Quality of life of epileptic children in Minia Governorate: a cross-sectional study

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Background
Quality of life of childhood epilepsy (QOLCE) is the main outcome that is increasingly being recognized as an essential element in the assessment of the epilepsy effects on life function and also treatment of epilepsy. This study aimed to assess the QOL among the epileptic children.
Patients and Methods
A cross sectional study design was carried out on 100 children. The study has been held in the Neurology and Psychiatry outpatient clinic of Minia university hospital; In addition to Minia Psychiatry hospital, the official psychiatry hospital in Minia governorate. The total sample included 100 children. Fifty epileptic children aged between 4–18 yrs and 50 apparently healthy children with no chronic illness, of matched age, sex, and social class were included as the control group.
Results
There was no significant difference between the two groups regarding sociodemographics, except for birth order and number of sibling, as well as for positive family history of epilepsy. Regarding the electroencephalography changes, there was a significant difference between the two groups.
There was a statistically significant difference between the two groups regarding the low QOLCE score. Polytherapy had low score on QOLCE, especially in emotional, social, physical, and total score.
Conclusions
Childhood epilepsy affects the QOL of the epileptic children, especially cognitive, social, emotional, and physical functions. Polytherapy was associated with more impairment of QOL. On the contrary, epileptic patients who were compliant to treatment had good QOL.

Keywords:
childhood epilepsy, Minia Governorate, quality of life

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Background

Childhood epilepsies present broad treatment challenges that are unique to this age group. These challenges include the possible diagnoses; the treatment options; the developmental, cognitive, and behavioral comorbidities that accompany epilepsies; and the likelihood that these different factors interact with developmental processes in the young brain (Blümcke *et al.*, 2013).

Epileptic children are at more risk of psychological and psychiatric impairments (Taylor *et al.*, 2011). They often experience daunting limitations and social stigma, fear of next seizure, medication adverse effects (Szaflarski *et al.*, 2006), and poor academic achievement (Taylor *et al.*, 2011); therefore, epilepsy impairs children's physical and cognitive health and psychosocial compatibility as evidenced by emotional, behavioral, social, and academic difficulties (De Souza Maia Filho *et al.*, 2007).

The management of epilepsy needs determination of potential effects of epilepsy on all domains of life (Aggarwal *et al.*, 2011).

Quality of life of childhood epilepsy (QOLCE) is the main outcome that is increasingly being recognized as an essential element in the assessment of the epilepsy effects on life function and also treatment of epilepsy (Modi *et al.*, 2009).

Because of considerable advances in epilepsy treatment, attention has shifted to perception of the effects of the disease on mental health and QOL (De Souza Maia Filho *et al.*, 2007). Epilepsy is an incongruous condition that differs based on etiology, seizure characteristics (e.g. type and frequency), clinical management, and existence of neurological pathology. However, limited research has been presented specifically on measuring the QOLCE of children with epilepsy (Miller *et al.*, 2003).

Research on chronic conditions has shown that QOL differs based on variables such as income, educational

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level, occupational status, age, and sex. In comparison with this tremendous set of studies, the field of epilepsy is limited by scarce research on demographic predictors of QOLCE.

Understanding the effects of demographic and clinical variables on QOLCE is the main goal for determining health policy interventions (Sherman *et al*., 2008). There is also much attention in comparing QOLCE between individuals with the same medical condition in diverse countries/cultures (Yam *et al*., 2008). On the contrary, epilepsy can be both a medical diagnosis and a social stigma, particularly in developing countries (Ronen *et al*., 2010).

There is an outstanding absence of studies on QOLCE among children with epilepsy from the developing countries (Aggarwal *et al*., 2011). In developing countries, community attitudes regarding epilepsy display cultural biases, including poor acceptance of a person with epilepsy entering into the family via marriage (Ghanean *et al*., 2013).

The effects on QOL and its related factors in children and adolescents with epilepsy remain unknown. Realization of factors associated with QOL in these children is essential to plan suitable interventions (Szaflarski *et al*., 2006).

Objectives

The aim is to assess the QOL among the epileptic children.

Patients and methods

Study design

A cross-sectional study design was carried out on 100 children.

Setting of the study

The study was held in the Neurology and Psychiatry Outpatient Clinic of Minia University Hospital, which is considered as a tertiary health care facility and includes specialized subunits for child psychiatry, adult psychiatry, and neurophysiology unit. In addition to Minia University Hospital, the study was conducted at the official psychiatry hospital in Minia Governorate (Minia Psychiatry hospital).

The total sample included 100 children: 50 epileptic children aged between 4 and 18 years and 50 apparently healthy children with no chronic illness, of matched age, sex, and social class, who were included as the control group.

(1) The inclusion criteria were as follows:
   (a) The age ranges from 4 to 18 years old.
   (b) The diagnosis of epilepsy in the children is based on history from a reliable eye witness account, the patient's account, and the electroencephalography (EEG) findings.
   (c) The elapse of minimum 6 months from the diagnosis of the disorder.
   (d) Informed consents from parents of the studied children.
(2) Exclusion criteria were as follows:
   (a) Children with apparent intellectual disabilities (IQ<75).
   (b) Children with history of neurological illness other than epilepsy.
   (c) Other major comorbid non-neurological disorders that would affect QOL (e.g. asthma requiring daily medication and renal failure).
   (d) Death of child during the study.

An oral and written consent was obtained from parents (mother or father) of children included in this research.

Approval to conduct this study was obtained from the local ethical committee of Minia Faculty of Medicine.

Study tools

A well-prepared sheet was used for the evaluation of the patients of the study. This sheet included several parts, investigating for (a) sociodemographics, (b) family atmosphere, (c) negative consequences of epilepsy on school performance and psychiatric health status as well as the QOL, and (d) the occurrence of seizures.

By performing detailed neurological examination, we had been aiming at excluding, as much as possible, any organic neurological basis of seizures and much more importantly picking up any sign that may warrant further neurological investigations.

All participants of the study were subjected to an EEG whether epileptic or control group.

(1) Sociodemographic characteristics:
   For the purposes of this study, the sociodemographic variables used were age, sex, marital status, working status, educational level, residence, number of siblings, birth order, and parental marital status.
(2) Illness characteristics:
   These included history, type, number and precipitating factors of seizures, and family and past history of epilepsy.

(3) EEG findings:
Normal, nonspecific changes, generalized sharp activity, generalized slowness, focal sharp activity, or focal slowness.
(4) Psychometric tools:

QOLCE.

QOLCE is a 55-item allocation, examining the following areas:

(1) Cognitive functioning (22 items).
(2) Emotional functioning (17 items).
(3) Social functioning (seven items).
(4) Physical functioning (nine items).

Scoring process

All items were recorded, with higher scores indicating higher well-being. The precoded numeric values of items were converted to a 0–100-point scale, with higher converted scores always reflecting better QOL. Responses were coded as 0, 25, 50, 75, and 100. The mean value of the items in each subscale were calculated, and then the denominator was adjusted to include only items answered. Finally, to calculate the total score, the nonweighted mean of the four subscales was taken (Goodwin, 2005).

Statistical analysis

Data analysis was done by the Statistical Package of Social Sciences (SPSS Inc., South Wacker Drive, Chicago, USA), version 16.0 for Windows. Frequencies and percentages were calculated for categorical variables, whereas means and SDs were calculated for continuous variables. Descriptive statistics of the study participants were conducted. *t* tests were used to compare the epileptic group with control group on continuous variables, whereas χ^2 tests were used in comparing the two groups on categorical variables. Correlations were conducted to study the magnitude, nature, and significance of the relationship between independent study variables (sociodemographics, illness characteristics) and dependent variables (psychiatric presentations), as well as to establish the relative predictive importance of the independent variables on the dependent variables.

Results

Comparison between the epileptic children group and the control group

Sociodemographic characteristics

The total sample of the study included 100 participants: 50 patients diagnosed clinically to have epilepsy and 50 ones as a control group. Regarding the epileptic group, 31 (62%) males and 19 (38%) females, with a mean age of 9.4±3.8 years. There were 17 (34%) patients from urban areas, whereas 33 (66%) patients were from rural areas. The educational status in the epileptic group showed that 31 (62%) patients were educated, whereas only nine (18%) patients were not educated, as well as 10 (20%) patients were preschool. The mean number of sibling among the epileptic patients was 4.5±1.8, with a mean birth order of 3.2 ±1.8.

However, there was no statistically significant difference between the epileptic and the control group regarding sociodemographic characteristics (age, sex, residence, marital status, and educational level). There was only a trend to statistical significance between the two groups regarding birth order, with a mean of 3.2±1.8 with seizures in contrast to a mean of 2.3±1 in the control group (P=0.012). In addition, there was a trend to statistical significance between the two groups regarding the number of siblings with a mean of 4.5±1.8 for epileptic children in contrast to a mean of 2.7±1.2 in the control group (P<0.001) (Table 1).

Illness characteristics in epileptic group

The mean age of onset of seizure was 6.4±3.3 years, with mean duration of each attack of 7.4±6.3 min. The mean of frequency of attacks was 6.3±8.1 months. The mean of the last seizure was 3.8±3.9 months. A total of 44 (88%) patients have experienced generalized tonic–clonic fits, five (10%) patients experienced focal fits, whereas only one (2%) patient had experienced absence seizure. Regarding the time of the seizure, 37 (74%) patients had experienced nocturnal and diurnal fits, 12 (24%) patients had experienced diurnal fits, whereas only one (2%) patient had experienced nocturnal fits (Tables 2 and 3).

Electroencephalography characteristics in the epileptic group and control group

QOL of the epileptic children group and the control group:

There was a statistically significant difference between the epileptic group and the control group regarding EEG changes, where 19 (38%) patients of epileptic group had epileptic EEG finding and four (8%) patients had nonspecific changes. On the contrary, the control group had two (4%) patients with epileptic EEG, and another two (4%) patients with nonspecific EEG changes (P<0.001) (Table 4).

Table 1 Comparison of sociodemographic characteristic between the epileptic group and control group

	Epileptic group (*N*=50) [*n* (%)]	Control group (*N*=50) [*n* (%)]	*P* value
Age			
Range	5–17	4–17	0.411
Mean±SD	9.4±3.8	10±4	
Sex			
Male	31 (62)	31 (62)	1
Female	19 (38)	19 (38)	
Handedness			
RT	50 (100)	50 (100)	–
LT	0	0	
Education			
Preschool	10 (20)	11 (22)	0.623
Illiterate	9 (18)	4 (8)	
Primary	22 (44)	23 (46)	
Preparatory	7 (14)	8 (16)	
Secondary	2 (4)	4 (8)	
Residence			
Rural	33 (66)	25 (50)	0.105
Urban	17 (34)	25 (50)	
Birth order			
Range	1–10	1–6	0.012*
Mean±SD	3.2±1.8	2.3±1	
Number of siblings			
Range	2–10	1–6	<0.001*
Mean±SD	4.5±1.8	2.7±1.2	

Mann–Whitney test for nonparametric quantitative data between the two groups. χ^2 test (if number per cell ≥5) and Fisher exact test (if number per cell <5) for qualitative data between the two groups. LT, left; RT, right. *Significant difference at *P* value less than 0.05.

Table 2 Illness characteristics in the epileptic group

	Epileptic group (*N*=50) [*n* (%)]
Age of onset of seizure	
Range	0–14
Mean±SD	6.4±3.3
Duration of attack (min)	
Range	1–30
Mean±SD	7.4±6.3
Frequency of attacks per month	
Range	0–50
Mean±SD	6.3±8.1
Last seizure in month	
Range	0–12
Mean±SD	3.8±3.9
Type	
Generalized	45 (90)
Absence	1 (2)
GTC	44 (88)
Tonic	0
Atonic	0
Focal	5 (10)
Time	
Diurnal	12 (24)
Nocturnal	1 (2)
Both	37 (74)

GTC, generalized tonic clonic.

Comparison between the epileptic group and the control group regarding the risk factors

There was a trend to statistically significance between the two groups regarding family history of seizure, where 12 (24%) patients had a family history of seizure in the epileptic group in contrast to two (4%) had a family history of seizure in the control group (*P*=0.008) (Table 5).

There was no statistically significant difference between the epileptic group and the control group regarding perinatal and postnatal risk factors (cyanosis and jaundice), except the febrile convulsions, where 12 (24%) patients in the epileptic group had febrile convulsion in contrast to no patients in the control group (*P*<0.001).

Correlation between independent variables and different parameters

The group of generalized fits shows to have a higher score of QOLCE, cognitive, with mean±SD, 82.8±17, in contrast to the focal fits group (mean±SD, 73.8±26.7).

The group of generalized fits shows to have lower score of QOLCE, social (mean±SD, 84.9±18.9), physical (59±24.8), emotion (71.9±16.9), and the total core (74 ±14.1), in contrast to the focal fits group. All of these correlations were not statistically significant (Table 6).

Polytherapy shows to have a lower score of QOLCE (this means that polytherapy led to more impairment in the QOL especially the emotional aspect). This

Table 3 Electroencephalography characteristics in the epileptic group in comparison with the control group

	Epileptic group (*N*=50) [*n* (%)]	Control group (*N*=50) [*n* (%)]	*P* value
EEG			
Normal	27 (54)	46 (92)	<0.001*
Epileptic	19 (38)	2 (4)	
Nonspecific	4 (8)	2 (4)	
Nonsignificant	0	0	
Laterality			
Unilateral	3 (15.8)	0	<0.001*
Bilateral	16 (84.2)	2 (100)	
EEG site			
Generalized	16 (84.2)		<0.001*
Frontal	1 (5.3)	2 (100)	
Temporal	2 (10.5)		
Parietal	0		
Occipital	0		

Fisher exact test for qualitative data between the two groups. EEG, electroencephalography. *Significant difference at *P* value less than 0.05.

Table 4 Quality of life of childhood epilepsy questionnaire score characteristics in epileptic and control group

QOLCE	Epileptic group (*N*=50)	Control Group (*N*=50)	*P* value
Cognitive			
Range	29–100	51–100	<0.001*
Mean±SD	81.9±17.9	94.1±8.7	
Emotional			
Range	32–100	41–100	<0.001*
Mean±SD	71.7±16.4	86.1±15.4	
Social			
Range	25–100	83–100	<0.001*
Mean±SD	85.6±18.1	99.7±2.4	
Physical			
Range	24–100	41–100	<0.001*
Mean±SD	60.6±24	94.7±11.8	
Total score			
Range	46–98	69–98	<0.001*
Mean±SD	74.4±13.8	90.8±7.6	

Independent sample *t* test for parametric quantitative data between the two groups. QOLCE, quality of life of childhood epilepsy. *Significant difference at *P* value less than 0.05.

correlation was statistically significant (*P*=0.039). Moreover, polytherapy group shows to have lower score of QOLCE (more impairment in the social, physical aspects, and total score) but were not statistically significant (Table 7).

On the contrary, the group of epileptics that was complaint found to have a higher score of QOLCE (cognitive and total scores) (*P*<0.001 and 0.018, respectively) in contrast to noncomplaint group (Table 8).

Discussion

Discussion of sociodemographics and illness characteristics of the epileptic sample

The total sample included 100 patients: 50 patients diagnosed with epilepsy and 50 ones as a control group. Within the epileptic group, the mean age was 9.4±3.8 years. These characteristics are consistent with the results of previous studies, such as Bilgiç *et al.* (2018), which had approximately similar results.

Within the epileptic group, males represented most cases (62%; *n*=31) in the current study. This higher male predominance is consistent with other studies, as in Momeni *et al.* (2015), who reported that patients included were 67 (62%) boys and 41 (38%) girls.

There were 17 (34%) patients from urban areas, whereas 33 (66%) patients were from rural areas. This is not consistent with the result from a previous study done by Momeni *et al.* (2015), who found that most cases were from urban areas (69.4%), whereas 30.6% were from rural areas.

Table 5 Prenatal, perinatal, and postnatal risk factors characteristics in the epileptic group in comparison with the control group

	Epileptic group (*N*=50) [*n* (%)]	Control group (*N*=50) [*n* (%)]	*P* value
Mother illness			
No	49 (98)	47 (94)	0.617
Yes	1 (2)	3 (6)	
Family history of epilepsy			
No	38 (76)	48 (96)	0.008*
Yes	12 (24)	2 (4)	
Consanguinity			
No	36 (72)	37 (74)	1
Yes	14 (28)	13 (26)	
Cyanosis			
No	49 (98)	50 (100)	1
Yes	1 (2)	0	
Jaundice			
No	50 (100)	50 (100)	–
Yes	0	0	
Febrile convulsions			
No	38 (76)	50 (100)	<0.001*
Yes	12 (24)	0	

χ^2 test (if number per cell ≥5) and Fisher exact test (if number per cell <5) for qualitative data between the two groups. *Significant difference at *P* value less than 0.05.

Table 6 Summarizes the correlations between type of seizure and quality of life of childhood epilepsy

	Type of seizure		*P* value
	Generalized (*N*=45)	Focal (*N*=5)	
QOLCE cognitive			
Range	29–100	31–95	0.407
Mean±SD	82.8±17	73.8±26.7	
QOLCE emotional			
Range	32–100	57–82	0.779
Mean±SD	71.9±16.9	73.6±11.2	
QOLCE social			
Range	25–100	75–100	0.932
Mean±SD	84.9±18.9	89±10.8	
QOLCE physical			
Range	24–100	58–90	0.346
Mean±SD	59±24.8	70.4±12.6	
QOLCE total score			
Range	46–98	59–91	0.779
Mean±SD	74±14.1	76.4±13.3	

There was a case with absence of seizure which was excluded due to small sample size. Mann–Whitney test for nonparametric quantitative data between the two groups. Independent sample *t* test for parametric quantitative data between the two groups. QOLCE, quality of life of childhood epilepsy. *Significant difference at *P* value less than 0.05.

Table 7 Summarizes the correlations between the polytherapy and quality of life of childhood epilepsy

	Polytherapy	
	R	*P* value
QOLCE cognitive	0.045	0.758
QOLCE emotional	–0.293	0.039*
QOLCE social	–0.067	0.644
QOLCE physical	–0.049	0.735
QOLCE total score	–0.097	0.504

Nonparametric Spearman's rho correlation. QOLCE, quality of life of childhood epilepsy. *Significant correlation at *P* value less than 0.05.

Table 8 Summarizes the correlations between compliance on the therapy and quality of life of childhood epilepsy

	Compliance	
	R	*P* value
QOLCE cognitive	0.523	<0.001*
QOLCE emotional	0.180	0.211
QOLCE social	0.138	0.341
QOLCE physical	0.260	0.068
QOLCE total score	0.334	0.018*

Nonparametric Spearman's rho correlation. QOLCE, quality of life of childhood epilepsy. *Significant correlation at *P* value less than 0.05.

This may be explained by the socioeconomic state of the patients attending the outpatient clinic in Mina Governorate. The mean age of onset of seizure was 6.4 ±3.3 years, with mean duration of each attack of 7.4 ±6.3 min. The mean of frequency of attacks was 6.3±8.1 months. The mean of the last seizure was 3.8±3.9 months.

A total of 44 (88%) patients have experienced generalized tonic–clonic fits, and this is consistent with other studies (Momeni *et al.*, 2015; Schraegle and Titus, 2017).

Regarding the family history of epilepsy, it was found that only 12 (24%) patients have a family history. This is consistent with a study done by Momeni *et al.* (2015) but not with the other previous studies, such as Lv *et al.* (2009) and Schraegle and Titus (2017).

Discussion of the comparison between the epileptic group and the control group

Regarding the birth order, there was a significant difference between the two groups (earlier the birth order of the epileptic children, the better the QOL), and this coincides with one study by Momeni *et al.* (2015) but does not correlate with the other by Ramsey *et al.* (2016).

It should be noted here that absence of significant difference in sociodemographic characteristics between the two groups adds more to the reliability of the comparison between them regarding other variables, which is discussed later, that is, the epileptic group serves as an age-matched and sex-matched group to the control group.

On the contrary, Iqbal *et al.* (2016) found that most of the parents of the epileptic children have a high education (73.6% among mothers and 54.7% among their fathers) with statistically significant effect of the maternal level of education on the overall QOL of the epileptic children.

Regarding the depression and anxiety according to Hamilton scale, there was a statistically significant difference between the epileptic group and the control group regarding Hamilton Anxiety Scale (HAM-A) score with a mean of 7±4.2 at seizures group, in contrast to a mean of 4.1±2.4 in the control group ($P<0.001$). There was no statistically significance between the two groups regarding the Hamilton Rating Scale for Depression (HDRS).

Regarding the prenatal risk factors (mother illness, drug intake, surgery, radiation, and consanguinity), there was no statistically significant difference between the epileptic group and the control group. There was a trend to statistically significance between the two groups regarding family history of seizure, where 12 (24%) patients had a family history of seizure in seizure group in contrast to two (4%) had a family history of seizure in the control group.

Regarding the school characteristics, there was no statistically significant difference between the group who had seizures and the control group. It concludes that there is no effect of childhood epilepsy on scholastic characteristics. This was not coincident with a previous study by Wo *et al.* (2017), who found that academic achievement was lower than controls. The high percentages of low achievement in epileptic children were especially in the older age group. This also does not correlate with Reilly *et al.* (2018), who found that epileptic children who experience academic difficulties may not qualify for formal educational supports to address these difficulties if eligibility criteria for such supports stress an IQ-achievement discrepancy.

Regarding the EEG, there was a statistically significant difference between the group of patients who had seizures and the control group, where 19 (38%) patients in the seizures group had epileptic EEG finding and four (8%) patients had nonspecific changes, in contrast to two (4%) patients with epileptic EEG finding and another two (4%) patients with nonspecific EEG changes in the control group. This does not correlate with Mahmoud (2009); who studied the prevalence of epilepsy among primary school children in El Minia Governorate, Egypt, and found that 62.2% of the epileptic children had epileptic EEG changes and 18.9% had nonspecific EEG changes ($P=0.068$).

Regarding the QOL of the epileptic children, there was a statistically significant difference between the epileptic group and the control group regarding QOLCE (emotional score, social score, physical score, and total score) ($P<0.001$). This coincides with Liu and Han (2015), who stated that the childhood epilepsy is associated with poor QOL, with a mean of 53.66±17.65 in the epileptic children in contrast to 72.33±14.47 within the control group.

Momeni *et al.* (2015) stated that the total QOL in the epileptic children was worse than control group in total score, the emotional score, and physical score.

Bilgiç *et al.* (2018) reported that all of the child-reported and parent-reported Health-Realted Quality of Life (HRQL) scores were significantly lower in the patient group. According to the regression analysis, the child-related psychiatric and seizure-specific factors, but not the maternal psychiatric factors, were associated with the child's HRQL.

Correlation between independent variables and different parameters

Regarding the correlations between sociodemographic characteristics (child age) of the whole sample and QOLCE, HDRS, HAM-A, Depression Anxiety Stress Scale (DASS). DASS, hamilton depression scale (HDS), and QOLCE (cognitive) was found to be more in younger ages, in contrast to HAS, QOLCE (social, physical, emotional and total score), which were

lower score in younger ages, (lower score correlated with low QOL). All of these correlations were not statistically significant. This does not coincide with Liu and Han (2015), who stated that higher age is associated with poor QOLCE.

Moreover, Devinsky *et al*. (1999) stated that older age of children and male sex associated with poor outcome regarding the QOLCE.

Regarding the parent education, higher parent education was shown to have a higher score of QOLCE, cognitive, which is the only result of statistical significance. This can be explained by their awareness to seek medical advice. Higher parent education shows to have higher score of QOLCE, emotional, social, physical, and total score but with no statistical significance.

The compliance on therapy in the complaint group shows to have a lower score of DASS and higher score of QOLCE (cognitive and total scores) in contrast to noncomplaint group. These correlations were statically significant (P=0.001).

Regarding the correlation between the QOL of the epileptic children using the QOLCE and depression as well as anxiety in their parents assessed by HDRS and HAM-A, respectively. It shows that better QOL of the epileptic children shows to have less depression and anxiety in their parents (P=0.003 and 0.007, respectively). This can conclude that psychosocial interventions as well as targeting adherence to antiepileptic drugs may improve the parent anxiety and depression. This coincided with Ferro *et al*. (2011), who stated that a poor QOL of the epileptic children can have a negative effect on parental emotional status.

These findings were not congruent with Bilgiç *et al*. (2018), who failed to find an association between the QOL of the epileptic children and maternal depression and anxiety.

Conclusions

(1) Childhood epilepsy affects the QOL of the epileptic children, especially cognitive, social, emotional, and physical.
(2) Childhood epilepsy has no effect on school characteristic as attendance and peer relation.
(3) There is no relation between the type of seizure and QOL of the epileptic children.
(4) Polyantiepileptic drug is associated with significant effect of the QOL of epileptic children.
(5) Compliance on medication shows to have better QOL of the epileptic children, especially the cognitive aspect.

Recommendations

Recommendations based on the results of the current study are as follows:

(1) Inclusion of the cases diagnosed with neurodevelopmental disabilities other than the epilepsy study; the extent of these diseases affects the children.
(2) Performing brain imaging to exclude any metabolic or organic cause for epilepsy.

Recommendations for future research are as follows:

(3) Further studies to prove the high association between the childhood epilepsy and lower QOL in the affected children.
(4) Further studies of other adverse psychiatric effects of childhood epilepsy.
(5) Further studies of the effects of childhood epilepsy and its medications on the general medical condition.

Limitations of the study

From the aforementioned discussion of the methodology and the results, we can conclude that the limitations of the present study are as follows:

(1) The sample size was relatively small and this did not permit an assessment of actual frequencies of depression and anxiety in the parents of the epileptic children, hence prevented generalization of the results. This also might be the reason that many of the correlations in the current study are not statistically significant.
(2) The inability to perform brain imaging (brain MRI) may interfere with exclusion of other comorbid neurological disabilities.
(3) The use of the patient or witness descriptions for determining the presence of seizures.

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Conflicts of interest
There are no conflicts of interest.

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