Common mental disorders and its determinants among epileptic patients at an outpatient epileptic clinic in Felegehiwot Referral Hospital, Bahirdar, Ethiopia: cross-sectional study

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Abstract

Background: Epilepsy is a chronic neurological condition that is highly predisposed to a variety of mental health problems due to its huge biological, social and psychological burdens. Despite this, there is a paucity of research in this area. Therefore, assessing common mental disorders and its determinants among epileptic patients would be of great importance.

Objective: This study was aimed to assess prevalence and associated factors of common mental disorders among people with epilepsy attending Felegehiwot Referral Hospital, Bahirdar, Ethiopia, 2019.

Methods: Institutional based analytic cross-sectional study design was utilized from January to February 2019 at Felegehiwot Referral Hospital among 422 epileptic patients who were diagnosed clinically and on follow up treatment. Systematic random sampling was applied to recruit participants. Interviewer based and pretested Self Reporting Questionnaire-20 was used to screen common mental illness with a cut-off point 7 and above as having a common mental disorder. Bivariate and multivariable logistic regression analysis with 95% CI were computed and variables with p < 0.05 in the final model were considered as associated factors for common mental disorders.

Result: Four hundred twenty-two patients with epilepsy were included in our study with a response rate of 100% and 64.5% were males. The mean age of participants was 59 ± 13.37 years. Common mental disorder among epileptic patients was found to be 35.8%. There was a statistically significant association between marital status, comorbid medical illness, nicotine dependence, alcohol misuse, and medication non-adherence with common mental disorders at p < 0.05.

Conclusion: The prevalence of common mental distress was high (35.8%) suggesting that it is a public health issue. Marital status, comorbid medical illness, nicotine dependence, alcohol misuse, and medication non-adherence were the factors having an association with a common mental disorder. Therefore, early screening and recognition of mental distress symptoms should be a routine activity while managing epileptic patients.

Keywords: Common mental disorders, Factors, Epilepsy, Ethiopia
Background

Epilepsy is defined as a neurological condition that is characterized by two or more unprovoked seizures according to the international league against epilepsy [1]. It is a chronic neurological condition estimated to affect 50 million people worldwide according to WHO [2]. Despite the worldwide prevalence of active epilepsy varies from 0.2 to 4.1% [3], higher prevalence and incidence are from low and middle-income countries (LMICs) when compared with developed countries [4, 5]. In fact, more than 85% of the global burden of epilepsy occurs in people living in LMICs [6, 7]. Epilepsy poses a multidimensional effect on the body like physical, mental and behavioral functions limitations and is associated with great risk of premature mortality due to factors like a traumatic injury to the brain, status epilepticus, suicide, pneumonia and sudden death [8, 9].

Common mental disorders define a range of anxiety and depressive disorders. Globally, 150 million individuals are affected by depression and 1 million commit suicide every year. Four of the top six causes of years lived with disability are due to neuropsychiatric disorders and more than 90 million suffer from alcohol or other substance use disorders [10, 11]. Projections to 2030 indicate that depression will be the leading cause of disability globally accounting for 6% of all [12]. The global rate of prevalence for depression ranges from 3.6 to 5.4% in the Western Pacific and African Region respectively. Whereas, anxiety disorders, rates from 2.9% in the Western Pacific Region to 5.8% in the Region of the Americas [13].

Studies done reported that a high prevalence of psychiatric disorders in people with epilepsy [14–16] and a higher risk of psychopathology compared with the general population or people with chronic non-neurological disorders [17]. Most (88%) of the patients experienced psychiatric disturbances and the most common psychiatric symptoms were neurovegetative (62%), anxiety (45%), and depression (43%), cognitive difficulties 82% [18]. Other studies showed that the prevalence of psychiatric disorders was 70% in Brazil [19], 25% for anxiety disorders, 19% for mood disorder in Dutch [20], 5.9% in Sweden [21], 52% in Iceland [22], 34.2% for mood disorder and 22.8% for anxiety [14], 50% of patients with epilepsy in United States [23].

Risk factors for common mental disorders among epileptic patients were family history of psychiatric illness [24], comorbidity of medical condition [25], being female, young age, lower-income, worse QOLIE-89 scores, more adverse drug events, unemployment [26], high seizure frequency, and low educational status in southwest Ethiopia [27], duration of illness, seizure frequency, poly-pharmacy, difficulties of adherence to antiepileptic drugs in northwest Ethiopia [28].

Common mental disorders reduce health-related quality of life (HRQOL) in patients with epilepsy [29, 30]. Comorbid depression in epileptic patients had socio-economic and physical consequences like disability in the social domain, cost of drug use and premature death [31, 32]. In addition, it affects the cognitive function of epileptic patients especially if they are not treated early or timely with the antiepileptic drug [33] and common mental disorder increases the risk of developing adverse effects of anti-epileptic medications [34]. Besides, antiepileptic drugs have a psychotropic effect that affects the brain negatively [35]. Moreover, the suicide rate in epilepsy is five times higher and depression will be a risk factor for seizure [36].

Despite this, there is a paucity of research into this area, especially in the Ethiopian context. Even those studies have done so far focused mainly on a specific mental disorder like depression. As per the investigators’ knowledge, there is no study done regarding the prevalence and associated factors of common mental disorders among epileptic patients in the study area.

Therefore this study was aimed to assess common mental disorders in epileptic patients and its associated factors, which would fill the gap in information by generating updated information and services as baseline evidence for future researchers and policymakers.

Methods and materials

Study design and setting

Institution based analytical cross-sectional study was implemented at Felegehiwot Referral Hospital, Bahirdar, Ethiopia from January to February 2019. This study was conducted at the Epileptic clinic of Felegehiwot Referral Hospital. The hospital is located in Bahirdar; which is the Capital City of the Amhara Region. The hospital services a catchment population of more than 5.5 million people [37].

Study participants

Participants were all epileptic patients registered for follow up of anti-epileptic medication in the Epileptic clinic of Felegehiwot Referral Hospital and as evidenced from the registration book, more than 3150 patients have a history of follow up for epilepsy in the clinic. On average 225 epileptic clients visit the clinic weekly so that the total number of epileptic patients estimated to attended follow up during the data collection period is 900. The optimal size of the sample had been calculated using a single population proportion formula; by taking the prevalence of common mental disorder 49.3% from a study conducted...
Respectively on 8-Item Morisky medication adherence scale [42–45]. Social support as assessed by Oslo-3 social support scale Poor social support, Moderate social support, and Good social support were operationalized at cut-off points 3–8, 9–11, and 12–14 points [46].

Data quality assurance

The questionnaire was pre-tested on 22 (5%) of the sample at Borumeda hospital 1 week before the actual data collection period. Data was collected by BSc psychiatry nurses after adequate training was given about research aims, procedures, and ethical issues. The collected questionnaire was checked for clarity, consistency, and completeness by the investigators every day and necessary corrections were made before the start of the next day’s work. Double data entry was done for reliability and correctness and computer data cleaning was undertaken.

Data processing, analysis, and interpretation

Epi-info version 7, was used as a data entry tool and the Statistical Packages for Social Sciences version 20 (SPSS-20) was utilized to analyze data after it was exported. Descriptive statistics (percentages, mean, median, standard deviation and crosstabs) were utilized to summarize common mental disorder and its predictor variables. A logistic regression model was fitted to assess potential risk factors for a common mental disorder. Variables with p value <0.25 in bivariate analysis were pooled into multivariable logistic regression. Odds ratio with 95% CI was employed to measure the strength of association and statistical significance was set at a p-value of <0.05 in the final model.

Result

Socio-demographic characteristics of the respondents

A total of 422 patients with epilepsy on follow-up treatment and evaluations at Felegehiwot Referral Hospital participated in the study with a response rate of 100%. The mean age of the participants was 30.7 years, with a Standard Deviation of 10.28 years and most of, 120 (28.4%) were between the age of 25–34 years. More than half (55.2%) of the respondents were males. A higher proportion (67%) of alcohol misuse was assessed using CAGE 4 items questions which had a score of 0–4 and with sensitivity 0.71 and specificity 0.90 at a cutoff point ≥ 2 [55] and used in several previous studies [56–59] for screening people who have problem drinking.

Nicotine dependence was assessed by Fagerstrom Test, a score ≥ 1 indicates tobacco use problem reliability coefficient(a) = 0.8 [41]. Morrisk-8 medication adherence scale was used to asses adherence to medication: low-adherence if a score is <6, medium adherence if a score is 6 and 7, and high adherence if a score is 8 on 8-Item Morisky medication adherence scale [42–45]. Social support as assessed by Oslo-3 social support scale Poor social support, Moderate social support, and Good social support were operationalized at cut-off points 3–8, 9–11, and 12–14 points [46].

Operational definitions

Common mental disorder A score ≥ 7 on Self-reporting questionnaires SRQ-20 [39].

Epilepsy In this study, epilepsy refers to a neurological condition characterized by two or more unprovoked seizures [1].

Ever substance use use of a specified substance for non-medical purposes at least once in their lifetime. Alcohol use problem: For alcohol use disorders CAGE was used which had a score of 0–4 and cutoff point 2 [40].

Adherence to medication adherence was considered as low, medium and high with a score <6, 6 and 7, and 8 respectively on 8-Item Morisky 8-item medication adherence scale [42–45].

Social support Poor social support, Moderate social support, and Good social support were operationalized at cut-off points 3–8, 9–11, and 12–14 points respectively on the Oslo-3 social support scale [46].

Data collection procedure

Questionnaires prepared in English and translated to Amharic were used to collect the data. An interviewer based questionnaire was used to collect data regarding common mental disorders using a standardized and valid SRQ questionnaire having 20 items was used to assess common mental disorders [39]. A cutoff point 7 and above was considered for delineating the presence of common mental disorders. SRQ-20 assess common mental symptoms in the past 30 days as Yes/No and Its Amharic version had been validated in Ethiopia [47] and used in several institutions based [48–51] as well community-based studies in Ethiopia [52–54].

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study participants had urban residency. Nearly two-thirds (62.6%) of the study participants were Muslims. About 229 (54.3%) of the participants were married and nearly one-fourth (25.6%) are farmers (Table 1).

**Clinical characteristics of epileptic patients**

One hundred ninety-seven (46.7%) of epileptic patients were taking anti-epileptic medication for less than 5 years and the type of anti-epileptic medications most study participants using was phenobarbitone 148 (73.3%). Regarding the controllability of seizure, most 375 (88.8%) had controlled seizure by current medication and did not complain epileptic fits in spite of taking their medications, 40 (9.5%) were having 1–2 seizure attacks while taking medication in the last 30 days and 7 (1.7%) of the respondents had 3–12 seizure attack even though they were on medication (Table 2).

**Prevalence of common mental disorders among epileptic patients at Felegehiwot Referral Hospital**

A cut-off point 7 on the self-reporting questionnaire-20 was used [39]. epileptic patients who scored 7 and above on the SRQ-20 were categorized as having common mental disorders while those scoring less than 7 on the SRQ-20 classified as not having common mental disorders. The prevalence of the common mental disorder in this study was 35.8% (95% CI 30.8, 40.4) (Fig. 1). The high common mental disorder was observed in the age group 45 years and older (57.5%) and divorced/widowed groups had high CMD (41.2%). The most prominent common mental disorder symptoms in this study were a headache (43.6%), poor appetite (41.5%), poor sleeping conditions (34.6%) and feeling tired all the time (24.6%). Suicidal ideation was complained by 74 (17.5%) of participants (Table 3).

### Table 1 Sociodemographic characteristics of epileptic patients attending Felegehiwot Referral Hospital epileptic clinic (n = 422), Bahirdar, Ethiopia, February 2019

| Characters       | Classification   | Frequency | Percent | Have no mental distress N (%) | Have mental distress N (%) |
|------------------|------------------|-----------|---------|-------------------------------|---------------------------|
| Sex              | Male             | 233       | 55.2    | 151 (64.8)                    | 82 (35.2)                 |
|                  | Female           | 189       | 44.8    | 120 (63.5)                    | 69 (36.5)                 |
| Age              | 18–24 years      | 120       | 28.4    | 79 (65.8)                     | 41 (34.2)                 |
|                  | 25–34 years      | 170       | 40.3    | 115 (67.6)                    | 55 (32.4)                 |
|                  | 35–44 years      | 92        | 21.8    | 54 (58.7)                     | 38 (41.3)                 |
|                  | 45 and above     | 40        | 9.5     | 17 (42.5)                     | 13 (57.5)                 |
| Marital Status   | Married          | 229       | 54.3    | 150 (65.5)                    | 79 (34.5)                 |
|                  | Single           | 176       | 41.7    | 111 (63)                      | 65 (37)                   |
|                  | Divorce/separate/widowed | 17 | 4       | 10 (58.8)                     | 7 (41.2)                  |
| Religion         | Orthodox         | 128       | 30.3    | 75 (58.6)                     | 53 (41.4)                 |
|                  | Muslim           | 264       | 62.6    | 177 (67)                      | 87 (33)                   |
|                  | Protestant       | 29        | 6.9     | 19 (65.5)                     | 11 (34.5)                 |
| Address          | Urban            | 266       | 63.0    | 171 (64.3)                    | 95 (35.7)                 |
|                  | Rural            | 156       | 37.0    | 100 (64)                      | 56 (36)                   |
| Educational Status| Illiterate       | 54        | 12.8    | 36 (66.7)                     | 18 (33.3)                 |
|                  | Can read and write | 71    | 16.8    | 42 (59)                       | 29 (41)                   |
|                  | Primary          | 78        | 18.5    | 49 (62.8)                     | 29 (37.2)                 |
|                  | Secondary        | 146       | 34.6    | 103 (70.5)                    | 43 (29.5)                 |
|                  | College and above | 73    | 17.3    | 41 (56)                       | 32 (44)                   |
| Occupational Status| Farmer          | 108       | 25.6    | 69 (63.9)                     | 39 (45.1)                 |
|                  | Gov’t employers  | 97        | 23.0    | 63 (64.9)                     | 34 (35.1)                 |
|                  | Self-employee    | 101       | 23.9    | 64 (63.4)                     | 37 (36.6)                 |
|                  | Student          | 93        | 22.0    | 60 (64.5)                     | 33 (35.5)                 |
|                  | Other            | 23        | 5.5     | 15 (65.2)                     | 8 (34.8)                  |
| Monthly income   | < 700            | 215       | 50.9    | 193 (78.8)                    | 22 (20.2)                 |
|                  | 700–1499         | 24        | 5.7     | 22 (91.7)                     | 2 (8.3)                   |
|                  | > 1500           | 183       | 43.4    | 165 (89)                      | 20 (11)                   |
Factors associated with common mental disorders among epileptic patients

Variables which pass into multivariate analysis with p-value < 0.2 on bivariate regression were age, marital status, educational level, religion, current epileptic medication, duration of epilepsy, mental illness in family, comorbid medical illness, alcohol dependence, nicotine dependence, medication non-adherence and frequency of seizure but only marital status, comorbid medical illness, alcohol dependence, nicotine dependence, medication non-adherence were significantly associated in final model with p-value < 0.05.

Participants who were divorced, widowed and separated as a group were about two times more likely (AOR = 1.95, 95% CI 1.67, 5.67) to develop the common mental disorder as compared to participants with a sustained marital relationship. The odds of study participants to develop a common mental disorder in the presence of comorbid medical illness was three times higher relative to participants with no comorbid medical condition (AOR = 2.99, 95% CI 1.95, 9.39).

Alcohol dependence was significantly associated with a common mental disorder. Participants with Alcohol dependence as measured by CAGE ≥ 2 were
2.2 times more likely to have mental disorder as compared to those who score CAGE < 2 (AOR = 2.20, 95% CI 1.78, 3.93). The odds of developing mental disorder among nicotine-dependent participants was slightly higher (AOR = 1.52, 95% CI 1.46, 4.62) relative to those participants with no nicotine dependence. Poor medication adherence was 2 times higher a risk factor to predispose to common mental disorder than good medication adherence (AOR = 1.9, 95% CI 1.72, 3.56) (Table 4).
Comorbidity of medical condition, nicotine dependence, alcohol dependence, medication non-adherence, and divorce/widow were the factors significantly associated with common mental disorders. This magnitude implied that large numbers of epileptic patients had not yet received an adequate intervention for psychiatric disorders specifically for a common mental disorder. So this result revealed that intervention has to be given for such comorbid-psychiatric problems in the epileptic clinic. Moreover, this finding strengthens the need for linkage of services between a psychiatric and neurological service for epileptic patients.

The prevalence of Common mental disorder in this study was in line with studies conducted so far in the USA (36.5%) [26], two Europe studies (37%) [60], (28.6%) [61], Iceland (35.5%) [62] and Ethiopia (35%) [63].

On the other hand, finding of current study was lower than the studies in Brazil (54.1%) [64], USA (70%) [65], (47%) [66] and (78%) [67], Netherlands (75.2%) [20], Iceland (54.8%) [22], Europe (54.8%) [68] and Italy (80%) [69], Ethiopia (45%) [28].The variation in prevalence might be due to the difference in sample size and assessment instruments used. Only 94 participants were included in Brazilian study [64], 60 participants in USA [65], 131 participants USA [67], 88 participants in Europe [68], and 38 participants in Italy [69] and 209 participants in the Netherlands study [20]. Methodological differences like DSM-IV in Brazilian [64], Iceland [22] and USA studies [65], Kessler-6 in the USA [66] and health style interview in the USA [67], CIDI in Netherlands study [20] would also contribute to the difference. Moreover, the study population in which the current study assesses all forms of epilepsy but only temporal lobe epilepsy in other studies that had a higher risk of mental disorders [70–72] might cause the variation.

The result of the study was higher than the studies conducted in Canada (23.5%) [14], in northern Sweden (5.9%) [73], in two European studies (11.2%) and (29%) [74, 75]. The different would be attributed to variation in sample size. In the northern Sweden study, a larger sample size of 713 patients with epilepsy was included. The difference in assessment instruments; Hospital anxiety and depression scale was used in European study [74], CIDI was used in Canadian [14] study and unstructured psychiatric interview in European study [73] might also contribute to the variation in the prevalence of the common mental disorder.

Divorce/separation was associated with CMD in this study, which was two times higher risk to develop common mental disorders as compared to married study participants who live together. This was supported by the study done at Emanuel specialized hospital, Addis Ababa, Ethiopia [63] and other studies outside Ethiopia [32, 76]. Divorce is a major psychosocial stressor predisposing to chronic stress which might disturb the social and emotional domains finally leading to common mental disorders.

Comorbidity of medical condition was also associated with a common mental disorder, three times higher risk as compared to participants with no comorbid medical illness. The finding is consistent in previous studies [25,
This might be due to medical conditions affecting the quality of life epilepsy patients as supported with a study [77].

Being alcohol dependence had a 2.2 times higher risk of developing a common mental disorder as compared with epileptic patients who had no alcohol dependence. This was supported by comparable studies in the USA [78, 79], New Zealand [80]. The reason might be alcohol consumption causing increased GABAergic neurotransmission and nervous system depression since GABA is inhibitory neurotransmitter [81]. Alcohol might also reduce seizure threshold and increase seizure frequency by affecting calcium and chloride flux through the ion gated glutamate and GABA receptors [82] and this might affect patients’ quality of life.

Having poor medication adherence was two times a higher risk factor for common mental disorder than good medication adherence. This was supported by a study outside Ethiopia [83] and in Ethiopia [28]. Non-adherence will lead to reduced seizure control, lowered quality of life, decreased productivity, seizure-related job loss [84] and recurrence of seizures might complicate to mental disorders [85] and since bidirectional interaction between epilepsy and mental disorders; up to 60% of epileptic patients develop depression and depression increase the risk of epilepsy [86, 87].

Nicotine dependence was a risk factor for CMD in this study, which was 1.5 times higher risk to develop common mental disorders as compared to participants who have no nicotine dependence. This was supported by a study finding that as smoking as a risk factor for major depression [88] and mental illness in general [89] The reason might be due to cigarette smoking increases risk of seizure recurrence [90] which might, in turn, lowers quality of life of epileptic patients.

Conclusion
This study found that common mental distress among epileptic patients was high. Divorce from socio-demographic variables, clinical variables such as comorbidity of medical illness, medication non-adherence and substance-related factors like alcohol misuse and nicotine dependence were risk factors for common mental disorder in this study. Early screening and treatment of epileptic patients have to be a routine activity to be conducted in epileptic clinics.

Abbreviations
AED: anti-epileptic drugs; CBE: community based education; CIDI: Composite International Diagnostic Interview; CMD: common mental disorders; EEG: electro encephalon gram; GABA: y-amino butyric acid; OPD: out patient department; PWE: patient with epilepsy; SRQ: self reporting questionnaires; USA: United States of America; WHO: World Health Organization.

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Authors’ contributions
MB and MN involved in the design, conduct, and analyses of the thesis and manuscript preparation. AB contributed to the review of the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials
The datasets used and/or analyzed during the current study are available from the corresponding authors on reasonable request.

Ethics approval and consent to participate
The study was approved by the ethical review board of Wollo University. Participants were fully informed about the study and verbal consent was received from each participant before the start of the interview. Information was collected anonymously and kept confidential throughout the study.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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