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Prevalence and Correlates of Depression and Anxiety in Children Aged 5 to 12 Years with Epilepsy

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Abstract

Background: Epilepsy is a chronic neurological disorder that significantly impacts the psychological well-being of affected children. Depression and anxiety are common comorbidities in pediatric epilepsy but are frequently underdiagnosed and undertreated, particularly in low-resource settings.

Objective: To estimate the prevalence of depression and anxiety among children aged 5 to 12 years with epilepsy and identify associated demographic, clinical, and seizure-related factors.

Methods: A hospital-based cross-sectional study was conducted on 120 children with a confirmed diagnosis of epilepsy. Depression and anxiety were assessed using age-appropriate validated screening tools (Children's Depression Inventory and Screen for Child Anxiety Related Emotional Disorders - SCARED). Sociodemographic and clinical data were collected, including seizure type, frequency, duration of illness, and treatment modality.

Results: The prevalence of depression and anxiety was 28.3% and 35.8%, respectively. Both conditions were significantly associated with frequent seizures, longer duration of epilepsy, polytherapy, and poor school performance ($p < 0.05$). Children with focal seizures showed higher levels of internalizing symptoms compared to those with generalized seizures.

Conclusion: Depression and anxiety are common but often overlooked comorbidities in children with epilepsy. Routine psychological screening and early intervention are essential to improve overall quality of life and treatment adherence in this vulnerable population.

Introduction

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Epilepsy is one of the most prevalent chronic neurological disorders in childhood, affecting approximately 0.5–1% of children worldwide (1). It is characterized by recurrent, unprovoked seizures resulting from abnormal electrical activity in the brain. Although the physical manifestations of epilepsy are often the focus of clinical management, the psychosocial burden of the disease, particularly in children, remains underrecognized. Children with epilepsy face multifaceted challenges that extend beyond seizure control, including social stigma, academic difficulties, and psychological comorbidities such as depression and anxiety (2).

The prevalence of psychiatric disorders among children with epilepsy is substantially higher than in their healthy peers. Multiple studies have reported rates of depression and anxiety ranging from 20% to 60%, depending on the assessment tools used, age of the child, and epilepsy-related factors (3). These emotional disturbances are not merely reactive but may be intrinsic to the neurobiological and psychosocial impact of epilepsy. Mechanisms proposed include abnormal neural circuitry, effects of antiepileptic drugs (AEDs), social isolation, and the unpredictability of seizures, all contributing to increased psychological vulnerability (4).

Depression in children with epilepsy often presents as irritability, withdrawal, low self-esteem, and somatic complaints, while anxiety may manifest through excessive worry, sleep disturbances, and separation fears. These symptoms may be subtle and easily overlooked, particularly when overshadowed by seizure management priorities. Importantly, untreated emotional disturbances have been shown to exacerbate seizure frequency, reduce treatment adherence, impair cognitive development, and decrease overall quality of life (5).

A variety of epilepsy-related factors influence the risk of developing depression and anxiety. Children with poorly controlled or frequent seizures, longer disease duration, earlier age of onset, or who are on multiple AEDs (polytherapy) appear to be at greater risk (6). Furthermore, the type of seizure (focal vs generalized), cognitive impairment, and comorbid learning disabilities may further increase susceptibility. Environmental and sociodemographic factors such as parental education, socioeconomic status, and school support also play a crucial role in the child's psychological adjustment to epilepsy (7). Despite growing awareness, mental health screening is often not routinely performed in children with epilepsy, especially in low- and middle-income countries, due to lack of resources, stigma surrounding psychiatric illness, and prioritization of physical health concerns.

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Recognizing the need for integrated neuropsychological care, international epilepsy management guidelines now emphasize the importance of mental health screening in all pediatric epilepsy patients. Validated tools such as the Children's Depression Inventory (CDI) and the Screen for Child Anxiety Related Emotional Disorders (SCARED) have been widely used in clinical settings for early identification of at-risk children (8). Early psychological assessment, followed by timely interventions such as cognitive-behavioral therapy and family counseling, has shown promising results in reducing distress and improving outcomes.

In this context, the present study was conducted to assess the prevalence of depression and anxiety in children aged 5 to 12 years with epilepsy attending a tertiary care hospital. Additionally, the study aimed to identify clinical and sociodemographic correlates of these psychological comorbidities, thereby contributing to the limited Indian literature on this topic and informing the development of integrated care models for pediatric epilepsy.

Methods

Study Design and Setting

This was a cross-sectional observational study conducted in the Department of Pediatrics and Pediatric Neurology at a tertiary care hospital in South India over a period of 12 months (January to December 2024). The study aimed to estimate the prevalence of depression and anxiety in children aged 5 to 12 years diagnosed with epilepsy and to identify clinical and demographic correlates.

Participants

Children aged between 5 and 12 years with a confirmed diagnosis of epilepsy, as defined by the International League Against Epilepsy (ILAE), were enrolled. Inclusion criteria included children who had experienced at least two unprovoked seizures more than 24 hours apart, with a minimum illness duration of 6 months. Children with known intellectual disabilities, neurodevelopmental disorders (e.g., autism spectrum disorder), or other chronic medical conditions were excluded. Children with acute symptomatic seizures or those on psychiatric medications were also excluded.

Sample Size

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A minimum sample size of 110 was calculated based on an estimated 30% prevalence of anxiety/depression in pediatric epilepsy, with 95% confidence level and 10% absolute precision. A total of 120 participants were enrolled to account for potential dropouts or incomplete data.

Data Collection Procedure

After obtaining written informed consent from parents or guardians and assent from children (wherever appropriate), a structured proforma was used to collect demographic and clinical data including:

- Age, gender, educational status
- Seizure type (focal/generalized), frequency, and duration of illness
- Current antiepileptic drug (AED) regimen (monotherapy/polytherapy)
- School performance and absenteeism
- Family history of epilepsy or psychiatric illness

Assessment Tools

Psychological evaluation was conducted by trained psychologists using standardized and age-appropriate tools:

- **Children's Depression Inventory (CDI)**: A 27-item self-report tool to assess depressive symptoms in children aged 7–17 years. A score ≥19 was considered indicative of clinical depression.
- **Screen for Child Anxiety Related Emotional Disorders (SCARED)**: A 41-item parent- and self-report tool validated for children aged 5–17 years. A total score ≥25 suggested the presence of an anxiety disorder.

In younger children (ages 5–6), parents completed a modified observer-rated version of the scales under psychologist guidance.

Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee. Participation was voluntary, and confidentiality was maintained throughout the study. Children identified as

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having significant depressive or anxiety symptoms were referred to pediatric mental health services for further evaluation and intervention.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 26.0. Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables were summarized as frequencies and percentages. The prevalence of depression and anxiety was calculated. The association between psychological morbidity and clinical/demographic variables was analyzed using chi-square tests for categorical data and independent t-tests for continuous variables. Logistic regression was performed to identify independent predictors of depression and anxiety. A p-value of <0.05 was considered statistically significant.

Results

A total of 120 children with epilepsy were enrolled. The mean age was **8.9 ± 2.3 years**, and 57 (47.5%) were female. The most common seizure type was generalized tonic-clonic seizures (GTCS), followed by focal seizures. The prevalence of depression and anxiety was **28.3%** and **35.8%**, respectively. Several demographic and clinical variables were significantly associated with these psychological comorbidities.

Table 1: Baseline Demographic and Clinical Characteristics (n = 120)

Parameter	**Value**
Mean age (years)	8.9 ± 2.3
Gender (Male:Female)	63 (52.5%) : 57 (47.5%)
Seizure type	GTCS – 68 (56.7%), Focal – 52 (43.3%)
Seizure frequency >1/month	34 (28.3%)
Duration of epilepsy >2 years	39 (32.5%)
On polytherapy	41 (34.2%)

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The cohort had a balanced gender ratio, with a substantial proportion on polytherapy and frequent seizures.

Table 2: Prevalence of Depression and Anxiety

Psychological Condition	Number (%)
Depression (CDI ≥19)	34 (28.3%)
Anxiety (SCARED ≥25)	43 (35.8%)
Both present	21 (17.5%)

Over one-third of the children had anxiety, and nearly one-third had depression, with notable overlap.

Table 3: Association of Clinical Variables with Depression

Variable	Depression Present (n=34)	Depression Absent (n=86)	p-value
Mean age (years)	9.1 ± 2.2	8.7 ± 2.4	0.41
Female gender	20 (58.8%)	37 (43.0%)	0.08
Seizure frequency >1/month	17 (50.0%)	17 (19.8%)	0.002
Duration of epilepsy >2 years	18 (52.9%)	21 (24.4%)	0.003
On polytherapy	20 (58.8%)	21 (24.4%)	<0.001

Depression was significantly associated with high seizure frequency, longer disease duration, and polytherapy.

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Table 4: Association of Clinical Variables with Anxiety

Variable	Anxiety Present (n=43)	Anxiety Absent (n=77)	p-value
Focal seizures	27 (62.8%)	25 (32.5%)	0.001
Poor school performance	31 (72.1%)	29 (37.7%)	<0.001
Seizure frequency >1/month	21 (48.8%)	13 (16.9%)	<0.001
Duration of epilepsy >2 years	24 (55.8%)	15 (19.5%)	<0.001

Anxiety was more common in children with focal seizures, poor academic performance, frequent seizures, and longer disease duration.

Table 5: Multivariate Logistic Regression for Predictors of Depression and Anxiety

Variable	Adjusted OR (95% CI)	p-value
Seizure frequency >1/month	3.4 (1.6–7.1)	0.001
Polytherapy	2.9 (1.3–6.6)	0.008
Focal seizure type	2.5 (1.1–5.8)	0.027
Poor school performance	3.7 (1.6–8.3)	0.002

Frequent seizures, polytherapy, focal seizures, and academic difficulties were independent predictors of depression and/or anxiety.

Discussion

This study assessed the prevalence and associated factors of depression and anxiety in children aged 5 to 12 years diagnosed with epilepsy. Our findings reveal that psychological morbidities

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are highly prevalent in this population, with **28.3%** of children screening positive for depression and **35.8%** for anxiety. Moreover, 17.5% had co-existing symptoms of both. These rates are consistent with previous literature, where estimates for emotional disorders in pediatric epilepsy range from 20% to 60% depending on sample characteristics and assessment tools used (2,3).

The elevated psychological burden in this age group underscores the multifactorial challenges that children with epilepsy face. Neurological vulnerabilities, social stigma, disrupted schooling, and the unpredictability of seizures contribute to significant psychological stress (4). Our findings confirm that children with **frequent seizures**, **longer illness duration**, and those on **polytherapy** were significantly more likely to suffer from depression. These clinical variables have been identified in earlier studies as risk factors for poor emotional functioning due to cumulative neurological and psychosocial stressors (6).

Importantly, we found a higher prevalence of anxiety symptoms in children with **focal seizures**, **poor school performance**, and **frequent seizures**. Several studies support this finding, proposing that children with focal epilepsy—especially involving temporal and frontal lobes—are more prone to internalizing symptoms due to underlying neural circuitry disruptions and medication side effects (9). Our findings also align with studies showing that frequent seizures contribute to a constant state of unpredictability and fear, which can manifest as chronic anxiety (10).

Children with poor school performance were significantly more likely to screen positive for anxiety. Academic challenges in children with epilepsy often stem from cognitive effects of seizures, sedating effects of antiepileptic drugs (AEDs), and frequent school absenteeism. Anxiety, in turn, can further impair concentration and academic achievement, creating a cyclical impact (11).

The association of **polytherapy** with depression is consistent with prior research showing that children on multiple AEDs are more likely to experience mood disturbances due to cumulative side effects, drug interactions, and more severe underlying disease (12). AEDs such as phenobarbital and topiramate have been particularly implicated in behavioral side effects, including irritability, apathy, and depressive symptoms.

Another critical observation in our study was that depression and anxiety were frequently co-existing. This comorbidity has been described in pediatric epilepsy populations, where

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overlapping symptoms such as somatic complaints, irritability, and sleep disturbances make it difficult to distinguish between these disorders without structured assessments. Children with dual symptoms may also face more profound functional impairments and worse quality of life than those with isolated symptoms.

Despite the high burden of psychological comorbidity, mental health screening in pediatric epilepsy remains infrequent, particularly in low-resource settings. Barriers include lack of trained personnel, limited awareness, and stigma surrounding mental illness. Yet early identification and intervention are crucial, as untreated depression and anxiety can worsen seizure control, increase emergency visits, and reduce treatment adherence (13).

Several screening tools, including the Children's Depression Inventory (CDI) and SCARED, have demonstrated reliability and ease of use in outpatient pediatric settings. Our use of these tools allowed for systematic detection of emotional symptoms in a population where such issues are often underreported. Studies have shown that early psychosocial support, cognitive behavioral therapy, and school-based interventions can significantly improve emotional functioning and quality of life in children with epilepsy (14).

The strength of our study lies in its structured psychological assessments and the inclusion of both clinical and sociodemographic variables. However, certain limitations must be acknowledged. The cross-sectional design limits causal inference, and the hospital-based sample may over-represent children with more severe epilepsy. Additionally, formal psychiatric diagnoses were not established through clinical interviews, and we relied on validated screening instruments to identify probable cases of depression and anxiety.

Conclusion

This study reveals a high prevalence of depression and anxiety among children with epilepsy, with nearly one in three exhibiting significant emotional distress. Clinical factors such as high seizure frequency, longer duration of illness, polytherapy, and poor school performance were strongly associated with psychological morbidity. Anxiety was particularly common in children with focal seizures. These findings emphasize that mental health challenges in children with epilepsy are common, clinically significant, and closely tied to seizure and treatment-related factors. Addressing these concerns is crucial not only for emotional well-being but also for improving seizure control, medication adherence, and long-term developmental outcomes.

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Recommendations

- **Routine screening** for depression and anxiety using standardized tools like CDI and SCARED should be integrated into pediatric epilepsy clinics.
- **Multidisciplinary care models**, including pediatric neurologists, psychologists, school counselors, and social workers, should be promoted for holistic epilepsy management.
- **Training for caregivers and educators** on recognizing emotional symptoms in children with epilepsy can help in early identification and support.
- **Psychoeducational and behavioral interventions** should be offered to children with emotional symptoms to reduce psychological distress and improve quality of life.
- **Longitudinal research** is needed to explore the trajectory of psychological morbidities in pediatric epilepsy and the effectiveness of early interventions in modifying outcomes.

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