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Assessment of the Quality of Life Scores of Operated and Unoperated Patients with Temporal and Extra Temporal Lobe Epilepsy and Their Relatives-Caregivers

Epilepsi Cerrahisi Uygulanan ya da Uygulanmayan Temporal ve Ekstratemporal Lob Epilepsisi Olan Hasta ve Yakınlarının Yaşam Kalitesi Ölçeklerinin Değerlendirilmesi

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Summary

Objectives: We investigated how seizure syndromes and treatment methods correlated with the quality of life and social functioning of patients with epilepsy and their relatives-caregivers.

Methods: A total of 203 patients with epilepsy and their relatives-caregivers were divided into four groups. The patients were administered the following assessments: Quality of Life in Epilepsy Inventory and the Social Functioning Scale. The patients and their relatives-caregivers were administered the Hamilton Depression and Anxiety Rating Scale. The Kruskal–Wallis Test and Mann–Whitney U Test were used for statistical analysis.

Results: When the quality of life and social functioning subscales were evaluated, the patient group with resistant temporal lobe epilepsy (TLE) had the lowest scores, while the highest scores occurred in the TLE group that had undergone surgical intervention and had entered remission with medical treatment. For both patients and their relatives-caregivers, the anxiety and depression scores were the highest in the resistant TLE group and the lowest in the surgical and remission group.

Conclusion: Control of seizures was the most important variable affecting the quality of life of patients with epilepsy and their relatives-caregivers. Treatment plans for epilepsy patients should encompass the quality of life considerations, including measures to increase social functioning such as assessments of comorbid psychiatric conditions like anxiety and depression.

Keywords: Anxiety in epilepsy; depression in epilepsy; social functioning in epilepsy; Quality of Life in Epilepsy Inventory.

Özet

Amaç: Farklı nöbet sendromlarının ve tedavi yönetimlerinin hastanın yaşam kalitesi, sosyal işlevselliği, hasta ve yakınının depresyon ve anksiyete düzeyleri ile ilişkisini inceledik.

Gereç ve Yöntem: Komplek parsiyel nöbet nedeni ile takip edilen 203 hasta ve hasta yakınları 4 gruba ayrıldı. Tüm hastalara Epilepside Yaşam Kalitesi Ölçeği, Sosyal İşlevsellik Ölçeği uygulandı. Ayrıca hasta ve yakınlarına Hamilton Depresyon ve Anksiyete Derecelendirme Ölçeği uygulandı. İstatiksal analizde Kruskal-Wallis Test ve Mann-Whitney U Testi kullanıldı.

Bulgular: Çalışmamızda yaşam kalitesi ve sosyal işlevsellik alt ölçekleri değerlendirildiğinde en düşük puanların dirençli TLE olan grupta, en yüksek puanların cerrahi uygulanan TLE ve medikal tedavi ile remisyona giren TLE olan grupta olduğu gözlendi. Hem hasta hem de yakınlarında anksiyete ve depresyon puanları en yüksek dirençli TLE, en düşük cerrahi ve remisyon grubunda saptandı.

Sonuç: Nöbetleri kontrol altına alınan bireylerin yaşam kalitesi ve sosyal işlevsellik düzeylerinin normal popülasyona yakın olmasına rağmen dirençli nöbetleri olan bireylerin nöbetleri kontrol altında olan epileptik bireylere oranla yaşam kalitesi ve sosyal işlevselliklerinin istatiksel anlamlılık yaratacak derecede düşük olması, yaşam kalitesini etkileyen en önemli değişkenin nöbet kontrolü olduğunu göstermektedir. Sonuç olarak hastaların yaşam kalitesini artırmaya yönelik yapılan planlarda hastanın sosyal işlevselliğinin arttırılmasına yönelik tedbirlerin alınması, hasta ve yakınlarının anksiyete ve depresyon gibi psikiyatrik komorbid durumlar açısından incelenmesi gerekmektedir.

Anahtar sözcükler: Anksiyete; depresyon; sosyal işlevsellik; Epilepside Yaşam Kalitesi Ölçeği.

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Introduction

Quality of life scales have been developed in recent years in relation to many diseases, including epilepsy, both to improve the satisfaction and life standard of patients and to reduce the cost incurred due to the disease.[1] Epilepsy is not only a disease involving psychosocial difficulties, but it is also a chronic neurological condition with the risk of developing psychiatric disorders.[2] Depression and anxiety are seen more commonly in patients with epilepsy than in patients with other chronic diseases; moreover, depression and anxiety levels have also been observed to be high in individuals providing care to the patient. It is known that the anxiety and depression experienced by patient relatives affect the life and social functioning of the individual, and such depression and anxiety of the caregiver reflect on the patient directly by raising his or her depression and anxiety levels even further and, as a result, negatively affecting his or her quality of life and social functioning.[3]

In this study, we investigated the effects of epilepsy on the quality of life in the context of social functioning and comorbid psychiatric conditions, such as anxiety and depression, both in patients and their relatives-caregivers. We aimed to detect the existence of comorbid psychiatric conditions in patients who have temporal lobe epilepsy (TLE) and extra temporal lobe epilepsy (ETLE), as well as their relatives-caregivers. In addition, we aimed to examine whether there was a significant correlation between the quality of life and social functioning, sociodemographic characteristics, antiepileptic drugs, resistance to drugs, epilepsy surgery, and duration of the disease.

Materials and Methods

This study was conducted at the Uludag University Faculty of Medicine (with the approval of the Uludag University Ethics Committee for Medical Research on February 18, 2014, approval number 2014-4/4) in accordance with the Declaration of Helsinki principles. The main purpose and nature of the study were explained, and the patients and their relatives-caregivers provided willing consent to participate. The study included a total of203 epilepsy patients observed between March 2014 and February 2015 to have complex partial seizures. A detailed medical history was available for the patients based on their previous hospital visits. Accompanied by their relatives-caregivers, the patients received a full neurological examination, including a cranial magnetic resonance imaging according to the Epilepsy Protocol, a 21 Channel electroencephalography, and neuropsychomotric test. During these examinations, neurologists administered the following assessments: the Epilepsy Evaluation Form, the Sociodemographic Information Form; the Hamilton Depression Rating Scale, and Hamilton Anxiety Rating Scale. In addition, expert psychologists and neurologists also administered the Quality of Life in Epilepsy Inventory (QOLIE-89, version 1.0) and the Social Functioning Scale (SFS).

This research included the patients with epilepsy between the ages of 18 and 65 who did not have any other medical or psychological issues affecting their quality of life and who received antiepileptic treatment, were voluntary participants, were able to answer the questions on the information forms, and had not had a craniotomy within the previous year. Out of 203 qualified patients, 102 were female, and 101 were male; the age average was 36.07 (range, 18–65). All patients were literate. The patients were classified into four groups (Fig. 1).

The following assessments were used in the study:

1. The Epilepsy Evaluation Form

Designed by the Department of Neurology at the Uludag University Faculty of Medicine, the Epilepsy Evaluation Form assesses the type of epileptic seizures suffered by a patient and evaluates the efficacy and side effects of the patient's current treatments.

2. The Sociodemographic Information Form

The Sociodemographic Information Form was created and applied by the researcher to assess the sociodemographic (education level, marital status) and clinical characteristics of the study participants.

3. The Quality of Life in Epilepsy Inventory

The QOLIE-89 version 1.0 evaluates the factors affecting the quality of life of patients with epilepsy. This survey was developed in 1993 by the QOLIE-89 Developmental Group and Cramer et al.; it has been used around the world and has been translated into several languages. This survey was shown to be a reliable, valid, and sensitive test for the use in patients with epilepsy in Turkey by Mollaoğlu et al.[4] The Quality of Life in Epilepsy Inventory consists of 89 items that form 17 subscales, including the overall quality of life (2 questions); emotional well-being (5 questions); role limitations: emotional (5 questions); social support (4 questions);

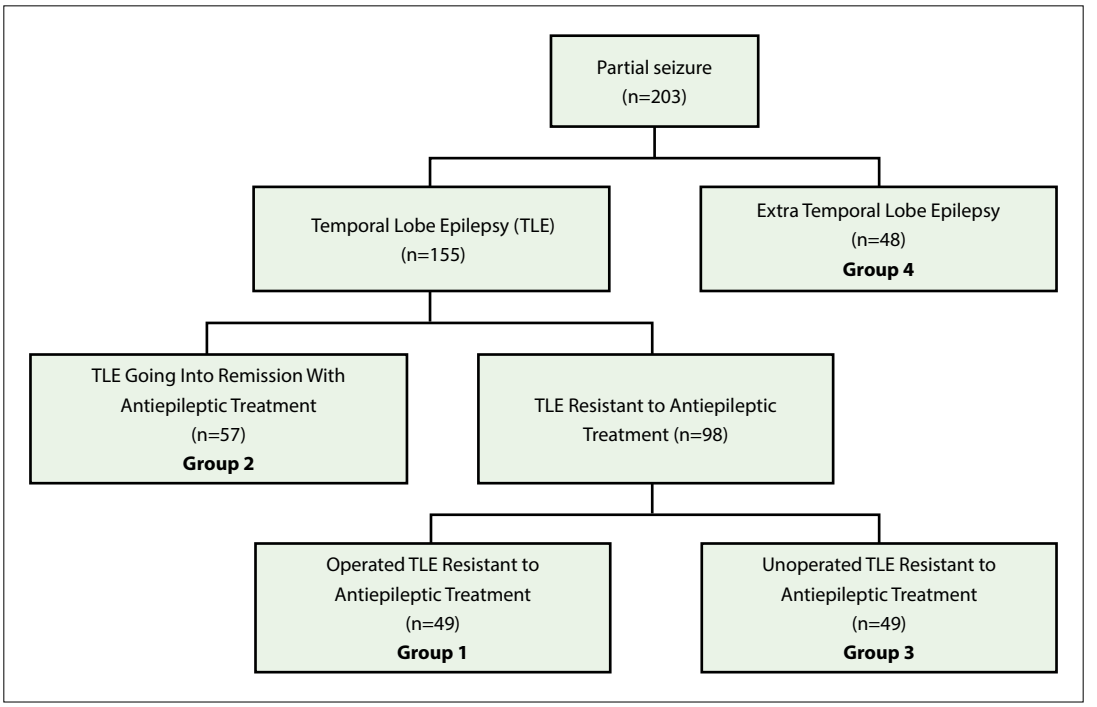

Fig. 1. Patient selection (n: number of patients).

social isolation (2 questions); energy/fatigue (4 questions); seizure worry (5 questions); medication effects (3 questions); health discouragement (2 questions); work/driving/social function (11 questions); attention/concentration (9 questions); language (5 questions); memory (6 questions); physical function (10 questions); pain (2 questions); role limitations: physical (5 questions); and health perceptions (2 questions). The total quality of life score ranges from 0 to 100. Higher scores indicate a higher quality of life.

4. The Social Functioning Scale

Developed by Birchwood et al.[5] in 1900, the SFS is a tool enabling the quantitative assessment of a patient's social skills, performance, main capacities, and social manners. The SFS assesses the presence or absence of key skills and social behaviors. This scale was shown to be a reliable, valid, and sensitive measure of social functioning in Turkish in 2001 by Serpil Yaprak Erakay.[6]

The SFS is a self-administered questionnaire that consists of 7 subscales: social engagement/withdrawal (time spent alone, initiation of conversation, social avoidance) (5 questions); interpersonal behavior (number of friends, having a romantic partner, quality of communication) (4 questions); prosocial activities (engagement in a range of common social activities, such as sports) (33 questions); recreation (engagement in a range of common hobbies, interests, and pastimes) (15 questions); independence–competence (ability to perform skills necessary for independent living) (13 questions); independence–performance (performance of skills necessary for independent living) (13 questions); employment/occupation (engagement in productive employment or a structured program of daily activity) (2 questions). Higher scores indicate improvement in social functioning.

5. The Hamilton Depression Rating Scale

This questionnaire was designed for adults by Max Hamilton and is used to rate the severity of their depression by probing mood, feelings of guilt, suicide ideation, insomnia, agitation or retardation, anxiety, weight loss, and somatic symptoms. Hamilton insisted that his scale should not be used as a diagnostic instrument.[7] The survey contains 17 rated items, and each is scored on a 0-to-4-point scale. The validity and credibility of the scale in Turkish was provided by Akdemir et al.[8] Higher scores indicate higher levels of depression.

6. The Hamilton Anxiety Rating Scale

The Hamilton Anxiety Scale was developed by Max Hamilton to quantify the severity of anxiety symptoms. The scale

is a clinician-rated evaluation[9] and consists of 14 items designed to assess the severity of a patient's anxiety. The validity and credibility of the scale in Turkish was provided by Yazıcı et al.[10] (1998). Higher scores indicate higher levels of anxiety.

Statistical analysis

Statistical analysis was performed using the IBM SPSS 22.0 program. Categorical variables were indicated as the number (n) and percentage (%). For intergroup comparisons, Pearson's Chi-squared and Fisher's Exact–Freeman Halton tests were applied. To compare more than two groups that did not follow a normal distribution, the Kruskal–Wallis test was used. To determine the statistical significance among groups, the groups were compared in doubles using the Mann–Whitney U test. Descriptive statistics were provided as a median (minimum–maximum). The credibility of the scale points was recalculated, and for each scale, a Cronbach α value was assessed. The Spearman's correlation analysis was used to examine the correlation among variables. The results of the analysis were interpreted considering $p<0.05$ to be statistically significant.

Results

A statistically significant difference was detected among the groups in terms of the marital status, age, and gender ($p<0.05$). The sociodemographic characteristics of the studied patients are provided in Table 1.

Cronbach's α coefficient of the Quality of Life in Epilepsy Inventory was recalculated and found to be 0.979. The sur-

Table 1. Comparison of intergroup demographic data

	Total (n=203)	Surgery	Remission	Resistant TLE	Resistant ETLE	p
		Median n (%)	Median n (%)	Median n (%)	Median n (%)	
Age (year), (min-max)	36.3 (18–65)	35.43 (18–64)	36.58 (18–65)	37.49 (19–65)	36.06 (18–65)	0.936
Gender						
Female	102 (50.2)	20 (40.8)	28 (49.1)	28 (57.1)	26 (54.2)	0.402
Male	101 (49.8)	29 (59.2)	29 (50.9)	21 (42.9)	22 (45.8)	
Marital status						
Single	84 (41.4)	20 (40.8)	23 (40.4)	23 (47.0)	18 (37.5)	0.809
Married/living together	119 (58.6)	29 (59.2)	34 (59.6)	26 (53.1)	30 (62.5)	
Level of education						
Primary education	131 (64.5)	33 (67.3)	26 (45.6)	37 (75.5)	35 (72.9)	0.008
Secondary education	37 (18.2)	4 (8.2)	15 (26.3)	9 (18.4)	9 (18.8)	
Higher education	35 (17.2)	12 (24.5)	16 (28.1)	3 (6.1)	4 (8.3)	
Employment status						
Unemployment	116 (57.1)	21 (42.9)	27 (47.4)	39 (79.6)	29 (60.4)	0.001
Employed (paid)	87 (42.9)	28 (57.1)	30 (52.6)	10 (20.4)	19 (39.6)	
Complex partial seizure frequency						
seizure free ≥1 year	75 (36.9)	41 (83.7)	34 (59.6)	0 (0)	0 (0)	<0.001
≤1 seizure/1 months	48 (23.6)	8 (16.3)	23 (40.4)	6 (12)	11 (22.9)	
>1 seizure/1 months	80 (39.4)	0 (0)	0 (0)	43 (87.8)	37 (87.1)	
Secondarily generalized seizure frequency						
seizure free ≥1 year	126 (62.1)	49 (100)	56 (98.2)	7 (14.3)	14 (62.1)	<0.001
≤1 seizure/1 months	66 (32.5)	0 (0)	1 (1.8)	34 (69.4)	31 (32.5)	
>1 seizure/1 months	11 (5.4)	0 (0)	0 (0)	8 (16.3)	3 (5.4)	
Antiepileptic treatment						
Monotherapy	69 (33.9)	19 (39.4)	49 (86.0)	0 (0)	1 (2.1)	<0.001
Polytherapy	134 (66.0)	30 (61.2)	8 (14.0)	49 (100)	47 (97.9)	

n: Number of Patients; TLE: Temporal lobe epilepsy; ETLE: Extra temporal lobe epilepsy.

vey was accepted to be valid and credible for the patients included into the study. When the subscales of the intergroup comparisons were analyzed, the average quality of life scores for the surgical and remission groups were the highest (with similar results for both), while the resistant TLE group had the lowest number of points (Table 2). The intergroup comparisons of the quality of life subscales are presented in Table 2.

Cronbach's α coefficient of the SFS was recalculated and found to be 0.925. The scale was accepted to be valid and credible for patients included into the study. When the subscales of the intergroup comparisons were analyzed, the average social functioning scores were the highest in the surgical and remission groups (with similar results for both), while the resistant TLE group had the lowest number of points. Intergroup comparisons of the social functioning subscales are presented in Table 3.

Cronbach's α coefficient for the two Hamilton scales was recalculated for the patients with epilepsy, resulting in 0.882 for the depression scale and 0.877 for the anxiety scale. For relatives-caregivers, the Cronbach's α coefficient was 0.815 for the depression scale and 0.870 for the anxiety scale. The scale was accepted to be valid and credible for the patients included into the study. When the intergroup comparisons of the sub-

Table 2. QOLIE-89 average points of subscales for intergroup comparisons

	I	II	III	IV	Bilateral comparison* p-value					
	Surgical	Remission	Resistant TLE	Resistant ETLE						
	Median (min-max)	Median (min-max)	Median (min-max)	Median (min-max)	I vs II	I vs III	I vs IV	II vs III	II vs IV	III vs IV
Health perceptions	63.79 (20–100)	60.31 (12.5–100)	43.35 (8.3–87.5)	42.81 (0–87.5)	0.19	<0.001	<0.001	<0.001	<0.001	0.78
Overall quality of life	68.67 (22–100)	71.49 (37.5–100)	40 (0–100)	41.41 (0–87.5)	0.50	<0.001	<0.001	<0.001	<0.001	0.71
Physical function	88.37 (45–100)	86.6 (0–100)	64.39 (0–100)	69.06 (10–100)	0.55	<0.001	<0.001	<0.001	<0.001	0.51
Role imitations: physical	75.1 (0–100)	73.33 (0–100)	36.94 (0–100)	46.46 (0–100)	0.92	<0.001	<0.001	<0.001	<0.001	0.25
Role limitations: emotional	72.49 (0–100)	72.28 (0–100)	36.73 (0–100)	38.92 (0–100)	0.71	<0.001	<0.001	<0.001	<0.001	0.75
Pain	79.54 (22–100)	74.78 (0–100)	52.76 (0–100)	57.86 (0–100)	0.32	<0.001	<0.001	<0.001	0.01	0.47
Social function	71.11 (8–100)	74.36 (18.1–100)	37.24 (0–97.3)	52.48 (4–100)	0.61	<0.001	<0.001	<0.001	<0.001	0.01
Energy	59.54 (10.–100)	58.95 (0–100)	40.03 (0–90)	41.56 (0–90)	0.94	<0.001	<0.001	<0.001	<0.001	0.80
Emotional well–being	58.45 (12–100)	60.91 (0–100)	43.35 (0–92)	49.58 (0–92)	0.56	<0.001	0.07	<0.001	<0.001	0.18
Attention	68.2 (18–100)	65.65 (2.2–100)	47.53 (2.2–92.7)	49.69 (0–97.2)	0.74	<0.001	<0.001	<0.001	<0.001	0.65
Health discouragement	72.65 (0–100)	72.63 (0–100)	33.88 (0–100)	43.33 (0–100)	0.92	<0.001	<0.001	<0.001	<0.001	0.23
Seizure worry	66.14 (0–100)	56.89 (0–100)	34.67 (0–100)	36.22 (0–100)	0.08	<0.001	<0.001	<0.001	<0.001	0.75
Memory	70.41 (6.6–100)	69.04 (5.5–100)	42.28 (3.3–93.3)	44.67 (0–100)	0.78	<0.001	<0.001	<0.001	<0.001	0.78
Language	81.04 (0–100)	78.88 (4–100)	53.55 (0–100)	55.67 (0–100)	0.44	<0.001	<0.001	<0.001	<0.001	0.64
Medication effects	63.66 (0–100)	64.57 (0–100)	37.87 (0–100)	44.91 (0–100)	0.93	<0.001	0.01	<0.001	<0.001	0.26
Social support	64.54 (6.2–100)	75.22 (12.5–100)	54.46 (0–100)	55.73 (0–100)	0.01	0.06	0.15	<0.001	<0.001	0.67
Social isolation	75.92 (10–100)	85.96 (0–100)	65.1 (0–100)	61.46 (0–100)	0.05	0.10	0.02	<0.001	<0.001	0.50

*In bilateral comparisons; Mann–Whitney U test was used. p<0.05; TLE: Temporal lobe epilepsy; ETLE: Extra temporal lobe epilepsy. QOLIE: Quality of Life in Epilepsy Inventory.

Table 3. Intergroup comparison of SFS subscales

SFS subscales	I	II	III	IV	Bilateral comparison* p–valeu					
	Surgical	Remission	Resistant TLE	Resistant ETLE						
	Median (min-max)	Median (min-max)	Median (min-max)	Median (min-max)	I vs II	I vs III	I vs IV	II vs III	II vs IV	III vs IV
Social withdrawal	9.14 (5–12)	9.37 (6–13)	8.33 (4–13)	8.69 (4–14)	0.623	0.084	0.124	0.029	0.05	0.708
Interpersonal behavior	6.63 (1–9)	6.74 (0–9)	5.12 (0–9)	5.73 (0–9)	0.686	0.002	0.029	<0.001	0.03	0.071
Prosocial activity	17.47 (3–47)	22.65 (1–46)	13.31 (0–50)	14.96 (0–40)	0.004	0.006	0.138	<0.001	<0.001	0.266
Recreation	16.37 (4–28)	17.96 (0–34)	13.18 (1–28)	14.6 (2–32)	0.157	0.010	0.103	<0.001	0.01	0.457
Independence-competence	35.73 (15–39)	34.88 (0–39)	32 (4–39)	32.17 (7–39)	0.543	<0.001	0.003	0.001	0.01	0.543
Independence-performance	28.31 (4–39)	27.07 (0–39)	20.1 (0–39)	25.4 (1–39)	0.859	<0.001	0.272	0.001	0.35	0.020
Employment/occupation	8.1 (0–10)	7.56 (0–10)	3.31 (0–10)	6.17 (0–10)	0.374	<0.001	0.016	<0.001	0.08	<0.001

*In bilateral comparisons; Mann–Whitney U test was used. p<0.05; TLE: Temporal lobe epilepsy; ETLE: Extra temporal lobe epilepsy. SFS: Social Functioning Scale.

Table 4. Bilateral intergroup comparison of level of anxiety and depression in patients and relatives-caregivers

	I	II	III	IV	Bilateral comparison* p–valeu					
	Surgical	Remission	Resistant TLE	Resistant ETLE						
	Median (min-max)	Median (min-max)	Median (min-max)	Median (min-max)	I vs II	I vs III	I vs IV	II vs III	II vs IV	III vs IV
Patient depression	5.06 (0–27)	5.09 (0–28)	10.1 (0–26)	9.44 (0–30)	0.72	<0.001	<0.001	<0.001	<0.001	0.58
HAMA total	6.02 (0–25)	6.32 (0–33)	10.76 (1–28)	11.4 (2–23)	0.62	<0.001	<0.001	<0.001	<0.001	0.43
HAMA somatic	3.29 (0–15)	3.19 (0–22)	6.08 (0–16)	6.23 (0–17)	0.93	<0.001	<0.001	<0.001	<0.001	0.73
HAMA psychic	2.73 (0–10)	3.12 (0–11)	4.67 (0–12)	5.17 (1–10)	0.51	<0.001	<0.001	<0.001	<0.001	0.23
Relatives-caregivers depression	4.76 (0–33)	4.28 (0–15)	6.2 (0–15)	5.54 (0–19)	0.86	<0.001	<0.001	<0.001	0.02	0.30
Relatives-caregivers HAMA Total	6.29 (0–42)	5.88 (0–20)	7.45 (0–18)	7.27 (0–24)	0.63	0.01	0.02	0.01	0.02	0.72
Relatives-caregivers HAMA somatic	3.16 (0–27)	3 (0–11)	3.86 (0–12)	3.94 (0–21)	0.29	0.01	0.01	0.03	0.05	0.80
Relatives-caregivers HAMA psychic	3.12 (0–15)	2.88 (0–9)	3.59 (0–8)	3.33 (0–6)	0.782	0.117	0.190	0.029	0.051	0.639

*In bilateral comparisons; Mann–Whitney U test was used. p<0.05; TLE: Temporal lobe epilepsy; ETLE: Extra temporal lobe epilepsy. HAMA: Hamilton Anxiety Rating Scale.

scales indicating the anxiety and depression levels in patients and their relatives-caregivers were analyzed, the surgical and remission groups had the lowest levels, while the resistant TLE group had the highest levels. The intergroup comparisons of the Hamilton depression and anxiety subscales for patients and their relatives-caregivers are shown in Table 4.

The scoring systems used in this study were evaluated using the Spearman's correlation analysis. In all groups, there was a positive correlation between the quality of life scores and social functioning scores. These factors had a negative correlation with the levels of anxiety and depression in patients and their relatives-caregivers. In all groups, there was a neg-

ative correlation between the social functioning scores and the anxiety and depression levels in patients and their relatives-caregivers. Finally, in all groups, there was a positive correlation between the level of anxiety and depression in patients and the level of anxiety and depression in their relatives-caregivers.

Discussion

We investigated whether there was a difference in the quality of life scores of patients with TLE and ETLE and whether the TLE groups differed based on their response to treatment. The existing literature, to the best of our knowledge, reveals this to be the first study to use such a broad range of surveys (the Quality of Life in Epilepsy Inventory QOLIE-89, the SFS, the Hamilton Depression Rating Scale, and the Hamilton Anxiety Rating Scale) on such a large study population (203 patients with complex partial seizures), with analysis divided into four patient groups. This study is also unique in terms of including the patient relatives-caregivers in the quality of life analysis.

A statistically significant difference was not detected among the groups in terms of marital status, age, gender, and family epilepsy history ($p>0.05$).

Epilepsy has been the focus of several quality of life studies. Previous studies have shown that individuals with epilepsy tend to have a lower quality of life compared to healthy participants and to the general reference population.[11–13] In addition, patients with drug-resistant epilepsy tend to have a lower quality of life compared to both other epilepsy groups and the general reference population. In contrast, many studies have shown that the quality of life for patients with epilepsy whose seizures were under control was nearly the same as the general reference population.[14] However, as the seizure frequency increased, the patient's general health perception became impaired, especially in physical-social activities and emotional well-being. In accordance with the literature, we found that a patient's response to treatment (going into remission with medical or surgical treatment) was the most important factor affecting the patient's quality of life. In nearly all subscales of the questionnaires, the average scores of the surgical and remission groups whose seizures were controlled showed that they had the highest quality of life. Meanwhile, there was a statistically significant difference in the quality of life subscale points for the resistant TLE and ETLE groups whose seizures were not controlled (Table 2). The results of this study demonstrate that control of seizures is the most important factor affecting the quality of life of a patient with epilepsy.

Although the quality of life for ETLE patients was higher than that of TLE patients, the absence of a statistical significance shows that many factors, apart from the anatomical localization of the seizures, affect the quality of life of a patient with epilepsy. Studies conducted on related subjects have suggested that social withdrawal, a decrease in interpersonal relationships, a decrease in recreational activities, and a loss of employment functionality are more often seen in patients with resistant seizures.

In accordance with the literature, this study found that the resistant TLE group had the lowest SFS scores. Compared to the surgical and remission groups, the social functioning scores of the resistant ETLE patients were lower. The surgical and remission groups had similar scores and ranked the highest in terms of social functioning. A statistical significance was found in the average social functioning scores for the surgical and resistant TLE patients, the remission and resistant TLE patients, and the remission and resistant ETLE patients (Table 3). These results indicate that the ability to control seizures improved social functioning, interpersonal relations, competence, performance, and the level of independence. It also affected employment/occupation in a positive manner.

In a study conducted by Wang et al.[15] (2015) that included 107 epilepsy patients based on the Social and Occupational Functioning Scale for Epilepsy, social functioning was found to be low in patients with epilepsy. In that study, a positive correlation was observed between social functioning, low mental test scores, and quality of life scores (QOLIE-31). Similarly, we found a low level of social functioning in epilepsy patients and a positive correlation between social functioning scores and quality of life scores (QOLIE-89) ($p<0.05$, $p<0.01$). We observed that patients whose social functioning was low also had a low quality of life, while patients who ranked high on interpersonal relations, independence, and level of employment had a higher quality of life. Consequently, social relations, job performance, and competence, as well as the elimination of workplace inequalities, are important factors in improving the quality of life of a patient with epilepsy.

The low quality of life and social functioning of patients with epilepsy are influenced by comorbid psychiatric disorders that lead to anxiety and depression in both the patients and

their relatives-caregivers.[15,16] Studies have suggested that the most frequently observed comorbid psychiatric disease in epilepsy patients is depression and that the anxiety levels of epilepsy patients are 2.4 times higher than in healthy individuals.[17–19] Studies based in Canada, Italy, the United States, and the United Kingdom have shown that depression and anxiety are the most frequently found disorders in patients with epilepsy.[20] In studies conducted in Italy and the United States, the levels of anxiety and depression were found to be higher in treatment-resistant TLE patients than in other groups. Depression in the resistant TLE patients was 33%, compared to 6% in the remission group, while anxiety in the resistant TLE patients was 11%–25%, compared to 7%–11% in the remission group.[20–22] Studies have also suggested that anxiety and depression levels in the relatives-caregivers of patients with epilepsy were higher than the normal population and that the caregivers' anxiety and depression affected the quality of life and social functioning of patients with epilepsy.[23] Studies have found anxiety and depression to be the two most important factors affecting the variability in the quality of life of patients with epilepsy.[24,25]

Since our patients were not examined by psychiatrists, we used numerical values to assess anxiety and depression levels. This made it easier to correlate the anxiety and depression levels with the quality of life assessments. For patients with epilepsy, the quality of life has a significant negative correlation with anxiety and depression. In accordance with the literature, we found high levels of anxiety and depression in our epilepsy patients, particularly in the resistant TLE group. In contrast, the surgical and remission groups had lower levels of depression and anxiety (Table 4). A negative correlation was detected between the depression and anxiety in relatives-caregivers and the quality of life and social functioning scores in the patients with epilepsy, while those factors had a positive correlation with the depression and anxiety scores in the patients with epilepsy. When seizures were under control, patients with epilepsy and their relatives-caregivers were less affected by comorbid psychiatric conditions such as depression and anxiety. The principles of the biopsychosocial model indicate that improving patient's quality of life and social functioning is a critical aspect of epilepsy treatment. As such, the patient's family is an important component that should be supported when necessary.

Conclusions

Although there are some parallels to previous studies conducted in Western countries, this study is unique because it included a wide range of variables reflecting both qualitative and quantitative data, and it divided patients into groups based on their responses to treatment. The study also investigated the effects of the psychological conditions of relatives-caregivers on the quality of life of patients with epilepsy and analyzed the overall effects of those factors on the social functioning of the patients.

Successful treatment of patients with epilepsy should be evaluated in multifactorial terms that consider both neurobiotic and psychosocial factors. To improve the quality of life for both patients and their relatives-caregivers, comorbid psychological conditions should be detected and treated aggressively. Neurologists, psychiatrists, and psychologists should examine and direct their patients from a multidisciplinary perspective.

Ethics Committee Approval

Ethics committee approved.

Peer-review

Externally peer-reviewed.

Conflict of interest

The authors declare that they have no conflict of interest.

Authorship Contributions

Concept: G.A., A.B.D.,İ.B., E.U.; Design: G.A., E.U.; Supervision: İ.B., A.B.D.; Materials: G.A., N.T., A.D.; Data collection &/or processing: G.A., N.T., A.D.; Analysis and/or interpretation: G.A., N.T., A.D., E.U.; Literature search: G.A.; Writing: G.A.; Critical review: İ.B., A.B.D.

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