

The effect of fear of COVID-19 on quality of life in patients with epilepsy

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Abstract

Objective: In the COVID-19 pandemic period, the effect of COVID-19 fear on quality of life was uncertain. This present study examined the effect of fear of COVID-19 on quality of life in patients with epilepsy through anxiety and depression. **Methods:** This single-center, cross-sectional study was conducted with a total of 319 adult patients with epilepsy. The mean age of the patients was 36.0 (\pm 11.1) years, and 53% were male. The mean duration of diagnosis was 16.0 (\pm 10.6) years, and more than half of the patients (52.4%) were using two and more antiepileptic drugs. Data were collected online between 15 December 2020 and 5 January 2021. COVID-19 Fear Scale, Beck Depression Inventory, Worry and Anxiety Questionnaire, and Epilepsy Quality of Life Scale-10 were used for data collection. Serial mediation analysis was conducted to determine the effect of COVID-19 fear on quality of life. **Results:** Although there was a significant correlation between them, the fear of COVID-19 did not directly affect the quality of life. The fear of COVID-19 increased anxiety and depression respectively, the increase in the mediators also decreased the quality of life.

Conclusion: The fear of COVID-19 experienced by patients with epilepsy did not have a significant direct effect on the quality of life. However, it was found that it had an indirect effect on the quality of life by increasing mental health problems such as anxiety and depression, the indirect effect was mostly on anxiety.

Keywords: Epilepsy, fear of COVID-19, anxiety, depression, quality of life

INTRODUCTION

The new type of coronavirus (SARS-CoV2 / COVID-19) outbreak, showing a relatively high spread and mortality rate, emerged in Wuhan, towards the end of December 2019. Due to the lack of a curative treatment for the virus, all individuals have been forced into staying at home. As a result of the measures taken to prevent contamination and reduce the burden of health care, the community at large, whose daily life was deeply affected, was subjected to tremendous psychosocial distress.¹⁻³ In addition to the negative effects of the lockdown, the number of deaths reported daily due to the outbreak has also increased the fear. In the early stages of the outbreak, when the uncertainty about the disease

was high, people lived in the fear of death, even lonely death, losing loved ones, economic collapse, and not returning to their former social life. Although people started to adapt to the disease and restrictions over time, a significant increase was observed in the rates of anxiety and depression in a large part of the population.^{4,6}

Considering that even the mental health of healthy individuals is seriously affected, the effect of COVID-19 on individuals with a chronic disease such as epilepsy may be more serious.⁷ Patients with epilepsy may experience more intense stress due to factors such as fear of not being able to access healthcare services, the possibility of seizures to be triggered due to fear and stress, and anxiety about having

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seizures and going to the emergency room. In studies conducted during the pandemic period, it has been reported that mental problems such as anxiety and depression are more common in patients with epilepsy compared to the healthy population.⁸⁻⁹ Considering the biopsychosocial effects of epilepsy on patients, it can be said that the already high levels of anxiety and depression in patients^{10,11} peaked during the pandemic. However, it is expected that anxiety and depression levels which are among the main predictors of deterioration in quality of life even under normal conditions may increase in a serious outbreak such as COVID-19 and worsen quality of life.¹²⁻¹⁶ In other words, we hypothesized that the great fear experienced during the pandemic may affect the quality of life indirectly through mental health. However, the direct effect of the fear of COVID-19 on the quality of life is uncertain. Although a study conducted in a healthy population reported that the fear of COVID-19 does not directly affect the quality of life¹⁷, to our knowledge, there is no study in patients with epilepsy. The purpose of this study is to examine the effect of COVID-19 fear on quality of life in individuals with epilepsy in line with the hypothesis model which was created based on study findings from general population (Figure 1).

METHODS

Study design and participants

The sample of this cross-sectional, descriptive study consisted of patients attending the epilepsy outpatient clinic of Istanbul University Istanbul Medical Faculty. Patients over the age of 18, with a definite diagnosis of epilepsy, and who do not have a chronic disease (such as cardiovascular disease, cancer, kidney failure, major depression, diabetes) that would seriously affect the quality of life were included in the study. The data of 7,788 adult epilepsy patients registered in the epilepsy outpatient clinic were reviewed. Approximately

half of them did not have any telephone number or e-mail address that could be reached. A message was sent to 4,861 patients whose phone numbers are registered. A total of 319 patients with epilepsy responded and participated in the study. The low number of response could be partly because the contact was not up to date. Data were collected between December 15, 2020 and January 5, 2021, approximately nine months after the first COVID-19 cases detected in Turkey (March 10, 2020) when pandemic had a second peak following a short plateau period during summer.¹⁸ The participants’ sociodemographic and drug use characteristics are presented in Table 1.

The mean age of the patients in the study was 36.0 (±11.1). Most of them were married (61.4%), and nearly half (49.9%) had a university degree. More than half of the patients (54.2%) were working actively, 14.5% were unemployed. More than 92.5 % of patients were taking one or more antiepileptic drug.

Measures

Sociodemographic and clinical characteristic Form: This form prepared by the researchers consists of items regarding sociodemographic characteristics such as age, gender, marital status, and employment status, and clinical characteristics such as the age of onset of the disease, the duration of epilepsy, and the number of antiepileptic drugs.

COVID-19 Fear Scale: The scale consists of one dimension and seven items. The total score obtained from the scale reflects the level of fear of COVID-19 experienced by the individual. The scores that can be obtained from the scale range between 7 and 35. High scores mean high levels of fear. The scale was developed by Ahorsu *et al.* (2020)¹⁹, its adaptation to Turkish was performed by Bakioğlu *et al.* (2020) and the Cronbach’s alpha coefficient was reported to be 0.82.²⁰ In this study, the Cronbach’s alpha coefficient of the measure was computed as 0.90.

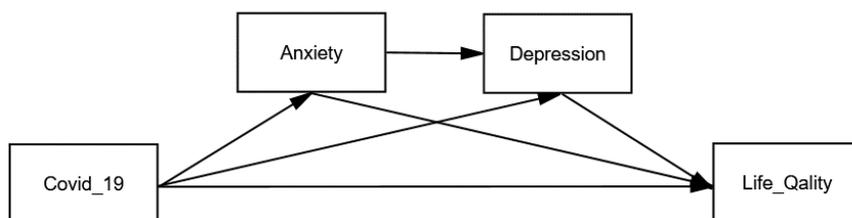


Figure 1. Hypothesis model the effect of COVID-19 fear on quality of life in epilepsy patients

Table 1: Sociodemographic and clinical characteristics (n=319)

	n (%)
Age (mean±sd)	36.0±11.1
Age of onset (years) (mean±sd)	19.8±11.7
Duration of epilepsy (years) (mean±sd)	16.0±10.6
Gender	
Female	150 (47.0)
Male	169 (53.0)
Marital status	
Single	123 (38.6)
Married	196 (61.4)
Education	
Primary school	60 (18.8)
High school	100 (31.3)
University	159 (49.9)
Employment status	
Employed	173 (54.2)
Housewife, retired, student	100 (31.3)
Unemployed	46 (14.5)
Number of antiepileptic drugs used	
Only one	128 (40.1)
Two or more	167 (52.4)
Don't use medication (in remission)	24 (7.5)

Beck Depression Inventory: The scale was developed by Beck *et al.* and consisted of 21 items. Each item of the scale is scored between zero and three (0-3), and the range of scores that can be obtained from the scale varies between 0 and 63. The scale measures the severity of the depressive mood. The scale was adapted to Turkish by Hisli *et al.* (1988), and its Cronbach's alpha coefficient was reported to be 0.80.^{21,22} In this study, the Cronbach's alpha coefficient of the measure was computed as 0.91.

Worry and Anxiety Questionnaire: This questionnaire, developed by Dugas *et al.*,²³ measures whether people have a generalized anxiety disorder. There are 11 items in the nine (0-8) point Likert type scale, but the first item is not included in the scoring. The score that can be obtained range between 0 and 80. High scores indicate that the person has high worry and anxiety. Validity of the scale was made by Akyay (2016), and the Cronbach's of the scale was found to be 0.89.²⁴ In this study, the Cronbach's alpha coefficient of the measure was computed as 0.93.

Epilepsy Quality of Life Scale-10: This 10-item-scale, developed by Cramer *et al.* (1996), questions how epilepsy affects the patients' daily life and general health status.²⁵ High scores indicate better quality of life. Turkish validity was studied by Mollaoğlu *et al.* (2017) and the Cronbach's alpha of the scale was found to be 0.82 for epilepsy effect, 0.71 for mental health, and 0.74 for role function.²⁶ In this study, the Cronbach's alpha coefficient of the measure was computed as 0.84.

Statistical analysis

Sociodemographic and clinical variables of the patients were given as numbers and percentages. Descriptive statistics regarding the scales were presented as mean and standard deviation, and the relations between the scales were analyzed by Pearson correlation. Serial mediation analysis was performed to investigate the effect of COVID-19 fear on quality of life, using Process package 3.5 in the R software.²⁷ In a serial multiple mediator model, independent variable affects outcome both directly and indirectly over two or more causally related mediators. This model also employs bootstrapping procedure, which does not require distribution normality, to estimate

parameters' significance. The power estimates for the parameters were calculated in the Web power package.²⁸ Pairwise comparisons were conducted to contrast the specific indirect effects.

Ethical approval was obtained from the Ethical Board of the Istanbul Medical Faculty (No: 29624016-050.99-1291) before data collection. Informed consent was obtained from all individual participants included in the study.

RESULTS

In this study, the effect of fear of COVID-19 on the quality of life was investigated in epilepsy patients. In the model, the fear of COVID-19 is considered as predictor, the anxiety and depression as mediators, and the quality of life as outcome variables. Descriptive statistics relating to the variables in the model are given in Table 2.

Table 2 shows that Pearson correlations show positive relationships between fear of COVID-19 and anxiety and depression and a negative relationship between these variables and quality of life. In addition, the internal consistency coefficients of the scales are between .84 and .91. Table 3 shows to what extent the proposed model explains the relationships between variables.

In Table 3, “b” parameters reveal that fear of COVID-19 directly increases both the levels of anxiety and depression (1.48 and 0.39). While anxiety and depression directly reduce life quality (-0.58 and -0.45), fear of COVID -19 does not lead to any significant change (0.01). Moreover, all indirect effects on life quality are statistically significant. For example, a one-unit increase in fear of COVID-19 leads to a 1.48-points increase in the anxiety scores and the anxiety transfers 0.58 of this increase to the quality of life. Thus, this first indirect effect is (C₁) -0.87 (1.48*-0.58). Similarly, the second one is (C₂) -0.17 (0.39*-0.45), and the third one is (C₃) -0.23 (1.48*0.34*-0.45). The indirect effect of C₁ is greater than C₂

and C₃, while the difference between C₂ and C₃ is insignificant. While the total effect of fear of COVID-19 on the quality of life is -1.27, only 0.01 of it's the direct effect. This suggests that although the Pearson correlation between two variables is -0.41, the effect of fear of COVID-19 on the quality of life is almost entirely indirect. Accordingly, anxiety and depression are full mediators, and these indicate that all negative effect of COVID-19 fear on quality of life is entirely mediated by anxiety and depression. The variance ratios explained range from 0.25 to 0.59 for models. That is, the fear of COVID-19 accounts for 25% of the variance in anxiety scores. These two variables account for 59% of the variance in depression scores; the proposed model explains 57% of the variance in quality of life scores.

DISCUSSION

This study was conducted to examine the effect of fear of COVID-19 on quality of life in patients with epilepsy. Our study has revealed that fear does not have a direct effect on the quality of life despite the presence of a correlation between COVID-19 pandemic-related fear and quality of life. However, fear was found to indirectly impair the quality of life through influencing anxiety and depression. It has been observed that the COVID-19 fear on the quality of life through mental health explains more than half the variance. The influence on the quality of life was more prominent through anxiety. Hence, it would be beneficial to provide a continuous health service through effective health systems (i.e. tele-health)²⁹, to take the necessary measures and to provide correct information to the community in order to reduce worries and anxiety. In a recent study, epilepsy patients were determined to require tele-health services most and the individuals who could not receive it had high level of anxiety.⁹

Table 2: Descriptive statistics of the questionnaires (n=319)

Questionnaires	M	SD	Pearson r			
			1	2	3	4
Fear of COVID-19	19.2	6.89	.90			
Anxiety	40.21	20.62	.50**	.93		
Depression	16.47	11.19	.55**	.74**	.91	
Quality of Life	52.15	21.35	-.41**	-.74**	-.65**	.84

Note:

1. Diagonal elements in the Pearson correlation columns are Cronbach alpha coefficients
2. ** p < .01

Table 3: Coefficients of Serial Mediation Predicting Quality of Life ($n=319$)

Effects	Outcome=Anxiety			Outcome=Depression			Outcome=QoL		
	b(SE)	LL	UL	b(SE)	LL	UL	b(SE)	LL	UL
Direct									
1. Fear of COVID-19	1.48(.15)**	1.20	1.78	.39(.07)**	.25	.52	.01(.14)	-.27	.28
2. Anxiety				.34(.02)**	.30	.38	-.58(.06)**	-.70	-.47
3. Depression							-.45(.11)**	-.67	-.23
4. Quality of Life (QoL)									
Indirect									
5. Fear of COVID-19 → Anxiety → QoL (C_1)							-.87(.13)	-1.15	-.62
6. Fear of COVID-19 → Depression → QoL (C_2)							-.17(.05)	-.26	-.09
7. Fear of COVID-19 → Anxiety → Depression → QoL (C_3)							-.23(.06)	-.36	-.11
Total									
8. Fear of COVID-19							-1.27(.14)	-1.56	-.99
Contrast									
9. $C_1 - C_2$							-.22(.05)	-.32	-.13
10. $C_1 - C_3$							-.21(.05)	-.30	-.12
11. $C_2 - C_3$.02(.02)	-.01	.06
				$R^2=.59^{**}$			$R^2=.57^{**}$		

Note:

1. Bootstrap estimates are written in italics
2. b: Unstandardized regression coefficient; SE: Bootstrap standard error; LL and UL: The upper and lower limits of the 95% bootstrap confidence interval
3. ** $p < .01$

Depression may become inevitable when social isolation, feeling of loneliness and impaired routines due to prolonged quarantine days are added to the already high level of anxiety. Taking into consideration the fact that epilepsy affects the mental health independently from the pandemic³⁰, it is not surprising that patients become vulnerable and need support during this period. Given that the COVID-19 fear significantly affects the mental health and the quality of life even in healthy individuals¹⁷, we may state that the individuals who have chronic disorders like epilepsy should be monitored more closely. That study¹⁷ has also revealed that COVID-19 fear affected the quality of life through anxiety and depression, consistent with our study. Therefore, it was concluded that the fear of getting ill and/or dying due to the virus deteriorates anxiety and depression and the deteriorated mental health impairs the quality of life.

Anxiety and depression were reported to be the two main predictors that impair the quality of life in previous studies conducted with epilepsy patients independent from the pandemic.^{10,13,15,32-34} Furthermore, the influence of mental health on the quality of life rather than the convulsion frequency was emphasized.^{35,36} Hence, it should be kept in mind that anxiety and depression have a deteriorating effect on the quality of life, both as predictors and mediators, and interventions should be carried out for preserving mental health under conditions like the COVID-19 pandemic, which has caused significant distress and fear in the community.

Despite the absence of evidence indicating that the mortality rate is higher among epilepsy patients compared to the general population, it may be stated that the COVID-19 fear is relatively high. The mean of FCV-19S in the present study was found to be higher than two different studies conducted in healthy individuals.^{17,19} The increased risk due to frequent control visits for epilepsy, the anxiety for canceling routine control appointments, having problems in the supply of antiepileptic drugs, the absence of telemedicine services, and the anticipation of increased seizure due to the virus could have affected the level of fear.^{37,38} In fact, it is interesting that the mean scores of fear that we interpreted as high compared to the data from different countries, are similar to those found in healthy individuals in our country.²⁰ This condition may be explained with the fact that different data were collected during different periods of the pandemic. Bakioğlu *et al.* (2020) collected their data when the virus had

just emerged in Turkey and this period may be defined as the period when obscurity, fear, panic and anxiety were the highest. On the other hand, the data of our study were collected about nine months after detection of the first cases in Turkey, and during this period people were relatively adapted to the pandemic.⁵ However, it would be more correct to make comparisons between patients and control groups during the same period instead of making comparisons between countries or times as the pandemic may go into a different dimension among different countries and different time period. In a general view, it may be stated that every part of the community experiences COVID-19 fear and interventions should be undertaken to reduce this. In a recent study, to minimize the COVID-19 fear, some recommendations such as not attributing every symptom to the virus, continuing social relations through different ways, establishing a positive approach to the pandemic by assuming that it could bring something positive, taking responsibility by adopting the current status and staying safe through obeying the rules were proposed.³⁹

Although the present study has revealed that COVID-19 fear causes a decrease in the quality of life, the difference in quality of life from the pre-pandemic period is not known. Making comparisons between the pre- and post-pandemic status of the same subjects would provide clear information about this issue; however, this was not carried out in the present study. Nonetheless, a remarkable difference may be reported when a comparison was made with the results of the previous studies conducted with epilepsy patients followed-up at the same clinic.¹² The fact that the patients received the minimum score from the mental health sub-dimension once more reveals that mental health is significantly affected. The quality of life being among the most studied parameters in epilepsy patients. Hence, providing a safe environment, preventing unnecessary fear and anxiety through providing sufficient information, and strengthening online counseling services would be beneficial for preserving mental health and the quality of life.

Carrying out the study in electronic media has led to inclusion of highly educated individuals who use digital tools actively. Therefore, the educational level and the rate of unemployment reported in the study may not reflect the characteristics of the general epilepsy population and this may be regarded as a limitation of the study. In addition, the low response rate considering the high number of patients invited to the study can be shown

among the limitations. Some patients may not have received a study invitation due to out of service or outdated phone numbers (In Turkey, usually a phone number instead of e-mail is registered in patient file). Again, the online study may have prevented people with a low level of education and having difficulties in making transactions online / electronic from participating in the study. The high education level of the patients who participated in the study explains this situation. In addition to all these, the lack of a control group consisting of healthy individuals in the study can be considered as a limitation. In order to be able to compare and discuss the data of patients with epilepsy more clearly, it is recommended to use a control group in future studies.

In conclusion, it may be stated that the fear experienced by epilepsy patients who have already higher anxiety and depression compared to general population during the COVID-9 pandemic threatens the mental health most. This fear, which was found not to have a direct effect on the quality of life, was seen to impair the quality of life through mental health, particularly anxiety. Hence, it is important to carry out interventions to reduce fear and anxiety and improve the quality of life of epilepsy patients who are vulnerable, as in all individuals.

DISCLOSURE

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