Indian Journal of
Neurology

Open Science Publications

Volume 7, Issue 1 - 2026

www.opensciencepublications.com

Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study

Research Article

Sami Saad[1]*, Andijani O[2], Alharthi AS[1], Al-Alfard HA[3], Fatani B[1], Alshehri T[3] and Abualela HM[4]

[1]Department of Mental Health, King Abdullah Medical City, Makkah, Kingdom of Saudi Arabia.

[2]Department of Ministry Health and Preventive Medicine, Jeddah, Kingdom of Saudi Arabia

[3]Department of Ministry Health and Psychiatry, Abha, Kingdom of Saudi Arabi

[4]Department of Neuroscience Center, Neurology, King Abdullah Medical City, Makkah, Kingdom of Saudi Arabia

***Corresponding author:** Sami Saad, Department of Mental Health, King Abdullah Medical City, Makkah, Kingdom of Saudi Arabia. E-mail Id: sami_yahya@hotmail.com

Article Information: **Submission:** 02/04/2026; **Accepted:** 18/04/2026; **Published:** 20/04/2026

Abstract

Background: Epilepsy is a chronic neurological disorder frequently associated with psychiatric comorbidities, particularly depression, which significantly impairs quality of life (QOL). Limited data exist regarding its prevalence and associated factors in tertiary care settings, specifically within Epilepsy Monitoring Units (EMUs), in the Kingdom of Saudi Arabia (KSA).

Objective: To determine the prevalence of depression and identify associated factors among patients admitted to the Epilepsy Monitoring Unit (EMU) at King Abdullah Medical City (KAMC) Specialist Hospital, Makkah, KSA.

Methods: A cross-sectional study was conducted from January 2024 to August 2025, enrolling adult patients with a confirmed epilepsy diagnosis admitted to the Epilepsy Monitoring Unit. Data were collected using structured questionnaires including demographic and clinical variables such as the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E), and the Oslo Social Support Scale (OSSS-3). Associations were examined using chi-square and non-parametric tests due to the non-normal distribution of variables, followed by multivariable logistic regression. A p-value <0.05 was considered to determine statistical significance.

Results: Among 68 participants admitted to the EMU, the prevalence of depression was 35.3% (95% CI: 25.0% to 47.2%). Higher seizure frequency (>5 seizures/year) and lower educational level showed trends toward increased depression risk. No other factors reached statistical significance.

Conclusion: Depression affects nearly one-third of patients admitted for monitoring in the EMU at KAMC Makkah, KSA. Routine screening and integrated neuropsychiatric care within the EMU setting are essential to improve overall outcomes and QOL among epilepsy patients..

Keywords: Antiepileptic drugs; Depression; Epilepsy; NDDI-E; ESS. OSSS-3; EMU

Introduction

Epilepsy is a chronic neurological disorder characterized by recurrent seizures affecting individuals of all ages worldwide. Beyond the physical and cognitive impacts of epilepsy, there is growing recognition of the significant burden of mental health disorders experienced by individuals with epilepsy [1, 2]. Among these, depression stands out as a prevalent and contributing factor to reduced quality of life (QOL) and increased morbidity [3, 4].

Depression is a serious mental health disorder associated with persistent feelings of sadness, hopelessness, and a loss of interest or pleasure in activities. It can profoundly affect an individual's emotional well-being, daily functioning, and overall health. Evidence suggests that patients with epilepsy have a higher risk of developing depression compared to the general population [5]. This association between epilepsy and depression is complex, with a bidirectional relationship between these two conditions [6].

Despite the recognized significance of depression among individuals with epilepsy, there remains a paucity of research investigating the prevalence and associated factors specifically within tertiary care settings such as KAMC [7]. In the literature, it is reported that 39% of participants with epilepsy reported clinically defined depressive symptoms, which is assessed by a reliable self-report index of mood such as Beck Depression Inventory-II (BDI-II) [8].

The Epilepsy Monitoring Unit (EMU) is a specialized inpatient setting where patients with refractory epilepsy undergo continuous video-EEG monitoring for seizure characterization and presurgical evaluation. Admission involves gradual withdrawal of antiseizure medications to provoke seizures, creating a uniquely stressful period marked by seizure anticipation and anxiety. The EMU, therefore offers a critical opportunity to assess the psychological burden of epilepsy, particularly depression, during a time of active seizure evaluation and heightened vulnerability.

A prospective EMU study [4] found that depression was the only independent predictor of quality of life in patients with refractory epilepsy, surpassing seizure burden. Depression affected 54% of patients, and the authors concluded that depression management is often inadequately prioritized compared to seizure reduction in intractable epilepsy. Another study in EMU [9] found that 40% of EMU patients had depression. One of the largest studies examining the prevalence of depression in EMU, among 395 epilepsy patients admitted to the EMU, found that 45.6% had depression [10].

To the best of our knowledge, no study has been done in Saudi Arabia about the prevalence of depression among EMU patients specifically. A large cross-sectional study across the four geographical regions of Saudi Arabia reported that depressive symptoms were prevalent in 84.7% of participants with epilepsy, with a higher prevalence noted among younger individuals (11). In a 2016 study conducted in Taif, a very high rate of depressive indications (89%) was found among adolescents with epilepsy aged 12 to 18 years [12] Broader studies across different age groups also report substantial prevalence. A national study found that a significant majority (73.7%) of PWE suffered from chronic depression lasting more than a year [13]. More recently, a study at a tertiary care hospital in Riyadh found that nearly half (48.25%) of the 400 participants exhibited depression, which was significantly associated with lower educational level, unemployment, longer epilepsy duration, and poorer quality of life [14]. Collectively, these findings underscore the high variability and critical need for routine screening and integrated care for depression in this patient population across the Kingdom.

Establishing the magnitude and determinants of depression in this population is crucial for informing evidence-based clinical practice. Identifying patients at higher risk enables healthcare professionals to implement early screening strategies and design integrated care models that simultaneously address neurological and mental health needs. A clearer understanding of these associations supports the development of targeted interventions, optimizes comprehensive epilepsy management, and ultimately contributes to improved treatment outcomes along with QOL.

Methodology

Study Design, Duration and Setting:

The cross-sectional study was conducted in January 2024 to August 2025. The study was conducted in King Abdullah Medical City Specialist Hospital (KAMC), Makkah, KSA, which is a tertiary and quaternary healthcare facility and a not-for-profit hospital.

Study Population

Adult epilepsy patients admitted to the Epilepsy Monitoring Units (EMU) at KAMC were enrolled.

Sampling Technique and Sample Size:

A simple random sampling technique was used to minimize selection bias. The required sample size was calculated using Raosoft sample size calculator, assuming a 5% margin of error, 95% confidence level, reference population of 108 patients based on hospital records, and an assumed response distribution of 50%. A total of 85 patients were enrolled; however, 68 were included in the final analysis after excluding 19 patients diagnosed with Psychogenic Non-Epileptic Seizures (PNES) and one patient who did not complete one of the scales. Although the final sample size was smaller than the initially calculated sample, it was considered adequate for the planned descriptive and comparative statistical analyses.

Eligibility Criteria

All adult patients (>18 years) diagnosed with epilepsy through electroencephalography (EEG) and who provided informed consent were included. The exclusion criteria were that patients who refused to participate in the study and were younger than 18 years of age.

Data Collection Tools

Data were collected from patients with a confirmed diagnosis of epilepsy admitted to the Epilepsy Monitoring Unit (EMU) at King Abdullah Medical City (KAMC), Saudi Arabia. Eligible participants who provided verbal informed consent completed a structured questionnaire consisting of two sections. The first section collected participants' demographic information. The second section included two validated scales (Appendix I). The Neurological Disorders

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.

Depression Inventory for Epilepsy (NDDI-E) [15] is a 6-item questionnaire used for rapid identification of major depressive disorder among patients with epilepsy. The Arabic version of the NDDI-E has been previously translated and validated [16]. The second scale is the Oslo Social Support Scale (OSSS-3), which is also used to assess perceived social support [17]. This scale comprises three items that assess the level of social support the participant receives.

Measurements

Depression was assessed using the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E). Item responses were summed to generate a total score ranging from 6 to 24, with higher scores indicating greater severity of depressive symptoms. A cutoff score of >13 was used to classify participants as screening positive for depression. Prior to the main data collection, a pilot study was conducted on 10 patients to assess the clarity and reliability of the study instruments. Based on the pilot data, the NDDI-E demonstrated good internal consistency (Cronbach's $\alpha = 0.780$). Perceived social support was measured using the Oslo Social Support Scale (OSSS-3). The sum score ranges from 3 to 14, with higher scores indicating stronger perceived social support. Scores were categorized as poor support [3-8], moderate support [9-11], and strong support [12-14]. Based on the pilot study data, the OSSS-3 demonstrated acceptable internal consistency in this sample (Cronbach's $\alpha = 0.647$).

Statistical Analysis Plan

Data were analyzed using R software (version 4.4.1). Descriptive statistics were used to summarize participants' sociodemographic and clinical characteristics. Continuous variables were assessed for normality using the Shapiro–Wilk test. Normally distributed variables were reported as mean ± standard deviation (SD), while non-normally distributed variables were presented as median and interquartile range (IQR). Categorical variables were summarized as frequencies and percentages. The prevalence of depression was estimated with 95% confidence intervals (CIs). Univariate analyses were conducted to examine associations between depression status and potential predictors. Categorical variables were compared using the chi-square test or Fisher's exact test as appropriate. Continuous variables were compared using the independent t-test if normally distributed; otherwise, the Wilcoxon rank-sum test (for two groups) or the Kruskal–Wallis test (for more than two groups) was applied. A multivariable logistic regression model was used to identify factors independently associated with depression. Age and gender were included in the model a priori as key demographic covariates. Additional candidate predictors were selected based on univariable screening ($p < 0.20$) and entered into the multivariable model. Results were reported as adjusted odds ratios (aORs) with 95% confidence intervals and corresponding p-values. A two-sided p-value < 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was sought from KAMC IRB 23.1200. No study activities were initiated until IRB approval was obtained. The purpose and nature of the study were explained to all patients along with a brief information sheet describing the study's purpose and its steps. It was emphasized that participation was voluntary, and they had the right to leave the study at any time to ensure autonomy. A serial No. was given to each participant to de-identify the patient.

Results

Participant characteristics and prevalence of depression

A total of 69 patients were enrolled in the study. Complete data were available for all participants; however, one patient did not complete the NDDI-E questionnaire, leaving 68 patients with evaluable depression status, among whom 24 met the NDDI-E cutoff for depression, yielding a depression prevalence of 35.3% (95% CI: 25.0%-47.2%).

As shown in (Table 1) participants were predominantly female (58.0%) and most were aged 30-40 years (40.6%). Over half were married (53.6%), and 52.2% had a high school/diploma education. Most participants were unemployed (76.8%) and reported an

Table 1: Sociodemographic, clinical, and psychosocial characteristics of the study participants (N=69)

Variable	Frequency (%) / Median [IQR]
Age group, n (%)	
<30	23 (33.3)
30-40	28 (40.6)
41-50	11 (15.9)
>50	7 (10.1)
Gender, n (%)	
Female	40 (58.0)
Male	29 (42.0)
Marital status, n (%)	
Married	37 (53.6)
Single	28 (40.6)
Divorced	4 (5.8)
Education level, n (%)	
Bachelor's degree or higher	21 (30.4)
High school/diploma	36 (52.2)
Middle school or below	12 (17.4)
Employment status, n (%)	
Employed	16 (23.2)
Unemployed	53 (76.8)
Income level, n (%)	
0-8,000 SR	58 (84.1)
8,001-15,000 SR	9 (13.0)
>15,000 SR	2 (2.9)
Seizure focus/location, n (%)	
Focal: Temporal	45 (65.2)
Focal: Non-temporal	15 (21.7)
Generalized/Unknown	9 (13.0)
Number of seizures in past year, n (%)	
≤5	27 (39.1)
>5	42 (60.9)
Hospitalization due to seizures, n (%)	
No	19 (27.5)
Yes	50 (72.5)
Psychiatric history, n (%)	
No	56 (81.2)
Yes	13 (18.8)

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.

Antidepressant use, n (%)	
No	57 (82.6)
Yes	12 (17.4)
Family history of psychiatric illness, n (%)	
No	61 (88.4)
Yes	8 (11.6)
History of other medical conditions, n (%)	
None	27 (39.7)
Other	37 (54.4)
Depression	4 (5.9)
Social support (OSSS-3 category), n (%)	
Strong	25 (37.3)
Moderate	32 (47.8)
Poor	10 (14.9)
Epilepsy duration (years), median [IQR]	17.00 [9.00, 23.00]
AED dose (mg), median [IQR]	
Levetiracetam dose	2000.00 [1000.00, 3000.00]
Lacosamide dose	200.00 [200.00, 400.00]
Lamotrigine dose	200.00 [100.00, 300.00]
Carbamazepine dose	600.00 [300.00, 800.00]
Depression status, n (%)	
Negative depression	44 (64.7)
Positive depression	24 (35.3)

Note: Values are frequency (%) for categorical variables and median [IQR] for continuous variables. Percentages are based on non-missing values. AED doses were summarized among participants who were taking the corresponding medication.

income of less than 8,000 SR (84.1%). Regarding epilepsy-related characteristics, 65.2% had focal temporal seizures, 60.9% reported more than 5 seizures in the past year, and 72.5% had a history of hospitalization due to seizures. The median epilepsy duration was 17.0 years (IQR: 9.0-23.0). Social support was most commonly moderate (47.8%), followed by strong (37.3%) and poor (14.9%).

Univariable comparisons by depression status

(Table 2) summarized univariable comparisons by depression status. No statistically significant associations were observed between depression status and age group, marital status, employment status, income, seizure frequency in the past year, seizure focus/location, hospitalization due to seizures, psychiatric history, history of other medical conditions, social support category, epilepsy duration, or antiepileptic drug doses (all $p>0.05$). Education level showed a non-significant association with depression status ($p=0.187$), with a higher proportion of depression among participants with middle school or below education (29.2% vs. 11.4% in the non-depression group). Family history of psychiatric illness also demonstrated a non-significant trend ($p=0.120$), with a larger proportion of depressed participants having family history (20.8% vs. 6.8%). Gender showed a non-significant trend ($p=0.126$), with a higher proportion of females in the depression group (70.8% vs. 50.0%).

Multivariable logistic regression

(Table 3) presents the results of the multivariable logistic regression model. Age group and gender were included a priori, and additional covariates were included based on univariable screening ($p<0.20$). After adjustment, none of the covariates were statistically

Table 2: Participant characteristics by depression status (NDDI-E)

Variable	Negative depression (n=44)	Positive depression (n=24)	*p*-value
Age group, n (%)			0.981
<30	14 (31.8)	9 (37.5)	
30-40	18 (40.9)	9 (37.5)	
41-50	7 (15.9)	4 (16.7)	
>50	5 (11.4)	2 (8.3)	
Gender, n (%)			0.126
Female	22 (50.0)	17 (70.8)	
Male	22 (50.0)	7 (29.2)	
Marital status, n (%)			0.778
Divorced	2 (4.5)	2 (8.3)	
Married	24 (54.5)	12 (50.0)	
Single	18 (40.9)	10 (41.7)	
Education level, n (%)			0.187
Bachelor's degree or higher	14 (31.8)	7 (29.2)	
High school/diploma	25 (56.8)	10 (41.7)	
Middle school or below	5 (11.4)	7 (29.2)	
Employment status, n (%)			0.384
Employed	12 (27.3)	4 (16.7)	
Unemployed	32 (72.7)	20 (83.3)	
Income, n (%)			0.537
0-8,000 SR	37 (84.1)	20 (83.3)	
8,001-15,000 SR	5 (11.4)	4 (16.7)	
>15,000 SR	2 (4.5)	0 (0)	
Seizure focus/location, n (%)			0.393
Focal: Temporal	29 (65.9)	15 (62.5)	
Focal: Non-temporal	11 (25.0)	4 (16.7)	
Generalized/Unknown	4 (9.1)	5 (20.8)	
Seizures in past year, n (%)			0.608
≤5	18 (40.9)	8 (33.3)	
>5	26 (59.1)	16 (66.7)	
Hospitalization due to seizures, n (%)			0.405
No	14 (31.8)	5 (20.8)	
Yes	30 (68.2)	19 (79.2)	
Psychiatric history, n (%)			0.520
No	37 (84.1)	18 (75.0)	
Yes	7 (15.9)	6 (25.0)	
History of other medical conditions, n (%)			0.780
None	18 (41.9)	9 (37.5)	
Other	23 (53.5)	13 (54.2)	
Depression	2 (4.7)	2 (8.3)	
Antidepressant use, n (%)			0.321
No	38 (86.4)	18 (75.0)	
Yes	6 (13.6)	6 (25.0)	
Family history of psychiatric illness, n (%)			0.120
No	41 (93.2)	19 (79.2)	
Yes	3 (6.8)	5 (20.8)	
Social support (OSSS-3 category), n (%)			0.886
Strong	17 (39.5)	8 (33.3)	
Moderate	20 (46.5)	12 (50.0)	

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.

Poor	6 (14.0)	4 (16.7)	
Epilepsy duration (years), median [IQR]	16.00 [7.00, 23.25]	17.00 [11.75, 19.25]	0.782
Levetiracetam dose (mg), median [IQR]	2000.00 [1000.00, 3000.00]	2000.00 [2000.00, 2750.00]	0.298
Lacosamide dose (mg), median [IQR]	200.00 [200.00, 375.00]	200.00 [200.00, 300.00]	0.936
Lamotrigine dose (mg), median [IQR]	200.00 [150.00, 300.00]	200.00 [100.00, 200.00]	0.352
Carbamazepine dose (mg), median [IQR]	400.00 [400.00, 800.00]	700.00 [200.00, 800.00]	0.816

Note: Continuous variables were non-normally distributed (Shapiro-Wilk test) and are presented as median [IQR]; group comparisons used Wilcoxon rank-sum (two groups) or Kruskal-Wallis tests (>2 groups). Categorical variables are presented as n (%) and compared using chi-square or Fisher's exact tests as appropriate.

Table 3: Multivariable logistic regression of factors associated with depression

Variable	Adjusted OR (95% CI)	*p*-value
Age group		
<30	Reference	
30-40	0.57 (0.16, 1.96)	0.373
41-50	0.35 (0.04, 2.09)	0.285
>50	0.13 (0.01, 1.56)	0.136
Gender		
Female	Reference	
Male	0.58 (0.18, 1.79)	0.346
Education level		
Bachelor's degree or higher	Reference	
High school/diploma	0.76 (0.22, 2.71)	0.671
Middle school or below	5.32 (0.69, 63.17)	0.133
Family history of psychiatric illness		
No	Reference	
Yes	2.56 (0.45, 15.64)	0.283

Note: Age and gender were included in the multivariable model a priori as key demographic covariates. All other candidate predictors were selected based on univariable screening ($p<0.20$) and entered into the multivariable logistic regression model.

significantly associated with depression (all $p>0.05$). Several factors showed suggestive trends toward higher or lower odds of depression. Participants aged over 50 years old had relatively lower odds of depression compared with those younger than 30 years old (a OR=0.13, 95% CI 0.01 to 1.56; $p=0.136$). Compared to participants with a bachelor's degree or higher, those with middle school or below education had higher odds of depression (a OR=5.32, 95% CI 0.69 to 63.17; $p=0.133$), although the confidence interval was wide.

Discussion

According to the NDDI-E scale, EMU patients with epilepsy had a depression prevalence of 35.3% (95% CI: 25.0% to 47.2%) in this cross-sectional study at KAMC, KSA. This study demonstrates that patients with epilepsy experience depression as a significant psychiatric comorbidity.

These findings align with current global data. Depending on screening methods and demographics, a 2020 meta-analysis by Yang Y et al. found that pooled depression prevalence rates among epileptic patients ranged from 27% to 34% [7]. Similarly, Vacca M et al. (2022) reported clinically significant depressive symptoms in 39% of patients attending a tertiary epilepsy facility [8]. Siddiqui et al. (2009), using the Hospital Anxiety and Depression Scale (HADS) in an EMU setting, found that 40% of patients had depression. Notably, they reported no significant associations between depression and clinical variables such as epilepsy type, age, sex, duration of epilepsy, seizure localization, MRI findings, or antiepileptic drugs [9]. Rocamora et al. (2021) conducted a large study on 395 patients with epilepsy admitted to an EMU. They assessed depressive symptoms using both the Beck Depression Inventory-II (BDI-II) and the (HADS-D) subscale. The study found that 45.57% of patients exhibited depression according to the BDI-II, and 30.9% according to the HADS-D. Aligning with our study, females had significantly higher BDI-II scores compared to males [18]. The study also highlighted that psychiatric symptoms were more severe when psychogenic non-epileptic seizures (PNES) coexisted with epilepsy. Differences in sample size, cultural background, healthcare access, and screening thresholds may account for our marginally lower prevalence. Overall, the prevalence in our observational cohort aligns with global and regional data, supporting the external validity of our findings.

Consistent with previous research, there was a trend toward higher seizure frequency being associated with depression, although this did not reach statistical significance in our sample. Higher seizure frequency dramatically raises the incidence of depressive symptoms according to a meta-analysis with odds ratios ranging from 2.0 to 3.5 [7]. Despite having large confidence intervals, patients with less than a middle school education had higher risks of depression. This is consistent with research found that depression was substantially correlated with lower educational status [19]. Reduced education may increase psychological vulnerability by limiting health literacy, coping strategies and socioeconomic prospects [19]. Another potential consideration is the presence of other medical comorbidities, which may act as confounding factors in the relationship between epilepsy and depressive symptoms. Although history of other medical conditions was not significantly associated with depression in our sample, the coexistence of chronic illnesses may still contribute to psychological burden through reduced functional status, medication load, and perceived health limitations. The lack of statistical significance in our study may be related to the limited sample size and heterogeneity of the reported medical conditions.

Although depressive patients were more likely to have poor social support this difference was not statistically significant. Nonetheless social support is regularly found to be protective in the literature. Strong associations between depressive symptoms and low support are shown by OSSS-3 standardization tests [17] social isolation in KSA may be somewhat mitigated by cultural and familial systems which could weaken statistical correlations.

There were no discernible links found between depression and AED dosages. Nonetheless, earlier studies have indicated that some drugs (such clonazepam) could cause mood swings in vulnerable [20] or Levetiracetam may cause significant psychiatric symptoms [21]. These findings highlight the need for more extensive

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.

pharmacovigilance focused research as they neither support nor contradict these correlations.

Implication of Findings

There are various ramifications to the assessment that depression affects almost one in three epileptic patients in Makkah, KSA. Early detection may be enhanced in neurology clinics by implementing proven instruments like the NDDI-E. Patients who have more frequent seizures and have less education should need a more thorough psychiatric evaluation. Important epidemiological evidence supporting structured mental health care in tertiary epilepsy centers is provided by this study.

Strengths of findings

This study has a number of noteworthy advantages. To improve the reliability and comparability of the results it first used internationally recognized and established assessment instruments such as the Oslo Social Support Scale (OSSS-3) and the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E). Second, a more thorough representation of people with epilepsy across various clinical severity within the EMU setting. Lastly, by concentrating on King Abdullah Medical City Specialist Hospital, a tertiary care facility in Makkah, the study fills a significant research gap in the region and offers useful epidemiological data from Saudi Arabia where there is little published data on depression in epileptic patients.

Limitations

There are various limitations of this study. Initially, the statistical power was limited by the smaller analytical sample size, which made it harder to identify meaningful correlations between depression and other risk variables. The temporal relationships cannot be established due to the cross-sectional design as it is impossible to identify whether depression arose as a result of or before epilepsy. The accuracy of diagnosing depression may be limited by the fact that the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E) is a validated and commonly used screening tool but it is still only a screening tool and cannot replace structured psychiatric diagnostic interviews based on standardized criteria. In addition, other coexisting medical conditions were recorded as broad categories rather than specific diagnoses, which may have limited the ability to fully assess their potential confounding effect on depressive symptoms. An additional limitation is that the depression scales were administered without accounting for the timing of the participants' most recent seizure, which may have influenced the scores.

Future Recommendations

Multicenter longitudinal studies throughout KSA should be the main focus of future research in order to improve generalizability and determine the temporal correlations between depression and epilepsy. Beyond screening methods, the use of structured mental diagnostic interviews based on DSM-5 criteria would increase diagnostic accuracy and enable more accurate estimation of the prevalence of depression. Clarifying underlying pathophysiological processes may be aided by additional research into putative biological indicators such as neuroinflammatory, neurochemical and genetic factors that connect epilepsy and depression. Such comprehensive approaches would improve the body of evidence and direct the creation of focused culturally relevant therapies.

Conclusion

The cross-sectional study conducted at KAMC Makkah KSA demonstrates that depression is a highly prevalent psychiatric comorbidity among patients with epilepsy underscoring structured psychiatric diagnostic interviews within tertiary care settings. Although multivariable analysis did not identify statistically significant independent predictors, clinically meaningful trends were observed. Lower educational attainment and higher seizure frequency appeared to be associated with increased depressive symptoms.

The results emphasize the importance of implementing integrated neuropsychiatric care models within epilepsy clinics including routine depression screening using validated assessment tools. Addressing depression as a core component of comprehensive epilepsy management is essential to enhance treatment adherence, optimize seizure control and improve overall quality of life. Future multicenter and longitudinal studies across Saudi Arabia are recommended to clarify potential causal pathways and to inform the development of culturally appropriate targeted mental health interventions for patients living with epilepsy. Such studies should also examine specific medical comorbidities as potential confounding factors influencing depressive symptoms in patients with epilepsy.

References

1. Rai D, Kerr MP, McManus S, Jordanova V, Lewis G, Brugha TS (2012) Epilepsy and psychiatric comorbidity: a nationally representative population-based study. Epilepsia 53:1095-1103.
2. Weatherburn CJ, Heath CA, Mercer SW, Guthrie B (2017) Physical and mental health comorbidities of epilepsy: Population-based cross-sectional analysis of 1.5 million people in Scotland. Seizure 45: 125-131.
3. Berg AT, Scheffer IE (2011) New concepts in classification of the epilepsies: entering the 21st century. Epilepsia 52:1058-1062.
4. Boylan LS, Flint LA, Labovitz DL, Jackson SC, Starner K, Devinsky O (2004) Depression but not seizure frequency predicts quality of life in treatment-resistant epilepsy. Neurology 62: 258-261.
5. Gaitatzis A, Trimble MR, Sander JW (2004) The psychiatric comorbidity of epilepsy. Acta Neurol Scand. 110: 207-220.
6. Lewis A (1934) Melancholia: A Historical Review: Part I. Journal of Mental Science 80:1-42.
7. Yang Y, Yang M, Shi Q, Wang T, Jiang M (2020) Risk factors for depression in patients with epilepsy: A meta-analysis. Epilepsy Behav 106: 107030.
8. Vacca M, Fernandes M, Spanetta M, Placidi F, Izzi F, Lombardo C, et al. (2022) Depressive symptoms in patients with epilepsy and clinically associated features in a single tertiary center. Neurol Sci 43: 1965-1974.
9. Siddiqui KA, Wahaas S, Sinha S (2009) Frequency of anxiety and depression in epilepsy monitoring unit.
10. Głąbiński P, Rzepiński Ł, Zawadka-Kunikowska M, Kucharska E (2022) Depression and anxiety in patients with epilepsy and psychogenic non-epileptic seizures during long-term video-EEG monitoring—A prospective study. J Clin Med 11: 5535.
11. Albalawi RSA, Alanzi SMO, Alharthe AFH, Atawi SHS, Albalawi RMD, Alanazi HAS, et al. (2023) Quantitative Cross-Sectional Study About the Prevalence of Depression Among Epileptic Patients in Saudi Arabia. Cureus 15: e45491.
12. Mubaraki AA, Sibyani AK, Alkhawtani RA, Alqahtani BG, Abu Alaynayn FK

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.

(2021) Prevalence of depression among epileptic patients in Taif City, Saudi Arabia. Neurosciences (Riyadh) 26: 366-371.

13. Swailem SK, Bamogaddam FA, Al-Attas AA (2024) The Prevalence of Depression in Patients With Epilepsy in the Kingdom of Saudi Arabia. Cureus 16: e55570.
14. Aljaffer MA, Almadani AH, Alghamdi AH, et al. (2025) Depression and Anxiety Among Patients with Epilepsy: A Cross-Sectional Study in Saudi Arabia. Brain Sci 15: 484.
15. Kim DH, Kim YS, Yang TW, Kwon OY (2019) Optimal cutoff score of the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E) for detecting major depressive disorder: A meta-analysis. Epilepsy Behav 92: 61-70.
16. Alkhamees HA, Selai CE, Shorvon SD, Kanner AM (2014) The use of the NDDI-E in Arabic to identify symptoms of depression of moderate or greater severity in people with epilepsy. Epilepsy Behav 32: 55-58.
17. Kocalevent RD, Berg L, Beutel ME, Hinz A, Zenger M, Härter M, et al. (2018) Social support in the general population: standardization of the Oslo social support scale (OSSS-3). BMC Psychol 6 :31.
18. Rocamora R, Chavarría B, Pérez E, Pérez-Enríquez C, Barguilla A, Panadés-de Oliveira L, et al. (2021) Mood disturbances, anxiety, and impact on quality of life in patients admitted to epilepsy monitoring units. Front Neurol 12: 761239. doi:10.3389/fneur.2021.761239.
19. Addis B, Wolde M, Minyihun A, Aschalew AY (2021) Prevalence of depression and associated factors among patients with epilepsy at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, 2019. PLoS One 16: e0257942.
20. Dokkedal-Silva V, Berro LF, Galduróz JCF, Tufik S, Andersen ML (2019) Clonazepam: Indications, Side Effects, and Potential for Nonmedical Use. Harv Rev Psychiatry 27: 279-289.
21. Tao K, Chen H, Chen Y, Gu Y, Wang X (2024) Levetiracetam induces severe psychiatric symptoms in people with epilepsy. Seizure 116: 147-150.

Citation: Saad S, Andijani O, Alharthi AS, Al-Alfard HA, Fatani B, et al. Prevalence of Depression and Associated Factors Among Patients in the Epilepsy Monitoring Unit at King Abdullah Medical City, Makkah: A Cross-Sectional Study. Indian J Neurol. 2026;7(1): 165.