ORIGINAL ARTICLE

The Impact of COVID-19 Outbreak On Quality of Life, Seizure Frequency, Depression, and Anxiety in Patients with Epilepsy: A Cross-Sectional Study During the Early Period

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Abstract

Objectives: Epilepsy, according to our current knowledge, does not increase the risk of Coronavirus disease 2019 (COVID-19) infection or the rate of complications related to this infection. However, the COVID-19 pandemic can have adverse effects on patients with epilepsy (PWE) and affect the mental health of the community in general. This study aimed to evaluate the depression and anxiety of epilepsy patients, the effect of the epidemic on the frequency of seizures, and the quality of life of the patients in the past 3 months during the pandemic.

Methods: The patients who were referred to an epilepsy outpatient clinic of a tertiary neuropsychiatry center within the past 2 years were retrospectively evaluated. The data regarding the seizures, quality of life, anxiety, and depression were recorded during follow-up or through an online platform. Seizure frequency, frequency change during the pandemic (April 2020 to June 2020), medications, admissions were obtained, and Beck Depression and Anxiety Scale were applied to the patients. The patients' quality of life was evaluated using the "Quality of Life Scale Short Form-36 (SF-36)" form.

Results: One hundred sixty-four patients (77 men, 87 women) included in the study were analyzed. The median overall seizure frequency and seizure frequency during pandemic were 0.2 seizures/month (0–1) and 0 seizures/month (0–0.9), respectively. 125(76.2%) of the patients reported that they had no seizures during that period. No significant difference was found between the frequency of seizures reported by the patients before and during the pandemic period (p=0.12). Only one patient had a PCR confirmed COVID-19 diagnosis, and the other six patients were diagnosed clinically and radiologically. No significant relationship was found between COVID-19 diagnosis and seizure frequency (p=0.671). 105(64.02%) patients were considered to have depressive symptoms with ten or more points according to the Beck Depression Scale. 116 patients (70.7%) were considered to have anxiety symptoms with nine or more points from the Beck Anxiety Scale.

Conclusion: This study was conducted to evaluate the seizure frequency, psychiatric status, and quality of life of PWE in April, May, and June 2020 during the first peak of the COVID-19 pandemic in our country while the social restrictions were applied at the highest level. We found that there was no significant increase in the seizure frequency of patients during the pandemic period and depressive symptoms were common in this patient group and affected their quality of life.

Keywords: Anxiety; coronavirus; COVID-19; depression; epilepsy; pandemic; quality of life.

Introduction

Coronavirus disease 2019 (COVID-19) led to a severe pandemic caused by acute respiratory syndrome coronavirus 2 with various clinical symptoms, particularly fever, cough, and myalgia. The disease was detected in Wuhan, China and affected people globally, the World Health Organization declared this condition as a pandemic in March 2020. Studies have shown that the disease can cause damage not only to the lung, but also to the central and peripheral nervous system. Neurological manifestations are observed in approximately one-third of patients. Neurological findings ranging from smell and taste disturbances to altered state of consciousness and cerebrovascular events may occur.[1,2]

Direct and indirect pathways related to the virus's entry into the central nervous system (CNS) have been proposed. It is suggested that this agent, a RNA virus, has an invasion into the CNS. The virus is thought to reach CNS by retrograde axo-

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Received 28.06.2021
Accepted 02.09.2021
Online date 09.11.2021

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Epilepsi Hastalarında COVID-19 Salgınının Yaşam Kalitesi, Nöbet Sıklığı, Depresyon ve Anksiyete Üzerine Etkisi: Erken Dönemde Kesitsel Bir Çalışma

Öz

Amaç: Epilepsi, mevcut bilgilerimize göre COVID-19 enfeksiyonu riskini veya bu enfeksiyona bağlı komplikasyon oranını artırmamaktadır. Bu çalışmada, epilepsi hastalarının pandemi sırasında son üç aydaki depresyon ve anksiyete durumlarının, nöbet sıklığına etkisinin ve yaşam kalitesinin değerlendirilmesi amaçlandı.

Gereç ve Yöntem: Son iki yıl içinde epilepsi polikliniğinden takip edilen hastalar retrospektif olarak değerlendirildi. Hastaların nöbet sıklığı, pandemi sırasındaki nöbet sıklık değişimleri, kullandıkları ilaçlar dökümente edildi. Hastalara Beck Depresyon Ölçeği ve Beck Anksiyete Ölçeği uygulandı. Hastaların yaşam kalitesi "Yaşam Kalitesi Ölçeği SF-36" formu kullanılarak değerlendirildi.

Bulgular: Çalışmaya 164 hasta dahil edildi. Pandemi sırasında ortanca nöbet sıklığı 0 nöbet/ay (0–0.9) idi. Hastaların 125'i (%76.2) adet döneminde nöbet geçirmediğini bildirdi. Pandemi öncesi ve pandemi döneminde nöbet sıklığı arasında anlamlı fark bulunmadı (p=0.12). COVID-19 tanısı ile nöbet sıklığı arasında anlamlı bir ilişki bulunamadı (p=0.671). 105 (%64.02) hasta depresyon, 116 hastada (%70.7) anksiyete bulguları göstermekteydi.

Sonuç: Bu çalışma, ülkemizde COVID-19 pandemisinin en yoğun olduğu ve sosyal kısıtlamaların en üst düzeyde uygulandığı Nisan, Mayıs ve Haziran 2020'de epilepsi hastalarının nöbet sıklığı, psikiyatrik durumu ve yaşam kalitesini değerlendirmek amacıyla yapılmıştır. Pandemi döneminde hastalarda nöbet sıklığında anlamlı bir artış olmadığı, bu hasta grubunda depresyonun yaygın olduğu ve yaşam kalitelerinin etkilendiği ortaya çıkmıştır.

Anahtar sözcükler: Anksiyete; coronavirus; COVID-19; depresyon; epilepsi; pandemi; yaşam kalitesi.

nal transport in some cranial or peripheral nerves, especially the olfactory bulbus, and causes demyelination and inflammation. The virus in the bloodstream invades the CNS by infecting the endothelial cells in the blood-brain barrier or epithelial cells in the choroid plexus or through leukocytes. The virus enters the cell through angiotensin-converting receptor-2. This receptor is found in glial cells and neurons and facilitates the entry of the virus into the CNS.[3–5]

It is known that neurological patients older than 60 years of age with accompanying additional internal diseases such as hypertension, diabetes mellitus, lung, and heart diseases are at high risk for COVID-19 pneumonia. In addition, the patients with neuromuscular diseases with low lung capacity may be more prone to the COVID-19 pneumonia and complications.[6] In the beginning of the outbreak, several studies suggested that multiple sclerosis patients who receive immune modulatory therapy may also be prone to COVID-19.[6,7] However, other publications reported not significant results.[8]

Epilepsy is a significant public health problem with paroxysmal events. The prevalence is known to be between 0.7% and 1%. According to our current knowledge, it is thought that having epilepsy or being under any antiepileptic treatment does not increase the risk of COVID-19 infection or the rate of complications related to this infection.[9] However, recent studies indicating that the cumulative incidence of COVID-19 is higher in patients with active epilepsy than those without epilepsy.[10] At the same time, it has been reported that 0.5–4.8% of COVID-19 patients have seizures.[2,11] Hypotheses are put forward that seizures may occur in these patients with the effects of inflammatory cytokines, encephalitis manifestation, or antivirals and antibiotics used in the treatment.[12–14] Finally, there are not sufficient data in the literature showing the relationship between epilepsy and COVID-19.

Epilepsy, as a chronic disease, disrupts the psychiatric conditions and quality of life of patients due to seizures and psychosocial problems. Epilepsy related factors were shown to be associated with stress and depression.[15] It was shown that people who follow COVID-19 updates more frequently on media, experience more anxiety and stress.[16,17] The burden on healthcare system caused disruption in the quality and availability of the care epilepsy patients received, which cause even more stress and further isolation.[18] All these factors independently increase the psychiatric disorder burden in this specific patient group, pandemic can have adverse effects on patients with epilepsy (PWE) and affect the mental health of the community in general.[19–21]

In our country, the first COVID-19 case was detected on March 10, 2020, and the disease had affected approximately 224 thousand people so far. We aimed to evaluate the depression and anxiety values of PWE, the effect of the pandemic on the frequency of seizures, and the quality of life of the patients at the first peak of pandemic period.

Ethical approval– Before the study, approval was obtained from the Turkish Ministry of Health Pandemic Research Committee and the Ethics Committee of Bakirkoy Dr. Sadi Konuk Training and Research Hospital in 06.07.2020 with the number 2020/291.

Materials and Methods

Patients who referred to the epilepsy outpatient clinic of our hospital within the past 2 years were retrospectively evaluated. PWE over 18 years of age who had at least 1 year of follow-up and who did not have mental retardation were included in the study. The patients who had not been followed up in the past 2 years were excluded from the study, considering that their data were not up to date.

The data were recorded during and after the visit, and if the patients who could not come to the hospital during the study period due to the pandemic were recorded through an online questionnaire infrastructure (Google Forms, California, USA). Sociodemographic characteristics, medications, co-morbidities, pre-pandemic seizure frequency, seizure frequency in the past 3 months during pandemics, current COVID-19 diagnoses and treatments of patients were all examined. The Beck Depression Scale and the Beck Anxiety Scale were applied to the patients to evaluate their depression and anxiety symptoms during the pandemic period. The patients' quality of life was evaluated using the "Quality of Life Scale Short Form-36 (SF-36)."

The Beck Depression Scale is a 21-question questionnaire that evaluates the presence of depression and shows the severity of depressive symptoms. Hisli conducted the Turkish reliability and validity of the form in 1988.[22] By evaluating the patients' scale results, patients with a total score of 11 and above are considered as having symptoms of depression.[23] The threshold score on the Beck depression scale was taken as 10. It was accepted that there was no depression in patients with a score between 0 and 9. The patients between the score 10–16 were considered as in mild depression, 17–29 in moderate depression, and 30–63 in severe depression.

The Beck Anxiety Scale is a questionnaire consisting of 21 questions that reveals anxiety symptoms. In this form, the patient scores his/her symptoms for the last 7 days in a score range of 0–3. The presence and severity of anxiety are determined by calculating the total scale score. Patients with a scale score of 8 and above are considered to have anxiety symptoms. The Turkish validity and reliability of this test were conducted by Ulusoy in 1998.[24,25] The cut-off value was accepted as 16 in the Beck anxiety scale. The scores of the patients between 8 and 15 were evaluated as having a mild anxiety disorder, 16–26 were considered to have moderate anxiety, and those between 26 and 63 were considered to have a severe anxiety disorder.

The Quality of Life (SF-36) Scale is a scale used in patients with physical diseases. It consists of 36 items and pro-

vides measurements in eight dimensions such as; physical functioning (PF) (10 items), role limitation due to physical problems (RP) (4 items), bodily pain (BP) (2 items), social functioning (SF) (2 items), mental health (MH) (5 items), role limitation due to emotional problems (RE) (3 items), energy and viability (VT) (4 items), and general perception of health (GH) (5 items). The evaluation is made as a Likert type except for some items, and the past 4 weeks are taken into account. Subscales evaluate the health status between 0 and 100, and 0 indicates poor health and 100 indicates good health. Turkish validity and reliability of the form were demonstrated in 1999 by Koçyiğit et al.[26,27]

Statistical analysis– Statistical analysis of this study was performed using SPSS software (version 26, IBM, New York, USA). Descriptive statistical methods (mean and standard deviation in normal distributions, median and interquartile range using Tukey's hinges method in non-normal distributions) were used in reporting the data. Seizure frequencies before and after the pandemic were evaluated using the dependent Wilcoxon Sign-Rank test. The Mann-Whitney-U test was used to evaluate the relationship between Beck depression and anxiety scales scores and the change in seizure frequency during the pandemic. The relationship between the COVID-19 diagnosis and the frequency of seizures was evaluated with Fisher's exact test and Mann-Whitney-U test was used to evaluate the relationship between quality of life and seizure frequency. $P<0.05$ was used as the statistical significance level.

Results

One hundred sixty-four patients (77 men, 87 women) were included in the study. The sociodemographic and clinical characteristics of patients are shown in Table 1. The mean age of the patients was 35.4±11.41 years. The majority of the patients were high school and university graduates (54.8%), and the overall median disease duration was 14 (7–20) years. Unemployment was noted in 89 (54.3%) patients. Thirty-four (20.7%) patients were using psychiatric medications, and 32 (19.5%) patients were being treated for different somatic diseases while 98 (59.7%) patients did not report any comorbidities.

Ninety-eight (59.7%) patients were using only one AED, and 66 patients (40.2%) were under polytherapy consisting of various drug combinations. The median overall seizure frequency and seizure frequency during pandemics were 0.2 seizures/month (0–1) and 0 seizures/month (0–0.9), respectively. 125 patients (76.2%) answered "no" to the question, "Has there been an increase in the frequency of seizures during the pandemic period?" Five (3%) patients

Table 1. Descriptive data of the patients with respect sociodemographic and clinical characteristics (n=164)

Sociodemographic characteristics		Clinical characteristics	
Age (mean±SD)	35.4±11.41	Duration of illness (year, median)	14 (7–20)
Gender		Antiepileptic drug treatments	
Male	77	Monotherapy	98
Female	87	Polytherapy	66
Marital status		Comorbidities	
Married	84	None	98
Single/divorced/widow	80	Psychiatric diagnosis	34
		Others	32
Education			
Primary school and lower	74	Seizure frequency/month	
Gymnasium and higher	90	Before pandemic (median)	0.2 (0–1)
		During pandemic (median)	0 (0–0.9)
Employment status			
Unemployed	89	Increase in seizure frequency	
Employed	75	No	125
		Yes	39
		COVID-19 diagnosis and treatment	
		Yes (PCR+)	1
		Yes (PCR−)	6
		No	157

stated that they received short-term inpatient treatment at the emergency or neurology clinic due to epileptic seizures during this period. No status epilepticus was observed. Only one patient had a PCR confirmed COVID-19 diagnosis, while six patients were diagnosed clinically and radiologically (with lung computerized tomography) and received treatment according to national protocols. One hundred fifty-seven (95.7%) patients had no clinical findings of infection (Table 1).

The median score of the Beck's depression scale were found to be 15 (6–26). Fifty-nine (35.9%) patients, whose scores were between 0 and 9 were not evaluated as in depression and 105 (64.02%) patients were considered to be in depression with 10 or more points.

The median score of the Beck's anxiety scale results was 13.50 (6–25). The number of patients with a total score below eight and without anxiety symptoms was 48 (29.2%). There were 87 (53.04%) patients who scored 8 to 15 points

and were evaluated as mild anxiety, 29 (17.6%) patients who scored 16 or more points were evaluated as moderate or severe anxiety. The evaluation of Beck's depression and anxiety scales are shown in Table 2. No significant relationship was found between gender and depression (p=0.188) or anxiety (p=0.624) scores.

SF-36 quality of life scores were shown in Table 3, PF median value was found as 50 (25–75), RP median value as 50 (50–75), RE median value as 50 (0–83), VT median value as 50 (40–100), MH median value as 60 (44–100), SF median value as 62.5 (37.5–100), BP median value as 100 (50–100), and GH median value as 65 (0–100).

Males showed significantly higher PF scores when compared to females (p=0.049). Psychiatric comorbidities were found to have a significant effect on RE (p=0.049), VT (p=0.008), SF (p=0.047) scores. No significant relationship was found between psychiatric comorbidity and depression (p=0.575) and anxiety scores (p=0.624).

Table 2. Beck depression and anxiety scale results and distribution of patients according to cut-off values (n=164)

The Beck Depression Scale Scores		The Beck Anxiety Scale Scores	
Total points (Median)	15 (5–26)	Total points (Median)	13.50 (6–25)
Depression−(0–9 Points)	59 (35.9%)	Anxiety−(0–7 Points)	48 (29.2%)
Depression+(10–63 Points)	105 (64.02%)	Anxiety+(9–63 Points)	116 (70.73%)

Table 3. The Quality of Life (SF-36) subscore distribution and interquartile ranges

Subgroup	Median	IQR
PF	50	25–75
RP	50	50–75
RE	50	0–83
VT	50	40–100
MH	60	44–100
SF	62.5	37.5–100
BP	100	50–100
GH	65	50–100

PF: Physical functioning; RP: Role limitation due to physical problems; RE: Role limitation due to emotional problems; VT: Energy and vitaliy; MH: Mental health; SF: Social functioning; BP: Bodily pain; GH: General perception of health; IQR: Interquartile range.

All quality of life subgroup scores of patients who reported an increase in seizure frequency was found to be significantly lower (P values; PF=0.007, RP=0.000, RE=0.009, VT=0.01, MH=0.000, SF=0.001, BP=0.000, GH=0.000) (Table 4). However, no relationship was found between Beck's depression and anxiety scores between the groups, with or without increase in seizure frequency (p=0.802, p=0.471, respectively).

No statistically significant difference was found between the frequency of seizures reported by the patients before and during the pandemic period (p=0.12). No statistically significant difference was found between the frequency of seizures and COVID-19 diagnosis (p=0.671). While 5 of 7 patients diagnosed with COVID-19 had seizures during this period, 2 of them did not report any seizures. The patients who received monotherapy and polytherapy were compared and no significant difference was found in terms of seizure frequencies (p=0.263).

No significant difference was found between the Beck's Depression and Anxiety Scales in patients with and without a COVID-19 diagnosis (p=0.742, p=0.947) (Table 5). In addition, no statistically significant difference was found between these two groups in terms of quality of life (Table 6).

Discussion

This study was conducted to evaluate the seizure frequency, psychiatric status and quality of life of PWE in April–June

Table 4. Subgroup comparison of the Quality of Life (SF-36) Scale according to increase in frequency

	Seizure frequency increased (n=39)		No increase in seizure frequency (n=125)		p-value[*]
Subgroup	Median	IQR	Median	IQR	
PF	35	25–50	50	25–75	0.007
RP	25	25–50	75	50–100	0.000
RE	0	0–50	50	0–100	0.009
VT	30	10–100	80	50–100	0.01
MH	48	18–100	98	50–100	0.000
SF	37.5	12.5–100	75	50–100	0.001
BP	50	22.5–100	100	55–100	0.000
GH	50	22.5–55	90	50–100	0.000

*Mann-Whitney U. PF: Physical functioning; RP: Role limitation due to physical problems; RE: Role limitation due to emotional problems; VT: Energy and vitaliy; MH: Mental health; SF: Social functioning; BP: Bodily pain; GH: General perception of health; IQR: Interquartile range.

Table 5. Comparison of Beck Depression and Beck Anxiety Scale Scores between COVID-19 positive and negative patients, and according to increase in seizure frequency

	(+) COVID Diagnosis (n=7)	(−) COVID Diagnosis (n=157)	p-value[*]
Beck Depression Scale Score	13 (IQR: 8.5–19.5)	15 (IQR: 6–26)	0.742
Beck Anxiety Scale Score	13 (IQR: 7.5–16)	14 (IQR: 6–25.5)	0.947
	Seizure frequency increased (n=39)	No increase in seizure frequency (n=125)	p-value[*]
Beck Depression Scale Score	14.5 (IQR: 7–28)	15.5 (IQR: 6–26)	0.802
Beck Anxiety Scale Score	13 (IQR: 6–26)	14 (IQR: 6–25)	0.471

*Mann-Whitney U. IQR: Interquartile range.

Table 6. Subgroup comparison of the Quality of Life (SF-36) Scale according to COVID-19 diagnosis

Subgroup	(+) COVID-19 Diagnosis (n=7)		(−) COVID-9 Diagnosis (n=157)		p-value*
	Median	IQR	Median	IQR	
PF	45	25–50	50	25–75	0.227
RP	50	25–62.5	50	50–75	0.287
RE	33.3	0–50	50	0–100	0.433
VT	80	50–100	50	37.5–100	0.626
MH	72	35–100	58	46–100	0.938
SF	50	31.25–100	62.5	37.5–100	0.800
BP	100	58.75–100	100	50–100	0.888
GH	55	47.5–100	67.5	50–100	0.959

*Mann-Whitney U. PF: Physical functioning; RP: Role limitation due to physical problems; RE: Role limitation due to emotional problems; VT: Energy and vitaliy; MH: Mental health; SF: Social functioning; BP: Bodily pain; GH: General perception of health; IQR: Interquartile range.

2020 when the COVID-19 pandemic was most intense in our country and social restrictions were applied at the highest level. It has been revealed that there was no significant increase in the frequency of seizures in patients during the pandemic period and depression was common in this patient group which affected their quality of life.

COVID-19 infection can cause epileptic seizures by neuroinvasion, as well as hypoxia, multiorgan insufficiency and severe metabolic disorders that occur in the course of this disease.[28] It has been reported in the literature that different rates of epileptic seizures have been observed in patients with neurological findings. There are also patients with recurrent focal motor seizures and patients diagnosed with encephalopathy from their first hospitalization.[29,30]

There are limited data on evaluating the frequency of seizures in PWE diagnosed with COVID-19, a study conducted in Wuhan reported that a seizure was observed in a previously diagnosed epilepsy patient.[2,18] It was thought that in PWE during the pandemic period, accompanying depression, sleep disorders due to anxiety disorders, inability to go to doctor's controls due to inadequate compliance of the telemedicine system and inability to access medications may trigger seizures.[31] In our study conducted with 164 PWE, it was found that 76.2% of the patients had no increase in their seizures during the past 3 months of the pandemic. No statistical significance was found between the patients' seizure frequencies before the pandemic and the past 3 months. While 5 of 7 patients diagnosed with COVID-19 reported seizures during the research period, two did not experience seizures. These results suggest that PWE do not have an increased COVID-19 frequency and those with infection did not show particularly increased number of seizures.

There is no study providing that epilepsy is a risk factor for COVID-19. In a recent study, the cumulative incidence of COVID-19 was found to be higher in PWE compared to other patient groups, where 1.3% of them were PWE and the incidence was found to be 1.2%.[10] In our study, only 4.2% of epilepsy patients were diagnosed with COVID-19. The COVID-19 prevalence in Turkey is around 0.3%, according to official sources. Although the frequency seems to be higher in PWE, it is not possible to make certain conclusion with these data. It may be possible to make a more accurate deduction with a study conducted on PWE across the country in the future.

Studies have shown that psychiatric comorbidity is higher in PWE compared to the healthy population. The prevalence of major depression in the healthy population is 2.4–3.8%; however, it is known that this rate is between 20% and 22% in PWE.[32,33] Anxiety disorder is also higher in PWE compared to the healthy population and is observed with a prevalence of 20.2–22.9%.[32] Psychological disorders in PWE may occur due to organic disorders that cause epilepsy, besides this, epileptic seizures, and social problems trying to cope with them could also cause depression and anxiety. It has been shown that the anxiety of being infected with COVID-19, the restriction of activities and the stress of staying at home, the stress of not being able to reach their doctors and go to follow-ups, economic insecurity, and anxiety of the caregivers have been shown to negatively affect the PWE during the pandemic period.[19] In our study, the rates of Beck's depression and anxiety scales during the pandemic period were found to be higher than the values in the literature and depression symptoms were found in 64.02% of the patients and anxiety symptoms in 49.6%.[34,35] This situation supports that depending on all related reasons, the patients' psychological conditions during the pandemic period are more affected. Due to disruption of the standard care, increased ex-

posure to COVID related information, fear of quarantine and social isolation render this specific patient more susceptible to depression and anxiety. Therefore, we recommend active screening of anxiety and depression. In a meta-analysis, anxiety was observed in 35.7% of the patients and depressive mood in 32.6% of the patients with other coronavirus infections (SARS or MERS).[21] However, sufficient data have not yet emerged for the COVID-19 pandemic. In our study, it is noteworthy that no statistically significant difference was found in terms of depression and anxiety when PWE who showed COVID-19 findings and received treatment when compared with other patients without COVID-19. (You can show the results in another table with the anxiety scores.) It is thought that further studies are needed on psychiatric manifestations in COVID-19 patients.

In a study conducted with 252 PWE and 252 controls during the pandemic period, psychological stress scales were found to be higher in PWE, while no relationship was found between gender and psychiatric disease history and the psychiatric conditions of the patients. Simultaneously, the frequency of seizures and the patients being under mono or polytherapy has not been shown to affect their psychiatric manifestation.[20] Similar results were obtained in our study. (In this situation, what could be the affecting cause? Only the stress or loss of contact with their health care providers or social isolation? Please make your own comments).

Epilepsy, a chronic paroxysmal disease, also causes social problems due to seizures, stigmatization and psychiatric comorbidity and impairs the quality of life of patients.[36] When SF-36 Turkish validation study values were taken as reference, a significant decrease was found in all subgroups in our study (Table 4). This observed difference was noteworthy as it was above the minimum clinically significant difference of 3–4.6 reported for SF-36.[37,38] In a study conducted on 138 PWE in our country, all groups except the BP subgroup were significantly lower than those in the control group.[38] In comparison with this study, we found low values in all subgroups except general health scores. This may be associated to low number of COVID positive cases. In a multicenter study conducted by Jacoby et al.,[39] SF-36 quality of life values in PWE were lower than the control group. The values of our study were determined to be lower than the scores of this study. Through these results, it can be concluded that the COVID-19 pandemic negatively affects the quality of life of epilepsy patients. Significantly low quality of life scores in patients with increased seizure frequency also supports this deduction (Table 4). While the quality of life scores of all patients was low in our study, no significant difference was observed when comparing the scores of pa-

tients diagnosed with COVID-19 and without COVID-19. For this reason, the main reason affecting the quality of life of the patients is not supposed to be the disease itself but can be related to the fact that it affects the mental health and social status of the whole society. This condition has also been supported in different studies.[16,40,41]

This study has limited aspects. Lack of a non-epileptic control group and insufficient documentation of seizure-triggering etiologies can be considered limitations of our research.

Conclusion– This study reveals that even though there is no increase in the frequency of seizures of the patients during the pandemic period, PWE experience significant psychological problems and their quality of life is negatively affected compared to the pre-pandemic period. Although epilepsy is not thought to be a specific risk factor for COVID-19 infection, this specific patient group is particularly vulnerable to social and mental limitations brought due to pandemic measures.

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