

Covid-19 Pandemisinde Nöroşirurji Hastalarının Perspektifinden Cerrahi Süreç Kaygısı

Surgical Process Anxiety From The Perspective Of Neurosurgery Patients In The Covid-19 Pandemic

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ÖZ

GİRİŞ ve AMAÇ: Bu çalışma, COVID-19 salgınının yarattığı korkunun nöroşirurji hastaları üzerindeki etkilerini belirlemek amacıyla yapıldı.

YÖNTEM ve GEREÇLER: Tanımlayıcı-kesitsel tipte olan çalışmada veriler, telefon görüşmesi yoluyla 93 nöroşirurji hastası ile anket formu ve COVID-19 Fobi Ölçeği kullanılarak toplandı.

BULGULAR: Hastaların pandemiye bağlı orta derecede korku yaşadığı ve bu korku nedeniyle hastaların %16.1'nin kontrol takip tarihlerini en az bir kez ertelediği tespit edildi. Acil ameliyat geçirenler, ameliyat süreçleri hakkında yeterli bilgi alamadığını bildirenler ($p=0.01$), tedavisinin tamamlanamayacağından korkanlar ($p=0.01$) ve takip için hastaneye otobüsle gidenlerin ($p = 0.003$) korku düzeyleri anlamlı olarak daha yüksekti. Hastaların korku düzeyleri ile hastanede kalış süreleri ($p=0.001$) ve takip için hastaneye başvuru sayıları ($p=0.01$) arasında pozitif yönde güçlü bir ilişki olduğu bulundu.

TARTIŞMA ve SONUÇ: Çalışma, pandemi döneminde cerrahi tedavi kılavuzlarının sürekli değişkenlik göstermesine rağmen, anksiyeteleri ne kadar yüksek olursa olsun, hastaların tedavilerini ertelemek istemediklerini göstermiştir. Hastaların kaygılarının giderilmesinde dikkatli davranmak ve standartlaştırılmış bir algoritma oluşturmak, hastaların cerrahi tedavi süreçlerinin tüm aşamalarını rahatlıkla deneyimlemeleri için faydalı olacaktır.

Anahtar Kelimeler: Anksiyete, cerrahi süreç, COVID-19, hasta, korku, nöroşirurji, pandemi

ABSTRACT

INTRODUCTION: This study was conducted to determine the effects of the fear created by the COVID-19 pandemic on the neurosurgery patients.

METHODS: In the descriptive-cross-sectional study, data were collected by phone call using a questionnaire and the COVID-19 Phobia Scale with 93 neurosurgery patients.

RESULTS: The patients experienced moderate levels of fear due to the pandemic, and due to this fear, 16.1% postponed their follow-up dates at least once. The COVID-19 fear levels were higher among those who had emergency surgery, those who could not get sufficient information on the surgery processes ($p=0.01$), those who were afraid that their treatment might not be completed ($p=0.01$) and those who went to the hospital for follow-up by bus ($p=0.003$). There were significant positive and strong relationships between the patients' fear levels and their durations of hospitalization ($p=0.001$) and numbers of visits to the hospital for follow-up ($p=0.01$).

DISCUSSION and CONCLUSION: The study showed that, although surgical treatment guidelines showed constant variation during the pandemic period, however high their anxieties may be, the patients did not want to delay their treatments. Acting carefully in eliminating the anxieties of patients and creating a standardized algorithm will be useful for patients to experience all stages of surgical treatment processes with comfort.

Keywords: Anxiety, COVID-19, fear, neurosurgery, pandemic, patient, surgical process

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INTRODUCTION

COVID-19, which started in China and is communicable through droplets and direct contact with infected individuals, has been declared as a pandemic by the World Health Organization (WHO) as it has spread fast intercontinentally and may cause deadly acute respiratory syndrome (1). After this declaration of WHO, countries have informed all parts of the society about fighting against this deadly pandemic by effective usage of today's communication technologies, especially social media (2). While a clear conclusion has not been yet reached about the treatment procedures and vaccination for COVID-19. There are ongoing vaccination studies, although the application has started. Therefore, it is attempted to take the process under control with guidelines that show frequent changes (3).

The pandemic adversely affects many countries, especially China, which is experienced in epidemics. First of all, chronic patient follow-up and treatment in the health system are negatively affected (4,5). This situation has not only led to uncontrolled management of the healthcare system but also affected the follow-ups and treatments of chronic patients negatively. It is a known fact that these patients have higher morbidity and mortality rates (6), and it is clear that especially their anxiety levels regarding the pandemic would be higher than other patients.3 With addition of surgical treatment needs onto this, postponement of treatments by patients may be in question (7-9).

In the early periods of the pandemic, the consensus among all health organizations, especially WHO and the Centers for Disease Control and Prevention (CDC), was to cancel or postpone all elective surgeries at all hospitals without regard to provision of the optimal conditions regarding the pandemic. Surgeries that require emergency intervention were kept outside this scope, and they were recommended to be continued at hospitals other than pandemic hospitals (7-10). While having a surgical intervention has already been a process involving uncertainty, anxiety and stress for patients and relatives, the anxieties of healthcare professionals regarding the surgical process have also increased with the onset of the pandemic. In addition to the complication risks of surgery, the risks created by the pandemic

process were also involved in this process (11,12,13).

While the fear of getting infected is a significant source of anxiety, in this period where even conservative treatments were postponed, the option of surgical treatment influenced patients negatively and increased their stress levels especially at the beginnings of the process. In this context, the finding in the study by Lei et al. (2020) that the mortality rate of 34 patients who were diagnosed with COVID-19 after surgery was 20.5% showed how right this anxiety is (14).

In the new world order created by COVID-19, fractures started to be shaped in time in the relationship between healthcare professionals who endured serious damages at first stages and patients (15). As in every field of medicine, for neurosurgery patients, too, new treatment and follow-up algorithms have been developed by the rise of the increasing morbidity and mortality risk above the acceptable levels (16,17).

Although, in line with guidelines published regarding management of the surgical process, healthcare professionals manage the process correctly and have high self-sacrifice levels, it is also important for patients to participate in the treatment and care process (18). Especially the surgical process consists of a set of stages that require the physician, nurse, patient and relatives to directly communicate. Even after being discharged, patients' relationships with the hospital may continue due to reasons such as drainage, dressing and checking the incision area (19,20).

In the province where the study was conducted, the high density of positive cases since the beginning of the pandemic suggests an important consideration in patient anxiety levels. Although there are studies conducted so far to measure the anxiety levels of neurosurgery patients, no study has been conducted to measure the questions forming among patients and patients' knowledge levels about the pandemic during the pandemic process. The most important problems in this pandemic period include the knowledge statuses of neurosurgery patients who receive surgical intervention on the pandemic, their fear levels and the relationship between data regarding the surgical treatment and care processes and COVID-19 fear levels.

This study was conducted for the purpose of investigating the effects of anxiety, stress and fear created by COVID-19 on the surgical treatment and care processes of neurosurgery patients in the pandemic period.

METHODS

Type, Population and Sample of The Study

This descriptive and cross-sectional study was conducted between March and October 2020 at the neurosurgery clinic of Zonguldak Bulent Ecevit University Health Application and Research Center Hospital with patients who received neurosurgical interventions after the first case of COVID-19 was seen in Turkey. The population of the study consisted of 125 patients. The study was conducted with 93 patients (74.4%) among these patients whose relationships with the hospital were ongoing in relation to their treatment or care after the surgical intervention, who were not diagnosed with COVID-19 after the surgical process, were able to communicate via the telephone, were 18 years old or older and agreed to participate in the study. Two patients did not agree to participate in the study, 11 patients could not be reached (mistake in telephone number or not answering the telephone), 19 patients had consciousness state disorders, and so, these 32 patients were not included in the sample.

Data Collection Instruments

The data in the study were collected by using a Questionnaire Form consisting of two parts and the Coronavirus-19 (COVID-19) Phobia Scale.

Questionnaire Form: The first part of the questionnaire consisted of 18 questions on the demographic and health-related characteristics of the patients (sex, age, education and employment status, marital status, presence of comorbidity, surgical intervention that they had, duration of hospitalization, having sufficient knowledge about the pandemic and surgical process, whether or not the process affected their reception of treatment and care) (9,21). The second part of the questionnaire consisted of 11 yes-no questions prepared in line with the literature to assess the patients' knowledge statuses regarding the COVID-19 pandemic (1,6).

Coronavirus-19 (COVID-19) Phobia Scale: It is a 5-point Likert-type scale that was developed by Arpacı et al. to assess phobia that may develop against the novel coronavirus disease. Items 1, 5, 9,

13, 17 and 20 measure the Psychological Dimension, items 2, 6, 19, 14 and 18 measure the Somatic Dimension, items 3, 7, 11, 15 and 19 measure the Social Dimension, and items 4, 8, 12 and 16 measure the Economic Dimension. The items are scored between 1 "Absolutely Disagree" and 5 "Absolutely Agree", and the total score varies between 20 and 100. Higher scores in the scale represent higher levels of fear of COVID-19 (22). The total scale Cronbach's Alpha coefficient in the study by Arpacı, Karataş and Baloğlu (2020) was reported as 0.925, while in this study, the Cronbach's Alpha value was found as 0.837.

Data Collection Process

The contact information of the patients was reached from the Neurosurgery Department by receiving permission from the institution. The researchers communicated with the patients via the telephone, the patients were informed on the telephone that the necessary permissions were obtained, participation in the study was voluntary, and they were briefly informed about the study. It was stated to the patients that their identity and personal information would be absolutely kept confidential among their patient data. The responses given by the patients on the telephone were simultaneously recorded in the data collection instruments. The researchers, physicians and nurses, who provide the transmission and evaluation of the COVID-19 Phobia Scale to the patients via telephone. The telephone conversation with each patient lasted 8-10 minutes on average.

Statistical Analysis

The data were analyzed in the SPSS 22.0 package software. The descriptive data are presented as frequencies, percentages, means and standard deviations. Kolmogorov-Smirnov test was used to test whether or not the data showed a normal distribution. As the data were found to have a normal distribution, analysis was carried out with parametric tests. The differences between the groups were analyzed by using independent-samples t-test and one-way ANOVA. Tukey's post-hoc test was utilized to determine the source of the difference between the groups. The relationship between the continuous variables was determined with the Pearson's correlation analysis method. The results were tested on a significance level of $p < 0.05$.

Ethical Considerations

In order to start the study, local ethical committee approval was obtained (date/number: 21-09-2020/874). Written permission was obtained from the corresponding author to use the Coronavirus Phobia Scale in the study, and implementation permission was received from the institution where the study would be conducted. The patients were informed of the purpose of the study, that the information collected during the study would not be used for any other purpose than the research, they would not be individually negatively affected by the results, and their names would not be included in the findings, and their consent was obtained.

RESULTS

The mean age of the patients who participated in the study was 53.13 ± 13.03 , 53.8% were female, 46.2% were male, and 38.7% had chronic diseases (Table 1). Among the surgeries of the patients, 67.7% were elective, and 61.3% were performed in and after the month of June. The most frequent (49.5%) surgery was lumbar disk hernia surgery (Table 2).

The mean duration of hospitalization of the patients was $5.89 (\pm 4.51)$ days, and the patients visited the hospital for follow-up after discharge by a mean number of $2.88 (\pm 2.76)$ times (Table 2). It was found that 20.4% of the patients went to follow-ups alone, 68.4% of these patients showed the pandemic as the reason for this behavior, and 76.3% used their personal vehicles to access the hospital. 16.1% postponed their follow-up dates after the surgical intervention at least once, and among those that postponed their appointments, 86.7% did so due to the pandemic. 74.2% of the patients stated that the pandemic did not affect their reception of sufficient levels of information regarding the knowledge, treatment and care towards their surgical processes. 26.9% stated that the pandemic negatively affected the surgery process, while it was determined that 16.1% experienced anxiety that their treatment might not be completed due to the pandemic (Table 2).

It was determined in this study that the patients experienced moderate levels of COVID-19 phobia with a mean total scale score of $57.12 (\pm 11.03)$. According to the dimensions of the scale, the

highest mean score of the patients was in the psychological dimension (20.56 ± 4.19), whereas their lowest mean score was in the somatic dimension (10.82 ± 5.24) (Table 3).

It was determined that most of the patients correctly answered the questions except for the ones 'Are sneezing and nasal flow seen less frequently in individuals infected with the coronavirus than the common cold? (question 2)' and 'Do all infected individuals show coronavirus symptoms? (question 3)'. The mean scale scores were significantly higher among the patients who responded as 'Sneezing and nasal flow would not be seen less frequently in individuals infected with the coronavirus than the common cold (question 2)', 'Not all infected individuals show coronavirus symptoms (question 3)', 'It would not make it easier to transmit the coronavirus to touch contaminated surfaces (question 10)' and 'The probability of the elderly and those with chronic diseases to be more severe cases is not higher (question 11)' ($p < 0.05$) (Table 4).

The subscale and total mean scores of those who had an emergency surgical intervention in the pandemic process ($p = 0.01$), those who thought the pandemic affected getting information about the surgery process ($p = 0.01$), those who used the bus to go to the hospital for follow-ups ($p = 0.003$) and those who stated that they had anxiety about their treatment would not be completed ($p = 0.01$) were significantly higher. The psychological and social dimension mean scores of the patients who received surgical intervention before 1 June 2020 when the normalization process started in Turkey were significantly higher ($p < 0.05$), and although their mean scores in the other subscales and the total scale were still higher, the difference was not statistically significant ($p > 0.05$). Moreover, it was determined that the mean scores in all dimensions except for the economic dimensions increased alongside the duration of hospital stay, and this relationship was significant and strong ($p = 0.001$, $r = 0.681$). The numbers of visits to the hospital after discharge for follow-up were positively and strongly related to all dimensions of the scale except for the social dimension ($p = 0.01$, $r = 0.709$) (Table 5).

Table 1. Demographic characteristics of the patients (n=93)

Variables	X±SD	Min	Max
Age	53.13±13.03	27	77
	n		%
Sex			
Female	50		53.8
Male	43		46.2
Educational status			
Illiterate	9		9.7
Primary/secondary school	61		65.6
High school	14		15.1
Associate's	4		4.2
Undergraduate and postgraduate	5		5.4
Form of employment			
Distance work	5		5.4
Seasonal	9		9.7
As before the pandemic	17		18.3
Became unemployed in the pandemic	7		7.5
Already unemployed	55		59.1
Marital status			
Married	75		80.6
Single	18		19.4
Has chronic disease			
Yes	36		38.7
No	57		61.3
Total	93		100.0

Table 2. Characteristics related to the surgery processes of the patients in the pandemic period (n=93)

Variables	n	%
Surgical intervention		
Lumbar discectomy	46	49.5
Glial tumor excision	14	15.1
Cervical discectomy	10	10.7
Hydrocephalus shunt surgery	2	2.2
Spinal fusion	17	18.2
Carpal tunnel syndrome	4	4.3
Period of surgical intervention*		
Before 01.06.2020	36	38.7
On and after 01.06.2020	57	61.3
Type of surgical intervention		
Emergency	30	32.3
Elective	63	67.7
Status of reception of information on surgery processes being negatively affected		
Yes	24	25.8
No	69	74.2
Visiting hospital for follow-up		
Alone	19	20.4
With relative	74	79.6
Reason for going to the hospital alone (n=19)		
Pandemic	13	68.4
Other	6	31.6
Form of accessing the hospital for follow-up		
Private vehicle	71	76.3
Taxi	17	18.3
Bus	5	5.4
Postponing follow-up		
Yes	15	16.1
No	78	83.9
Reason for postponing follow-up (n=15)		
Pandemic	13	86.7
Other	2	13.3
Status of surgery processes being negatively affected		
Yes	25	26.9
No	68	73.1

Anxiety about not continuing treatment			
Present	15	16.1	
Absent	78	83.9	
	X±SD	Min	Max
Time spent at the hospital (days)	5.89±4.51	1	25
Number of visits to the hospital after discharge for follow-up	2.88±2.76	1	15

*Grouping was carried out on the date of surgical intervention as the normalization date for Turkey was 01.06.2020.

Table 3. Anxiety statuses based on subscale and total coronavirus-19 phobia scale scores			
C-19P-S	X±SD	Min.	Max.
Psychological Dimension	20.56±4.19	10	25
Social Dimension	19.05±2.04	10	23
Economic Dimension	11.71±3.68	4	16
Somatic Dimension	10.82±5.24	5	20
Total	57.12±11.03	29	84

Table 4. Comparison of total C-19P-S mean scores based on responses to statements about COVID-19

Statements about COVID-19		n	%	C-19 P-S	Independent-samples t-test
				X±SD	
Are the main symptoms of coronavirus fever, dry cough and body ache?	Yes (True)	78	83,8	54.24±11.40	p=0.85
	No (False)	15	16,2	54.86±15.38	
Are sneezing and nasal flow seen less frequently in individuals infected with coronavirus than the common cold?	Yes (True)	43	46,2	54.39±12.09	p=0.02*
	No (False)	50	53,8	54.30±12.11	
Do all infected individuals show coronavirus symptoms?	No (True)	39	42,0	55.25±9.63	p=0.005*
	Yes (False)	54	58,0	53.68±10.20	
Can the disease be transmitted by those not showing coronavirus symptoms?	Yes (True)	80	86,0	54.48±12.38	p=0.77
	No (False)	13	14,0	53.46±10.03	
Can avoiding crowded places may prevent coronavirus infection?	Yes (True)	90	96,7	54.61±11.82	p=0.24
	No (False)	3	0,3	46.33±18.61	
In the case of having to be in a crowded place, can keeping a distance of at least 1 meter from other people protect from the virus?	Yes (True)	87	93,5	54.02±11.96	p=0.33
	No (False)	6	6,5	59.00±13.40	
Can wearing a medical mask and washing hands prevent coronavirus infection?	Yes (True)	88	94,6	54.29±12.20	p=0.87
	No (False)	5	5,4	55.20±9.80	
Can using alcohol-based hand disinfectant in cases we cannot wash our hands prevent the transmission of the virus?	Yes (True)	85	91,3	54.03±12.18	p=0.42
	No (False)	8	8,7	57.62±10.48	
Can coronavirus be transmitted through respiratory droplets?	Yes (True)	77	82,7	54.59±11.98	p=0.65
	No (False)	16	17,3	53.12±12.62	
Can touching contaminated surfaces make the spread of coronavirus easier?	Yes (True)	65	69,8	55.66±13.07	p=0.02*
	No (False)	28	30,2	51.28±8.64	
Is the probability of the elderly and chronic patients to be severe cases higher?	Yes (True)	88	94,6	54.20±12.33	p=0.03*
	No (False)	5	5,4	56.80±10.25	

*p<0.05

Table 5. Comparison of some characteristics of the patients regarding their surgery processes in the pandemic period and their mean C-19P-S scores

Variable	Psychological dimension	Somatic dimension	Social dimension	Economic dimension	Total score
	X±SD	X±SD	X±SD	X±SD	X±SD
Type of surgical intervention					
Emergency	22.04±2.29	18.36±1.14	14.23±5.01	10.25±3.78	70.06±10.61
Elective	12.27±6.97	13.46±6.45	18.69±2.65	14.17±2.06	53.52±12.66
Statistical analysis	p = 0.04	p = 0.02	p = 0.06	p = 0.74	p = 0.01
Term of surgical intervention*					
Before 01.06.2020	22.06±2.65	11.20±3.45	19.03±4.17	14.69±2.96	75.53±7.24
On and after 01.06.2020	12.06±3.47	7.03±5.15	14.39±2.45	10.78±3.50	55.53±11.99
Statistical analysis	p = 0.02	p = 1.92	p = 0.03	p = 0.196	p = 0.687
Status of reception of information on surgery processes being negatively affected					
Yes	20.14±3.69	15.63±2.46	17.36±2.14	13.36±1.54	69.76±12.94
No	16.35±2.57	10.16±3.25	11.64±2.56	11.26±2.87	52.57±11.28
Statistical analysis	p=0.001	p=0.01	p=0.26	p=0.06	p=0.01
Form of transportation to the hospital for follow-up					
Private vehicle (1)	14.26±2.45	10.69±2.57	18.12±2.98	15.45±1.02	48.36±10.69
Taxi (2)	20.89±2.78	16.47±2.26	17.65±1.46	12.23±2.14	56.24±13.82
Bus (3)	22.26±2.39	19.16±1.65	20.78±2.45	14.16±2.65	68.31±14.26
Statistical analysis	p = 0.003	p = 0.001	p = 0.075	p = 0.05	p = 0.003. 1-3 (post-hoc)**. p=0.003
Anxiety that treatment might not be completed					
Present	23.16±2.04	16.26±2.47	16.03±2.19	13.69±2.71	64.16±12.94
Absent	14.25±1.26	9.13±3.70	12.78±2.45	12.16±2.71	55.57±11.28
Statistical analysis	p = 0.001	p = 0.03	p=0.69	p=0.196	p = 0.01
Time spent at the hospital (days) 5.89±4.51	20.56±4.19	10.82±5.24	19.05±2.04	11.71±3.68	57.12±11.03
Statistical analysis***	r=0.701; p=0.000	r=0.654; p=0.001	r=0.608; p=0.03	r=0.540; p=0.096	r=0.681; p=0.001
Number of visits to the hospital after discharge for follow-up (2.88±2.76)	20.56±4.19	10.82±5.24	19.05±2.04	11.71±3.68	57.12±11.03
Statistical analysis***	r=0.694; p=0.001	r=0.696; p=0.002	r=0.651; p=0.05	r=0.713; p=0.003	r=0.709; p=0.01

Note: t, independent-samples t-test, F, One-way analysis of variance (ANOVA)

* Grouping was made on the date of the surgical intervention as the normalization date for Turkey was 01.06.2020.

** Significant difference: Tukey's test.

***Pearson's correlation analysis

DISCUSSION

It is seen in the literature that studies examining the effects of the COVID-19 pandemic on different patient groups and healthcare workers during the pandemic period have been carried out. On the other hand, this study is the first study examining the effects of COVID-19 on surgical treatment processes from the perspective of neurosurgery patients.

As the hospital where the study was conducted was not a pandemic hospital, both elective and emergency surgeries were applied on patients who were admitted to the neurosurgery clinic. This way, the treatments of the patients were not postponed. Following the decrease in the number of cases in Turkey, the Ministry of Health started the normalization process on 1 June 2020 (23). Restrictions on going outside led to reductions in

human movements. In connection to this, with the decrease in traumas such as falls and traffic accidents, the number of cases requiring emergency neurosurgery operations decreased (17,24). The number of cases in the compulsory restrictions period in this study was in agreement with the literature.

In addition to the fact that the morbidity and mortality rates of neurosurgery patients are high (25), in the case that these patients were infected with COVID-19, these rates have increased even further due to the other complications caused by the virus. A multi-center study reported that, while the pre-pandemic complication rate was 14%, and the mortality rate was 1.6%, in the pandemic period, these rates rose to 15% and 1.8% respectively (16). In another study, among five patients who were diagnosed with subdural hematoma and infected with COVID-19, all those who received surgery died, and only the patient who received conservative treatment

survived (mortality rate: 80%) (26). As a consequence of these results, it is expected that neurosurgery patients would experience higher levels of fear and anxiety in comparison to other surgical patients. A global survey study reported that patients with brain tumors and their caregivers experienced high levels of anxiety, and for this reason, they attempted to continue their treatment with the tele-health method (27). Another study found that patients experienced moderate levels of anxiety. In the same study, the anxiety levels that were not high were explained by the feeling of trust of the included patients in the high-level effort spent in managing the pandemic by the hospital where they received treatment (3). In another study, it was reported that anxiety levels of neurosurgery patients who were operated for a non-emergency reason were high (28). In this current study, it was also found that the patients experienced moderate levels of COVID-19 fear (57.12 ± 11.03), and especially the psychological and somatic subscale mean scores were higher. It is thought that this result was related to the fact that the hospital was not a pandemic hospital, the patients found the pandemic management of the institution administrators and healthcare workers successful, and they felt confidence and satisfaction.

Ghosh et al. (2020) found the anxiety levels of patients high ($p < 0.05$), while most patients did not want to postpone their treatment (3). In this study, 83.9% of the patients stated that they did not experience anxiety regarding that their treatments might not be completed. Furthermore, those experiencing anxiety in this direction had very high mean total scale and psychological and somatic subscale scores. The score difference between those that experienced anxiety and those that did not was significant ($p = 0.01$). It was determined that most patients did not postpone their follow-ups, and this variable did not significantly affect the fear scores ($p > 0.05$).

In the study, a third of the patients stated that their status of being informed about the surgery processes was affected negatively by the pandemic. These patients had higher fear scores than the others. There was a significant difference between those that stated they were affected negatively in terms of information and those that stated they received sufficient information regarding their

psychological and somatic subscale scores and total fear scores ($p = 0.01$). Additionally, the high fear scores in both patient groups may suggest that, although the patients were sufficiently informed about the surgery processes, they might not have received information regarding how the surgery process would be managed in relation to the pandemic. Thus, provision of education focusing on this topic by healthcare professionals may be effective in reducing the COVID-19 fear levels of patients. As opposed to the result in this study, Tashkandi et al. (2020) found that the vast majority of patients (78%) said their medical care reception status was affected by the pandemic (9). This high rate in their study may be associated with the fact that the study was carried out with oncology patients.

Although it was determined that the patients mostly (79.6%) visited the hospital for follow-ups with their relatives, the rate of those who went alone stating the pandemic as a reason for this behavior was 68.4%. However, due to reasons such as elderly patients and requirement of care support due to surgery, those who have to go to the hospital with a relative may have concerns for both themselves and their relatives. The anxiety levels of these patients who were found to have visited the hospital by a mean number of two times after being discharged may be multiplied as this number increases. It was reported that, when especially elderly patients experienced health problems, they had fears of accessing health institutions and being infected during their transportation to these institutions (29). Likewise, it was stated that surgical patients are faced with various thoughts and feelings such as their treatment process being negatively affected by the pandemic, the virus infecting themselves or relatives in the process, the surgical process remaining incomplete, unwillingness about treatment and care and fear of death (14,26).

It was found that the patients mostly used private vehicles while going to the hospital for follow-ups. Those who went to the hospital by bus had the highest COVID-19 fear levels ($p = 0.003$). In line with the decisions made by the Scientific Committee on COVID-19 in Turkey regarding the use of public transportation vehicles, despite precautions such as reduction of passenger capacities, formation of seating arrangements complying with social distancing rules and rejection of patients without

masks, it is seen that patients experience anxiety regarding the use of these vehicles while going to the hospital (30).

In the study, it was seen that, as the duration of hospital stay and number of visits to the hospital for follow-up increased, the fear levels of the patients also increased (Table 5). Kayani et al. (2020) reported that there was a correlation between the hospital stay durations of surgical patients and their complication and mortality rates ($p<0.05$) (31). Shortening the hospital stay of surgical patients in line with up-to-date guidelines is important in terms of reducing postoperative complication risks (32). In this context, it would be the right approach to minimize their relationship with the hospital during the pandemic process. However, considering that hospitalization durations and numbers of visits increase due to the effects of factors such as the general health status of the patient, type of the surgery and its seriousness, it is an ordinary outcome to find a strong correlation between the fear levels of the patients and the aforementioned variables in the pandemic process. In protection from complications and reduction of the fear levels of patients, it is important to continue the surgical processes of patients with the tele-health method, provide special education regarding all precautions that could be taken during transportation and comply with precautions to the maximum degree during hospitalization. Other studies conducted in the pandemic period supported this issue (7,33).

Having sufficient knowledge about the pandemic is important for individuals to take effective measures to prevent the spread of the virus and comply with precautions. This will also reduce the anxieties of individuals. Accordingly, the COVID-19 knowledge level of patients is an important parameter in assessment of process management. Hezima et al. found the mean COVID-19 general knowledge score of patients as 78.2% (6). In this current study, the general accuracy rate of the knowledge levels of the neurosurgery patients who had surgical intervention was 80.1%. Although the results were close, the difference may vary based on the data when studies are conducted. Hezima et al. conducted their study in the early period of the pandemic (March-April). The general knowledge levels of patients were also found lower in another study which collected data in the months of March

and April (34). It should be noted that the information on the disease had not been clarified yet in the early period. The disease, which is not known with all its aspects even today, used to be known less then, and less information could be provided to people.

It was determined that the patients mostly answered the COVID-19 knowledge questions correctly. It was seen that the responses to some questions (2nd, 3rd, 10th and 11th questions) significantly affected the total scale mean scores ($p<0.05$). It was seen that the patients responding incorrectly to especially the second and third questions were in the majority. It is thought that this result may have been caused by the lack of knowledge of the patients regarding the ways the virus spreads and its symptoms, as well as starting to observe severe cases and deaths in not only old patients but also young patients.

Strengths and Limitations of the Research

The study was carried out in a province where density of COVID-19 pandemic cases was high. In relation to the intense mining activities in this province, it is known that the rate of patients with chronic diseases and numbers of elderly patients are also high. For this reason, it is believed that patients may have experience in managing their treatment processes with the fear created by the pandemic in patients. It is important that the study was conducted in such a city and with neurosurgery patients where critical surgeries are performed. This study is also highly significant in terms of examining the patients' individual decisions on the continuity of their treatment and behavioral attitudes with the effect of the pandemic.

Despite these strengths, this study had some limitations. The first limitation was that the study was carried out at only one institution. The second was that some patients could not be included in the study due to the fact that changes may occur in the consciousness status of patients after neurosurgery operations. For the future, it is recommended to conduct studies in regions with high numbers of cases, simultaneously with different institutions and with large samples.

CONCLUSION

The neurosurgery patients experience fears that their surgical processes may be affected and might not be completed due to the pandemic. Despite this, it is seen they are willing to continue their treatment and are showing effort. Nevertheless, these patients whose health statuses are critical should be provided with special education on the topics of coping with stress, protecting their health and maintaining it throughout their surgery processes that start with making the decision for surgery and in extraordinary situations like a pandemic. If possible, meetings should be held with patients after discharge via tele-health methods. If in person meeting is required in relation to the care requirements of patients, more active communication should be established with primary healthcare institutions.

Conflicts of Interest

The authors report no actual or potential conflicts of interest.

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