Anxiety, depression and associated factors among patients with Epilepsy patients in Ethiopia 2018

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ABSTRACT

Introduction: Depression and anxiety are the most common mental illness, but both are frequently unrecognized and unmanaged among patients with epilepsy.
Objective: To assess magnitude of anxiety, depression and associated factors among patients with epilepsy in Ethiopia, 2018.
Methods: An institution based cross - sectional study design was conducted from May 15 to June 24, 2018. Depression and anxiety were measured by using Hospital Anxiety and Depression Scale (HADS).
Results: A total of 416 study participants were interviewed with 99.3% response rate and 59.6% of study participants were male. The mean age of the study participants was 33.19 ±13.66 years. The prevalence of depression and anxiety among people with epilepsy was 37.7 % and 39.9 %, respectively. Depression was associated with poor social support, low monthly income, perceived stigma, medication non –adherence, side effects of AEDs and current use of alcohol. Anxiety was associated with poor social support, perceived stigma, medication non –adherence, >= 4 times frequency of seizure attacks per months, and side effects of AEDs.
Conclusion: The prevalence of depression and anxiety among people with epilepsy was high. Both depression and anxiety had a statistically significant association with perceived stigma, AEDs side effects, medication non-adherence, and social support.
Keywords: depression, anxiety, epilepsy

INTRODUCTION

Epilepsy is a serious common neurological disorder characterized by recurrent seizures, two or more than two seizures attack unprovoked due to abnormal synchronized neuronal discharges (Ahmed El Sayed Badawy, Aya Abd El Hakeem Younis 2021). It is expressed by seizures attack that can be short and almost too quiet or last for long periods of time, and It is the most common severe brain disorder, it affects more than 50 million people worldwide (Fymat 2017).

People with epilepsy have a high prevalence of depressive and anxiety disorders, they experience a depressive disorder or anxiety disorder in one of every 3 patients with epilepsy in the course of their life (Kanner 2013).

Depression and anxiety co-morbidities have a negative impact on daily living in people with epilepsy (Park 2016). Depression and anxiety are highly prevalent in patients with epilepsy when compared to other chronic neurological diseases, with prevalence rates among people with epilepsy were ranging from 20% to 55%, whereas the prevalence of depression and anxiety among the people with epilepsy was 28.5% and 26.2%, respectively (Alsaadi et al. 2015).

According to a study conducted in Canada in the total sample size of 250 patients, the prevalence of anxiety disorder among people with epilepsy was close to 40.0% by using HADS-A , whereas the prevalence of depression among people with epilepsy by using PHQ-9 was 24.1%, whereas factors that were significantly associated with depression and anxiety among people with epilepsy were including medication side effects, illicit substance use and smoking and uncontrolled seizures (Pham et al. 2017).

The prevalence of anxiety disorder and depression among people with epilepsy was 39.4% and 24.4% respectively in Brazil by using HADS, whereas the prevalence both anxiety and depression among patients with epilepsy was recognized 42.9%, Variables that were strongly associated with depression among people with epilepsy including failure in their work, never had a job, and fewer years of schooling, Whereas factors that were associated with anxiety among people with epilepsy including female sex, and low economic (Stefanello et al. 2011).

According to a study conducted from Bulgaria, 2014 in 64 patients with refractory epilepsy and cognitive problems, the prevalence of depression and anxiety among patients with epilepsy was 40.63% and 71.43%, respectively (Viteva 2014).

A study done in Iran in total sample of 25,180 people with epilepsy, the prevalence of Major depressive disorder among patients with epilepsy was 49 %, whereas the

prevalence of the following anxiety disorder among people with epilepsy, Obsessive compulsive disorder was 30%, Panic Disorder was 29%, General Anxiety Disorder 9% and Suicidal attempt was 37% (Ayşe Kutlu 2016).

A study done in Faridkot , India , in a total of sample 100 patients with epilepsy, by using ICD-10 diagnostic criteria of depression, the prevalence of depression among people with epilepsy was 25%and also the prevalence of mild depression and moderate depression among patients with epilepsy was 67% and 33% ,respectively (Harish Arora 2009).

A study conducted in Omani, Arab, the prevalence of depressive disorder and anxiety disorder among people with epilepsy was 27% and 45% , respectively (Al-asmi et al. 2012).

A cross-sectional study was done in the United Arab Emirates, in the 186 patients by using PHQ-9 and GAD-7, the prevalence of major depression among people with epilepsy was 27% and the prevalence of anxiety among people with epilepsy was 25.8%. The prevalence of both anxiety and depression among people with epilepsy was 17.7% (El et al. 2015).

A study done in Nigerian in 156 people with epilepsy, the prevalence of Major depressive disorder using the DSM-IV criteria among adolescent people with epilepsy was 28.2%, factors that were significantly associated with the presence of MDD among people with epilepsy are medication adherence, seizure control, frequency of seizures in the preceding 4 weeks, and duration of illness (Fela-Thomas, Akinhanmi, and Esan 2016).

A study done in Northwest Ethiopia by using Beck Depression Inventory (BDI), the prevalence of depression among people with epilepsy was 45.2 %, out of this 29.6 % were mild, 14.8 % were moderate and 0.8 % were severely depressed and In that study, factors that were significantly associated with depression among people with epilepsy are social support, onset of the illness, family history of mental illness, seizure frequency, age, adherence to AEDs, multidrug use and educational status (Bifftu et al. 2015).

The prevalence of co-morbid anxiety and depression was high among people with epilepsy. The prevalence of anxiety and depression among people with epilepsy were 33.5 and 32.8 %, respectively. In that study factors that was significantly associated with anxiety including divorced and widowed, whereas factors that was significantly associated with depression including perceived stigma, types of AEDs, and unable to read and write and factors that was significantly associated with both depression and anxiety among people with epilepsy including occurrence of seizure, monthly income and AEDs side effects (Tegegne et al. 2015).

The consequences of anxiety and depression in people with epilepsy in terms of lost health condition of the individuals are large and depression is order as the single largest source of global disability for 7.5% of all years lived with disability in 2015 and also the major risk to suicide deaths, nearly 800, 000 per year; whereas anxiety disorders are grade 6th leading cause of global disability for almost 3.4% (World Health Organization 2017).

Operational definition

Anxiety: Those who are found to score ≥8 from Hospital Anxiety and Depression Scale (HADS-A) was considered as having anxiety (Reda 2011).

Depression: Those who are found to score ≥8 from Hospital Anxiety and Depression Scale (HADS-D) was considered as having depression (Reda 2011).

Social support: Those who are found to score Oslo -3 scales a score 3–8 was considered as having Poor support, 9–11 as having moderate support and a score 12–14 as having strong support (Abiola, Udofia, and Zakari 2013).

Perceived stigma: Those who are found to score of the three-item scale ≥1 was considered as having Perceived stigma (Jacoby 1994).

Current use: using at least one of a specific substance for non - medical purpose within the last three months (alcohol, khat, tobacco, others substance). Ever use of substance: using at least one of any specific substance for non-medical purpose at least once in lifetime (alcohol, khat, tobacco, others substance) (Henry-Edwards et al. 2003).

Chronic physical illness: Those respondents who was respond having a Hypertension, Cardiac disease, Diabetes mellitus, HIV/AIDS, Cancer, Tuberculosis, Asthma and others which is diagnosed before from any private and public health institution and currently on follow up.

Medication non-adherence: A patient on AEDs who were scored ≥2 on MMAS-4 were considered as having non adherence to AEDs (Tesfay et al. 2013).

Antiepileptic drugs side effects: Those who were scores range from 19 to 76, Liverpool adverse event profile (LAEP),with high scores indicating more frequent symptom considering them as having Antiepileptic drugs side effects (Panelli et al. 2007). By using median, those who are scores ≥ 26 on LAEP scores were considering them as having AEDs side effects.

Income: < 1.25 USD/day (< 735 ETB) classified as international standard of extreme poverty, 1.25 – 2.00 USD/day (735-1176 ETB) classified as international poverty bench mark, > 2.00 USD/day (>1176 ETB) classified as above poverty bench mark (Ravallion 2009).

METHOD AND METERIALS

Study design and Period

An institutional based cross - sectional study was conducted from May15 to June 24, 2018.

Study Design, Perod, Area, Source Population, and Study Population

The study was conducted at Ayder Comprehensive Specialized Hospital, Mekelle and Adigrat General Hospital. Ayder Comprehensive Specialized Hospital is located in Mekelle, Tigray. The three hospitals selected by lottery methods from rest 3 hospitals available in Tigray, Ethiopia. In the three hospitals, total follow of patients with epilepsy per month were 1236, this data were taken from the registration book of the three hospitals.

Even though there is a high prevalence of depression and anxiety among people with epilepsy in different researches, which factors that can decrease or increase the prevalence anxiety and depression in patients with epilepsy is there is no adequate study about the magnitude of this issue. However, there was a limitation of information in Ethiopia that addresses the magnitude of anxiety, depression and associated factors among people with epilepsy.

Therefore, this study intended to address the magnitude of anxiety, depression and associated factors among patients with epilepsy in outpatients in Ethiopia, 2018. This study can give important information for neurologists and mental health professionals to be familiar with and provide interventions for patients with epilepsy that have anxiety and depression. The study can also serve as baseline data for further studies and increase awareness in mental health strategies, and health managers about the problem that occur with patients with epilepsy.

All adult patients with epilepsy attending in Ayder Referral, Mekelle and Adigrat Hospital were source of population.

All adult patients with epilepsy visiting in Outpatient Epilepsy and psychiatry Clinics department who were on treatment with one or more AEDs in Ayder Referral, Mekelle and Adigrat Hospital during data collection periods were source of study population.

Inclusion Criteria: All adult patients with epilepsy visiting in Outpatient department, epilepsy and psychiatric Clinics who were on treatment with one or more AEDs in Ayder Referral, Mekelle and Adigrat Hospital who were available during data collection.

Exclusion Criteria: Those who were serious medical and/or psychiatric illness and having difficulty to give consent. And also those who were unable to speak and hear.

Sample Size Determination

The sample size was calculated by using single population proportion formula, by using the following assumptions; the proportion was taken from a study done in the University of Gondar Hospital, the prevalence of depression among patients with epilepsy were 45.2 %(Bifftu et al. 2015) and, 95% confidence interval, margin of error 5%, non-response rate 10%. The formula shown below was used to determine the sample size.

$$n = \frac{(Z\alpha/2)^2 * p (1-p)}{d^2}$$

Where n=sample size, z =reliability coefficient, P =proportion is 45.2%, 0.452, Level of significance 5% ($\alpha = 0.05$), z $\alpha/2 = 1.96$, Margin of error = 5% (d = 0.05), Non response = 10%

$$n = \frac{(1.96)2 *0.452(1- 0.452)}{0.05^2}$$

n = 381, By adding 10% non-response rate, the final sample size was 419.

Sampling Method and Technique

A systematic random sampling technique was used to select study population. The Sampling interval (k) value was determined by dividing total study population during one month data collection period by a total sample size. Therefore, Participants was selected from the total study population every kthinterval.

Dependent Variables: Depression: present / absent, and Anxiety: present / absent

Independent Variables: Socio-demographic factors: Age, Sex, Religion, Educational level, Occupation, Income, Marital status, Number of children and Ethnicity, Clinical factors: Family history of mental illness, Types of seizures, Duration of epilepsy, Duration of treatment, Age of onset of epilepsy, Name of AEDs, suicidal attempt and thoughts, chronic medical illness, AEDs side effects, uncontrolled seizures, multidrug use, adherence to AEDs and seizures frequency. Substance - related factors: Alcohol use, Cigarette use, Khat use, and Cannabis use. Psychosocial related factors: Perceived stigma and Social support.

Data Collection Tools

A structured interviewer-administered questionnaire was used which has 8 parts: a socio-demographic questionnaire to assess the patients' background information. Hospital Anxiety and Depression Scale (HADS) to assess anxiety and depressive symptoms. HADS was used to assess anxiety and depression among people with epilepsy with a score ≥ 8; it was a reliable and valid instrument in Ethiopia. It was validity among people with HIV with the

internal consistency for anxiety was 0.78, 0.76 for depression subscales and 0.87 for the full scale of HADS. The intra-class correlation coefficient (ICC) was 80%, 86%, and 84% for the HADS –A and HADS –D subscales, and HADS, respectively (Reda 2011).

Clinical factors including physical illness was assessed by yes / no. Support at a time when difficulties and critical conditions like financial, social and psychological assessed by Oslo -3 scales which has total of 14 scores & classified into three broad categories: poor support: 3–8, Moderate support: 9–11 and Strong support: 12–14 (Abiola et al. 2013). Substance use history was assessed by yes / no answers of respondents by using tools of WHO , 2003 (Henry-Edwards et al. 2003).

Perceived stigma was measured by using a three-item scale Jacoby perceived stigma scale developed originally for another neurological condition, stroke, for which it was shown to have good psychometric properties; and was subsequently adapted for epilepsy and each of the three items requires a simple yes/no response (Jacoby 1994).

Medication non adherence was measured by the Morisky scale 4 items a commonly used, valid and reliable and the Morisky scale assesses patients' forgetfulness about taking medications, carelessness about taking medications, stopping medication when feeling better, and stopping medication when feeling worse (Tesfay et al. 2013).

Liverpool Adverse Events Profile was used to assess AEDs side effects; it was developed in the 1990s by the Liverpool group and the LAEP was used to assess the frequency of AED side effects during the last four weeks and it includes 19 items rated on a 4-point Likert scale with 1) never a problem; 2) rarely a problem; 3) sometimes a problem; and 4) always a problem and total scores range from 19 to 76, with high scores indicating more-frequent symptom reporting (Panelli et al. 2007).

Data Collection Procedures

Data were collected using face to face interview. A standardized questionnaire having 8 parts were translated to Amharic language and local language Tigrigna by psychiatric professionals. Then it was translated back to English by independent person to check for consistency and understand ability of the tool. Six data collectors and two supervisors were recruited from Ayder Comprehensive Specialized Hospital, Mekelle and Adigrat Hospital, who were psychiatric nursing professionals(BSc), and they was taken two days training about data collection and respondent privacy issues.

Data Quality Control

To assure the data quality high emphasis were given in designing data collection instruments; structured and pre-tested questionnaires were used to collect information. The

training was given for data collectors and supervisors by the principal investigator on the methods of data collection for two days. The questionnaire was pretested prior to one week the actual data collection period on 5 % patients of the respondents that were not included in the main survey from Quha Hospital.

Data processing, Analysis, Interpretation and Presentation

The entire Questionnaire was checked for completeness. The data were cleaned, coded and entered into the computer using Epi-data 3.1 version then it was exported to SPSS 20 version statistical software for analysis. Descriptive statistics were used to summarize and present the results. Binary logistic regression was used; the bivariate analysis was used to see the association between dependent and independent variables. Variables that had p-value < 0.2 were entered to multivariate logistic regression to control the confounding factors. The significance was confirmed at p-value < 0.05. To determine an association between dependent and independent variables adjusted odds ratio at 95% CI were confirmed statistically significant.

Ethical Consideration

Ethical clearance was obtained from Ethical Review Board of the University of Gondar and Amanuel Mental Specialized Hospital Ethical Committee to approve this study after discussing the ultimate purpose and method of the study. Written Informed consent was obtained from patients.

RESULTS

Socio-demographic characteristics of the study participants: A total of 416 study participants were interviewed with 99.3% response rate and 248 (59.6%) were male. The mean age of the study participants was 33.19 ± 13.66 years and range from 18 to 85 years.

Clinical characteristics of the study participants: The median age at onset of epilepsy was 17 years, whereas the median duration of the disease was 10 years, and the nearly half of the study participants193 (46.4%) duration of the epilepsy was >= 11 years, followed by 140 (33.7%) were in the range 6-10 years. The median of frequency of seizure attacks was found one times per months.

Substance - related factors: Form the participants, 228 (54.8%) had ever use of alcohol, 13 (3.1%) had ever use of khat, 8 (1.9%) ever use of Tobacco and 5 (1.2%) ever use of cannabis in their life time.

Psychosocial related factors: From the study participants, majority of them 313 (75.2 %) had perceived Stigma. Social support of the study participants 114(27.4%) had poor support, 166 (39.9%) moderate support and 136 (32.7%) strong support.

Prevalence of Depression and Anxiety among patients with Epilepsy: The prevalence of depression among patients with epilepsy was 157 (37.7 %), 95% CI (32.9, 42.5), whereas the prevalence of anxiety among patients with epilepsy was 166 (39.9 %), 95% CI (35.1, 45.0).

Factors associated with depression among patients with epilepsy: By using multivariate logistic regression, individuals having poor social support (AOR = 3.33 , 95 % CI (1.57, 7.03)) was associated with depression, the odds of developing depression among participants who had poor social support was 3.3 times higher as compared to participants who had strong social support. The odds of developing depression among participants who had low monthly income was 2.2 times higher as compared to participants who had high monthly income (AOR = 2.17, 95% CI (1.20, 3.92)). The odds of developing depression was 5 times (AOR =5.01, 95% CI (2.37, 10.59)) higher among participants who had perceived stigma as compared to participants who did not report perceived stigma. Participants who had current use of alcohol (AOR =2.35, 95% CI (1.11, 5.00) was associated with depression, those who had current use of alcohol 2.35 times more likely to develop depression than those who had not report current use of alcohol within the last three months.(Table 1)

Anxiety, depression and associated factors among patients with Epilepsy patients in Ethiopia 2018

Table 1: Bivariate and Multivariate logistic regression analysis of variables associated with depression among patients with epilepsy at Ayder Referral, Mekelle and Adigrat Hospital (n = 416), Tigray, Ethiopia, 2018.

Variables name		Depression		COR (95% CI)	AOR (95% CI)
		Yes	No		
Age in years	18-24	41	81	0.48(0.27, 0.86)	0.98(0.30,3.18)
	25-34	52	104	0.48(0.27, 0.83)	0.61(0.20, 1.83)
	35-44	24	36	0.63(0.32, 1.25)	1.12(0.38, 3.24)
	>= 45	40	38	1.00	1.00
Social support	Poor support	60	54	4.28(2.46, 7.46)	**3.33(1.57, 7.03)****
	Moderate support	69	97	2.74(1.64, 4.61)	**2.69(1.36, 5.33)****
	Strong support	28	108	1.00	1.00
Monthly income	< 735 ETB	100	118	2.24(1.45, 3.46)	**2.17(1.20, 3.92)****
	735-1176 ETB	12	22	1.44(0.66, 3.15)	0.96(0.34, 2.71)
	>= 1176 ETB	45	119	1.00	1.00
Educational status	Cannot write and read	60	63	1.97(1.11, 3.53)	1.06(0.45, 2.54)
	5-10 grades	70	140	1.04(0.60, 1.78)	0.76(0.37, 1.53)
	College and above	27	56	1.00	1.00
Perceived stigma	No perceived stigma	12	91	1.00	1.00
	Perceived stigma	145	168	6.55(3.45, 12.43)	**5.01(2.37, 10.59)****
Medication adherence	Medication adherence	50	135	1.00	1.00
	Medication non adherence	107	124	2.33(1.54, 3.53)	**2.06(1.16, 3.66)****
AEDs side effects	No AEDs side effects	39	158	1.00	1.00
	AEDs side effects	118	101	4.73(3.05, 7.35)	**3.71(2.11, 6.52)****
Frequency of seizure attack per months	0	78	168	1.00	1.00
	2-3 times	53	72	1.585(1.02, 2.47)	0.92(0.46, 1.80)
	>= 4times	26	19	2.947(1.54, 5.64)	1.35(0.52, 3.49)

GTCs numbers over 6 months	No GTCs	39	135	1.00	1.00
	1-8 times	87	87	3.46(2.17, 5.51)	**2.78(1.49, 5.19)**
	>= 9 times	31	37	2.90(1.59, 5.26)	1.23(0.49, 3.04)
Suicide ideation	Yes	43	31	2.77(1.66, 4.64)	1.94(0.99, 3.78)
	No	114	228	1.00	1.00
Chronic medical illness	Yes	17	14	2.13(1.02, 4.44)	1.53(0.58, 4.06
	No	140	245	1.00	1.00
Current use of Alcohol	Yes	29	29	1.797(1.03, 3.14)	**2.35(1.11, 5.00)***
	No	128	230	1.00	1.00
Age at onset of disease in year	< 6	5	15	0.264(0.08, 0.84)	0.28(0.05, 1.51)
	6-11	17	45	0.30(0.14, 0.65)	0.52(0.13, 2.05)
	12-17	46	99	0.369(0.19, 0.71)	0.57(0.17, 1.94)
	18-24	40	47	0.675(0.34, 1.35)	0.98(0.29, 3.33)
	25-34	20	30	0.529(0.24, 1.16)	0.74(0.22, 2.45)
	>= 35	29	23	1.00	1.00
Number of medication	Mono –pharmacy	140	242	1.00	1.00
	Poly –pharmacy	17	17	1.729(0.86, 3.49)	1.01(0.35, 2.92)
Daily dose	<= 200 mg	103	199	1.00	1.00
	201-401 mg	34	40	1.642(0.98, 2.75)	1.54(0.78, 3.02)
	402-602 mg	15	14	2.07(0.96, 4.45)	0.93(0.29, 2.95)
	>=603 mg	5	6	1.61(0.48, 5.40)	1.52(0.30, 7.64)
Seizure control	Uncontrolled seizure	37	16	4.68(2.50, 8.76)	2.27(0.98, 5.24)
	Controlled seizure	120	243	1.00	1.00

Note:$*P < 0.02$, $**P < 0.01$, statistically significant ($p < 0.05$)**,** the p-value of Hosmer and lemeshow goodness of fit test was 0.888.

Factors associated with anxiety among patients with epilepsy: By using multivariate logistic regression, individuals having poor social support (AOR = 4.59 , 95 % CI (2.20, 9.56)) was associated with anxiety, the odds of developing anxiety was 4.6 times higher among participants who had poor

social support than those who had strong social support. The odds of developing anxiety among participants who had epilepsy perceived stigma was 2.4 times higher as compared to participants who did not report perceived stigma (AOR =2.42, 95% CI (1.25, 4.68)). The odds of developing anxiety among participants who had medication non – adherence was 2.77 times (AOR =2.77, 95% CI (1.57, 4.88)) higher as compared to participants who had medication adherence. The odds of developing anxiety among participants who had 2-3 times frequency of seizure attacks per months was 2 times (AOR =2.06, 95% CI (1.07, 3.94)) higher as compared to participants who had free of frequency of seizure attacks per months. The odds of developing anxiety among participants who had side effects of AEDs was 5 times higher as compared to participants who did not report of AEDs side effects (AOR = 4.92, 95% CI (2.83, 8.56)). **(Table 2)**

Table 2: Bivariate and multivariate logistic regression analysis of variables associated with anxiety among patients with epilepsy at Ayder Referral, Mekelle and Adigrat Hospital (n =416), Tigray, Ethiopia, 2018**.**

Variables name		Anxiety		COR (95% CI)	AOR (95% CI)
		Yes	No		
Age in years	18-24	43	79	0.49(0.27, 0.87)	0.57(0.16, 2.03)
	25-34	60	96	0.56(0.33, 0.98)	0.48(0.16, 1.45)
	35-44	22	38	0.52(0.26, 1.04)	0.41(0.14, 1.16)
	>= 45	41	37	1.00	1.00
Marital status	Married	83	101	1.00	1.00
	Single	70	133	0.64(0.43, 0.96)	0.74(0.35, 1.53)
	Divorced and widowed	13	16	0.99(0.45, 2.17)	0.52(0.18, 1.46)
Social support	Poor support	68	46	5.45(3.13, 9.50)	**4.59(2.20, 9.56)****
	Moderate support	69	97	2.63(1.57, 4.38)	**2.33(1.21, 4.49)****
	Strong support	29	107	1.00	1.00
Educational status	Cannot write and read	60	63	1.77(1.00, 3.15)	0.86(0.36, 2.05)
	5-10 grades	77	133	1.08(0.63, 1.83)	0.77(0.39, 1.51)
	College and above	29	54	1.00	1.00
Perceived stigma	No perceived stigma	19	84	1.00	1.00
	Perceived stigma	147	166	3.92(2.27, 6.75)	**2.42(1.25, 4.68)****
	Medication adherence	50	135	1.00	1.00

Medication adherence	Medication non adherence	116	115	2.72(1.79, 4.12)	**2.77(1.57, 4.88)****
AEDs side effects	No AEDs side effects	39	158	1.00	1.00
	AEDs side effects	127	92	5.59(3.59, 8.69)	**4.92(2.83, 8.56)****
Frequency of seizure attack per months	0	75	171	1.00	1.00
	2-3 times	64	61	2.39(1.54, 3.73)	**2.06(1.07, 3.94)***
	>= 4times	27	18	3.42(1.77, 6.58)	**3.04(1.18, 7.80)***
GTCs number over 6 months	No GTCs	46	128	1.00	1.00
	1-8 times	90	84	2.98(1.90, 4.67)	**2.39(1.32, 4.33)****
	>= 9 times	30	38	2.19(1.22, 3.94)	0.62(0.25, 1.49)
Suicide ideation	Yes	45	29	2.83(1.69, 4.75)	1.94(0.98, 3.79)
	No	121	221	1.00	1.00
Chronic medical illness	Yes	16	15	1.67(0.80, 3.48)	1.44(0.56, 3.73)
	No	150	235	1.00	1.00
Age at onset of disease in year	< 6 years	5	15	0.33(0.12, 1.05)	0.87(0.16, 4.80)
	6-11 years	18	44	0.41(0.19, 0.88)	1.18(0.31, 4.63)
	12-17 years	56	89	0.63(0.33, 1.19)	2.12(0.63, 7.03)
	18-24 years	39	48	0.81(0.41, 1.62)	2.04(0.59, 6.98)
	25-34 years	22	28	0.79(0.36, 1.71)	2.19(0.67, 7.11)
	>= 35 years	26	26	1.00	1.00
Number of medication	Mono –pharmacy	148	234	1.00	1.00
	Poly –pharmacy	18	16	1.78(0.88, 3.59)	1.06(0.36, 3.17)
Daily dose	<= 200 mg	112	190	1.00	1.00
	201-401 mg	35	39	1.52(0.91, 2.54)	1.55(0.78, 3.03)
	402-602 mg	15	14	1.82(0.85, 3.91)	0.86(0.27, 2.70)
	>=603 mg	4	7	0.97(0.28, 3.38)	0.50(0.11, 2.41)
Seizure control	Uncontrolled seizure	36	17	3.79(2.05, 7.02)	1.44(0.62, 3.35)
	Controlled seizure	130	233	1.00	1.00

Note: *P <0.03, **P <0.01, statistically significant (p <0.05), the p-value of Hosmer and lemeshow goodness of fit test was 0.956

DISCUSSION

In this study, the prevalence of depression and anxiety among patients with epilepsy was 37.7 % and 39.9 %, respectively.

Prevalence and factors associated with depression among patients with epilepsy

The study showed that the prevalence of depression among patients with epilepsy was 37.7%. The study was in line with the study done in Mexico (42.3%) (Espinola and Sosa 2008), Bulgaria (40.63%) (Viteva 2014), Turkey (34.14%) (Balibey et al. 2015b), Zambia (39.6%) (Evaluation et al. 2014), Nigeria (42%) (Ogunrin and Obiabo n.d.) and Amanuel mental specialized Hospital (32.8%) (Tegegne et al. 2015).

However, in the present study, it was lower than the result reported from the study done in University of Gondar Hospital (45.2%) (Bifftu et al. 2015), the possible reason for the difference in University of Gondar Hospital, the tools were Beck Depression Inventory. The prevalence of this study, it was also slightly higher than the result reported from Cardiff (11.2%) (Mensah et al. 2007), the possible reason for the difference from study done in Cardiff might be due to Study design was community - based study, tool cut off point (HADS score >11) and the sample size also difference, Brazil (24.4%) (Stefanello et al. 2011), the possible reason for the difference from study done in Brazil the Study design was community –based, and sample size was (153) , but in this present study institutional based and sample size was 416, Indian (25%) (Harish Arora 2009), from study done in Indian, might be due to sampling methods was consecutive methods, ICD-10, and sample size (100), but in this present study systematic random sampling technique, HADS and sample size, Arab (27%) (Al-asmi et al. 2012) and Nigerian (28.2%) (Fela-Thomas et al. 2016) from study done in Arab and Nigerian the tools, inclusion criteria ,and sample size are different from the present study.

Regarding the associated factors with depression patients with epilepsy who had poor and moderate social support was associated with depression. Participants who had poor and moderate social support were found to have depression 3.3 and 2.7 times, respectively more likely as compared to patients with epilepsy who had strong social support. This finding was in line with the study done in USA (Reisinger and DiIorio 2009) and Northern Nigeria (Nuhu et al. 2013). The possible reason could be due to irregular nature of seizures, patients with epilepsy tend to avoid social situations (Reisinger and DiIorio 2009).

In this study, having epilepsy perceived stigma was associated with depression, patients with epilepsy who had perceived stigma was found 5 times more likely to develop depression as compared to patients with epilepsy who did not report perceived stigma. This finding was consistent with many previous studies(Tegegne et al. 2015). The possible reason

could be due to Stigma, is it the risk factor for depression from different studies and traditional believes about the disease and lack of support.

People with epilepsy who had medication non –adherence was associated with depression, those who had medication non - adherence was 2 times more likely to have depression as compared to those who had medication adherence. This finding was consistent with previous studies in Korea (Park 2016) and University of Gondar Hospital (Bifftu et al. 2015). The possible reason could be the side effects of drugs, depression and medication non –adherence severity can worsen the problem.

Participants who had Side- effects of AEDS were associated with depression; participants who had side effects of AEDs were 3.7 times more likely to develop depression as compared to people with epilepsy who did not report side effects AEDs. This finding was consistent with many previous studies. The possible reason could be the side effects AEDs (Mensah et al. 2006).

Participants with epilepsy who had 1-8 times GTCs over 6 month's period was associated with depression, those who had 1-8 times GTCs over 6 months periods was found 3 times more likely to have depression as compared to people with epilepsy who had free GTCs over the 6 months periods. This finding was consistent with many previous studies in Italy (Piazzini, Canevini, and Maggiori 2001), Athens (Kimiskidis et al. 2007), and Northern Nigeria (Nuhu et al. 2013). The finding implies that having more GTCs over 6 months is a predictor of depression among people with epilepsy as compared to people with epilepsy who had free GTCs over the 6 months periods.

And also individuals who had current use of alcohol was associated with depression; those who had current use of alcohol was found 2.4 times more likely to develop depression than those who had not report current use of alcohol. This finding was consistent with previous studies (Pham et al. 2017). The possible reason could be alcohol increase the sedative effects of antiepileptic drugs and alcohol can also reduce the effects of Carbamazepine and Phenobarbital.

Patients with epilepsy who had low monthly income was associated with depression, those who had low monthly income was 2 times more likely to have depression as compared to participants who had high monthly income. This finding was consistent with previous studies in Amanuel Specialized Mental Hospital (Tegegne et al. 2015). The possible reason could be due to socioeconomic problems.

Prevalence and factors associated with anxiety among patients with epilepsy

The prevalence of anxiety among patients with epilepsy was 39.9%. Anxiety among patients with epilepsy was in line with the study done in Mexico (38.8%) (Espinola and Sosa 2008), Canada (40.0%) (Pham et al. 2017), and Brazil (39.4%) (Stefanello et al. 2011), Zambia (39.8%) (Evaluation et al. 2014).

However, in the present study, it was lower than the result reported from Bulgaria (71.43%) (Viteva 2014), the possible reason for the difference might be due to tools was Glasgow Anxiety Scale, the study participants were refractory epilepsy and cognitive problems and the sample size were 64, but in this present study HADS, all patients with epilepsy and sample size was 419, and Arab (45%) (Al-asmi et al. 2012), the possible reason for the difference might be due to used two-phase designs, the tools were ICD -10, DSM 4 and HADS and sample size (150). The prevalence of this study, anxiety also slightly higher than from the result reported Germany (19.6%) (Kanner 2011), the possible reason for the difference from study done in Germany might be due to the tools were DSM- IV, consecutive sampling methods, and people with epilepsy 97 were included, Cardiff (20.5%) (Mensah et al. 2007), the possible reason for the difference from study done in Cardiff might be due to Study design was community based study, tool cut off point (HADS score >11) and also India (14%) (Jaiswal n.d.), the possible reason for the difference from study done in India might be due to tools were DSM-IV, Psychiatric Co morbidities and 100 people with epilepsy, but in this study tools was HADS, depression and anxiety only, and 416 people with epilepsy, and also in United Arab Emirates (25.8%) (El et al. 2015), the possible reason for the difference from study done in United Arab Emirates might be due to tools were GAD-7, 18–65 years age inclusion criteria, and 186 patients were included, and Amanuel mental specialized Hospital (33.5%) (Tegegne et al. 2015), the possible reason for the difference might be due to the study participants were included diagnosis of epilepsy and under treatment with one or more antiepileptic drugs at least 6 months and sample size.

Regarding the associated factors with anxiety, patients with epilepsy having poor and moderate social support was associated with anxiety. People with epilepsy who had poor and moderate social support were found 4.6 and 2.3 times, respectively more likely to develop anxiety as compared to people with epilepsy who had strong social support. This finding was consistent with previous studies in Northern Nigeria (Nuhu et al. 2013). The finding implies that, social support was found to be the main predictor of anxiety among people with epilepsy, with those reporting lower levels of social support reporting higher anxiety scores among people with epilepsy.

In this study, having epilepsy perceived stigma was associated with anxiety, patients with epilepsy who had perceived stigma was 2.4 times higher to develop anxiety as compared to patients with epilepsy who did not report perceived stigma. This finding was consistent with previous studies (Tegegne et al. 2015), (Fadare et al. 2018). The possible reason could be perceived stigma is the risk factor for depression from different studies, traditional believes about the disease and lack of social support.

People with epilepsy who had medication non–adherence were associated with anxiety, those who had medication non- adherence was found 2.7 times higher to have anxiety as compared to those who had medication adherence. This finding was consistent with many previous studies. The possible reason could be the Side effects of drugs, traditional believes and treatment and medication non–adherence severity can worsen the problem, then leading them to become anxious.

Participants who had a frequency of seizure attacks per months was associated with anxiety, those who had 2-3 times and >= 4 times frequency of seizure attacks per months was found 2 and 3 times higher to develop anxiety as compared to those who had free of frequency of seizure attacks per months. This finding was consistent with many previous studies (Bifftu et al. 2015). The possible reason could be the frequency of seizure attacks severity, the high frequency of seizure attacks increase anxiety than free frequency of seizure attacks. Those who had 1-8 times GTCs over 6 months periods were found 2.4 times more likely to have anxiety as compared to those who had free of GTCs over the 6 months periods. This finding was consistent with many previous studies in Italy (Piazzini et al. 2001), Athens (Kimiskidis et al. 2007), and Northern Nigeria (Nuhu et al. 2013). The finding implies that having more GTCs over 6 months is a predictor of anxiety among people with epilepsy as compared to people with epilepsy who had free GTCs over the 6 months periods. The possible reason could be the amount and severity of GTCs over 6 months.

People with epilepsy, those who had side - effects of AEDs was associated with anxiety, those who had AEDs side effects in the past 4 weeks was found 5 times more likely to develop anxiety as compared to those who did not report of AEDs side effects. This finding was consistent with many previous studies (Pham et al. 2017). The finding implies that having side effects AEDs increases the risk of having anxiety. The possible reason could be the AEDs side effects severity.

Limitation of the study: This study was a cross-sectional study design, it did not allow establishing a temporal causal - effects relationships between depression and anxiety and significant associated factors.

CONCULSION AND RECOMMODATIONS

The prevalence of depression and anxiety among patients with epilepsy was high. Both depression and anxiety had a statistically significant association with perceived stigma, AEDs side effects, medication non-adherence, poor and moderate social support, and number of GTCs over 6 months. Being lower monthly income and current use of alcohol had a statistically significant association with depression only. A frequency of seizure attacks per months had a statistically significant association with anxiety only. The high rates of anxiety and depression reinforced the need for early recognition and treatment of depression and anxiety in people with epilepsy.

To Tigray Regional Health Bureau, Ethiopia: To reinforce health workers in epilepsy clinics for early recognition and treatment of depression and anxiety in people with epilepsy.

To Ayder Referral, Mekelle and Adigrat Hospital, Tigray, Ethiopia: To work in integration with psychiatric clinics and epilepsy clinics to screen and treat early depression and anxiety among people with epilepsy. Epilepsy clinics better give attention to patients who have epilepsy perceived stigma, AEDs side effects, medication non-adherence, poor and moderate social support, and number of GTCs over 6 months, lower monthly income, high frequency of seizure attacks per months and current use of alcohol. This finding implies high rates of anxiety and depression reinforced the need for early recognition and treatment of depression and anxiety in people with epilepsy.

To researchers: For further research on risk factors of depression and anxiety and its co morbidity should be conducted to strengthen and broaden the current findings. For longitudinal studies to establish the exact causal direction and effects relationships between anxiety, depression and significant associated factors among patients with epilepsy.

Research Statement

Ethical Aproval: The study does not require ethical approval.

Conflict of Interest: The authors declare that there is no conflict of interest for the study.

Financial Support: This study has received no grants from any funding agency in the public, commercial or social-profit sectors.

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