The predictors of psychiatric disorders among people living with epilepsy as seen in a Nigerian Tertiary Health Institution

Kazeem Ayinde Ayanda, Dauda Sulyman

Department of Psychiatry, Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, Nigeria

ABSTRACT

Background: Mental disorders may complicate epilepsy which can further impair the quality of life of people living with this chronic neurological condition. The aim of this study was to determine the types of psychiatric disorders in patients with epilepsy and to determine the sociodemographic and clinical factors that may predict these psychiatric illnesses. **Materials and Methods:** This is a descriptive cross-sectional study carried out over a period of 6 months at Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, Nigeria. The Mini International Neuropsychiatric Interview was used to determine the psychological health of 74 consecutively recruited adult patients with epilepsy attending the psychiatric outpatients' clinic of the hospital. Psychiatric diagnoses were based on Diagnostic and Statistical Manual for Mental Disorders, 4th Edition criteria, and logistic regression analysis was done to determine variables that predict psychiatric disorder. **Results:** Majority of the participants were male (67.6%) with their age ranging from 18 to 68 years and the mean age of 30.55 ± 10.91 years. Thirty-three (44.6%) of our study respondents had psychiatric diagnoses that included major depressive disorder (21.6%), schizophrenia (17.6%), generalized anxiety disorder (4.1%), and hypomania (1.4%). Being unemployed (odds ratio [OR] = 3.24. 95% confidence interval [CI] = 1.15–9.10, P = 0.026) and short-term seizure free period (OR = 0.19, 95% CI = 0.04–0.78, P = 0.022) were the variables found to be predictive of psychiatric diagnoses. **Conclusions:** The study revealed that a large percentage of people living with epilepsy develop mental disorders which can further increase the burden and worsen the quality of life of patients with this chronic debilitating condition.

Key words: Epilepsy, Nigeria, psychiatric disorders

Address for correspondence:
Dr. Kazeem Ayinde Ayanda,
Department of Psychiatry,
Abubakar Tafawa Balewa University
Teaching Hospital, Bauchi, Nigeria.
E-mail: kazeem12us@gmail.com

INTRODUCTION

Epilepsy is the most common chronic neurological disorder affecting about 50 million of the world population. The number of people suffering from epilepsy is higher in the developing nations than the developed countries due to the greater risk of conditions that may result in irreversible brain damage; thus, it is not surprising that about 80% of people living with epilepsy are from developing nation.[1]

Epilepsy is associated with a higher risk of psychiatric complications either before or after the diagnosis of epilepsy.[2] The nature of the illness, which in some cases may be associated with altered consciousness, the discrimination experienced by sufferers, the cultural belief system as it relates to the cause and treatment, the high rate of physical complications and side effects of antiepileptic medications may impact on the psychological well-being of people living with epilepsy. Other factors that may predispose patients with epilepsy to psychiatric disorders include a shared pathophysiological mechanism causing both the seizure and the behavioral problem,

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social disadvantages such as stigma, underemployment, and marital problems.[3] Furthermore, documented in the literature is a reciprocal relationship between epilepsy and psychiatric disorders particularly depression and psychosis in that seizure disorder may arise in patients who had already been diagnosed of psychiatric illness, which may be explained by the shared pathophysiological mechanism causing both epilepsy and psychological problem.[4,5]

Psychiatric disorders particularly depression, anxiety, and psychoses are commonly seen among people suffering from epilepsy.[3] These psychological problems together with other social complications resulting from epilepsy may impact negatively on the course of the illness, treatment response,[6] and quality of life of patients[7,8] and may increase the burden of the illness on people with epilepsy and their caregivers.

Varying rates had been reported for the prevalence of psychiatric disorders in epilepsy owing to methodological differences such as the instrument used or the population (e.g., temporal lobe epilepsy and medically intractable cases) that was studied.[9-11] Globally, prevalence rate ranging from 20% to 80% had been reported for psychiatric disorders in epilepsy.[11] In Nigeria, most of the researchers had reported a similar prevalence rate, though most of these studies had focused on the prevalence of depression and anxiety among this patient population with only a few looking at the full gamut of psychiatric disorder in patients with epilepsy.[7,12,13]

We aimed at determining the various types of psychological problems and their prevalence in patients with epilepsy in this part of the country. This is important as it will help increase the awareness of health practitioners involved in the care of people with epilepsy to these problems, and it will help inform the need for liaison services with mental health practitioner as early detection and treatment of these conditions may improve the quality of care of patients with epilepsy.

MATERIALS AND METHODS

This is a descriptive cross-sectional study carried out at the Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), Bauchi from July 2014 to December 2014. Bauchi is located in the North Eastern region of Nigeria. It has a total of 55 ethnic groups with Hausa/Fulani being the most predominant, and the state has a total population of about 3.8 million people.[14] ATBUTH is a tertiary health facility which serves the people of the neighboring states.

All consenting consecutive adult patients with a diagnosis of epilepsy attending the psychiatric outpatient clinic constituted the study population. The diagnosis of epilepsy was based on International League Against Epilepsy[15] criteria using patients' clinical history; eye witness accounts with or without supportive electroencephalogram findings. Only patients with a diagnosis of epilepsy and on anticonvulsant medication for at least 1 year and who gave informed consent were included in the study. The exclusion criteria for the study include patients with a prior diagnosis of psychiatric illness before the onset of epilepsy, patients with learning disability, patients with a comorbid chronic medical condition, and patients who were too ill to participate.

Approval for the study was obtained from the ethics and research committee of ATBUTH. The sample size was attained during the 6 months period the study was undertaken. Only patients who gave informed consent were included in the study. A proforma questionnaire was designed and administered to all consenting eligible participants to obtain their sociodemographic and clinical characteristics. The sociodemographic data obtained include age, ethnicity, occupation, and marital status, whereas the clinical characteristics include variables such as duration of epilepsy, period the patients were free of seizure attacks, frequency of attacks, type, and number of anticonvulsant medications the participants were taking, presence of physical complications due to epilepsy such as burns, fractures, and bruises. All the patients were administered Mini International Neuropsychiatric Interview 6.0[16] for assessment of psychiatric disorder by the clinic consultants. The diagnosis of psychiatric disorder was based on Diagnostic and Statistical Manual for Mental Disorders, 4th Edition[17] criteria.

Data analysis

Data obtained from the study was analyzed using EPI-INFO version 6.04d (Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, USA). Frequency tables were generated, and proportions were compared using Chi-square. The level of statistical significance was set at 5% confidence limit for the two-tailed test. A second stage analysis was done using logistic regression. Only variables that were statistically significant at the initial analysis were included in the logistic regression. This was done to determine variables that predict psychiatric morbidity among the studied population.

RESULTS

Seventy-four respondents were recruited during the study period, 46 (62.2%) were males while 28 (37.8%) were females. The age range of respondents was between 18 and 68 years (mean 30.55 ± 10.91). The majority (67.6%) of the respondents felt no discrimination as a result of having epilepsy while 24 (32.4%) felt being discriminated against. Among those who felt being discriminated against, 9 (37.5%) were discriminated against by family, 9 (37.5%) by friends, 4 (16.7%) by neighbors, and 2 (8.3%) by families and friends [Table 1].

The causes and risk factors of epilepsy in the study respondents were assessed. The cause of epilepsy in the majority of respondents (75.7%) was unknown, 11 (14.9%) was caused by head trauma, other conditions that were recognized as causing epilepsy in some of the participants include febrile seizures 3 (4.1%), pregnancy induced toxemia (eclampsia) 2 (2.7%), meningitis 1 (1.4%), and cerebrovascular accident 1 (1.4%). The majority (75.9%) of the participants were placed on single anticonvulsant while 3 (24.1%) were placed on two medications for their illness [Table 2].

In Figure 1, 33 out of the 74 study respondents had psychiatric diagnoses giving a prevalence rate of 44.6% for psychiatric disorders. The prevalence rate of individual psychiatric diagnoses in the study population was major depressive disorder 16 (21.6%), schizophrenia 13 (17.6%), generalized anxiety disorder 3 (4.1%), and hypomania 1 (1.4%).

Among the sociodemographic variables considered unemployment status (χ^2 = 6.618; df = 1; P = 0.010) and the feeling of discrimination by the respondents (χ^2 = 4.609; df = 1; P = 0.032) shows a significant statistical association with the presence of psychiatric disorder [Table 3].

In Table 4, the seizure-free period of the participant (χ^2 = 6.486; df = 1; P = 0.011) was the only variable that was significantly associated with the presence of psychiatric disorder.

Predictors of psychiatric disorders

The sociodemographic and the clinical variables that were statistically significant with psychiatric diagnoses were entered into a logistic regression analysis to determine which factor independently predicts the presence of psychiatric disorder among the study respondents [Table 5]. Only 2 variables emerged as predictors of psychiatric disorder, and they include unemployment status (odds ratio [OR] = 3.237; 95% confidence interval [CI] = 1.152–9.097; P = 0.026) and short-term seizure free period (OR = 0.188; 95% CI = 0.045–0.784; P = 0.022) while the presence of discrimination (OR = 2.956; 95% CI = 0.971–9.004; P = 0.057) was not predictive.

DISCUSSION

In this study, there were more males than female respondents, and the majority of the respondents were young adults (18–40 years) with a mean age of 30.55 years. This gender difference has been reported in several
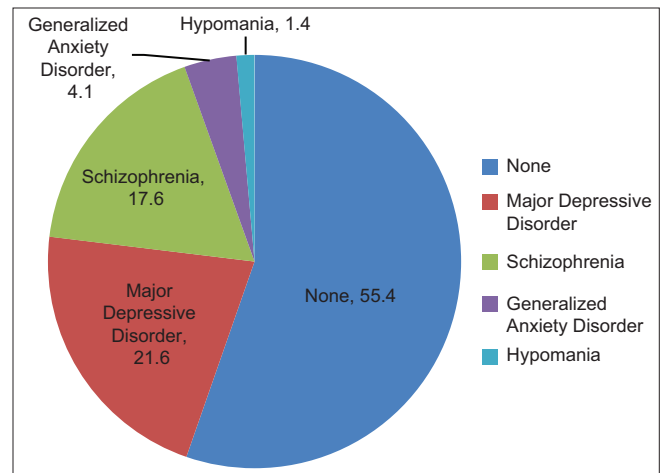
Figure 1: Pie chart of psychiatric diagnoses among respondents

Table 1: Sociodemographic characteristics of respondents (*n*=74)

Variables	Frequency *n* (%)
Age group	
18-40	61 (82.4)
41-59	11 (14.9)
≥60	2 (2.7)
Sex	
Male	46 (62.2)
Female	28 (37.8)
Religion	
Christianity	5 (6.8)
Islam	69 (93.2)
Marital status	
Married	42 (56.8)
Not married	32 (43.2)
Ethnicity	
Hausa/Fulani	59 (79.7)
Others	15 (20.3)
Employment status	
Employed	37 (50.0)
Unemployed	37 (50.0)
Educational status	
No education/primary	35 (47.3)
Secondary/tertiary	39 (52.7)
Adequate support	
Yes	64 (86.5)
No	10 (13.5)
Feeling of discrimination	
Yes	24 (32.4)
No	50 (67.6)

Table 2: Clinical characteristics of respondents (*n*=74)

Variables	Frequency *n* (%)
Family history of epilepsy	
Yes	7 (9.5)
No	67 (90.5)
Duration of epilepsy (years)	
1-5	23 (31.1)
>5	51 (68.9)
Frequency of epilepsy	
Daily	18 (24.3)
Weekly	24 (32.4)
Monthly	24 (32.4)
>monthly	8 (10.8)
Seizure free period (year)	
<1	57 (77.0)
≥1	17 (23.0)
Presence of complication	
Yes	14 (18.9)
No	60 (81.1)

Table 3: Sociodemographic variables of the respondents with psychiatric disorders compared with those without psychiatric disorders

Variables	Epilepsy patients with psychiatric disorders (n=33) n (%)	Epilepsy patients without psychiatric disorders (n=41) n (%)	χ^2	df	P
Age group					
18-40	31 (93.9)	30 (73.2)	5.299*	2	0.071*
41-59	1 (3.0)	10 (24.4)			
≥60	1 (3.0)	1 (2.4)			
Sex					
Male	20 (60.6)	26 (63.4)	0.061	1	0.805
Female	13 (39.4)	15 (36.6)			
Religion					
Christianity	3 (9.1)	2 (4.9)	0.063*	1	0.802*
Islam	30 (90.9)	39 (95.1)			
Marital status					
Married	17 (51.5)	25 (61.0)	0.667	1	0.414
Not married	16 (48.5)	16 (39.0)			
Ethnicity					
Hausa/Fulani	27 (81.8)	32 (78.0)	0.161	1	0.688
Others	6 (18.2)	9 (22.0)			
Employment status					
Employed	11 (33.3)	26 (63.4)	6.618	1	0.010
Unemployed	22 (66.7)	15 (36.6)			
Educational status					
No education/primary	13 (39.4)	22 (53.7)	1.493	1	0.222
Secondary/tertiary	20 (60.6)	19 (46.3)			
Adequate support					
Yes	30 (90.9)	34 (82.9)	0.431*	1	0.511*
No	3 (9.1)	7 (17.1)			
Feeling of discrimination					
Yes	15 (45.5)	9 (22.0)	4.609	1	0.032
No	18 (54.5)	32 (78.0)			

*Yates' corrected Chi-square and P value

Table 4: Clinical characteristics of respondents with psychiatric disorders compared with those without psychiatric disorders

Variables	Epilepsy patients with psychiatric disorders (n=31) n (%)	Epilepsy patients without psychiatric disorders (n=37) n (%)	χ^2	df	P
Family history of epilepsy					
Yes	3 (9.1)	4 (9.8)	0.091*	1	0.763*
No	30 (90.9)	37 (90.2)			
Duration of epilepsy (years)					
1-5	9 (27.3)	14 (34.1)	0.403	1	0.526
>5	24 (72.7)	27 (65.9)			
Frequency of epilepsy					
Daily	7 (21.2)	11 (26.8)	1.628*	3	0.653*
Weekly	14 (42.4)	10 (24.4)			
Monthly	9 (27.3)	15 (36.6)			
>monthly	3 (9.1)	5 (12.2)			
Seizure free period (year)					
<1	30 (90.9)	27 (65.9)	6.486	1	0.011
≥1	3 (9.1)	14 (34.1)			
Presence of complications					
Yes	6 (18.2)	8 (19.5)	0.021	1	0.885
No	27 (81.8)	33 (80.5)			

*Yates' corrected Chi-square and P value

studies in the world as mentioned by Banerjee et al.[18] and Senanayake and Roman.[19] Studies in Nigeria also reported a higher prevalence in male[7,20] though a community study by Osuntokun et al. reported a female preponderance.[21] The variations in the gender prevalence in epilepsy may be due to the different methodological approach used by various

Table 5: Logistic regression of significant variables

Variables	OR	CI	Coefficient	SE	P
Employment status	3.237	1.152-9.097	1.175	0.527	0.026
Presence of discrimination	2.956	0.971-9.004	1.084	0.568	0.057
Seizure free period	0.188	0.045-0.784	−1.672	0.729	0.022

OR – Odds ratio; CI – Confidence interval; SE – Standard error

researchers and social complications of epilepsy such as inability of females in getting suitors which may explain why females with the illness may not disclose it or come for treatment and, therefore, are missed. Likewise, the higher male representations may be due to increase exposure to epilepsy risk factors such as head trauma[22,23] and epilepsy inducing psychoactive drugs.[22] Some investigators also explained that the effect of female sex hormone in raising the seizure threshold may explain this gender difference.[24] Majority of our study respondents were young adults which are comparable to that obtained in a Nigerian study by Nuhu et al.,[7] likewise the mean age of the participants in this study is also comparable to the mean age of 28.7 years and 31.82 years obtained by Nuhu et al.[7] and Adebayo et al.,[25] respectively. Though it is known that epilepsy occurs across all age group with the highest incidents in the extreme of ages;[7,26] however, the high prevalence among young adult in these studies is not surprising because only adult population were studied.

The range of psychiatric diagnoses seen among our respondents were major depressive disorder, generalized anxiety disorder, hypomania, and schizophrenia which is similar to pattern of psychiatric diagnoses found commonly among patients with epilepsy as mentioned by Chang et al.[27]

The prevalence of psychiatric disorder in this study was 44.6%. This value falls within the prevalence reported in the various studies of this nature.[28,29] It may also be comparable to the prevalence of 48% obtained among epileptic patients in a South London study using Clinical Interview Schedule (CIS),[30] though it is higher than the rate obtained in an Italian[31] and Nigerian[32] studies using CIS, where prevalence rates of 19% and 37% were obtained, respectively. It is also higher than that reported in a study carried out in a neurological clinic in Nigeria by Tunde-Ayinmode et al.[9] where a prevalence rate of 28.6% was obtained. The higher rate obtained in our study may be related to the setting where the study was done, being a psychiatric outpatient clinic. It has also been reported that studies in clinical settings have a higher rate of psychiatric morbidity than those carried out within the general population.[33] The rate of psychiatric disorders in our study is, however, lower than the United States studies by Victoroff[34] and Silberman et al.[35] where prevalence rates of 70% and 71% were obtained, respectively. These high prevalence rates may not be surprising as they both studied lifetime rates of psychiatric disorders among epilepsy

patients.[28] Victoroff also studied patients with severe illness who had intractable seizures.[34]

Depression is the most common psychiatric diagnosis found in this study, and this is similar to the pattern reported in various studies among epilepsy patients.[10,26,34] The prevalence rate of depression in our study falls within the reported rate of 20–55% for depression in the most studies among patients with epilepsy.[10,34,36,37] However, the rate we obtained is far less than a rate of 85.5% obtained in a study carried out in a hospital setting in the south eastern region of Nigeria using Beck's inventory of depression[12] This high rate may result from the instrument used in their study as Beck Inventory of Depression-like other screening tools are based on subjective criteria and tends to overestimate rates of psychiatric disorders.[11] Likewise, it is also lower than the prevalence rate of 66.7% obtained in another Nigeria study by Tunde-Ayinmode et al.[9] The rate of schizophrenia in this study was 39.4% which is just slightly less than the rate obtained for depression. The rate of schizophrenia in our study is far higher than a rate between 3% and 7% reported in some studies.[10,38] It is also higher than the rate of 29% and 11% obtained in other Nigerian studies by Gureje[32] and Tunde-Ayinmode et al.,[9] respectively. These differences in rate may be related to sociocultural differences[9] as the studies are carried out in different regions of the country with varying culture. It may also reflect the fact that the study was carried out in a psychiatric outpatient clinic, which may have selection bias by the referring physicians. The study by Tunde-Ayinmode et al.[9] was carried out in a neurology clinic. This result further underscores the need for multicenter studies involving all region of the country to understand the true reason for these differences. A prevalence rate of 9.1% was obtained for generalized anxiety disorder in our study. This may be comparable to studies in which rates of 11.1% were obtained.[9,10]

In this study, unemployment status was found to be the only sociodemographic variable predictive of the presence of any psychiatric diagnosis. This is similar to the study by Zis et al.[37] in which unemployment was among the important determinants of major depressive episode among patients with epilepsy. Unemployment constitutes a social disadvantage that may be a reason for either delayed presentation to hospital or poor adherence to medication which may both result from the inability to finance the treatment of a chronic illness such as epilepsy thus serving as a stressor that may predispose to psychiatric illness.[39]

In our study, gender or age group did not show any statistical significance with the presence of psychiatric diagnoses which may be comparable to the study by Onwuekwe et al.[12] in Enugu, South East Nigeria in which age group, gender, or educational level was not significantly associated with depression but differs from some Nigerian

study where psychopathology were significantly found among the older age and female gender.[7,9]

People living with epilepsy also experience discrimination either from close relations, neighbors, or at work. It was mentioned by Agrawal and Govender as part of the factors recognized to increase the risk of developing psychopathology in patients with epilepsy.[33] Likewise, in a Nigerian study, it was reported that felt stigma is among the predictors of anxiety and depressive disorders in patients with epilepsy.[13] In our study, discrimination which was experienced by about a third of the studied population was significantly associated with the presence of psychiatric disorder in the first stage analysis but loss this significance at the level of logistic regression. It is, however, important to mention that measures that will increase the social awareness about epilepsy among the general population to debiased their mind of the belief they have about the cause and treatment of epilepsy may help improve the time of patients presentation to hospitals and may also help improve the support obtained by patients and thus reduce the risk of psychiatric disorders.

Among the clinical variables, short-term seizure free period was predictive of the presence of any psychiatric diagnosis. A similar finding was reported by Nuhu *et al.*,[7] where short seizure-free periods were significantly associated with emotional distress. It was also comparable to the study by Adewuya and Ola, in which it was reported that uncontrolled seizure was predictive of anxiety and depressive disorders among patients with epilepsy.[13] The short seizure-free periods may be worrisome to patients and may bring about feeling of helplessness in them as the illness still occurs despite medications. Likewise, they may also feel overwhelmed by the illness as they increasingly become unwell within a short-term interval which may interfere with their social functioning. The aforementioned may invariably increase their predisposition to psychiatric disorders. Measures to reduce the recurrence of seizure and at improving seizure control such as early diagnosis of epilepsy and effective treatment, improve medication adherence among patients may go a long way to reduce psychiatric complication.

The major limitation in this study is that it is a cross-sectional study and not a longitudinal study which would have been a better study at recognizing factors that predispose to psychiatric complication in people with epilepsy, and also the findings in this study cannot be generalized due to its small sample size.

CONCLUSIONS

Our study revealed that psychiatric disorder particularly depression and schizophrenia are a common complication in epilepsy and that unemployment status and short-term seizure-free periods are predictive of these psychopathology,

which invariably may increase the burden on the patients, increase their healthcare costs, and, in turn, reduce their quality of life. It is, therefore, important for medical practitioners involved in the care of people living with epilepsy to pay particular attention to possible emergence of psychiatric symptoms and refer appropriately to psychiatrists as early detection and treatment may alleviate or remove the deleterious consequences that may result from this comorbidity. The study also underscores the need for collaboration between psychiatrists and nonpsychiatrist physicians in the care of patients with epilepsy, especially in health institutions where such services are not being rendered.

Conflicts of interest
There are no conflicts of interest.

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