

Depression and Anxiety in Mothers of Children Hospitalized for COVID-19 Infection

COVID-19 Enfeksiyonu Nedeniyle Hastaneye Yatırılan Çocukların Annelerinde Depresyon ve Anksiyete

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Abstract

Objective: Coronavirus disease-2019 (COVID-19) infection and the pandemic process have become crucial public health problems with devastating effects on the psychological, social, and economic aspects of society. This study aimed to examine the emotional state of the mothers of the children diagnosed with this disease, to investigate the symptoms of depression and anxiety, and to reveal the situations that might affect these due to the COVID-19 pandemic, which is a crucial source of stress.

Method: We included mothers of 50 pediatric patients (under 18 years old) hospitalized for COVID-19 infection proven by severe acute respiratory syndrome-coronavirus-2 polymerase chain reaction test, and mothers of 50 patients hospitalized with other diagnoses except for COVID-19. We evaluated mothers with the hospital anxiety and depression scale (HAD).

Results: We assessed the relationship between education level and anxiety/depression in mothers of children diagnosed with COVID-19. A negative correlation was found between education level and HAD anxiety subscale ($p=0.049$, $r=-0.280$). The mean HAD anxiety score of mothers of COVID-19 positive children was statistically significantly higher than in the control group ($p=0.001$). The incidence of depression in the study population was almost equal, and there was no statistically significant difference between the groups ($p=0.839$). According to the total HAD scale score, the mean score of the mothers of the COVID-19 group had statistically significantly higher scores than the control group ($p=0.043$).

Conclusion: Although two years have passed since the pandemic started, COVID-19 is still a source of anxiety and stress for parents. In addition, socio-demographic factors affecting the psychological health of parents may further increase this burden.

Keywords: Anxiety, children, COVID-19, depression, mothers, socio-demographic factors

Öz

Amaç: Koronavirüs hastalığı-2019 (COVID-19) enfeksiyonu ve pandemi süreci, toplumun psikolojik, sosyal ve ekonomik yönleri üzerinde yıkıcı etkileri olan çok önemli halk sağlığı sorunu haline gelmiştir. Bu çalışmada, bu hastalık tanısı alan çocukların annelerinin duygusal durumlarının incelenmesi, depresyon ve anksiyete belirtilerinin araştırılması ve çok önemli bir stres kaynağı olan COVID-19 pandemisi nedeniyle bunları etkileyebilecek durumların ortaya konulması amaçlanmıştır.

Yöntem: Çalışmaya şiddetli akut solunum sendromu-koronavirüs-2 polimeraz zincir reaksiyon testi ile kanıtlanmış COVID-19 enfeksiyonu nedeniyle hastaneye yatırılan 50 pediyatrik hastanın (18 yaş altı) annelerini ve COVID-19 tanısı hariç diğer tanılarla hastanede yatan 50 hastanın annelerini dahil ettik. Anneler hastane anksiyete ve depresyon ölçeği (HAD) ile değerlendirildi.

Bulgular: COVID-19 tanısı alan çocukların annelerinde eğitim düzeyi ile anksiyete ve depresyon arasındaki ilişki değerlendirildi. Eğitim düzeyi ile HAD anksiyete alt ölçeği arasında negatif korelasyon ($p=0,049$, $r=-0,280$) saptandı. COVID-19 pozitif çocukların annelerinin HAD anksiyete puan ortalaması kontrol grubuna göre istatistiksel olarak anlamlı derecede yüksekti ($p=0,001$). Çalışma popülasyonunda depresyon insidansı neredeyse eşitti ve gruplar arasında istatistiksel olarak anlamlı bir fark yoktu ($p=0,839$). Toplam HAD ölçek skoruna göre COVID-19 tanısı alan gruptaki annelerin puan ortalamaları kontrol grubuna göre istatistiksel olarak anlamlı derecede yüksekti ($p=0,043$).

Sonuç: Pandeminin başlamasından bu yana iki yıl geçmesine rağmen, COVID-19 hala ebeveynler için bir anksiyete ve stres kaynağıdır. Ayrıca ebeveynlerin psikolojik sağlığını etkileyen sosyo-demografik faktörler bu yükü daha da artırabilir.

Anahtar kelimeler: Anksiyete, anneler, COVID-19, çocuklar, depresyon, sosyo-demografik faktörler



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Introduction

The Coronavirus disease-2019 (COVID-19) infection, which started in China in December 2019 and spread rapidly around the world, was declared a pandemic by the World Health Organization on March 11, 2020 (1). COVID-19 infection and the pandemic process have become crucial public health problems with devastating effects on the psychological, social, and economic aspects of society (2).

During the COVID-19 pandemic, many precautions have been taken in our country as the rest of the world. These precautions included the transition to online education and work instead of face-to-face teaching and working, quarantine, and curfews during the pandemic (3). Studies have shown that the COVID-19 pandemic process affects the mental health of parents and children (4,5). In a study conducted in China, where the pandemic first started, it was emphasized that more than half of adult people had anxiety symptoms during this process (6). Studies conducted during previous epidemics have also shown an increase in psychiatric diseases, especially anxiety, depression, and post-traumatic stress disorder (2,7).

In children infected with COVID-19, the hospitalization process is stressful for children and their parents. The main factors that cause stress and anxiety among parents are those related to the child's health conditions and environmental, administrative, and socio-economic factors, and are in parallel with an increasing number of cases and deaths, scarcity of hospital beds, risk of infection due to close contact with the patient, other family members. Worrying about health, fear of death, the sadness of losing loved ones, and economic recession are some of the other causes that can worsen the situation by increasing psychological stress (2). Studies have also emphasized that psychiatric symptoms occur in children hospitalized for COVID-19 and their parents (8-10). A study conducted in our country has stated that the age of the parents, education level, and economic level are socio-economic variables that may affect the mental health of both families and children (3).

There are limited studies on how the mental health of mothers of children hospitalized with the diagnosis of COVID-19 infection is affected (2,9). This study aimed to examine the emotional state of the mothers of the children diagnosed with this disease, to investigate the symptoms of depression and anxiety, and to reveal the situations that may affect these due to the COVID-19 pandemic, which is a crucial source of stress. Also, our study aimed to understand and address the needs of children and their

mothers and to prevent psychiatric disorders that might occur by developing action plans or training programs for this.

Materials and Methods

We conducted this study in University of Health Sciences Turkey, Kartal Dr. Lütfi Kırdar City Hospital between April 2022 and June 2022. We included the mothers of 50 pediatric patients (under 18 years old) hospitalized in the Clinic of Pediatric Infectious Diseases due to COVID-19 infection proven with severe acute respiratory syndrome-coronavirus-2 polymerase chain reaction test and the mothers of 50 patients hospitalized with other diagnoses except for COVID-19 diagnosis. Our study was approved by the Ethics Committee of University of Health Sciences Turkey, Kartal Dr. Lütfi Kırdar City Hospital on March 30, 2022, with the decision number 2022/514/222/45, and performed in accordance with the Declaration of Helsinki. We would need a sample size of 45 in each group to reliably (with a probability greater than 0.8) detect an effect size of $0.6 \geq d$, assuming a two-sided criterion for detection that allowed for a maximum type I error rate of $\alpha=0.05$. We added five more patients to each patient group for possible data loss problems in the study. We used a stratified random sampling method for the control group and designed the study as a prospective, cross-sectional case-control study.

We included patients after they were informed about the study and obtained their written consent. All the participant children's conditions were stable. We excluded mothers if their children had poor general conditions (respiratory distress, cardiovascular dysfunction, neurologic disorder, malignancy), psychiatric disease, used psychiatric drugs, or they did not want to participate in the study. We conducted all interviews on the 2nd day of hospitalization (24 hours after hospitalization). We uploaded all data we collected to a database and kept monitored records. Interviews with the mothers lasted about half an hour, with personal protective equipment and masks.

First, we asked questions to the participant mothers about their age, educational status, occupation, marital status, average monthly income, having a history of a psychiatric disease, having a child loss before, and whether the inpatient child had a chronic disease or not, and we recorded obtained data on an interview form.

After that, we assessed hospital anxiety and depression scale (HAD). Zigmond and Snaith (11) developed this scale, and the validity and reliability were proven in our country

by Aydemir et al. (12). The questionnaire contains a total of 14 questions which consists of two subscales, including anxiety (HAD-A) and depression (HAD-D). Odd numbers measure anxiety, and even numbers estimate depression. Each item has different scoring values. Answer options in questions 1, 3, 5, 6, 8, 10, 11, and 13 have decreasing scores from A to D (from 3 to 0). On the other hand, answer options of the 2nd, 4th, 7th, 9th, 12th, and 14th questions have increasing scores (from 0 to 3). The total scores of the subscales are obtained by summing these item scores. For the anxiety subscale, the 1st, 3rd, 5th, 7th, 9th, 11th, and 13th items; for the depression subscale, the scores of the 2nd, 4th, 6th, 8th, 10th, 12th, and 14th items are summed. We took the cut-off score as 10 for the anxiety subscale and 7 for the depression subscale following the literature (12). We considered the mothers as the under-risk group, who had scale scores above these cut-off points, and evaluated the results in this context.

Statistical Analysis

We expressed normally distributed quantitative variables as mean ± standard deviation. We used the Student's t- and Mann-Whitney U tests to compare two groups with normally and non-normally distributed data with a p-value of <0.05, respectively. We assessed correlation coefficients in non-normally distributed data with the Spearman's correlation test, and used the chi-square test to compare two groups with categorical data. We used SPSS 25 software (IBM SPSS Statistics, New York) for statistical calculations.

Results

A total of 100 mothers, including 50 mothers of COVID-19-positive children and 50 mothers of COVID-19-negative children, were included in the study. The median age of mothers of COVID-19-positive patients participating in this study was 33.16±5.18 years (Table 1). Nine (18%) of these mothers had primary school graduates, while 21 (42%) had high school, 16 (32%) had a university, and 4 (8%) had master's degree graduates (Table 1). The financial situations of 20 (40%) patients were low, 22 (44%) of them were moderate, and 8 (16%) of them were good (Table 1). While 47 of the mothers were married, 3 of them were divorced (Table 1). When we compared the socio-demographic data according to the groups, there was no statistical difference (Table 2). We assessed the relationship between education level and anxiety/depression in mothers of children diagnosed with COVID-19. A negative correlation was found between education level and HAD anxiety subscale (p=0.049, r=-0.280). There was no significant relationship

between education level and HAD depression subscale. There was no correlation between age (r=-0.042, p=0.775) and mean monthly income (r=-0.133, p=0.358) and HAD anxiety subscale. Also, HAD depression subscale did not correlate with age (r=-0.133, p=0.433) and monthly income (r=-0.152, p=0.293) (Table 3). In addition, HAD anxiety and HAD depression subscale scores were high in divorced or separated mothers p=0.008; p=0.016).

According to the HAD anxiety subscale, 42% of the mothers of children diagnosed with COVID-19 had anxiety symptoms, and 58% did not. On the other hand, 20%

Table 1. Socio-demographic data of the mothers

	COVID-19- positive group	COVID-19- negative group	p
Age (years)			
Mean ± SD	33.16±5.18	33.0±5.35	0.895*
(min-max)	(21-45)	(20-44)	
Educational status n (%)			0.968**
Primary school	9 (18)	8 (16)	
High school	21 (42)	22 (44)	
University	16 (32)	17 (34)	
Master's degree	4 (8)	3 (6)	
Marital status n (%)			0.695**
Married	47 (94)	46 (92)	
Single	3 (6)	4 (8)	
Job n (%)			0.977**
Housewife	27 (54)	25 (50)	
Official	17 (34)	17 (34)	
Employee	3 (6)	4 (8)	
Business	3 (6)	4 (8)	
Average monthly income n (%) Turkish liras (TL)			0.914**
<5000	20 (40)	19 (38)	
5000-10000	22 (44)	24 (48)	
>10000	8 (16)	7 (14)	

*Student's t-test, **chi-square test, SD: Standard deviation, COVID-19: Coronavirus disease-2019

Table 2. Comparison of groups according to HAD scale scores

		Anxiety	Depression	Total
COVID-19 (+)	Mean ± SD	10.36±4.62	7.5±4.7	17.8±8.4
	(min-max)	(3-20)	(0-20)	(3-40)
COVID-19 (-)	Mean ± SD	7.62±3.3	7.3±2.9	14.96±5.35
	(min-max)	(1-16)	(1-13)	(2-24)
p*		0.001	0.839	0.043

*Student's t-test, SD: Standard deviation, COVID-19: Coronavirus disease-2019, HAD: Hospital anxiety and depression scale

of mothers of COVID-19-negative children had anxiety symptoms, whereas 80% did not. According to the HAD depression subscale, 28% of the mothers of COVID-19-diagnosed children had significant depression symptoms, whereas 72% did not. On the other hand, 22% of mothers of COVID-19-negative children had depression symptoms, whereas 78% did not. The mean HAD anxiety score of mothers of COVID-19-positive children was statistically significantly higher than the control group ($p=0.001$). The incidence of depression in the study population was almost equal, and there was no statistically significant difference between the groups ($p=0.839$). According to the total HAD scale score, the mean score of the mothers of the COVID-19 diagnosed group had statistically significantly higher scores than the control group ($p=0.043$) (Table 4).

Table 3. Correlation between the socio-demographic data of the mothers of the COVID-19-positive group and HAD scale scores

	Anxiety		Depression	
	r	p	r	p
Age	-0.042	0.775	-0.113	0.433
Education level	-0.280*	0.049	-0.124	0.390
Average monthly income	-0.133	0.358	-0.152	0.293

*Spearman's correlation test, COVID-19: Coronavirus disease-2019, HAD: Hospital anxiety and depression scale

Table 4. Anxiety and depression results regarding marital status in COVID-19 group

	Married	Separated	p
Anxiety	9 (7-12)	19 (18-19.5)	0.008
Depression	6 (4-10)	17 (14-18.5)	0.016

*Mann-Whitney U test, COVID-19: Coronavirus disease-2019

Discussion

Studies conducted in previous outbreaks and during the COVID-19 pandemic showed a significant increase in psychiatric diseases, especially generalized anxiety disorder, depression, and post-traumatic stress disorder, in infected people or in those under infection risk (2,7). In this study, we tried to find the main factors contributing to the rate of anxiety and depression and psychiatric findings in mothers of hospitalized children with a positive diagnosis of COVID-19. Although the mean anxiety score of mothers of COVID-19-positive children was significantly higher than the control group, the depression score was almost equal in both groups.

The mean anxiety score of COVID-19-positive children's mothers was significantly higher than the control group in the Yuan study (9). However, contrary to our study, the depression score was higher in the COVID-19-positive group (9). Anxiety was observed in 42% of mothers of COVID-19-positive children, while depression was seen in 48% (9). Similarly, in a study conducted with the mothers of 150 children hospitalized for COVID-19 in India in 2020, the anxiety rate was 35%, and depression was 38% (2). Studies stated that psychological vulnerability and uncertainty factors might play a role as the cause of anxiety developing during pandemic processes (13-15). However, in our study, depression symptoms were not high, contrary to the literature. But these studies were conducted in the early period of the COVID-19 pandemic. The world was unprepared for this pandemic, and death rates were higher than nowadays. We can attribute this to heavy quarantine conditions, economic problems, and people facing uncertainty.

Different studies have been conducted to date to evaluate the psychological impact of the COVID-19 pandemic on individuals. In Zhao et al.'s (16) meta-analysis, which included 74 studies examining the psychiatric effects of COVID-19 and SARS on society, the mean prevalence of depression was 23.9% during the COVID-19 outbreak in 21 of 36 studies about COVID-19. In addition, the mean prevalence of anxiety was 23.4% in 24 studies. Another study conducted with 7143 people in China during the pandemic reported the anxiety symptom rate as 25% (17). The results obtained in these studies were similar to the results of the mothers of our COVID-19-negative patients. Hospitalization of children with COVID-19 positivity during the pandemic period is a risk factor affecting the mental health of the children's parents. Therefore, the stress, anxiety, and depression levels of the parents whose children were admitted due to COVID-19 infection were higher than the control group, as stated in the above studies, which is also consistent with the results of our study.

In our study, we also aimed to reveal the importance of the psychological impact of socio-demographic factors on the study population, and we found that mothers with lower education levels showed higher anxiety symptoms. However, there was no significant correlation between education level and depression. Studies conducted during and before the pandemic investigated the protective effect of education levels against psychological problems (3,18). These results suggested that people with high education level could develop effective mechanisms for

offering solutions to psychological problems by accessing information during the pandemic.

Arikan and Acar (3), who included approximately 247 parents from our country in their study, reported that age was a risk factor for depression. However, we did not find a significant relationship between age and depression. Some studies suggested that depression was less in older individuals than in younger adults (19). Our results were different, and we think that it is because the mean age of our individuals was high, and the other studies were conducted in the early period of the COVID-19 pandemic.

In addition, we found that anxiety and depression were significantly higher in divorced mothers or mothers separated from their spouses in our study. A study emphasized that spousal support is crucial for coping with the anxiety and stress that occur during the struggle with health problems (20). In addition, studies report the protective effect of the cohabitation of spouses on depression (21).

Study Limitations

We conducted the research in a single center with limited participants, including only the mothers of the inpatients, due to circumstances. However, the results may differ in studies with larger populations, so larger-scale epidemiological assessments are needed in this area.

Conclusion

As a result, although two years have passed since the pandemic started, COVID-19 is still a source of anxiety and stress for parents. In addition, socio-demographic factors affecting the psychological health of parents may further increase this burden. Large-scale studies on this subject may boost awareness of parents' mental situation and evaluate parents' psychological status on time, which may result in early interventions for necessary circumstances.

Ethics

Ethics Committee Approval: Our study was approved by the Ethics Committee of University of Health Sciences Turkey, Kartal Dr. Lütfi Kırdar City Hospital on March 30, 2022, with the decision number 2022/514/222/45, and performed in accordance with the Declaration of Helsinki.

Informed Consent: We included patients after they were informed about the study and obtained their written consent.

Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Concept: M.T.K., E.K., Y.A., Design: M.T.K., E.K., Y.A., Data Collection or Processing: M.T.K., A.K., A.E., Analysis or Interpretation: M.T.K., E.K., C.Ç., Z.V.P., Drafting Manuscript: M.T.K., E.K., Z.V.P., A.E., Critical Revision of Manuscript: E.K., A.K., C.Ç., Y.A., Final Approval and Accountability: M.T.K., A.K., E.K., C.Ç., Z.V.P., A.E., Y.A., Technical or Material Support: E.K., Z.V.P., A.E., Supervision: M.T.K., A.K., Y.A., Writing: M.T.K., A.K., E.K., C.Ç., Z.V.P., A.E., Y.A.

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