Research article

Treatment pathways of Alzheimer in Nigeria

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A R T I C L E   I N F O

A B S T R A C T

Alzheimer poses lots of challenges in Low and Middle Income Countries, especially in Nigeria. Globally, the causes of Alzheimer are poorly understood. Cultural factors affect the preference of mental health treatment for treating people living with Alzheimer's disease (PLWA However, Alzheimer's and its gender differentials have been given little consideration in particular. Twenty-four in-depth study was conducted with caregivers and family members/relatives of people living with Alzheimer's (PLWA) residing in the study area. 52.2 percent of respondents were female out of the total while 45.8 percent were male. For male respondents, 40.4%; 49.4 %; 49.2%; 35 % and 28.3% indicated spiritual preference of mental health counseling; traditional; medical practitioner; both traditional and spiritual and psychiatrist respectively. On the other hand, 59.6%; 50.6%; 50.8%; 65% and 70.7% of female respondents indicated spiritual; traditional; medical practitioner; both traditional and spiritual and psychiatrist respectively. This research found that gender disparities primarily affected the mental health intervention care pathways. The availability of mental health resources to support adult mental health were key factors which could influence mental health status.

1. Introduction

Alzheimer's disease is the most common form of dementia which can occur in 60–70 percent of cases (World Health Organization, 2020). Alzheimer's disease (AD) has become a major public health concern as the world's population ages. By 2050, it is predicted that people aged 60 and over will account for 22 percent of the world's population, with four-fifths living in Asia, Latin America or Africa. The most common type of dementia is Alzheimer's disease (Gross et al., 2012; Shaffer et al., 2013; Swardfager et al., 2010). Alzheimer's disease had the highest incidence at 2.0 percent (1.0–2.9), according to (Adeloye et al., 2019), among the dementia subtypes. In Nigeria, other dementia subtypes have prevalence rates of less than 1 percent. The incidence rates of Alzheimer disease in Yoruba Africans were two to three times less than in Africa Americans (Hendrie et al., 2001). Therapies are not available to prevent or reverse the progression of the disease, which worsens as it progresses and inevitably leads to death. There are currently no clear markers that can validate the diagnosis of Alzheimer's disease with 100 percent certainty (Honjo et al., 2012).

Choosing the best services for mental health is essential to modernizing systems for health and social care. Increasing option offers greater communication between people dealing with Alzheimer's disease and what resources are offered as a result (Olawande, 2017; Olawande et al., 2019). The provision of mental health services aims at encouraging greater independence, participation and empowerment in the treatment and care provided, widening the variety of resources available and increasing the standard of care (Samele et al., 2007). Preference imposes choices on treatment decisions with people living with Alzheimer. Belief processes are essential components of behavior in health and disease. When either a person with mental illness gets ill or their families get ill, they influence the varieties that individuals make.

Culture affects the perception, attitudes and actions of people when treating mental illness (World Health Organisation, 2007, 2018). In Somalia, there is a widespread belief that evil spirits cause mental illness and that hyenas are gifted with the capacity to see them and can thus heal the mentally ill by scratching them and entering them (Hooper, 2013). This stance is different from that given in Western countries, since some causes of mental illness, such as genetics that are often medically treated, are known to exist.

Women and men experience different health issues and often have different experiences with health care providers. A basic question about the patient's option is the issue of taking care of people living with Alzheimer's disease and at the same time shielding them and the public from devastation (Honjo et al., 2012). To those at risk of hurting themselves or

others, however, choices to people with Alzheimer's are restricted. According to (Olawande et al., 2018), the real choice of mental health treatment facilities is limited by the range of services available.

A individual with Alzheimer's is often very hard to care for, and as a result, many family and other unpaid caregivers experience high levels of emotional stress and depression. Caring for someone with Alzheimer's disease has been shown to have a negative impact on the wellbeing, employment, incomes, and financial security of many caregivers (Viñas-Diez et al., 2017; D'onofrio et al., 2015). Access to better treatment for people living with Alzheimer's disease in the works of (Awad and Voruganti, 2008) comprising drug prescriptions, psychosocial interferences and reintegration programs is important central fundamentals in alleviating the burden on carers and families of people living with Alzheimer's disease. Additional relations include ability to handle crises, It is also important to provide legally delegated community care to avoid hospitalization and knowledgeable balance help (Olawande et al., 2018).

Global rates of men living with Alzheimer's are the same for women (Kessler et al., 1994; World Health Organization, 2019). Nevertheless, there are significant differences in gender differences (GD) in the types of various mental illnesses, particularly Alzheimer's. In terms of masculinity and femininity, financial status, cultural perceptions and social support vary and affect a person's vulnerability to Alzheimer's disease. Epidemiological findings suggest that married women are more vulnerable to work-related stress than married men and men are more likely to be affected by marital conflict. This growth has much to do with the positions and expectations of masculinity and femininity in the world (Mak et al., 2014). Until the mental health of women is considered, the mental health disparities between men and women should not be reduced (Avotri and Walters, 1999). Differences between men and women take the form of seeking mental illness treatment. Male and female bias also happens as mental illness is treated (World Health Organisation, 2014). The interferences obtainable in developed countries to prevent and treat psychological illness are very minimal (World Health Organisation, 2012).

In addition, African cultures, particularly Nigeria, assume that the causes of Alzheimer's are supernatural powers, and this affects Alzheimer's choice of healer. Alzheimer's treatment methods typically contrast sharply with those across Nigeria in western countries, where most psychiatric patients find traditional healers (Ogunniyi et al., 2005). There is prejudice against women with regard to presumed reasons, labeling, choice of care and medical services, and it has become troublesome even for medical professionals to manage women in the study field. In African culture, religion also plays a major role and enshrines trust in an all-powerful creator and caretaker to whom one prays for one's health needs (Koenig, 2008).

In addition to the above, it is noteworthy that Alzheimer's disease is included in the choice of treatment pathways, patriarchy and cultural inhibitions are key pointers in the accessibility and choice of mental healthcare facilities among both gender in the study area. This study, therefore examines the choice of mental healthcare services in the treatment of Alzheimer considering the gender implications.

2. Methodology

2.1. Research design

This research used a cross-sectional as well as exploratory method. This paper adopted both quantitative and qualitative data collection processes. The In-Depth Interview (IDI) framework is used as a qualitative research tool while the quantitative research tool was designed as a questionnaire.

This research explored the disparities that occur in the choice of mental health care services in the study area between male and female participants. Participants in the study were drawn from male and female adults who are residents of selected Local Government Areas (LGAs) accessing Ogun State psychiatric hospitals. The choice of study area is influenced by the easy use of health facilities for individuals with Alzheimer's disease.

2.2. Study area

The study area was Ogun State, Southwestern, Nigeria. It is mainly a Yoruba-origin homogeneous group of six sub-ethnic dialectical groups: Egba, Ijebu, Remo, Egbado (also known as Yewa), Awori and Egun. Abeokuta is the national capital. As a traditional Yoruba state with a large female population, the Yoruba culture and belief that witchcraft will involve the causes of Alzheimer's makes the Ogun State relevant. Included in this study were psychiatric hospitals and Local Government Areas (LGAs):

Strategically, these hospitals and Local Government Areas (LGAs) were selected. For psychiatric hospitals, the selection criteria used are:

 i. The provision of care for psychiatric patients; and
ii. Psychiatric patients' readiness

The conventional healers were communicated through local and state associations in Ogun State.

2.3. Study participants

The study respondents were drawn from both male and female adults, who are Yoruba ethnic groups and permanent residents in the research area. Via in-depth interviews (IDIs), the perspectives of relatives and paying caregivers of people living with Alzheimer's have been documented.

2.4. Determination of sample size

The sample size (represented by N) used in this analysis was derived from the Fisher formula in the selected LGAs for the proportion of the population of adults over 18 years of age.

$$N = Z^2 PQ/d^2$$

N stands for the required minimum sample size.
P stands for the proportion of population (18 years and above).
Q = (1-P). This stands for the proportion of the population that is not up to 18 years old.
Z means the standard normal deviation for the 95 percent at the confidence level of 3.42
d means precision, that is, the level of desired accuracy. This is put at 0.04.
Total Population = 564,080.
The sample size for the locations of the study was based on the latest estimates from the National Population Census and the preliminary statistics for 2016 published by the National Population Commission. For the determination of sample size, the Fisher type was used using the prevalence rate of each LGA specified. The investigator allowed the sampling error to have an attrition rate of 5 percent.
From the above calculation, the sample size is 820.

2.5. Data collection and sampling techniques

Data analysis involved a triangulation of both quantitative and qualitative methods. 820 respondents were given a questionnaire (See Appendix II), while in-depth interviews were carried out at each of the selected institutions. A multi-stage sampling technique was adopted because of the presence of specific mental health facilities, particularly the first generation Neuropsychiatric Hospital, Aro, and the role of the state in the history of psychiatry in Nigeria.

Ordered questionnaires were the tools used to gather data. According to the calculated survey, a total of 820 Yoruba adults (male and female)

aged 18 and over were selected from the Local Government Areas. As a result of the existence of psychiatric hospitals in the state, Ogun State was deliberately chosen. The state was eventually stratified into three regions of local government. Following the World Health Organization sampling manual, random selection of two-fifths of the wards was followed in each area of the study site. Communities and compounds were selected from the chosen local government areas. The survey was carried out in person. It lasted from May until September for a total of five months.

In-Depth Interview Guides (See Appendix III), adapted for each group of respondents. However the qualitative approaches were permitted to be optional for the interviewees. People with Alzheimer's disease could not be surveyed because they were not in the right state of mind. Rather, the relatives or paid caregivers as the case maybe were interviewed. The first point of contact was to meet with the health professionals, social workers and occupational therapies to discuss the essence of the research with them. Thereafter, the Authors booked apartment with the relatives/paid caregivers. The rate of refusal to participate initially was very high but with counselling and adequate information on the essence of the interview was discussed at length.

The primary purpose of the research was made clear to the interviewees at the beginning of the interviews, and their consent (See Appendix I) was sought and received to be part of the analysis. They were also assured of data confidentiality, and the interview venue was released from intrusion as far as possible. Also, permission was sought for the participants before recording the interviews on tape.

In this research, the different types of therapy as indicated are spiritual preference of mental health counselling which comprises of the Christian-based-faith and Islam-based-faith. For the traditional, it implies the use of plant, animal, and/or mineral-based medicines in the treatment, diagnosis and prevention of Alzheimer disease. Medical practitioners include health professionals, for example, psychiatrists, psychologists and psychiatric nurses.

2.6. Data analysis

At the Univariate level, descriptive statistics such as frequency and percentage were used to interpret quantitative data, while chi-square tests were used to determine the relationship between the measured variables. The bivariate analysis examined the correlation between an independent variable and a dependent variable in the sample. Sex differentials are the dependent variable because the independent variables that can be manipulated are sensitivity to the treatment pathways of Alzheimer. Chi-Square has been used to figure out whether a relationship occurs at a relevant level of 0.05 between variables.

Due to the peculiarity of the research and in order to overcome language barrier, the questionnaire and the In-depth-Interview guide were written in both English (See Appendix III) and Yoruba language (See Appendix IV). The administration of research instruments depends on the language acceptability of the participants. Qualitative data was analyzed through interview transcripts and reported discussions. A professional translator translated the Yoruba recordings into English and also transcribed them for further study. The transcriptions were correlated with the notes taken after data processing. In terms of content and structured theme, the collected data was analyzed. Information obtained was stated in quotes from the documented expressions of the participants as phrases.

3. Ethical considerations

Participants were selected on the basis of the principles of data protection, participant gain, participant non-malfeasance and voluntary activity. The Aro Neuropsychiatric Hospital, the Abeokuta ethical committee with approval number PR003/16 and the Federal Medical Centre, Abeokuta with approval number FMCA/470/HERC/05/2016 received institutional approval.

4. Results

Table 1 presents the effects of the respondents' socio-demographic characteristics in the field of research. Gender results found that a majority of respondents (76%) were females, while males were 24% females. The distribution of marital status of respondents showed that 37 % were single, and 61 % were married to the highest proportions of respondents. The religious distribution revealed that the three main religions were practiced by the respondents in Nigeria. The study found that Christianity was practiced by the largest number of respondents (51 percent), followed by Islam (36 percent), and only 13.2 percent practiced any form of traditional African religion. There was a slight margin for respondent professions. Artisans accounted for 12.8 per cent; 12.2 per

Table 1. Distribution of respondents by socio-demographic characteristics.

Characteristics	Categories	Frequency	Percentage
Gender	Male	200	24.4
	Female	620	75.6
	Total	**820**	**100**
Age In Group	Less than 20	87	10.6
	20–29	128	15.6
	30–39	346	42.2
	40–49	159	19.4
	50+	100	12.2
	Total	**820**	**100**
Marital Status	Single	300	36.6
	Married	500	61
	Separated	15	1.8
	Divorced	3	0.4
	Widowed	2	0.2
	Total	**820**	**100**
Religion	Christianity	418	51
	Islam	294	35.9
	African Traditional Religion	108	13.2
	Total	**820**	**100**
Education	No education	53	6.5
	Primary education	125	15.2
	Junior/Senior Secondary	540	65.9
	Tertiary	102	12.4
	Total	**820**	**100**
Occupation	Artisan	105	12.8
	Trader	100	12.2
	Civil Servant	220	26.8
	Farmer	187	22.8
	Pensioner	112	13.7
	Clergy/Spiritualist	39	4.8
	Unemployed	57	7.0
	Total	**820**	**100**
Years lived in the Community	1–3	157	19.1
	4–6	230	28
	7–9	348	42.4
	10 and above	85	10.4
	Total	**820**	**100**
Family Type	Nuclear	319	38.9
	Extended	501	61.1
	Total	**820**	**100**
Marriage Form	Monogamy	313	38.2
	Polygyny	507	61.8
	Total	**820**	**100**

Table 2. Demographic profile of in-depth interview participants in the selected local government areas (LGAs).

Selected Characteristics of Carers/Relatives of PLWA	Frequency	Percentage
Gender		
Male	9	37.5
Female	15	62.5
Total	**24**	**100.0**
Age in years		
18–29	5	20.8
30–39	7	29.2
40 and above	12	50.0
Total	**24**	**100.0**
Marital Status		
Single	1	4.2
Married	20	83.3
Separated	3	12.5
Total	**24**	**100.0**
Educational Level		
No Education	2	8.3
Primary Education	3	12.5
Secondary Education	10	41.7
Tertiary Education	9	37.5
Total	**24**	**100.0**
Religion		
Christianity	12	50.0
Islam	9	37.5
Traditional	3	12.5
Total	**24**	**100.0**
Relation to Patients		
Parent	5	20.8
Spouse	8	33.3
Sibling	4	16.7
Paid Caregivers	7	29.2
Total	**24**	**100.0**
Local Government Areas		
Abeokuta South	8	33.3
Abeokuta North	8	33.3
Sagamu	8	33.3
Total	**24**	**100.0**

the nuclear family, while 61.1 percent were from the extended family. Table 1 also showed that 38.2 percent of respondents practiced monogamy, while 61.8 percent practiced polygyny.

Table 2 revealed that a total of 24 paid caregivers/relatives of people living with Alzheimer's disease were interviewed at a 100 percent response rate. Of these, 38% were males while 63% were females. Findings showed that 21% were below the age of 29, 29% were between 30 and 39, and 50% was the highest percentage in the 40-year and above range. The mean age of the respondents is 41.41 while its standard deviation is 11.93. Larger percentage of the participants (83 percent) was married, while 4.2 percent were single. The distribution of religion showed that half of the participants practiced Christianity while 13% practiced African Traditional Religion (ATR). It is also worthy to note that half of the respondents had relations with parents while about 17% had relation with siblings. For equal representation, all the selected Local Government Areas in the study area had 33% participants.

Table 3 showed that male prefer traditional pathways (24.5%) in treating Alzheimer while female prefer Psychiatric hospitals (24%). In all, 21% prefer the use of Psychiatric hospitals in the treatment of Alzheimer. The Chi-square statistics indicate 16.5132 while the p-value is 0.002402. The result is significant at $p < 0.05$.

The participants from the in-depth interview shared their opinions on the community's preferred mental healthcare services in the treatment of Alzheimer. See quotation below:

I recommend taking my wife for treatment to the mental hospital where she will be given prompt care. The hospital also has trained healthcare specialist staff. So I am pleased with that. **(Relative, Abeokuta South Local Government Area, IDI).**

Her reaction was mentioned by another participant:

I like the facilities at the psychiatric hospital. I went to traditional homes, but the way my husband was tied to the tree, I don't like that. The traditional healer gave the brew to my husband for a drink. Instead of changing the situation, it got worse. But she has changed dramatically since I brought him here. **(Relative, Sagamu Local Government Area, IDI).**

However another participant has to say this:

I have used both theological and psychiatric clinics. I think whatever happens in the physical is founded in the metaphysical. I still went to church to pray for my cousin to cure him. In a nutshell, just for me, I used both psychiatric and spiritual hospitals to ensure my cousin gets well as soon as possible. **(Paid Caregiver, Abeokuta North Local Government Area, IDI).**

Her reaction was thus reported by another participant:

I prefer the use of clinics for psychiatry. Ever since my brother came here he has been improving significantly. The drugs are very effective. He was booked twice a month to see a doctor. **(Relative, Sagamu Local Government Area, IDI).**

It can be deduced from the above that respondents preferred psychiatric hospitals.

cent were traders; a higher proportion of respondents were civil servants (26.8 per cent). In addition, farmers accounted for 22.8 percent; retirees accounted for 13.7 percent, while the lowest percentage was clerical/spiritualist (4.8 percent) and unemployed (7 percent).

The number of years that respondents lived in the community showed that 19.1 percent of respondents lived in the neighborhood for between one and three years. 28 percent suggested a stay for four to six years. In contrast, 42.4 percent, 10.4 percent above were respondents who had lived for seven to nine years. The distribution of respondents by family group showed that 38.9 percent were from

Table 3. Distribution of respondents by choice of treatment of Alzheimer according to gender.

Therapy Pathways	Gender		Total	X²	Df	p-value	p < 0.05
	Male	Female		16.5132	5	0.002402	
Spiritual	40 (20%)	124 (20%)	164 (20%)				
Traditional	49 (24.5%)	106 (17%)	155 (19%)				
Medical Practitioner	48 (24%)	106 (17%)	154 (19%)				
Traditional/Spiritual	35 (17.5%)	136 (22%)	171 (21%)				
Psychiatric hospitals	28 (14%)	148 (24%)	176 (21%)				
Total	**200 (100%)**	**620 (100%)**	**820 (100%)**				

5. Discussion of findings

The analysis of the study results shows the particular dimension of the data obtained, assisted by literature and by the extension of the literature, contributing to information. The results showed that the preference of the respondent's determinants in the choice of mental illness treatment was clarified, especially Alzheimer's, was the assumption that Alzheimer should be treated by well trained healthcare professional especially psychiatrist (Olawande, 2017; Olawande et al., 2019; Olawande et al., 2018). Most respondents preferred psychiatrists over all other choices for treatment. The findings obtained and evaluated in this study revealed that psychiatrist was preferred to spiritual/traditional healers by most female respondents. This result supports (Chikaodiri, 2009) 's claim that general practitioners mainly offered care for people living with Alzheimer's disease; only a few were treated by alternative practitioners such as traditional healers. However, Yoruba individuals prefer the conventional type of mental illness care to the modern method (Olawande et al., 2019). This status has also been corroborated by the consistency of data obtained.

*I prefer to use the traditional route for my elder sister to be okay. The only reason why I brought her to the psychiatric hospital is for her to get rehabilitated. For me, the best option is to go the traditional way (***Relative, Abeokuta South Local Government Area, IDI***).*

*The combination of traditional and psychiatric hospitals cannot be over-emphasized. It is the best option (***Paid** Caregiver, Sagamu Local Government Area, IDI***).*

This finding in this Study is however in contrast with the works of (Ogunniyi et al., 2005) which posited that home management is the favored pattern in the treatment of People Living with Alzheimer. This is because of the strong family ties and cohesion notable in developing countries, especially Nigeria. Many factors favored home care management of People living with Alzheimer which include avoidance of stigmatization resulting in concealment within families, limited beliefs in orthodox care and cultural beliefs such as spiritual causation.

Nonetheless, in the works of (Ogunniyi et al., 2005) only 10–20% of the respondents opined that medications and visit to psychiatrists could be useful in the treatment of Alzheimer which is sharp contrast to the findings in this study. In developing countries especially Nigeria, many families cannot afford the cost of visiting hospitals to have appointment with psychiatrist thus, the need to seek other treatment pathways such as spiritual, that is the use of Christian-faith based and Islam faith based as well as the traditional methods.

In people living with Alzheimer's disease there were important correlations between gender and treatment pathways. Such results underpinned the fact that female could be mentally more affected than any other household member (Gureje et al., 2005; Ogunniyi et al., 2005). It is also worthy to mention that larger percentage of caregivers are women. This is also in line with the works of (Ogunniyi et al., 2005).

6. Conclusion and recommendations

This paper explored the choice of mental health facilities for Alzheimer's treatment in the state of Ogun, Nigeria. Subsequent recommendations were made based on the study findings:

1. The efficiency of mental health facilities should be improved by the government: mental health facilities have an important role to play in alleviating suffering related to mental illness such as behavioral dysfunction, anxiety, emotional and psychological disorders. Abused women are addicted to sedatives and alcohol, those upset by political viciousness, attempted suicides, in particular, those suffering from serious mental illness will be significantly helped by experienced mental health practitioners. Notwithstanding this, practitioners in the mental health sector are limited in the chosen field of study.

2. Mainstreaming of male and female views should take place in the mental healthcare community. Mainstreaming can be achieved by educating society's women about the possibility of intervention available for mental wellbeing and possible treatment and system that is critical for achieving emotional well-being change. The extension of community-based development networks will focus on women's involvement with their indigenous cultures and their commitment to the family members' community health. Formal mental healthcare facilities that provide appropriate treatment plans for psychotropic drugs and consistent distribution of adequate supplies at reasonable rates

3. Mental illness treatment rates should be subsidized by the government. This support is intended to allow for the better treatment of people living with Alzheimer's disease (PLWA).

4. Stakeholders should encourage efforts to establish gender strategies and make women central to the development and implementation of strategies for mental health services: women represent the vast majority of first and last choice caregivers for mentally ill adults. Negligibly, assistance with this encumbrance by structured health care is in the long-term social interest of a society. Also, because women are central to implementing health policy, they should be allowed to be active in formulating mental health policy.

Declarations

Author contribution statement

T. Olawande, M. Ajayi, E. Amoo and A. Olawole-Isaac: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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References

Adeloye, D., Auta, A., Ezejimofor, M., Oyedokun, A., Harhay, M.O., Rudan, I., Chan, K.Y., 2019. Prevalence of dementia in Nigeria: a systematic review of the evidence. J. Glob Health Rep. 3, e2019014. Epub 2019 Mar 27. PMID: 31528708; PMCID: PMC6746335.

Avotri, J.Y., Walters, V., 1999. 'You just look at our work and see if you have any freedom on earth': Ghanaian women's accounts of their work and health. Soc. Sci. Med. 48 (9), 1123–1133.

Awad, A.G., Voruganti, L.N.P., 2008. The burden of schizophrenia on caregivers. Pharmacoecon. 26 (2), 149–162.

Chikaodiri, A.N., 2009. Attitude of health workers to the care of psychiatric patients. Ann. Gen. Psychiatr. 8, 19–25.

D'onofrio, G., Sancarlo, D., Addante, F., Ciccone, F., Cascavilla, L., Paris, F., Picoco, M., Nuzzaci, C., Elia, A.C., Greco, A., Chiarini, R., 2015. Caregiver burden

characterization in patients with Alzheimer's disease or vascular dementia. Int. J. Geriatr. Psychiatr. 30 (9), 891–899. Sep.

Gross, A.L., Jones, R.N., Habtemariam, D.A., Fong, T.G., Tommet, D., Quach, L., Schmitt, E., Yap, L., Inouye, S.K., 2012. Delirium and long-term cognitive trajectory among persons with dementia, 2012 Sep 24 Arch. Intern. Med. 172 (17), 1324–1331. Update on 2004 Background Paper, BP 6.11 Alzheimer Disease 6.11-52 7.

Gureje, O., Lasebikan, V.O., Ephraim-Oluwanuga, O., et al., 2005. Community study of knowledge and attitudes to mental illness in Nigeria. BJP 186, 436–441, 2005.

Hendrie, H.C., Ogunniyi, A., Hall, K.S., et al., 2001. Incidence of Dementia and Alzheimer in two communities in Yoruba residing in Ibadan, Nigeria and African Americans residing in dianapolis, Indiana. J. Am. Med. Assoc. 285, 739–747, 2001.

Honjo, K., Black, S.E., Verhoeff, N.P., 2012. Alzheimer disease, cerebrovascular disease, and the β-amyloid cascade, 2012 Nov Can. J. Neurol. Sci. 39 (6), 712–728. Review.

Hooper, R., 2013. Where hyenas are used to treat mental illness. Available online at. Retrived 28th June 2020. www.bbc.co.uk.

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.U., Kendler, K.S., 1994. Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in the United States. Arch. Gen. Psychiatr. 51 (1), 8–19.

Koenig, H.G., 2008. Religion and mental health: what should psychiatrists do? Psychiatry 32, 201–203.

Mak, W., Chong, E., Wong, C., 2014. Beyond attributions: understanding public stigma of mental illness with the common sense model. TAJOO 84 (2), 173–181, 2014.

Ogunniyi, A., Hall, K.S., Baiyewu, O., Gureje, O., Unverzagt, F.W., Gao, S., et al., 2005. Caring for individuals with dementia: the Nigerian experience. W. Afr. J. Med. 24, 259–262, 2005.

Olawande, T.I., 2017. Gender Differentials in the Perception and Treatment of Mental Illness Among the Yoruba of Ogun State. A PhD thesis submitted to Covenant University, Ota, Nigeria.

Olawande, T.I., Jegede, A.S., Edewor, P.A., Fasasi, L.T., Samuel, G.W., 2018. An exploration of gender differences on availability of mental healthcare services among the Yoruba of Ogun state, Nigeria. Int. J. Emerg. Mental Health Hum. Resili. 20 (1), 1–7.

Olawande, T.I., Ajayi, M.P., Amoo, E.O., Iruonagbe, C.T., 2019. Variations in family attitudes towards coping with people living with mental illness. Open Access Macedonian J. Med. Sci. 7 (12), 2010–2016.

Olawande, T.I., Okagbue, H.I., Jegede, A.S., Edewor, P.A., Fasasi, L.T., 2019. Survey datasets on patterns of utilization of Mental healthcare services among People living with mental illness. Data Brief. 2095–2103.

Samele, C., Lawton-Smith, S., Warner, L., Mariathasan, J., 2007. Patient choice in psychiatry. Br. J. Psychiatr. 191, 1–2.

Shaffer, J.L., Petrella, J.R., Sheldon, F.C., Choudhury, K.R., Calhoun, V.D., Coleman, R.E., Doraiswamy, P.M., 2013. Alzheimer's disease neuroimaging initiative. Predicting cognitive decline in subjects at risk for Alzheimer disease by using combined cerebrospinal fluid, MR imaging, and PET biomarkers. Radiology 266 (2), 583–591, 2013 Feb.

Swardfager, W., Lanctôt, K., Rothenburg, L., Wong, A., Cappell, J., Herrmann, N., 2010. A meta-analysis of cytokines in Alzheimer disease. Biol. Psychiatr. 68 (10), 930–941.

Viñas-Diez, V., Turró-Garriga, O., Portellano-Ortiz, C., Gascón-Bayarri, J., Reñé-Ramírez, R., Garre-Olmo, J., Conde-Sala, J.L., 2017. Kinship and cohabitation in relation to caregiver burden in the context of Alzheimer's disease: a 24-month longitudinal study. Int. J. Geriatr. Psychiatr. 32 (12), e72–82, 2017 Dec.

World Health Organisation, 2007. Assessment Instrument for Mental Health Systems (WHO-AIMS) Country Report in Nigeria. Ministry of Health, Nigeria.

World Health Organisation, 2012. Gender and Women's Mental Health Factsheet. World Health Organisation, Geneva.

World Health Organisation, 2014. Gender Disparities in Mental Health. Department of Mental Health and Substance Dependence. World Health Organisation, Geneva.

World Health Organisation, 2018. Dementia Factsheet. World Health Organisation, Geneva.

World Health Organization, 2019. Dementia. Accessed on 30th June, 2020. https://www.who.int/news-room/fact-sheets/detail/dementia.

World Health Organization, 2020. Dementia. Accessed on 30th June, 2020. https://www.who.int/news-room/fact-sheets/detail/dementia.