0.622; Sig. (2-tailed = <0.001).

Fig 3: Group comparison of depression scores for family function categories of PMW attending the FMC.



Total N	170
Test Statistic	97.042
Degrees of Freedom	1
Asymptotic Sig. (2-sided test)	.000

1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because there are less than three test fields.

As shown in figure 3, family function scores of the non-depressed group were statistically significantly higher than scores of the depressed group (p = .001).

Discussion

Our survey administered 182 questionnaires, 179 were fit for analysis after screening, giving a retrieval rate of 98.4%. The mean age of the women in this study was 58.6years with a standard deviation of 8.04years, and a median age of 59.0years. Our finding is comparable to that reported by Dienye et al, in their study of 385 menopausal women accessing care in the FMC clinic in UPTH, for frequency of symptoms and health-seeking behaviours, where they reported a mean age of 58.4 ± 10.39 years and median age of 58 years. They had also reported in that study that majority of the participants were in the 45-54 years age group, whereas in the present study, more of the women were in the over 60 years age group. Note however that their study was conducted in 2013, about 5years apart, and the demographics of the menopausal women attending this clinic might have changed during this period. A more recent study might do well in substantiating this finding.

Elsewhere in Benin city, Edo State-Nigeria, a similar mean age of 57.4 ± 6.3 years has been reported among menopausal women.[35] Saka et al [16] also reported a comparable mean age of 57.2±1.2 years in their survey of behavioural pattern of menopause in Nigeria, In a survey of primary healthcare clinics in Abha-Saudi Arabia, the mean age of women evaluated for prevalence of symptoms experienced during menopause, the mean age reported was slightly lower, at 48.24 ± 6.91years.[36] The survey however, included premenopausal women. The majority of the women were married (58.5%) or widowed (34.6%). Saka et al had also reported that the majority of the women were married (65.7%) or widowed (27.6%) in their study. In the latter study, the majority (70.8%) of the women had been below 60years of age.[16]

Being a study conducted in South-South Nigeria where a majority of the population are Christians, 94.4% of the study population were Christians, with Muslims contributing only3.4%, and the other 2.2% being women who practiced the African Traditional Religion. In their study, Saka et al had reported that 72.5% of the population were Muslims with Christians contributing the other 27.5%. Note here that this latter study was conducted in Northern Nigeria.

The finding in this study where over 40% of the population had not received formal education was similar to that reported by Dienye et al (39.2%) and Saka et al (47.2%). Those with tertiary level of education were 27.1% of the women, a proportion that is over twice that reported by Dienye et al in the same population 5years prior.

The unemployed/retired group was the most represented of the study population, consisting of over 40%, while women working in white-collar jobs were 21.6%, and those that were self-employed 10.8%. Twenty-seven percent of the women were artisans. This high proportion of those in the unemployed/retired group might have been the result of the higher proportion of those women who were over age 60years. Earlier, Dienye et al had reported that the most prevalent occupational groups among the study population were trading (27.3%), and Farming (23.4%).

Our study, found statistically significant relationship between respondents' depression status and their ages, such that women above 60years were more depressed compared with those 60years or below. This finding confirms earlier reports implicating age as an important factor in the epidemiology of depression. [44],[45] But, marital and educational status of the PMW in our survey had no effect on their depression status. This finding however, differs from reports of Brannon & N-Danesh et al indicating that the above factors play important roles in the epidemiology of depression..

Family Function of post-menopausal women in the study centre

The majority of the PMW in our study had functional families (65.9%), which is known to improve depression status, while the others had either frank dysfunctional families (5.9%) or indeterminate family function (28.2%). Many surveys corroborates with our outcome that the family function domains correlated strongly with the overall family function score.[25],[40],[41]

Rate of depressive illness among PMW in study centre

Our study noted that the rate of depressive illness among the PMW was 66.7%, with up to over two-thirds having some degree of mood disturbance or clinical depression. This prevalence is higher than the 12.2% reported in a Nigeria- based study on peri-menopausal women in Lagos metropolis.[43] It however compares with a prevalence of 41.8% reported in a community-based survey of peri-menopausal women in Turkey.[44] However, in the Lagos-based survey, participants were screened using a different tool which may have less sensitivity compared to Beck Depression Inventory (BDI). This may explain the lower

prevalence reported, as BDI for instance, has been shown to have a sensitivity of 87%, and would better capture depressed persons than the more subjective method employed by the authors.

Association between depressive illness and some socio-demographic characteristics of PMW attending FMC, UPTH

Among the women in this study, there was statistically significant relationship between depression and respondents' age group, such that women who were over 60 years of age were more depressed compared with those 60years or below. This finding confirms earlier documentations implicating age as an important factor in the epidemiology of depression.[37],[38]. According to Souza et al older women were 1.87 times more likely to suffer from depressive symptoms than older men.

In this study, respondents' marital status, and their educational attainments were not statistically significant associates of depression. This finding however, differs from earlier reports [38],[42], indicating the above factors play important roles in the epidemiology of depression.

Association between family function and depressive illness among PMW attending FMC, UPTH

Our study revealed a statistically significant association between respondents' family function class and depressive illness ($\chi 2$ =117, p-value = <.001). There was also statistically significant strong negative correlation between respondents' family function scores and their depression scores (Spearman's rho = -0.622; sig. (2-tailed = <.001). Using Independent-samples Kruskal-Wallis test, the relationship between family function scores and clinical depression categories was such that women with clinical depression had significantly lower family function scores, when compared with those with sub-clinical or no depression. These findings confirm previous documented inverse associations between family functioning and depression by Oliveira et al who reported that, using Pearson's chi-square test, there was a statistically significant association between Family APGAR scores and Geriatric Depression Scale scores of institutionalised. Brazilian, elderly patients (0.002). [39],[42] That study documented that groups with moderate depressive symptoms and severe depressive symptoms had significantly greater family dysfunction (p = 0.009 and p = 0.017 respectively) when compared to the elderly who did not have depressive symptoms. In the above study however, the authors noted that manifestations of depressive symptoms did not show significant difference in terms of their total family APGAR score (p =0.900). [39] Regarding family dysfunction according to Souza et al, the chance of older people experiencing depressive symptoms was 5.36 times higher (95% CI = [3.03 to 9.50]), compared to those who had good family functioning.

2. Conclusion

This cross-sectional descriptive survey examined the influence of perceived family functioning on the depression among post-menopausal women that attended the family medicine clinic of a tertiary hospital in South-South Nigeria.

Our study revealed that age of the women was an important demographic factor that influence depressive illness. Two-thirds of the post-menopausal women had some degree of clinical depression and their family function significantly influenced depressive illness in them. Such that women from dysfunctional families were more likely to have depressive illnesses than those who had functional family life.

The consensus from our survey and many others like Souza et al affirmed clearly that functional family represent effective reinforcement for the elderly with depressive symptoms; offering a comfortable

environment ensures well-being of members. Whereas dysfunctional family hardly provides necessary care for the elderly, this can exacerbate depressive symptoms.

Recommendations

Based on our survey, we recommend that the management of illnesses in PMW should also focus on improving their family function as this would ultimately decrease their likelihood of becoming depressed, and help reduce the high burden of depression in that population. Screening and early diagnosis of depression in this population, would also minimize illness progression to its least severe forms, and therefore reduce its complications such as suicide and reduced quality of life.

Limitations of this study

There was the possibility that depressive illness identified in these women were more associated with other latent comorbidities, than to post-menopause. Being a hospital-based survey, our findings could represent higher burden (prevalence) of depressive illness than would a community-based survey. The predictors of depression burdens in PMW is an area of interest for further research in the future.

3. References

[1] Cox, L., & James, H. L. "Primary ovarian insufficiency: an update." International journal of women's health **6,** 235-43, doi:10.2147/IJWH.S37636 (2014).

[2] American College of Obstetricians and Gynecologists Committee on Gynecologic Practice and Practice Committee. "Female age-related fertility decline. Committee Opinion No.589." *Fertility and sterility* **101**(3), 633-4. doi:10.1016/j.fertnstert.2013.12.032 (2014).

[3] Williams, J.W., Hoffman, B.L. *Williams Gynecology* (2nd ed.). New York, N.Y.: McGraw-Hill Education LLC., 2012.

[4] Dienye, P.O., Judah, F., Ndukwu, G. Frequency of symptoms and health-seeking behaviours of menopausal women in an out-patients' clinic in Port Harcourt, Nigeria. *J Glob. Health.* **5**(4), 39-47 (2013).

[5] Raimundo-Zangirolam, J., et al. Depression in women in climacteric period: a brief review. *Rev Assoc Med Bras*. **69**(7), e20230385. https://doi.org/10.1590/1806-9282.20230385 (2023).

[6] Ameh, N., Madugu, N.H., Onwusulu, D., Eleje. G. & Oyefabi, A. Prevalence and predictors of menopausal symptoms among post-menopausal Ibo and Hausa women in Nigera. Trop J Obstet Gynaecol **33**, 263-9 (2016).

[7] At Last Natural. Risk factor of menopause. http://www.atlastnatural.com/pages/Risk-Factors- of-Menopause. html (2016). (Accessed 25 April 2023).

[8] 34 Menopause symptoms. 3 main types of menopausal treatment. General Articles. http://www.34-menopause-symptoms.com/articles/three-main-types-menopausal-treatment (2016). (Accessed 25 April 2023).

[9] Jack-Ide, I.O., Emelifeonwu, E.S., Adika, A.V., Psychological effects and experiences of menopausal women in a rural community in Niger Delta region of Nigeria. *International Journal of Nursing and Mid-wifery*.**6**(6),74-79 (2014).

[10] Rodríguez-Tovar, G.L., Medrano-Martínez, M.R., Castro-García, R.I., Rivera - Vázquez, P. Depression and family functioning in elderly. *Int J Fam Commun Med.* **2**(4), 248–251 (2018).
[11] Shittu, R.O., et al. Association between depression and social demographic factors in a Nigerian family practice setting. Open Journal of Depression. **3**(1), 18-23. http://dx.doi.org/10.4236/ojd.2014.31006 (2014).
[12] Michael, K. Peri-menopausal depression. Health line. March 29,2012. http://www.healthline.com/health/depression/preimenopausal-depression(2016). (Accessed 25 May 2023).
[13] Arnot, M., Emmott, E. H., & Mace, R. The relationship between social support, stressful events, and menopause symptoms. *PloS one*, **16**(1), e0245444 (2021).
[14] Depression Tool Kit. Org. Depression during menopause. http://www.depressiontoolkit.org/women/menopause.asp (2016). (Accessed 25 April 2023).
[15] UNFPA Nigeria. Nigeria Demographic and Health Survey 2008, http://www/nigeria. unfpa.org/pdf/nigeriadhs2008.pdf, accessed 14 August 2023.
[16] Saka, M,J., Saidu, R., Jimoh, A., Akande, T., Olatinwo, A.W. Behavioural pattern of menopausal Nigerian women. Ann Trop Med Public Health [serial online] [cited 2018 Oct 30] **5,** 74-9. Available from: http://www.atmph.org/text.asp?2012/5/74/95953. (2012).
[17] Torres I. Depression and family functionality in older adults, 2012.
[18] Escalona Pérez, B., Ruiz Martínez, A.O. Mental health and family functioning in older adults of Melchor Ocampo, State of Mexico. Ibero-American Psychology. **24**(1), 38–46(2016).
[19] .Quintero, Á., et al. Changes in depression and the feeling of loneliness after the therapy of laughter in elderly inpatients. Biomedical. **35**(1), 90–100 (2015).
[20] Martínez, A., Pastrana, E., Rodríguez-Orozco, A., et al. There is a correlation between depression and family function in older adults who attend a family medicine clinic. Medical Journal of Chile. **137**(2), 1642–1643(2009).
[21] Guadarrama, J., et al. Family conditions in the elderly diagnosed with depression in the Family Medicine Unit No.222 of the IMSS; 2014.
[22] Ruíz, D., Zegbe, J., Sánchez-Morales, F. Depression in older adults treated in public health institutions in Zacatecas. Journal of education and development. **1**(1), 73–78 (2014).
[23] Saavedra-González, A., Rángel-Torres, S., García-de León, A., et al. Depression and family functionality in older adults of a family medicine unit in Guayalejo, Tamaulipas, Mexico. Family Care. **23**(1), 24–28 (2016).
[24] Colvin A., Richardson, G.A, Cyranowski, J.M., Youk, A., Bromberger, J.T. The role of family history of depression and the menopausal transition in the development of major depression in midlife women: study of women's health across the nation mental health study (SWAN MHS). Depress Anxiety. **34**(9), 826-35. https://doi. org/10.1002/da.22651 (2017).
[25] Soares, C.N. Depression and menopause: current knowledge and clinical recommendations for a critical window. Psychiatr Clin North Am.**40**(2), 239-54. https://doi.org/10.1016/j.psc.2017.01.007 (2017).
[26] Barghandan, N., Dolatkhah, N., Eslamian, F., Ghafarifar, N., Hashemian, M. Association of depression, anxiety and menopausal-related symptoms with demographic, anthropometric and body

composition indices in healthy postmenopausal women. BMC Womens Health.**21**(1), 192. https://doi.org/10.1186/s12905-021-01338-w (2021).
[27] Paula Rebouças, C.M., et al. Association between sleep quality and depression among institutionalized and community older people - Brazilian Western Amazonia. BMC Psychiatry. **21**(1), 367 https://doi. org/10.1186/s12888-021-03368-y (2021).
[28] Zangirolami-Raimundo J., et al. Postmenopausal women's cognitive function and performance of virtual reality tasks. Climacteric. https://doi.org/10.1080/13697137.2023.2190511 (2023).
[29] Padayachey, U., Ramlall, S., Chipps, J. Depression in older adults: prevalence and risk factors in a primary health care sample. S Afr Fam Pract. **59**(2), 61–6(2017).
[30] Sjöberg L., et al. Prevalence of depression: comparisons of different depression definitions in population-based samples of older adults. J Affect Disord. **221**, 123–131. doi:10.1016/j.jad.2017.06.011 (2017).
[31] Balsamo M., Cataldi, F., Carlucci, L., Padulo, C., Fairfield, B. Assessment of late-life depression via self-report measures: a review. Clin Interv Aging. **13**, 2021–2044. doi:10.2147/CIA.S178943 (2018).
[32] Meeks, T.W, Vahia, I.V., Lavretsky, H., Kulkarni, G., Jeste, D.V. A tune in "a minor" can "b major": a review of epidemiology, illness course, and public health implications of subthreshold depression in older adults. *J Affect Disord*.**129**(1–3), 126–142. doi:10.1016/j.jad.2010.09.015 (2011).
[33] Negida, A. Sample Size Calculation Guide - Part 7: How to Calculate the Sample Size Based on a Correlation. *Advanced journal of emergency medicine*, **4**(2), e34, https://doi.org/10.22114/ajem.v0i0.344 (2020).
[34] Ogwumike, O.O., Adeniyi, A.F., Orogbemi, O.O. Physical activity level of postmenopausal women in Nigeria: Association with self-rated health status, overall obesity, and abdominal obesity. Women & health. **56**(5), 487-501(2016).
[35] Al-Musa, H.M., et al. The prevalence of symptoms experienced during menopause, influence of socio-demographic variables on symptoms and quality of life among women at Abha, Saudi Arabia. Biomedical Research. **28**(6), 2017.
[36] Walker, E.R., McGee R.E., Druss, B.G. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. *JAMA Psychiatry*. **72**(4), 334–341. doi:10.1001/ jamapsychiatry. 2014. 2502 (2015).
[37] Zenebe, Y., Akele, B., W/Selassie, M., Necho, M. Prevalence and determinants of depression among old age: a systematic review and meta-analysis *Annals of General Psychiatry* **20,** 55 https://doi.org/10.1186/s12991-021-00375-x (2021).
[38] Oliveira, S.C., Santos, A.A., Pavanni, S.C. The relationship between depressive symptoms and family functioning in institutionised elderly. Revista da Escola de Enfermagem da USP, **48**(1), 65-71(2014).
[39] Dai, L., Wang, L. Review of family functioning. Open Journal of Social Sciences, **3,** 134-141(2015).
[40] Castilla, H., Caycho, T., Shimabukuro, M., Valdivia, A. Perception of family functioning: Psychometric Analysis of Family APGAR Scale in Adolescents in Lima. Journal of Educational Psychology-Propósitos y Representaciones. **2**(1), 65-78(2014).
[41] Souza, R.A., et al. Family functioning of elderly with depressive symptoms.Rev Esc Enferm USP **48**(3), 469-76(2014).

[42] Adegoke O, Iranloye BO, Osibogun A. Psychosomatic menopausal experience in Nigerian women-The influence of age of menarch and age at menopause. Asian journal of epidemiology. **1**, 72-76(2008).
[43] Timur, S., Sahin, N.H. The prevalence of depression symptoms and influencing factors among peri-menopausal and post-menopausal women. Menopause. **17(**3), 545-51(2010).
[44] Brannon L. Gender: psychological perspectives. Taylor & Francis, 2016.
[45] N-Danesh A, Landeen J. Relationship between depression and socio-demogaphic factors. Int J Ment Syst. **1,** 4 (2007).

Authors' Contributions:
AAT: Conceptualization, Writing – original draft, Writing – review & editing.
ENS: Conceptualization, Writing – original draft, Writing – review & editing.
OA & UWO:Writing-review & editing. All the authors read and approved the final manuscript.
Competing Interests: We, the authors solemnly declare no competing/conflict of interests. When our work is published, the information submitted can be used as the source of truth for our proclamation.