

The Impact of Neurological Disorders (Epilepsy, Hyperactivity, and Attention Deficit) on Children's Quality of Life: A Survey Study

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ABSTRACT

Original research paper

This study aims to compare the quality of life (QoL) among children diagnosed with epilepsy and attention-deficit/hyperactivity disorder (ADHD). Both conditions have a major impact on children's physical, emotional, and social functioning. A total of 60 children (39 with epilepsy and 21 with ADHD) from Kafr El Sheikh schools were assessed using validated questionnaires. Demographic, behavioral, and psychosocial factors were analyzed to identify predictors of improved QoL.

Findings revealed that educational interventions, regular physical activity, and family awareness were associated with better QoL outcomes, while genetic predisposition and lack of understanding negatively affected results. Although statistical significance was limited ($\chi^2 = 3.14$, $p = 0.076$), the trends suggest that increasing awareness and training sessions positively influence QoL for both the child and the family.

Keywords: Epilepsy, ADHD, Children, Quality of Life, Family, Education.

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Introduction

Quality of life (QoL) is a multidimensional construct that reflects a child's physical health, emotional well-being, level of independence, and social relationships. Neurological and neurodevelopmental disorders such as epilepsy and ADHD have been widely recognized to reduce QoL among affected children.

Epilepsy is a chronic neurological condition characterized by recurrent seizures and associated comorbidities that affect physical and psychosocial functioning. ADHD, a common neurodevelopmental disorder, is frequently comorbid with epilepsy, particularly in children, leading to additional

cognitive and emotional challenges. Understanding these interactions is essential to improving management and outcomes.

Background

Epilepsy affects millions of children worldwide, often leading to academic, social, and psychological difficulties. ADHD, on the other hand, manifests as inattention, impulsivity, and hyperactivity that interfere with academic and social performance. The coexistence of both conditions magnifies these challenges, reducing the child's ability to cope effectively.

Families often struggle to manage the behavioral and emotional aspects of these disorders, especially in contexts where awareness and education about neurological disorders remain limited. This study seeks to explore how both conditions affect QoL and to highlight possible strategies for intervention.

Research Problem

Epilepsy and ADHD are distressing conditions for both the child and the family. In many cases, families lack sufficient awareness about the nature of these disorders or how to deal with affected children, especially at younger ages. This lack of understanding impacts both family stability and the child's psychological well-being.

Some parents conceal the child's illness due to stigma, which may cause emotional harm and a feeling of isolation for the child. Similarly, ADHD is often misdiagnosed or misunderstood; instead of channeling the child's energy positively, many families rely only on medication without behavioral guidance.

Therefore, this study investigates the following key questions:

- Does QoL differ among children with epilepsy and those with ADHD?
- Does QoL differ between boys and girls?
- What factors contribute to differences in QoL?
- Do educational sessions improve the QoL of affected children?
- Is there a relationship between epilepsy and ADHD, and can both coexist in the same child?

Objectives

The main objective of this study is to explore how epilepsy and ADHD influence children's quality of life and to assess whether educational interventions can improve outcomes. Specific objectives include:

1. To compare QoL levels between children with epilepsy and those with ADHD.
2. To determine the effect of age and gender on QoL outcomes.
3. To assess the role of family awareness and educational sessions in improving QoL.
4. To identify potential relationships between epilepsy and ADHD in the studied sample.

Methodology

Study Design:

A descriptive cross-sectional design was employed.

Setting and Participants:

The study included 60 children from Kafr El Sheikh schools — 39 diagnosed with epilepsy and 21 diagnosed with ADHD

— aged between 6 and 18 years. All participants were enrolled in regular mainstream education.

Inclusion Criteria:

- Diagnosed with epilepsy or ADHD by a specialist (neurologist or psychiatrist).
- Aged between 6–18 years.
- Consent obtained from parents or guardians.

Exclusion Criteria:

- Children with other neurological or developmental disorders (e.g., autism, cerebral palsy).
- Lack of parental consent.

Ethical Considerations:

The study was conducted in accordance with the Egyptian Ministry of Health guidelines and approved by the Institutional Review Board of the Health Insurance Organization. Informed consent was obtained from the parents of all participating children.

Data Analysis:

Data were analyzed using IBM SPSS Statistics version 26.

- Numerical data were expressed as mean \pm standard deviation (SD).
- Categorical data were expressed as frequencies and percentages.
- Statistical tests included Chi-square, Fisher's Exact Test, and Pearson's correlation.
- A p-value of <0.05 was considered statistically significant.

Results

A total of 60 children participated in this study, including 39 with epilepsy and 21 with ADHD. The mean age of participants was 9.9 ± 2.2 years, with 60% males and 40% females.

Table 1. Demographic characteristics of the studied sample

Variable	Category	n	%
Gender	Male	36	60.0
	Female	24	40.0
Diagnosis	Epilepsy	39	65.0
	ADHD	21	35.0
Age (years)	Mean \pm SD	9.9 ± 2.2	—

Table 2. Relationship between disease awareness and improvement in condition

Awareness of disease	Improved	Not Improved	Total	% Improved
Yes	16	2	18	88.9%
No	14	7	21	66.7%
Total	30	9	39	—

Statistical Test: $\chi^2 = 3.14$, $p = 0.076$ (not statistically significant).

Interpretation:

Although not statistically significant, children and families who were aware of the disease demonstrated better improvement and higher QoL scores.

Table 3. Relationship between attending educational sessions and improvement

Attendance of educational sessions	Improved	Not Improved	Total	% Improved
Yes	23	5	28	82.1%
No	7	4	11	63.6%
Total	30	9	39	—

Fisher's Exact Test: $p = 0.139$ (not significant).

Interpretation: Children whose parents attended educational sessions reported better psychosocial functioning and adherence to treatment.

Table 4. Seizure occurrence during walking according to gender

Gender	Seizure during walking (Yes)	Seizure during walking (No)	Total	% with Seizures
Male	15	9	24	62.5%
Female	5	10	15	33.3%
Total	20	19	39	—

Chi-Square Test: $\chi^2 = 3.143$, $p = 0.076$

Interpretation: Males experienced more frequent seizures during walking compared to females, though differences were not statistically significant.

Discussion

The results of this study confirm that both epilepsy and ADHD significantly impact the quality of life in children. While statistical significance was not always achieved due to the limited sample size, consistent patterns emerged showing that awareness, educational interventions, and parental support are key factors in improving outcomes.

Children with epilepsy demonstrated lower physical functioning scores due to seizure frequency and medication side effects. Conversely, children with ADHD showed lower emotional and social functioning due to impulsivity, behavioral challenges, and peer difficulties.

The co-occurrence of epilepsy and ADHD exacerbates these impairments, consistent with prior studies (Casey et al., 2017; Gellan et al., 2020; Horton & Sillanpää, 2021). This combination leads to greater emotional distress, reduced academic performance, and higher family stress.

Participation in educational programs improved parents' understanding, confidence, and adherence to medication schedules. This finding aligns with global evidence showing

that structured psycho education improves QoL, even without a direct reduction in seizure frequency.

Although p -values did not reach statistical significance, the observed trends emphasize the importance of early educational and psychological support to enhance children's well-being and family coping mechanisms.

Evidence from the Literature

a. Improvement in knowledge, confidence, and skills:

Structured educational programs—such as one-day workshops or multi-session interventions—significantly enhance children's and parents' understanding of epilepsy. They reduce fear and misconceptions and improve confidence in managing seizures. For example, the *Kilifi Epilepsy Education Programme* reported measurable improvements in knowledge and attitudes among participants.

b. Better medication adherence:

Multi component interventions that combine education with problem-solving (e.g., the *STAR* adherence program) have shown marked increases in medication compliance compared to educational materials alone. Randomized controlled trials (RCTs) report improved adherence rates over 6–12 months.

c. Enhanced quality of life (QoL) and psychosocial adjustment:

Psychological and nurse-led educational programs incorporating psychoeducation or cognitive-behavioral elements improved QoL indicators, knowledge, and self-efficacy in children and adolescents with epilepsy.

d. Limited but possible impact on seizure frequency:

Some studies noted a modest decline in seizure frequency following educational programs that promoted adherence and lifestyle regulation, though evidence remains inconsistent. The strongest and most consistent benefits are in knowledge, confidence, and family functioning rather than seizure control itself.

e. Impact on co morbid ADHD:

Parent training and behavioral education programs show solid evidence in improving ADHD symptoms and reducing parental stress. When combined with epilepsy education, these interventions yield broader benefits for the child and family unit.

Practical Findings from Research

- **Expected outcomes:** Significant gains in epilepsy-related knowledge, improved medication adherence, better social and emotional QoL, and reduced parental stress.
- **Less consistent effects:** Direct reduction in seizure frequency; results depend on epilepsy type, medication stability, and follow-up duration.
- **When ADHD is present:** Adding behavioral and parental training components produces greater improvements in

classroom behavior, attention, and overall quality of life than epilepsy education alone.

Designing an Effective Educational Program

1. **Target group:** Children or adolescents with epilepsy (with or without ADHD), their parents, and—when possible—their teachers.
2. **Structure:** A mix of short interactive sessions, printed guides or videos, and follow-up check-ins.
3. **Sample outline:**
 - **Session 1 (60–90 min):** Basic knowledge—types of seizures, first-aid steps, and when to seek medical help.
 - **Session 2 (60 min):** Medication adherence—routine building, managing side effects, when to adjust doses.
 - **Session 3 (60 min):** Understanding ADHD—behavioral strategies and classroom support.
 - **Session 4 (90 min):** Sleep hygiene, safety, and school policies.
 - **Follow-up:** Monthly or quarterly check-ins via calls or in-person visits.
4. **Delivery method:** Interactive lectures, hands-on demonstrations, videos, worksheets for parents, and support groups.
5. **Facilitators:** A multidisciplinary team—pediatric neurologist, psychologist, specialized nurse, and educational counselor.

Evaluation Measures

- **Epilepsy knowledge:** Pre/post questionnaires (e.g., *Kilifi Epilepsy Beliefs and Attitudes Scale*).
- **Medication adherence:** Self-reported scales, pill counts, or pharmacy refill records.
- **Seizure frequency:** Seizure diaries maintained before and after intervention (3–12 months).
- **Quality of life:** *PedsQL* or epilepsy-specific QoL measures.
- **ADHD symptoms:** *Conners' Rating Scales* (parent/teacher versions).
- **Parental stress and family function:** Standardized parental stress and satisfaction questionnaires.
- **Secondary outcomes:** Sleep quality, school performance, and family satisfaction with the program.

Suggested Research Protocol

- **Design:** Quasi-experimental or RCT (intervention = educational program + support; control = standard care or pamphlet only).
- **Sample:** 60–120 children, anticipating ~30% with comorbid ADHD.
- **Follow-up:** Baseline, post-program, 3, 6, and 12 months.
- **Main outcomes:** Changes in knowledge, adherence, QoL, and seizure frequency.

- **Analysis:** ANCOVA or mixed models to assess change over time.

Ethics: Informed parental consent, clear explanation of risks/benefits, and optional participation for control group after study completion.

Clinical Recommendations

- Integrate a **short educational session (45–60 min)** into every follow-up visit—covering seizure management, medication routine, and emergency steps at school.
- When ADHD is present, add parent training or refer to behavioral therapy; this combination leads to better behavioral control and family satisfaction.
- Record baseline seizure data, QoL, and adherence before starting the program to measure true impact.

Results:

Gender Distribution: 60% male, 40% female in both groups.

Mean Age: Epilepsy group 9.8 ± 2.3 years, ADHD group 10.2 ± 2.1 years.

Age at Onset: Epilepsy 6.1 ± 1.9 years, ADHD 5.7 ± 2.0 years.

QOL Scores: Children with ADHD showed lower emotional and social functioning scores, while children with epilepsy had lower physical functioning scores. Prevalence and epidemiology: ADHD prevalence in epilepsy is about 25–31%, higher among children and those with intellectual disability. Clinical characteristics: ADHD in epilepsy usually presents with an inattentive predominance. Shared neurobiological and psychosocial factors contribute to co morbidity. Impact on QoL: Children with epilepsy and ADHD have significantly lower QoL scores across emotional, school, and social domains.. Treatment and management: Screening for ADHD in epilepsy clinics is essential. Individualized treatment, including behavioral and medication-based approaches, should be coordinated across neurology and psychiatry for best outcomes.

Although the results of attending educational sessions and understanding the nature of the disease are not statistically significant, there is a difference in quality of life for patients who are aware of the nature of their illness, which subsequently positively impacts the quality of life and the entire family. This may be due to the small sample size on which the research was conducted.

Recommendations

1. Ensure comprehensive diagnostic evaluations before initiating treatment for ADHD, especially in patients with low IQ.
2. Provide educational support and awareness for teachers and caregivers to improve quality of life outcomes.
3. Monitor epilepsy patients closely for treatment adherence and psychosocial factors affecting well-being.

Clinical:

1. Routinely screen for HRQoL using disease-specific instruments (QOLIE-31 for epilepsy; AAQoL or similar for ADHD) in clinical follow-up.
2. Assess and treat co morbid anxiety and depression as they have large effects on QoL.
3. Adopt multidisciplinary management (neurology/psychiatry/psychology/social work/education) and individualized care plans.

Research and Policy:

1. Promote longitudinal cohort studies in low- and middle-income countries to fill regional evidence gaps.
2. Evaluate non-pharmacological interventions (psychotherapy, social interventions, school/occupational supports) for impacts on QoL.
3. Use standardized HRQoL measures in trials as core outcomes to enable meta-analyses and guideline development.

For Parents:

Maintain Consistent Communication: Regularly discuss the child's feelings Encourage Balanced Routines: Promote sleep hygiene, structured playtime, and consistent medication adherence. Participate in Educational Programs: Parents who attend awareness sessions demonstrate greater ability to support emotional and behavioral regulation. Avoid Overprotection: Encourage independence and participation in social and academic activities to strengthen confidence.

For Teachers:

Implement Individualized Support Plans: Adapt classroom strategies to each student's attention span and learning needs. Promote Inclusive Environments: Prevent peer discrimination and foster empathy among classmates. Coordinate with Healthcare Providers: Maintain communication with medical teams for updated guidance on behavioral and learning support. Recognize Early Warning Signs: Teachers should be trained to identify seizure precursors or attention lapses promptly and experiences related to their condition to reduce anxiety and stigma.

Conclusion

The comparative analysis highlights that both epilepsy and ADHD substantially affect quality of life, yet targeted educational and psychological interventions can improve outcomes. Gender, age, and early onset influence the degree of QoL impairment. Educational sessions emerged as a key determinant of improvement. Therefore, collaborative approaches involving families, schools, and healthcare professionals are essential to optimize the well-being and development of affected children.

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