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Original Research

Comparison of Resilience and Depression in Children and Adolescents with Epilepsy and Healthy Controls

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ABSTRACT

Objective: The purpose of this study was to compare the depression and resilience scores of children and adolescents with epilepsy and healthy controls. Furthermore, its purpose was to investigate whether resilience mediates the relationship between epilepsy and depression.

Methods: 100 children and adolescents (46 patients and 54 healthy controls) were included in the study. Questionnaire on sociodemographic data was administered to the all participants at the time of application to our center and all participants were asked to complete the Anxiety and Depression Scale in Children-Revised (RCADS-CV) and Child and Adolescent Psychological Resilience Scale (CYRM-12).

Results: 46 epilepsy patients had higher RCADS-CV depression scores (P=0.008) and lower psychological resilience scores (P= 0.001) compared to the control group. Although there was a negative correlation between psychological resilience scores and RCADS-CV depression scores in epilepsy patients and the control group, this correlation was not statistically significant.

Conclusion: We found that children and adolescents with epilepsy had lower psychological resilience and higher depression symptoms compared to healthy controls.

Keywords: Epilepsy, depression, resilience, child and adolescent

INTRODUCTION

Epilepsy is a neurological disease that occurs with excessive electrical discharges of brain cells and is characterized by recurrent seizures due to disturbances in the electrical functions of the brain. Seizures can cause serious suicide risk, premature death, social exclusion and depression in patients and affect their quality of life. Epilepsy is the most common neurological disorder in children and its prevalence in childhood is estimated to be 0.05-1% [1]. The fact that it is the most common among chronic neurological diseases makes the studies on this subject more important. Studies focusing on the prevalence of psychopathology in pediatric epilepsy have also documented that children with epilepsy have an estimated overall risk of childhood psychopathology of 16-77% [2, 3].

Children with epilepsy often have negative mood disorders such as depression. Depression in children manifests as mood swings, impulsivity, poor self-esteem, self-harm, suicide, and abdominal pain, which can have undesirable consequences for both the patient and the family [4]. There were many studies about childhood and adolescents epilepsy that report neuropsychiatric disorders in 35–50% of these patients [5]. Patients with epilepsy exhibit a 4-5 higher rate of depression compared with healthy population. In studies on epilepsy was found that the age of the patient, the age of onset of the seizure, the seizure type, the seizure frequency, the life span with the disease, the education level, the use of antiepileptic drugs and the socioeconomic status of the patient were associated with depression [6].

Psychological resilience, on the other hand, comes from the concept of "resilience", which derives from the Latin verb "salire" that meaning to jump again. It has been translated into Turkish with terms such as resilience, psychological resilience and flexibility [7]. The concept of psychological resilience, which is the ability of individuals to recover themselves or to overcome what they have experienced despite many challenges and difficulties they encounter in life, has been the subject of many studies in the literature [8]. Studies on the psychological resilience of depressed children and adolescents; shows that psychological resilience may play a role in the etiology of depression [9, 10].

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Many previous studies have shown that self-esteem is an important predictor of resilience [11-13]. In patients with epilepsy, the age of diagnosis of epilepsy is low, the duration of living with epilepsy is increased, uncontrolled seizures, the uncertainty of when the seizures will occur, loss of consciousness and body control during the seizure, difference in recovery time after the seizure, fear of being labeled, non-compliance with drug therapy negatively affects its life quality [14, 15]. Situations such as epilepsy patients experiencing unpredictable and suddenly developing seizures, losing control during seizures, growing socially isolated, families having a protective approach, and deterioration in social relations may cause individuals to lose their self-esteem [16].

Many studies have shown that epilepsy reduces resilience and causes depression but these studies have been conducted in adults with epilepsy or in families of children with epilepsy, the relationship between resilience and depression in children with epilepsy is among the barren areas. Therefore, in this study, we aimed to compare the depression and resilience scores of children and adolescents with epilepsy and healthy controls, and to investigate whether resilience mediates the relationship between epilepsy and depression.

METHODS

Study Population

This Study was planned as a single-center, prospective cohort study. Patients aged 8-17 years who applied to the Pediatric Neurology Clinic of Gaziantep University Medical Faculty Hospital and who had been diagnosed with epilepsy for at least 1 year, and healthy children aged 8-17 who applied to the Gaziantep University Medical Faculty Hospital Pediatric Clinic who were not diagnosed with any disease were included in the study. Patients with missing or incomplete data, patients with seizures below 6 months, patients younger than 8 years old, patients older than 17 years of age, and cases with psychiatric disorders such as autism or mental retardation were not included in the study. Dieter Schmidt's 2007 study showed that the response to antiepileptic drugs in the first 6 months is an excellent indicator of the response at 12 months in patients with epilepsy [17]. Therefore, patients with a seizure-free at least 6 months were preferred in order to exclude acute psychological symptoms of seizures and seizure side effects in patients with epilepsy in addition to reach more objective results by preventing antiepileptic drug changes during this period. Ethical consent was obtained for the study (Gaziantep University Faculty of Medicine Ethics Committee; decision dated 24.02.2021 and numbered 2021/34). Informed consent was obtained from all individuals included in the study. Questionnaires applied during the application to our center are Sociodemographic Data Form, Anxiety and Depression Scale in Children-Revised (RCADS-CV), Child and Adolescent Psychological Resilience Scale (CYRM-12).

Main Points:

- Many studies have shown that epilepsy reduces resilience and causes depression, but these studies have been conducted in adults with epilepsy or in families of children with epilepsy, the relationship between resilience and depression in children with epilepsy is among the barren areas.
- In this study, it was found that 46 patients with epilepsy who were followed up in the Pediatric Neurology Clinic of Gaziantep University Medical Faculty Hospital had higher RCADS-CV depression scores and lower psychological resilience scores compared to the control group.
- Parenting styles in Turkish society and the overprotective attitudes of families with children with epilepsy may also have contributed to low resilience scores and high depression scores.

Scales

Sociodemographic Data Form: In this form, there are questions about the sociodemographic characteristics of the child, such as gender, date of birth, class, number of siblings, and whether he applied to the psychiatry clinic. The form also includes information about the age and professional status of the parent. In addition, epilepsy-specific information such as drugs used by children and adolescents with epilepsy, time of diagnosis of epilepsy, seizure type, time of last seizure, and EEG results were collected. This form was completed by the clinician.

Anxiety and Depression Scale in Children-Revised (RCADS-CV): The RCADS-CV was developed by Chorpita et al. for children 3-12 grades. It consists of a total of 47 items and measures separation anxiety, social phobia, obsessive compulsive disorder, panic disorder, generalized anxiety disorder and major depressive disorder [18]. The validity and reliability of the Turkish version was made by Vahdet Söylemez, Ayse Kılınçaslan, Abdurrahman Cahid Örengül, Chad Ebesutani, İlyas Kaya, Veysi Ceri, Serhat Nasıroğlu, Mekiya Filiz & Bruce Chorpita [19]. Each item is scored between never (0), sometimes (1), often (2), and always (3) in the four-Likert scale. A high score indicates a high level of anxiety or depression symptoms.

Child and Youth Resilience Scale (CYRM-12): The original 28-item form of the scale consists of three subscales and eight sub-dimensions [20]. The short form study was done by Liebenberg, Ungar, and LeBlanc (2013), and a 12-item structure was obtained as a result of two different studies [21]. The Turkish validity and reliability study of the scale was performed by Arslan et al. [22]. This form was completed by children and adolescents. The measurement tool, which has a five-point Likert structure, is rated between "Describes me completely (5)" and "Does not describe me at all (1)". A high score indicates a high level of resilience.

Statistical Analysis

The sociodemographic and medical data of the participants were made using descriptive statistical methods. The normal distribution of numerical variables was tested with the Shapiro Wilk test. The Mann Whitney U test was used to compare the skewed variables between the two groups, and the Kruskal Wallis test was used for multiple comparisons. The relationships

between the skewed numerical variables were tested using the Spearman rank correlation coefficient, and the relationships between the categorical variables were tested using the Chi-square test. SPSS for Windows version 22.0 was used for statistical analysis. P value <0.05 was considered statistically significant.

RESULTS

The mean age of the children was 12.64 ± 2.74 (8-18 years), the mean age of onset of disease was 10.52 ± 2.26 (7 -14), and the mean disease duration was 36.63 ± 17.19 (12 -102 months). Data from a total of 100 children and adolescents, 31 males (31%) and 69 females (69%), were analyzed. Of the patients 32 (69.6%) had generalized epilepsy and 27 (58.7%) had seizure remission in the past year. Most of the participants' parents were not college graduates. Table 1 shows the comparison of the sociodemographic characteristics of the children and adolescents participating in the study. There was no significant difference in terms of age, gender, class, number of siblings, father's education, income status and having a room of their own. However a significant difference was found in terms of maternal education level (p=0.039). The mother's education level was higher in the control group.

The comparison of depression and resilience scores of children with epilepsy and control groups is shown in Table 2. According to the data obtained, the RCADS-CV Depression Score of children with epilepsy was 11.17 ± 14.03; the children in the control group were found to be 5.7 ± 5.75 (p=0.008). In the comparison made in terms of psychological resilience scores, it was found that the children with epilepsy were 44.57 ± 7.57 and the control group was 53.07 ± 9.03 (p=0.001). When these results were evaluated, it was found that children with epilepsy were more depressed and had lower psychological resilience. Although there was a negative relationship between psychological resilience scores and RCADS-CV depression scores in epilepsy patients (P=0.285) and control group (P=0.233), this relationship was not statistically significant (Table 3).

In the study, the age of onset of the disease, the duration of the disease, the number of siblings, the number of antiepileptic drugs [23], the type of seizure, gender, number of seizure-free years, and consanguinity between parents were found to be unrelated to RCADS-CV depression and psychological resilience scores. (Table 4,5) In the Kruskal Wallis test performed, no statistically significant correlation was found between the type of antiepileptic drug used in adolescents with epilepsy, seizure time, EEG (electroencephalography) findings and RCADS-CV depression and psychological resilience scores (p>0.05).

Table 1. Comparison of sociodemographic characteristics of children and adolescents with epilepsy with healthy controls

Variables		**Control (n=54)**	**Patient (n=46)**	
Continuous Variables		**Median (Min-Maks)**	**Median (Min-Maks)**	**P[a]**
Age		12 (8 – 18)	12.5 (8 – 18)	0.136
Grade		6.5 (1 – 11)	7 (3 – 12)	0.073
Number of siblings		3 (1 – 7)	3 (0 – 5)	0.462
Categorical Variables		**N (%)**	**N (%)**	**P[b]**
Gender	Female	41 (75.9)	28 (60.9)	0.105
	Male	13 (24.1)	18 (39.1)	
Father's education	Only literate	1 (1.9)	2 (4.3)	0.443
	Primary school	14 (25.9)	17 (37.0)	
	Secondary school	8 (14.8)	7 (15.2)	
	High school	15 (27.8)	13 (28.3)	
	University degree	16 (29.6)	7 (15.2)	
Mother's education	Only literate	0 (0)	4 (8.7)	**0.039**
	Primary school	20 (37.0)	25 (54.3)	
	Secondary school	7 (13.0)	5 (10.9)	
	High school	14 (25.9)	6 (13.0)	
	University degree	13 (24.1)	6 (13.0)	
İncome rate	Less than the minimum wage	9 (16.7)	8 (17.4)	0.694
	The minimum wage	24 (44.4)	23 (50.0)	
	The minimum wage x2	9 (16.7)	9 (19.6)	
	The minimum wage x3	12 (22.7)	6 (13.0)	
Child's own room	Yes	25 (46.3)	19 (41.3)	0.616
	No	29 (53.7)	27 (58.7)	

P[a]: Mann Whitney U test was used to evaluate the level of significance. P[b]: Chi-square test was used to evaluate the level of significance.

Table 2. Comparison of resilience and RCADS-CV depression scores of adolescents with epilepsy and control group

	Patient (n=46)	Control (n=54)	P
RCADS-CV Depression Score	11.17 ± 14.03	5.7 ± 5.75	0.008*
CYRM-12 Resilience Score	44.57 ± 7.57	53.07 ± 9.03	0.001*

*Significant at the 0.05 level, Mann Whitney U test was used to evaluate the level of significance. RCADS-CV: Anxiety and Depression Scale in Children, CYRM-12: Child and Adolescent Psychological Resilience Scale

Table 3. Correlation between RCADS-CV depression scores and resilience scores in adolescents with epilepsy

Group			CYRM-12 Resilience Score
Control	RCADS-CV Depression Score	R	-0.165
		P	0.233
Patient	RCADS-CV Depression Score	r	-0.161
		P	0.285

*Significant at the 0.05 level; r: Spearman rank correlation coefficients RCADS-CV: Anxiety and Depression Scale in Children, CYRM-12: Child and Adolescent Psychological Resilience Scale

Table 4. Correlation between RCADS-CV depression and CYRM-12 resilience scores in adolescents with epilepsy, number of antiepileptic drugs, number of siblings, duration of disease, age of onset of disease

Group			Number of AEDs	Number of siblings	Duration of disease	Age of onset of disease
Patient	RCADS-CV Depression Score	r	-0.008	0.196	-0.150	0.112
		P	0.958	0.192	0.321	0.460
	CYRM-12 Resilience Score	r	-0.036	0.025	-0.055	-0.036
		P	0.810	0.869	0.717	0.814

*Significant at the 0.05 level; r: Spearman rank correlation coefficients RCADS-CV: Anxiety and Depression Scale in Children, CYRM-12: Child and Adolescent Psychological Resilience Scale, AED: Antiepileptic drug

Table 5. Comparison of the RCADS-CV depression and CYRM-12 resilience scores of the patient group according to the number of seizure-free years, seizure type, gender, and consanguinity between parents

Variables		RCADS-CV Depression Score	CYRM-12 Resilience Score
Number of seizure-free years	1 year	9.44 ± 12.35	43.67 ± 7.29
	6 months	13.63 ± 16.15	45.84 ± 7.98
	P	0.292	0.288
Seizure type	Focal	7.57 ± 7.035	45.29 ± 5.823
	Generalize	12.75 ± 16.016	44.25 ± 8.289
	P	0.235	0.756
Gender	Female	11.93 ±13.741	45.82 ± 6.401
	Male	10 ± 14.789	42.61 ± 8.952
	P	0.348	0.241
Consanguinity between parents	Yes	11.38 ± 13.362	44.29 ± 8.804
	No	11 ± 14.838	44.80 ± 6.545
	P	0.465	0.982

*Significant at the 0.05 level, Mann Whitney U test was used to evaluate the level of significance, RCADS-CV: Anxiety and Depression Scale in Children, CYRM-12: Child and Adolescent Psychological Resilience Scale,

DISCUSSION

In the current study, which aimed to compare the depression and resilience scores of children and adolescents with epilepsy and healthy controls and to investigate whether resilience mediates the relationship between epilepsy and depression; it was determined that 46 patients with epilepsy who were followed up in the Pediatric Neurology Clinic of Gaziantep University Medical Faculty Hospital had higher RCADS-CV depression scores and lower psychological resilience scores compared to the control group. (Table 2) Although there was a negative relationship between psychological resilience scores and RCADS-CV depression scores in epilepsy patients (P=0.285) and control group (P=0.233), this relationship was not statistically significant (Table 3).

While the first reaction of parents who have children with epilepsy is to deny it, over time, families experience the stages of shock, devastation, disappointment, mourning and depression. Families may develop an overprotective attitude towards the child at the end of this fear/anxiety process [24]. This attitude of the families causes the child to become suppressed and overly dependent [25]. Epilepsies seen in childhood cause parents to develop a more conservative approach and accordingly individuals become dependent on others [26]. Families in Turkey often dictate and expect normative behavior and this attitude leads to repression of negative emotions by punishing them frequently [27]. Trying to manage something by suppressing is not among the most effective coping methods [27]. Since parenting that teaches children to deal with their emotions constructively is not common in Turkey, feelings of fear or helplessness are tried to be suppressed by the child [28]. This either leads to increased mood problems or manifests as psychosomatic problems [29].

Resilience and parenting style have been found to be inextricably linked. Studies have found that parenting styles have a positive or negative effect on their children's resilience [30].

According to the study of Wu et al. higher resilience is associated with a better positive coping style [31]. Individuals with low psychological resilience may not be able to develop adequate coping mechanisms when exposed to diseases, so these individuals may be more likely to experience depression. Therefore, parenting styles in Turkish society and the overprotective attitudes of families with children with epilepsy may also have contributed to low resilience scores and high depression scores [32].

In a study by Tedrus et al. in 2020, seizure control, normal EEG background activity and antiepileptic drug monotherapy were associated with greater resilience. Higher resilience has been associated with improved cognitive performance and less depressive symptom formation [33]. In our study, although there was a negative relationship between psychological resilience scores and RCADS-CV depression scores in patients with epilepsy, this relationship was not significant at the $p<0.05$ level. (Table 3) This may be due to the low sample size.

In a study conducted by Oguz A. et al. at Dokuz Eylül University in 2002 was determined that epilepsy-related factors such as duration of epilepsy, seizure frequency, and polytherapy increased anxiety and depression, while seizure onset age, seizure type, and electroencephalographic findings were not associated with anxiety and depression [34]. In our study, as in Dokuz Eylul, seizure onset age, seizure type, and EEG findings were not correlated with RCADS-CV depression scores, but unlike the study, RCADS-CV depression scores were also found to be unrelated with gender, number of siblings, frequency of seizures, seizure type, seizure time, AED type and polytherapy (Table 4,5). Ekinci et al. also suggested that AED use or AED type are not consistent predictors of depression [35].

According to a study conducted in China, the psychological resilience of the first child was found to be significantly lower than that of the only child [36]. Although there was no relationship between the number of siblings and psychological resilience in our study, more detailed results can be obtained by adding the parameters of one child and first child (Table 4).

In the study by Tedrus et al. greater reslience was observed in patients with epilepsy who had controlled seizures, normal EEG background activity, and took a single AED. There were no significant differences between resilience of groups in gender, seizure type, lateralized epileptic activity on EEG, epilepsy with lateralization of TLE-HS (Temporal lobe epilepsy and hippocampal sclerosis) [33]. In our study, however, no correlation was found between the number of seizure-free years, EEG findings, gender, seizure type, age at onset of epilepsy disease, number of antiepileptic drugs, and psychological resilience scores. This difference between studies can be explained that by the larger sample size in the study conducted in Brazil. At the same time, many studies have shown that having recurrent seizures affects the resilience and depression scores of people with epilepsy, especially when compared with those in seizure remission [37-40]. In our study, however since patients who had seizure in 6 months or less than 6 months were excluded, no significant results could be obtained.

During the reliability and validity testing phase, participants in the pilot study were limited to one hospital and the sample size was small. Therefore, it is necessary to further expand the sample size and improve the representativeness of the sample in the next study to validate the results of the study.

One of the strengths of this study was young people's involvement in interviews rather than their parents, thus providing a unique view on family processes. Furthermore many studies have shown that epilepsy reduces resilience and causes depression, but these studies have been conducted in adults with epilepsy or in families of children with epilepsy, the relationship between resilience and depression in children with epilepsy is among the barren areas. Current findings provided a overview of the relationship between resilience and depression in children.

Since resilience scores may vary according to parenting attitudes, it may be more useful to include them in the study. Although there was no relationship between the number of siblings and psychological resilience in our study, more detailed results can be obtained by adding the parameters of only child and first child.

Since puberty may also affect depression and resilience scores, two samples can be formed before and after puberty to exclude the effects of puberty.

In order to distinguish whether epilepsy directly affects psychological resilience negatively and causes a tendency to depression, a study can be conducted to evaluate the psychological resilience of adolescents with epilepsy by forming two groups as those with and without depressive complaints.

Educating families about mood disorders may provide earlier diagnosis of depression and easier access to psychiatric treatment in children with epilepsy. At the same time, providing families with information on how to communicate with their children with epilepsy and how to manage the crisis can increase positive coping mechanisms and psychological resilience and decrease the frequency of depression.

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Ethics Committee Approval: The study was approved by Gaziantep University Clinical Research Ethics Committee (Approval Number: 2021/34, Date: 24-02-2021). Informed consents were given to the all subjects. This study is based on first author's master dissertation.

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