Addis Ababa University, College of Health Science, Department of Neurology, Addis Ababa, Ethiopia

DEPRESSION IN EPILEPSY AND ITS EFFECT ON SEIZURE CONTROL AMONG PATIENTS AT NEUROLOGY REFERRAL CLINIC AT TIKUR ANBESSA SPECIALIZED HOSPITAL AND ZEWDITU MEMORIAL HOSPITAL, ADDIS ABABA, ETHIOPIA

A Thesis Submitted to Addis Ababa University College of Health Science, Department of Neurology in Partial Fulfillment of the Requirements for the Specialty Certificate in Neurology

By

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DECLARATION

I declare that this thesis (Depression in Epilepsy and its Effect on Seizure Control among Patients in Neurology Referral Clinic at Tikur Anbessa Specialized Hospital and Zewditu Memorial Hospital, Addis Ababa, Ethiopia) is my original work. It has not been submitted for a degree or specialty certificate in any other universities and all the materials used in this study have been properly acknowledged.

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STATEMENT OF CERTIFICATION

This is to certify that, I, Dr. Elham Abdulhakim (Neurology Resident) have carried out this thesis research work entitled "Depression in Epilepsy and its Effect on Seizure Control among Patients in Neurology Referral Clinic at Tikur Anbessa Specialized Hospital and Zewditu Memorial Hospital, Addis Ababa, Ethiopia" for the partial fulfillment of the Requirements for the Specialty Certificate in Neurology at Addis Ababa University, College of Health Science, Department of Neurology. This study is original and is not submitted for any degree or specialty certificate in this university or any other universities and is suitable for submission of Specialty Certificate in Neurology.

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Acronyms

AAU-MF	Addis Ababa University-Medical Faculty
AED	Antiepileptic drugs
ANOVA	Analysis of Variance
BDI	Beck Depression Inventory
CBT	Convulsion behavioral therapy
GABA	Gamma- aminobutyric acid
HADS	Hospital Anxiety and Depression Scale
HRSD	Hamilton Rating Scale for Depression
ILAE	International League against Epilepsy
JUSH	Jimma University Specialized Hospital
MINI	Mini International Neuropsychiatric Interview
NaSSA	Noradrenergic and Specific Serotonergic Antidepressant
NDDI-E	Neurological Disorders Depression Inventory for Epilepsy
PHQ-2	Patient Health Questionnaire 2
PHQ-9	Patient Health Questionnaire 9
PWE	People with Epilepsy
SNRI	Serotonin- Norepinephrine Reuptake Inhibitors
SPSS	Statistical Package for the Social Sciences
SSE-SR	Stigmata Scale for Epilepsy Self Report
SSRI	Selective Serotonin Reuptake Inhibitors
TASH	Tikur Anbessa Specialized Hospital
ZMH	Zewditu Memorial Hospital

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Abstract

Background: *Depression is the most frequent comorbid psychiatric disorder in epilepsy. The prevalence is 6-30% in developed countries and reaches approximately 50% in developing countries, including Ethiopia. There is a bidirectional relationship between depression and epilepsy. The seizures themselves or the anticonvulsant drugs can provoke depression in patients with epilepsy. Anti-depression medications can also lower the seizure threshold and provoke seizure.*

Objective: *The study was conducted to assess socio-demographic characteristics and prevalence of depression in epilepsy and its impact on seizure control among epilepsy patients on follow up at Tikur Anbessa Specialized Hospital and Zewditu Memorial Hospital neurology referral clinic.*

Method: *A multi-institutional prospective cross-sectional study design was conducted from June 20, 2020 to October 30, 2020 at Tikur Anbessa Specialized Hospital and Zewditu Memorial hospital epilepsy follow up clinic. A stratified sampling method was used to collect data using a semi-structured questionnaire. The study participants were epilepsy patients who are on anti-epileptic drug treatment during the study period.The questionnaire comprises of basic demographic data, clinical variable and PHQ-9. Data analysis was conducted using SPSS version 25, descriptive statistics were used to describe the characteristics of the study participants. The results were summarized and described using tables. A logistic regression analysis was used to assess the association between seizure control and depression and P value of <0.05 was considered significant.*

Result: *Of the 247 study participants, 128(51.8%) were females. The mean age was 30.7 ± 12.47 years. Co-morbid illness was present in 85(34.4%) with neurological diseases being the commonest. 137 (55.5%) of the respondents were seizure free in previous one year. The prevalence of depression in this study population was 38.1%. Presence of depression and the use of polytherapy was associated with poor seizure control.*

Conclusion: *The prevalence of depression in epilepsy is high. The presence of depression and polytherapy use were significantly associated with poor seizure control.*

Recommendations: *Epilepsy patients should be evaluated for presence of depression using screening tools as it helps in better management of seizure control.*

Keywords: *Depression, epilepsy, and seizure control*

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Epilepsy is a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures, and by the neurobiological, cognitive, psychological, and social consequences of this condition. It affects 65 million people worldwide and is the third most common neurological cause of years lived with disability. Its annual incidence is about 50 cases per 100,000 persons in developed countries and 100–190 cases per 100,000 persons in developing countries (1–5).

Mood disorders are the most frequently encountered psychiatric co morbidities in patients with epilepsy. They are often ignored, unless they are severe enough to cause major problems or disability. This is because of multiple factors, including the patients' reluctance to discuss about mental health issues, lack of specific training of the treating neurologist to recognize these psychiatric co morbidities and a lack of time in very busy clinics to screen for them(2,6–9).

Major depressive disorder is defined as at least five symptoms that have been present during the same two-week period (and at least one of the symptoms must be diminished interest/pleasure or depressed mood). The symptoms include significant weight change or appetite, sleep disturbance, psychomotor agitation, loss of energy, feeling of worthlessness, indecisiveness and suicidal ideation. Depressive disorders can be rated as mild, moderate, or severe(10).

The lifetime prevalence for major depressive disorder is approximately 10% in the general adult population but is estimated at over 17% in patients with epilepsy and even higher in those with drug-refractory focal epilepsy. In Sub-Saharan Africa, estimated prevalence reaches 32.7%. Institution based studies conducted in Ethiopia shows higher prevalence of depression in epilepsy patients reaching up to 49.3% (6,7).

The relationship between depression and epilepsy is not only neurological but also triggered and shaped by socioeconomic factors(8). Several factors have been found to be associated with increased risk of depression in the epileptic population. The factors significantly associated are lower educational status, higher perceived stigmata, female gender, the frequency of seizure, duration of epilepsy and advanced age (11–13). Poly-therapy has also been associated with

depression and epilepsy with significant variation across studies, some finding a significant positive associations and others none (14,15).

Due to under ascertainment of depression in epilepsy, and on the basis that those with epilepsy have increased risk of depression and that there is an independent association of the two disorders, screening for depression is recommended. A number of depression screening tools now exist to facilitate the diagnosis of depression in patients with epilepsy. Selection of the best tool may vary depending on the setting and available resources. There is psychobiological relationship between the seizure type, such as temporal lobe epilepsy and the presence of depression. Pre-ictal, intra-ictal and post-ictal symptoms of epilepsy can simulate as depressive symptoms. For this reason, the DSM-5 criteria for major depressive disorder may not be as robust for detecting depression in those with epilepsy. The most commonly used screening tools, NDDI-E and PHQ-9, are validated, easy to understand, available in many language translations and have greater sensitivity and specificity for detecting depression (1,16). The PHQ-9 has the best balance of sensitivity & specificity and acceptance for screening except some somatic symptoms of depression could overlap with common side effects of antiepileptic medications (17).

Therefore, targeted examination for possible depression can help identify patients who may benefit from medical attention and other therapeutic support. Reliable screening instruments such as PHQ-9 are suitable for the timely identification of patients needing help. Neurologists will be able to identify and manage mild to moderate co-morbid depression or refer to mental health specialists when it is mandatory as in severe and difficult-to-treat cases.

1.2 Statement of the Problem

Depression is the most frequent co morbid psychiatric disorder in epilepsy. Its lifetime prevalence has been estimated between 6% and 30% in population-based studies and up to 50% among patients followed in tertiary centers (18,19). The estimated prevalence in sub-Saharan Africa is 32.7%. In Ethiopia, though few studies were conducted, there is an increased prevalence of depression among epileptic patients ranging from 43.8 % up to 49.3% (7,13,14).

There is a bidirectional relationship between depression and epilepsy. The two disorders share common pathogenic mechanism that facilitates the occurrence of one disorder in the presence of the other. Depression in patients with epilepsy can be provoked by a number factors: the seizures themselves, the anticonvulsant drugs used to treat the seizure and their withdrawal,

epilepsy surgery, and the social consequence of epilepsy have all been linked to development of depression (9,11,12). On the other hand, both antipsychotics and antidepressants can lower the seizure threshold and provoke seizure (13).

Depression leads to underemployment, low rates of marriage, and a greater chance of social isolation when compared to the counterparts(20,21). The high magnitude of depression among people living with epilepsy negatively influences their quality of life and increase suicidal frequency. The risk of suicide has been estimated to be 10 times higher than that in the general population (22,23).Factors such as side effects of AEDs, perceived stigmata, discrimination, joblessness, lack of social support, increased frequency of seizure, and non-adherence to their medications have contributed to inducing depression among epileptic patients (24).

Studies have also revealed that a history of depression is associated with a 4- to 6-fold greater risk of developing epilepsy. Despite its relatively high prevalence, depression remains unrecognized and untreated, and unfortunately its treatment is based on empirical and uncontrolled data (25–27).

In Ethiopia, the few studies conducted addresses the prevalence of depression in epilepsy, early recognition of depression and the risk factors associated with and contributing to increased occurrence of depression among epileptic patients. Despite the association between depression and epilepsy and its burden & consequences, there is limited literature on the magnitude of depression and associated factors in people with epilepsy in the study area (7,13,14,28).

Therefore, this study is intended to fill the gap by assessing the socio-demographic characteristics, prevalence of depression in epilepsy, and its effect on seizure control among patients at neurology clinic follow-up. In addition, it will also help to established protocols to timely diagnose depression in epileptic patients, to assess factors that adversely affect the epilepsy management by identifying those epileptic patients who are at increased risk of morbidity and mortality with co morbid depression.

1.3 Objectives of the Study

1.3.1 General Objective

To determine the prevalence and impact of depression among epilepsy patients on follow up at TASH and ZMH Neurology Referral Clinic.

1.3.2 Specific Objectives

- To determine the most common type of epileptic seizure among patients at TASH & ZMH Neurology Referral Clinic
- To determine sociodemographic characteristics of epilepsy patients at TASH & ZMH Neurology Referral Clinic
- To determine type of AED taken by epilepsy patients at TASH & ZMH Neurology Referral Clinic
- To identify other factors associated with seizure control

1.4 Significance of the Study

This study will provide information about the prevalence of depression among epilepsy patients at Tikur Anbessa Specialized Hospital (TASH) and Zewditu Memorial Hospital (ZMH) neurology referral clinic and will also assess the impact of depression in the management and control of seizure.

As to the knowledge of the investigator, there are no studies conducted in Ethiopia addressing the effect of depression on seizure control and on the management of epilepsy. The finding will also be used as a basis for designing a standard protocol for early screening & management of depression in epilepsy patients and also identify factors associated with poor treatment outcome that improves the quality of healthcare, decrease hospital cost, morbidity and mortality.

1.5 Scope of the study

The study was conducted in TASH and ZMH which are located in Addis Ababa, Ethiopia. TASH was opened in 1972 and is currently run under Addis Ababa University. It is the largest referral hospital in the country and the main teaching hospital for both clinical and preclinical training of most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation. There are various departments, faculties and residents under specialty training in the School of Medicine and provide patient care in the hospital.

The neurology department currently has 17 consultants who provide clinical services on a daily basis along with nurses, interns, residents and other supporting staffs. There are 16 beds allocated for neurology patients. It used to provide outpatient clinical services to neurologic

patients at Zewditu Memorial hospital until early this year where the study was also conducted. Zewditu memorial hospital is in the centre of Addis Abeba, has more than 300 inpatient beds, and has outpatient speciality clinic indifferent fields of medicine which includes neurology referral clinic run by 3 neurologists. The outpatient clinic works in weekdays and seizure clinic is active once weekly. On average, the flow of epilepsy patients on follow up at the seizure clinic is 1800 per year.

1.6 Definition of Operational Terms

- **Epilepsy**: Two unprovoked seizure occurring >24hrs apart, one unprovoked seizure with risk of recurrence (60%) over next 10 years, diagnosis of epilepsy syndrome(1).
- **Depression**: A score of ≥ five on a scale 1-27 as measured using Patient Health Questionnaire 9 (PHQ-9) assessment (29).
    - **Mild depression:** Score of 5-9 on PHQ-9
    - **Moderate depression:** Score of 10-14 on PHQ-9
    - **Moderately severe depression:** Score of 15-19 on PHQ-9
    - **Severe depression:** Score of 20-27 on PHQ-9
- **Polytherapy:** Appropriately chosen and dosed two or more AEDs.
- **Seizure control** (30)
    - **Good control**:
        - Total absence of seizure activity over the past one-year period.
    - **Poor control**:
        - The presence of new seizure activity during the last one-year period

CHAPTER TWO: LITERATURE REVIEW

Epilepsy is a brain disorder characterized by recurrent interruptions of brain activities called epileptic seizures. It is not a singular disease entity but a variety of disorders reflecting underlying brain dysfunction that may result from many different causes. Seizure classification starts with whether the initial manifestations of the seizure are focal or generalized. If the onset of the seizure is missed or is unclear, the seizure is of unknown onset (1,5).

The goal of therapy in patients with epileptic seizures is to achieve a seizure free status without adverse effects. Medical treatment is the standard of therapy for epilepsy and seizure control is accomplished in more than 60% of patients who require treatment with anticonvulsants. Poly-therapy has also been associated with depression and epilepsy with significant variation across studies. Though most of the people with epilepsy can become seizure-free with the optimal use of drug therapy, the treatment outcome in the majority of epileptic patients remains unsatisfactory in resource limited countries (6,15,25,27,31,32).

Poorly controlled seizure leads to impairment of quality of life, excessive bodily injury, neuropsychological impairment, social stigma, reduced marriage rates, poor education, reduced employment levels, and finally shortened lifespan(21).

There is a bidirectional relationship between depression and epilepsy. Depression may decrease treatment adherence, increase the risk of suicide, interfere with self-management, and diminish quality of life in those with epilepsy(2,7,22).

Psychiatric comorbidities are more common in PWE than the general population without epilepsy. The coexistence of depression and epilepsy has significant impact in the quality of life in PWE. There is an increased risk of stigmatization due to the psychosocial consequences of the seizure. Suicidality is also increased in PWE in the presence of comorbid depression (2,20,28).

Studies also show that depression imposes a negative impact on seizure control. Clinically depressed patients with epilepsy report higher perceived severity and bother from seizure. In

one study, major depression was associated with six fold increased risk in unprovoked seizure(33).

There are several screening tools designed for early detection of depression among epilepsy patients and their reliability has been assessed by several studies. Although selection of the best tool may vary depending on the setting and available resources, the optimal tool to screen for depression is not well established. The NDDI-E score was found to have higher specificity while the PHQ-9 is more sensitive for detecting major depressive disorders in PWE, especially in outpatient settings(16,29,34).

A systematic review and meta-analysis study conducted among epileptic patients in Sub-Saharan Africa shows that the pooled estimated prevalence of depression in epilepsy was 32%. Further regional sub-group analysis form this meta-analysis shows that the prevalence is even higher in East Africa. The odds of depression among epileptic patients receiving polytherapy were higher than in those receiving monotherapy(9,35).

In Ethiopia, though there is institutional variation, general tonic-clonic seizure was the dominant seizure type in epileptic patients. Patients are usually on single antiepileptic medications and phenobarbitone was the commonly prescribed drug in the majority of cases. Two cross sectional studies conducted in Ethiopia showed that there is a high prevalence of depression among epileptic patients. The presence of epilepsy-related perceived stigmata, polytherapy of anticonvulsants, high seizure frequency, and low educational status were found to be predictors of depression among subjects with epilepsy(7,11–13,25,36).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

Multi-institution cross-sectional study design was used among epilepsy patients at Tikur Anbessa Specialized Hospital and Zewditu Memorial Hospital seizure clinic from June 20, 2020 to October 30, 2020.

3.2 Sampling Design

3.2.1 Population of the Study

Epilepsy patients on follow up at TASH & ZMH seizure clinic from June 20 – October 30, 2020 as the population of the study.

3.2.2 Target Population

Eligible patients' on follow up at TASH & ZMH seizure clinic from June 20, 2020 to October 30, 2020.

3.2.2.1 Inclusion Criteria

- Patients with confirmed diagnosis of epilepsy.
- Age ≥ 16 years
- Patients willing to give informed consent

3.2.2.2 Exclusion Criteria

- Patients who are below the age of 16 years
- Patients not willing to give informed consent

3.2.3 Sample Size

The sample size for the study was determined using a formula;

$n = \frac{(Z\alpha/2)^2 P(1-p)}{d^2}$ Where: n = required sample size

Z α/2= Critical value=1.961.

p= 50%. P-value is taken as 49.3% was taken from a similar study published in our country (Spina & Perucca, 2002); whereas d= precision (marginal error) =0.05

Therefore: $n = \frac{(1.96)^2(0.49X0.51)}{(0.05)^2} = 384$

Since the study population is less than 10,000 the final sample size was determined by the formula $nf = \frac{n}{[1 + n/N]}$; where nf = Final Sample Size

$nf = \frac{384}{[1 + 384/860]} = 265$

Hence, the data was designed to be collected from 265 epilepsy patients from TASH & ZMH seizure clinics.

3.2.4 Sampling Techniques

Stratified sampling method was utilized for selecting the focused patients from the two seizure clinics of TASH & ZMH.

Table 1: Proportionate Stratified Sample

S.N	List of Stratum	Total Strata Size	Proportionate Sample Size
1	TASH seizure clinic	540	$\frac{265*540}{860} = 166$
2	ZMH seizure clinic	320	$\frac{265*320}{860} = 99$
	Total Sample Size	**860**	**265**

3.3 Sources of Data collection tool and procedure

Data was collected from epilepsy patients who were on follow up at TASH and ZMH neurology referral clinic from June 20, 2020 to October 30, 2020 via face-to-face & phone interview using semi-structured questionnaire. The questionnaire is composed of three main parts to accomplish the aim of the research. A total of (29) question was prepared. The questionnaire was prepared by both English & Amharic language as indicated in appendix A here within this document.

3.1 Methods of Data Analysis

The collected data was entered into a computer and analyzed using Statistical Package for Social Science (SPSS) version 25. Descriptive statistics (frequencies, tables, percentage, means and standard deviation) were used to describe the results. A P-value < 0.05 was considered statistically significant. For clinical correlation and practical understanding, logistic regression analysis was also conducted after dichotomization of data. Results were presented using word and tables.

3.2 Ethical Consideration

The researcher addressed ethical considerations of confidentiality and privacy throughout the research process. Respondents were assured that their names will not be revealed in the questionnaire and the research report. Moreover, the participants were given a verbal and written description of the study, and informed consent was taken before the survey. Participation in the study was held through only voluntarily and they were assured that the responses would only be used for the purpose of this study.

CHAPTER FOUR: Results

There were a total of 265 questionnaires (having 29 questions) filled in person and phone and 247 were filled and returned giving a response rate of 93%.

Table 2: The response rate across each stratum in the two hospitals

No.	Stratum	Total Strata Size	Proportionate Sample Size	No. of Respondents	Response Rate
1	TASH	540	166	157	95%
2	ZMH	320	99	90	91%
	Total	**860**	**265**	**247**	**93%**

4.1 Socio-Demography of Patients

Out of the 247 patients, more than half (51.8%) of them were female. The age of patients ranges from 16-78 years. However, most patients (38.5%) were in the age group of 15 – 24 years and 25 – 34 years (30.8 %). From this data, we can conclude that most of epilepsy patients in the two hospitals are in the age group of 15 – 44 years with a cumulative share of 86.3%.

Among all epileptic patients, majority (88.3%) live in urban setups. Nearly a third (61.1%) of the study participants were never married. On the other hand, 5.7% of the patients are divorced/separated and widowed. More respondents (40.9%) have completed secondary school; and 13.4% of the patients have not passed through any formal education.

Most (64%) have no income and are dependent on others. Least percentage of patients (6.9%) have a monthly income of above 6,000 Birr. More than half (65%)are unemployed. Among the employed (35%), the highest share (43%) are engaged in professional job. With respect to the unemployed patients, 38% of the patients are currently student. Whilst, least share of patients (4%) are retired.

Table 3: Sociodemographic Information of Patients with epilepsy in TASH & ZMH between June & October,2020

Variable	Category	Frequency	Percent
Gender	Male	119	48.2
	Female	128	51.8
Age Group	15 – 24 Years	95	38.5
	25 – 34 Years	76	30.8
	35 – 44 Years	42	17.0
	45 – 54 Years	18	7.3
	Above 55 Years	16	6.5
Place of Residency	Urban	218	88.3
	Rural	29	11.7
Marital Status	Married	82	33.2
	Never Married	151	61.1
	Divorced/Separated	12	4.9
	Widowed	2	0.8
Education Level	No Formal Education	33	13.4
	Primary Education	53	21.5
	Secondary Education	101	40.9
	More than Secondary Level	60	24.3
Income Category	No Income	158	64.0
	< 2,000 Birr	23	9.3
	2,001 – 4,000 Birr	31	12.6
	4,001 – 6,000 Birr	18	7.3
	Above 6,000 Birr	17	6.9
Employment Status	Employed (Professional)	37	15.0
	Employed (Skilled)	18	7.3
	Employed (Unskilled)	29	11.7
	Employed (Agriculture)	3	1.2
	Unemployed (House Wife)	36	14.6
	Unemployed (Retired)	6	2.4
	Unemployed (Out of Job)	58	23.5
	Unemployed (Student)	60	24.3

4.2 Clinical Data of Patients

Majority (91.1%) of epilepsy patients are free from psychiatric illness whilst the remaining 8.9% of the patients has history of psychiatric illness.

The average duration of being epileptic patient is 8 years. Least number of patients (6.9%) have been diagnosed with epilepsy for less than or equal to 1 year.

The study also revealed that more than half (65.6%) of the patients don't have any co-morbid illness. On the other hand, 9.3% of the patients have other co-morbid illnesses such as CHF, CKD, diabetes, and other illness.

Table 4: Clinical Data of Patients with epilepsy in TASH & ZMH between June & October,2020

Variable	Category	Frequency	Percent
Family History of Psychiatric Illness	Yes	1	0.4
	No	246	99.6
Epilepsy Duration	Less than or equal to 1 year	17	6.9
	2 – 5 years	91	36.8
	6 – 10 years	90	36.4
	Greater than 10 years	49	19.8
Co-morbid Illness	Neurologic	27	10.9
	Psychiatric Illness	22	8.9
	HIV	26	10.5
	HTN	9	3.6
	Others	23	9.3
	None	162	65.6

From the total of 247 study participants, 68.4%of the patients were treated with monotherapy of AEDs and 70(28.3%) and needed dual therapy. Triple therapy was used only in eight (3.28%). Regarding the number of AEDs, from a total of 333 prescribed AED drugs, phenobarbitone accounted for about 258 (45.4%), followed by phenytoin, 85 (38.5%); and valproate, 70 (28.3%). The type of antiepileptic drugs which were prescribed in the study are presented in Table 4.5.

Table 5: Antiepileptic therapy of Patients with epilepsy in TASH & ZMH between June & October, 2020

Therapy type	Number (%)	AED	Number (%)
Single AED	169 (68.4)	Phenobarbitone	66 (26.7)
		Phenytoin	39 (15.8)
		Carbamazepine	35 (14.2)
		Lamotrigine	4 (1.6)
		Valproate	25 (10.1)
Dual AEDs	70 (28.3)	Phenytoin + phenobarbitone	16 (6.5)
		Phenobarbitone + Valproate	15 (6.1)
		Carbamazepine + phenobarbitone	11 (4.5)
		Carbamazepine + valproate	9 (3.6)
		Phenytoin + valproate	13 (5.3)
		Phenytoin + carbamazepine	4 (1.6)
		Lamotrigine +carbamazepine	2 (0.8)
Triple AED	8 (3.2)	Phenytoin + carbamazepine + valproate	4 (1.6)
		Phenobarbitone + phenytoin + valproate	4 (1.6)

4.3 Descriptive Analysis of Seizure Type and Seizure Control

As indicated in table 4.6, among the 247 patients, generalized tonic clonic seizure was the most frequent seizure type accounting for 55.5%.

Table 6: Frequency of Seizure type of Patients with epilepsy in TASH & ZMH between June & October, 2020

Variable	Frequency (%)	Category	Frequency	Percent
Focal Seizure	90 (36.5)	Simple (Partial) Seizure	32	35.6
		Complex Partial	32	35.6
		Focal with sec gen.	26	28.9
Generalized Seizure	141 (57.1)	Tonic-Clonic	137	97.2
		Myoclonic	1	0.7
		Absence	3	2.1
Unclassified	16 (6.5)			

As indicated in table 4.7, 55.9% of patients were seizure free in the previous year.

Table 7: Frequency of Seizure Control of Patients with epilepsy in TASH & ZMH between June & October, 2020

Variable	Category	Frequency	Percent	Cumulative Percent
Seizure Control	Seizure Free	138	55.9	55.9
	1 – 5 Seizure	82	33.2	89.1
	Greater than 5 Seizures	27	10.9	100.0

The Prevalence of Depression

The prevalence of depression in this study was 38.1% though the level of severity varies across the patients. The result of the study indicates that majority of the patients with depression (21.9%) have mild depression. The score of depression ranges from 0 to 22, and the mean of the depression level is found to be 7(Table 8 and table 9).

Table 8: Frequency of PHQ-9 parameters of Patients with epilepsy in TASH & ZMH between June & October,2020

Variable	Category	Frequency	Percent
Little interest or pleasure in doing things	Not at all	145	58.7
	Several Days	53	21.5
	>half the days	30	12.1
	Nearly Everyday	19	7.7
Feeling down, depressed, or hopeless	Not at all	87	35.2
	Several Days	87	35.2
	>half the days	49	19.8
	Nearly Everyday	24	9.7
Trouble falling or staying asleep, or sleeping too much	Not at all	108	43.7
	Several Days	72	29.1
	>half the days	37	15.0
	Nearly Everyday	30	12.1
Feeling tired or having little energy	Not at all	92	37.2
	Several Days	70	28.3
	>half the days	32	13.0
	Nearly Everyday	53	21.5
Poor appetite or overeating	Not at all	126	51.0
	Several Days	57	23.1
	>half the days	41	16.6
	Nearly Everyday	23	9.3
Feeling bad about yourself or that you are a failure or have let yourself or your family down	Not at all	132	53.4
	Several Days	70	28.3
	>half the days	18	7.3
	Nearly Everyday	27	10.9
Trouble concentrating on things, such as reading the newspaper or watching television	Not at all	133	53.8
	Several Days	87	35.2
	>half the days	9	3.6
	Nearly Everyday	18	7.3
Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual	Not at all	156	63.2
	Several Days	52	21.1
	>half the days	19	7.7
	Nearly Everyday	20	8.1
Thoughts that you would be better off dead or of hurting yourself	Not at all	176	71.3
	Several Days	50	20.2
	>half the days	4	1.6
	Nearly Everyday	17	6.9

Table 9: Category of Depression Score of Patients with epilepsy in TASH & ZMH between June & October,2020

Category	Frequency	Percent
No Depression (0-4 Score)	153	61.9
Mild Depression (5 – 9 Score)	54	21.9

Category	Frequency	Percent
Moderate Depression (10 – 14 Score)	27	10.9
Moderately Severe Depression (15 – 19 core)	10	4.0
Severe Depression (20 – 27 Score)	3	1.2
Total	247	100

The following tables show the sociodemographic & clinical data of patients with depression

Table 10: Sociodemographic data of Patients with epilepsy with depression in TASH & ZMH between June & October, 2020

Variable	Category	Epilepsy patients with depression
		Frequency(%)
Gender	Male	40(16.2)
	Female	54(21.8)
Age Group	15 – 24 Years	42(17)
	25 – 34 Years	28 (11.4)
	35 – 44 Years	16 (6.5)
	45 – 54 Years	3(1.2)
	Above 55 Years	5(2)
Place of Residency	Urban	85 (34.4)
	Rural	9 (3.6)
Marital Status	Married	20 (8.1)
	Never Married	69 (27.9)
	Divorced/Separated	5 (2.1)
	Widowed	-
Education Level	No Formal Education	12 (4.9)
	Primary Education	22 (8.9)
	Secondary Education	46(18.6)
	More than Secondary Level	14 (5.7)
Income Category	No Income	69 (28)
	< 2,000 Birr	7 (2.8)
	2,001 – 4,000 Birr	11 (4.4)
	4,001 – 6,000 Birr	3 (1.2)
	Above 6,000 Birr	4 (1.6)
Employment Status	Employed (Professional)	9 (3.6)
	Employed (Skilled)	6 (2.4)
	Employed (Unskilled)	10 (4)
	Employed (Agriculture)	-
	Unemployed (House Wife)	9 (3.6)
	Unemployed (Retired)	3 (1.2)
	Unemployed (Out of Job)	30 (12.1)
	Unemployed (Student)	27 (10.9)

Table 11: Clinical data of Patients with epilepsy with depression in TASH & ZMH between June & October, 2020

Variable	Category	Epilepsy patients with depression
		Frequency(%)
Family History of Psychiatric Illness	Yes	1 (0.4)
	No	93 (37.7)
Epilepsy Duration	Less than or equal to 1 year	7 (2.8)
	2 – 5 years	27 (10.8)
	6 – 10 years	34 (13.8)
	Greater than 10 years	26 (10.5)
Co-morbid Illness	Neurologic	10 (4.0)
	HIV	6 (2.4)
	HTN	6 (2.4)
	Psychiatric Illness	16(6.5)
	None	64 (25.6)

4.4 Regression analysis of depression and seizure control

As shown in the above table, the binary regression analysis shows that the presence of depression and the use of polytherapy were the only two variables with statistically significant negative impact on the seizure control (P-value: 0.00, AOR (95%CI) = 0.297[0.165-0.537] and, P-value:0.000, AOR (95% CI) = 0.326 (0.174- 0.612, respectively).

Table 12: Binary logistic regression analysis of baseline sociodemographic and clinical characteristics of epilepsy patients with seizure control for patients at ZMH and TASH, June-October 2020 G.C. (n = 247)

					95% C.I.for EXP(B)	
		B	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Mean age	.288	.396	1.333	.687	2.589
	Employed	-.002	.998	.998	.312	3.193
	Illetrate	.333	.453	1.396	.584	3.334
	Polytherapy	-1.120	.000	.326	.174	.612
	Mean duration of epilepsy	-.342	.255	.711	.394	1.280
	Married	.340	.319	1.405	.720	2.743
	Drug discontinuation	-.887	.073	.412	.156	1.087
	Mean incomes	-.561	.375	.571	.165	1.969
	Depression	-1.213	.000	.297	.165	.537
	Constant	1.373	.057	3.949		

CHAPTER FIVE –DISCUSSIONS

There were a total of 247 study participants who were on seizure clinic follow up at Tikur Anbessa Specialized hospital and Zewditu memorial hospital during the study period. In this study, there were more female (51.8%) than men and the mean age (SD) was 30 (±12.47) years. Higher number of patients (38.5%) belong to 16-24 years' age group. Urban residence accounted for 88.3% study group and majority 81% were living with family and relatives. Comorbid illness was apparent in 34.4% of the study population with neurological disease 28.5% being the commonest. There were also 22 patients with psychiatric illness and all, except three patients, were on anti-psychiatric medications.

Generalized tonic clonic seizure accounted for 55.5% of the study population and 68% of patients were on monotherapy. About 27% of patients experienced at least one seizure attack during the previous one-month period and 55.5% of patients were seizure free during the prior one-year period. 11.7% of patients had discontinued antiepileptic medications and financial issue was reported as a main reason for discontinuation in majority of them. The prevalence of depression was 31.8%.

The prevalence of depression in epileptic patients is high in a study conducted in southwest Ethiopia & the prevalence in our study was similar to the findings of the study conducted at Amanuel hospital which also showed similar results. The low price and availability at governmental pharmacy might explain the increased use of phenobarbitone and phenytoin. In our study, assessment of seizure control during the previous year showed majority (55.5%) of the respondents were seizure free. Compared to previous studies conducted in Ethiopia which showed higher incidence of depression among epileptic patients, our study showed 38.1% patients falling in this category. Possible reasons include higher educational status and also the higher percentage of patients who were seizure free.

Assessment of association using logistic regressions showed that the presence of depression was associated with poor seizure control.

CHAPTER SIX –CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

6.1Conclusions

Based on the result of the study the prevalence of depression in epilepsy was 38.1% which is significant considering the impact of each in patients' health. The factors associated with poor seizure control were the presence of depression and the use of more than one antiepileptic drugs. Early recognition and treatment of depression through routine use of screening tools should become an integral part of epilepsy follow up and management.

6.2 Recommendations

- Newer antiepileptic drugs should be available since they have lesser side effect and better efficacy
- All epileptic patients should be screened for the presence of depression using a depression screening tool
- A social support system should be established and be actively involved in the management of epilepsy patients
- In future there should be prospective cohort study with more study participants and sites to fill the gaps seen in this study.

6.3 Limitations of the Study

- The study did not assess the etiology of the epilepsy as factor affecting seizure control
- Larger sample sizes were not analyzed due to the time limitation of the study
- Patient flow was reduced due to the current COVID-19 pandemic so telephone service was used as a means to incorporate remaining samples which might affect the quality of the data
- Patients adherence to treatment were assessed simply using yes or no questions which might not truly address non-adherence

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