A comparative study of separation anxiety and sleep problems in school-aged children of health professionals during the COVID-19 pandemic

COVID-19 pandemisi sırasında sağlık çalışanlarının okul çağındaki çocuklarında ayrılık kaygısı ve uyku sorunlarının karşılaştırmalı araştırılması

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SUMMARY

Objective: The COVID-19 pandemic continues to affect physical health as well as mental health in children and adolescents. In this study, we aimed to investigate the state, trait, separation anxiety, and sleep disturbances in the children of health professionals in the first and third waves of the pandemic. **Method:** 33 children of health professionals and 42 children whose parents were not health professionals were included in the study. Sociodemographic data form, The State-Trait Anxiety Inventory (STAI), Separation Anxiety Assessment Scale-Child Version (SAAS-C), The Sleep Disturbance Scale for Children (SDSC) were used for assessment each for the first and third waves of the pandemic. **Results:** The state, trait anxiety, and SAAS-C scores of the children of health professionals were higher than the control group in the first wave of the pandemic, state anxiety and SAAS-C scores were still higher than controls in the third wave. Positive correlations were found between the STAI and SAAS-C scores with the working hours of mothers in the pandemic. State anxiety, and SAAS-C scores were higher in children of healthcare workers with a history of COVID-19. **Discussion:** STAI and SAAS-C scores were found to be higher in the children of health professionals compared to the control group in the first and third wave of the pandemic. There was no effect being children of healthcare workers on SDSC scores. Anxiety levels were related to the time the mother worked during the pandemic and the parent's history of COVID-19.

Key Words: COVID-19, health professionals, children, separation anxiety, sleep

ÖZET

Amaç: COVID-19 pandemisi, çocuk ve ergenlerde fiziksel sağlığın yanı sıra ruh sağlığını da etkilemeye devam etmektedir. Bu çalışmada, pandeminin birinci ve üçüncü dalgalarında sağlık çalışanlarının çocuklarında durumluk, sürekli kaygı, ayrılık kaygısı ve uyku bozukluklarının araştırılması amaçlandı. **Yöntem:** Çalışmaya 33 sağlık çalışanı çocuğu ve ebeveyni sağlık çalışanı olmayan 42 çocuk dahil edildi. Pandeminin birinci ve üçüncü dalgalarının her biri için sosyodemografik veri formu, Durumluk-Sürekli Kaygı Envanteri (DSKÖ), Ayrılma Kaygısı Değerlendirme Ölçeği-Çocuk Versiyonu (AKDÖ-Ç), Çocuklar İçin Uyku Bozukluğu Ölçeği (ÇUBÖ) kullanıldı. **Bulgular:** Sağlık çalışanlarının çocuklarının durumluk, sürekli kaygı ve AKDÖ-Ç puanları pandeminin birinci dalgasında kontrol grubuna göre daha yüksek bulundu, üçüncü dalgada durumluk kaygı ve AKDÖ-Ç puanları kontrol grubuna göre daha yüksekti. Pandemi döneminde annelerin çalışma saatleri ile DSKÖ ve AKDÖ-Ç puanları arasında pozitif korelasyon saptandı. COVID-19 öyküsü olan sağlık çalışanlarının çocuklarında durumluk kaygı ve AKDÖ-Ç puanları daha yüksekti. **Sonuç:** Pandeminin birinci ve üçüncü dalgasında sağlık çalışanlarının çocuklarında kontrol grubuna göre DSKÖ ve AKDÖ-Ç puanları daha yüksek bulundu. Sağlık çalışanı çocuğu olmanın ÇUBÖ puanlarına etkisi saptanmadı. Anksiyete seviyeleri, annenin pandemi sırasında çalıştığı süre ve ebeveynin COVID-19 öyküsü ile ilişkili bulundu.

Anahtar Sözcükler: COVID-19, sağlık çalışanları, çocuklar, ayrılık kaygısı, uyku

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INTRODUCTION

The Coronavirus disease (COVID-19) first appeared in China, it spread all over the world in a short time and caused the first pandemic of the 21st century. To combat this disease, which is mainly transmitted by droplets and contact, the use of masks became widespread, schools were closed, work from home was increased and quarantine was applied in many countries. With the use of vaccines developed with different methods, the transmission of the disease, intensive care hospitalization, and mortality are decreasing, but the pandemic has still not been fully controlled. As of 20 December 2022, globally close to 650 million confirmed cases and over 6.6 million deaths have been reported, and over 13 billion doses of vaccine have been administered (1).

Because of the restrictions imposed, there has been an increase in psychiatric symptoms in children and adolescents affected by the pandemic. In a study involving children aged 9-12 in the COVID-19 pandemic, it was discovered that the level of trait anxiety increased with age (2). Children in the same age group reported moderate trait anxiety, low state anxiety, and trait anxiety was found to be higher in girls (3). A large population study found a significant delay in bedtime and waking time in children during the COVID-19 outbreak in Italy. At the same time difficulty falling asleep, night wakings, anxiety at bedtime, sleep terrors, and nightmares were reported during the pandemic (4). The group with the most difficult working conditions during the pandemic has been healthcare workers. Long-term work in emergency, clinical and intensive care units providing COVID-19 services not only increases the risk of COVID-19 transmission but also paves the way for the emergence of mental pathologies in healthcare workers. In a study, it was shown that 50.8% of healthcare workers had severe state anxiety and 71.9% had moderate trait anxiety during the pandemic. The anxiety levels of the participants who were married and had children were found to be higher (5). It was reported that 39.8% of healthcare professionals working at the beginning of the pandemic had poor sleep quality, and also increased depression and anxiety scores were seen in this group (6).

On the other hand, it is possible for the children of healthcare workers to experience separation anxiety due to separation from their parents, to have increased anxiety due to fear of contacting COVID-19. Also, sleep disorders maybe appear as a result of increased time spent at home and screen exposure (7,8).

When the relevant literature was examined, it was found that psychiatric symptoms and findings were investigated in children and healthcare workers, but there were limited studies investigating the mental status of children of healthcare workers during the pandemic period. With the recent study, we aimed to comparatively examine separation anxiety and sleep problems, as well as state and trait anxiety in the first and third waves of the pandemic period in healthcare workers' children.

METHOD

Participants and design of the study

In this study, thirty-three healthcare workers' children without mental retardation, neurological and metabolic disease, and forty-two healthy children whose parents were not healthcare workers were included. The children participating in the study were between the ages of 6 and 12 years. In addition to face-to-face interviews, an online survey system was also used to collect data. The anxiety and sleep scales were completed twice time by the children and their parents, once in the first wave (April-May 2020), the period when the pandemic first started, and in the third wave (March- April 2021), when the cases increased again. Research approval was obtained from the Erciyes University ethics committee (2020/258). Written informed consent was obtained from the children and their parents after detailed explanations were given about the study. The procedures followed the ethical standards of the responsible committee on human experimentation (institutional or regional) or with the Helsinki Declaration of 1975 (as revised in 1983).

Measures

Sociodemographic data form: The researchers created a sociodemographic form and scale to collect information about the demographic characteristics of patients. The age, gender, education degree, parent's work frequency in the pandemic, the thoughts of children about being at home, the COVID-19 history of parents, and causes of sleep disturbance were obtained.

The State-Trait Anxiety Inventory (STAI): It was developed by Spielberger et al.(9) in 1970, and adapted to Turkish by Öner and Le Compte (10). It is a 20 question Likert-type scale that assesses both state and trait anxiety levels. The theoretical range is from 20 to 80. A high level of anxiety level is revealed by a high score, while a low level of anxiety is suggested by a low score.

Separation Anxiety Assessment Scale-Child Version (SAAS-C): It's a 34-item, 4 points Likert-type scale designed to assess separation anxiety and anxiety-related symptoms in children aged 6 to 10 (11). Teze et al. (12) did a validity and reliability study in Turkey in 2016, and this scale has 14 items, with the lowest score being 14 and the maximum being 56.

The Sleep Disturbance Scale for Children (SDSC): It is a Likert-type scale filled by parents, consisting of 26 items and 6 sub-dimensions. It was developed by Bruni et al. (13). It is possible to get a minimum of 26 points and a maximum of 130 points. Study of Turkish validity and reliability performed by Agadayi et al (14).

Statistical analysis

The Statistical Package for Social Sciences software program (SPSS, version 21.0 for 96 Windows) was used for statistical analysis. Continuous variables were represented by the mean and standard deviation, whereas categorical variables were represented by percentages. The normality of the distribution of continuous variables was tested using the Shapiro-Wilk and Kolmogorov-Smirnov tests. The Chi-square test was used to compare categorical variables. To compare variables between groups, repeated ANOVA test and two-way ANOVA test were utilized. Bonferroni correction was also used. Pearson's correlation analysis was used to determine the relationship between two variables. Significance was determined as a probability value of $p < 0.05$.

Table 1. Comparison of the two groups in terms of sociodemographic outcomes in the first wave of pandemic

	Healthcare workers' children n=33		Control group n=42	
Age (mean±sd)	9.0±1.837		9.16±2.023	
Gender (n/%)				
Female	15	45.5%	13	31%
Male	18	54.5%	29	69%
Education degree (n/%)				
Primary school	24	72.7%	29	64.3%
Secondary school	9	27.3%	13	35.7%
Parental status (n/%)				
Mother healthcare worker	10	30.3%		-
Father healthcare worker	13	39.4%		-
Both parents healthcare workers	10	30.3%		-
Parent's work frequency in the pandemic (n/%)				
Every day	29	87.9%		-
Several days a week	2	6.1%		-
Few days in 2 weeks	1	3%		-
Several days in a month	1	3%		-
COVID-19 history of parents (n/%)				
Positive	10	30.3%	10	23.8%
Negative	23	69.7%	32	76.2%
Being at home (n/%)				
Boring	20	60.6%	29	69%
Enjoyable	3	9.1%	5	11.9%
Scary	6	18.2%		-
Pleasant	4	12.2%	7	16.7%
Other		-	1	2.4%
Sleep disturbances (n/%)				
Increase in screen exposure	6	18.2%	10	23.8%
Deterioration in sleep hygiene	7	21.2%	22	53.4%
Anxiety	20	60.6%	10	23.8%
Other		-		-

n: number, sd:standard deviation

RESULTS

The study sample consisted of 33 healthcare workers' children and 42 children whose parents were not healthcare professionals. The sociodemographic characteristics of the healthcare workers' children and the control group in the first wave were shown in Table 1. There was no significant difference between the ages of the participants ($p=0.319$). It was found that the vast majority of healthcare workers work every day, and children find staying at home to be boring. Sleep disturbance was also questioned in the sociodemographic data form. It was detected in all children participating in the study, and while anxiety was at the forefront in the children of healthcare workers, the deterioration of sleep hygiene was at the forefront during the time spent at home due to restrictions in the control group. In the third wave, 60% of health professionals worked every day, a higher number of working days (mothers or fathers) were included in both waves in the group whose parents were both healthcare workers. Also, there were no children who lost their parents or any relatives due to COVID-19.

STAI state anxiety, trait anxiety, and SAAS-C

Table 2. Comparison of STAI, SAAS-C, SDSC scores in healthcare workers' children and control group during the first wave of pandemic

	Healthcare workers' children [mean(sd)]		Control group [mean(sd)]		Comparison *(Greenhouse-Geisser Sig.)*
	First-wave [a]	Third-wave [b]	First-wave [c]	Third-wave[d]	
STAI /State anxiety	46.60(5.30) a>b, a>c	42.69(5.32) b>d	41.66(5.54)	39.35(6.33)	p= 0.043,*np2*= 0.055
STAI/ Trait anxiety	50.45(7.81) a>b, a>c	41.93(7.91)	45.19(6.45) c>d	38.66(6.41)	p<0.001,*np2*= 0.189
SAAS-C	31.51(9.13) a>b, a>c	29.51(8.36) b>d	27.92(9.29) c>d	27.00(9.30)	p=0.041, *np2*= 0.083
SDSC	38.54(10.80)	38.06(10.9)	43.28(14.24) c>a, c>b	43.69(14.26) d>b	p<0.001, *np2*= 0.163

Repeated measures of ANOVA, Bonferroni correction was used for post hoc analyses,
SAAS-C: Separation Anxiety Assessment Scale-Child Version, SDSC: The Sleep Disturbance Scale for Children STAI: The State-Trait Anxiety Inventory

scores were found to be higher in children of healthcare workers than the control group during the first wave of the pandemic. STAI state anxiety and SAAS-C scores were still higher than controls in the third wave of the pandemic and it was observed that being children of healthcare workers was effective on results (Table 2). There was no effect being children of healthcare workers on SDSC scores and also SDSC scores were found to be higher in controls (Table 2). Although SDSC scores were higher in controls, there was no correlation between anxiety scores and SDSC scores. On the other hand, in the first wave of the pandemic, it was found that state anxiety score was correlated with SDSC score in children of healthcare workers (r=0.495 p=0.022).

When the healthcare workers were compared among themselves, SDSC scores were found to be higher in whose parents were both health professionals (p=0.023), while SAAS-C scores were found to be lower in the group with only father healthcare workers (p=0.041). This difference was not observed in the third wave.

A positive correlation was found between the first wave STAI total and state anxiety scores and the time the mother was worked in the COVID-19 pandemic, similarly between the SAAS-C scores and the time the mother was worked in the COVID-19 pandemic (respectively r=0.323, p=0.004, r=0.334 p=0.003, r=0.295 p=0.010) in first-wave of the pandemic. No correlation was found between the anxiety and the time father worked in the pandemic.

When the effect of both the parent's COVID-19 history and being children of healthcare workers was examined; STAI state anxiety, trait anxiety, and SAAS-C scores were higher in children of healthcare workers. Also, state anxiety and SAAS-C scores were higher in children of healthcare workers with a history of COVID-19 (Table 3).

DISCUSSION

COVID-19 pandemic has caused symptoms of stress, anxiety, depression, and insomnia among healthcare workers, especially in women and older professionals (15). Undoubtedly, mental pathology has increased in healthcare workers as well as in children. Because healthcare workers' children are

Table 3. Assessment of the parents' COVID-19 history and STAI, SAAS-C, and SDSC scores in healthcare workers' children and control group in the first wave of pandemic

		df	F	*np2*	p values
STAI /State anxiety	*Healthcare workers*	1	2.718	0.042	0.043
	COVID-19 history	1	.725	0.010	>0.05
	*1*2*	1	1.75	0.032	0.048
STAI/Trait anxiety	*Healthcare workers*	1	5.007	0.066	0.028
	COVID-19 history	1	.758	0.011	0.387
	*1*2*	1	1.082	0.015	0.302
SAAS-C	*Healthcare workers*	1	4.429	0.059	0.039
	COVID-19 history	1	1.102	0.015	0.297
	*1*2*	1	3.324	0.045	0.049
SDSC	*Healthcare workers*	1	2.886	0.039	0.094
	COVID-19 history	1	0.068	0.001	0.795
	*1*2*	1	0.618	0.009	0.434

Two way ANOVA
*1*2 means when the effects of both factors are evaluated together*
SAAS-C: Separation Anxiety Assessment Scale-Child Version,
SDSC: The Sleep Disturbance Scale for Children STAI: The State-Trait Anxiety Inventory

aware of at least some of the challenges their parents face in the pandemic, such as the risk of infection and death, they are more susceptible to stress and trauma, also face worse outcomes in case of loss of a parent (16).

In our study, STAI state, trait, and SAAS-C scores were found to be significantly higher in the children of healthcare workers in the first wave of the pandemic compared to the control group. This was an expected result and maybe because of separation from parents, the thought of losing them, conversations at home about the pandemic, and the challenges it brings. STAI state anxiety, and SAAS-C scores were still higher than controls in the third wave of the pandemic and, these results showed that being children of healthcare workers was associated with increased anxiety levels.

In the study comparing the pre-pandemic and 3 different periods of the pandemic, anxiety levels were found to be higher in all three waves compared to the pre-pandemic period in the children and adolescents (17). The prevalence of anxiety during the pandemic was 19.4% in children. Social distancing without parents was to be associated with higher Children's Anxiety Questionnaire scores (18). During home quarantine state and trait anxiety scores were found 43.17±5.86 and 51.53±5.19 in adolescents (19). In our study, similarly, in the first wave of the pandemic the scores were 46.60±5.30 and 50.45±7.81, in the third wave of the pandemic 42.69±5.32 and 41.93±7.91 respectively. In a study in which 121 healthcare workers and their children aged 8-17 participated, the level of anxiety in children was determined by Screen for Child Anxiety Related Emotional Disorders (SCARED) and parental anxiety level was measured with Beck Anxiety Inventory. While 17% of the parents had moderate anxiety and 27% had severe anxiety, approximately 33% of the children were found to have anxiety above the cut-off value in the SCARED parent and child form. According to both parents and personal reports, half of the children were above the cut-off score for separation anxiety disorder (20). The findings of the current study are in line with the data of previous studies.

The fact that STAI total and state anxiety scores, as well as separation anxiety, were positively correlated with the number of days the mother worked during the pandemic suggests that separation from parents in such a chaotic period contributes to the development of anxiety in children. In Turkey, especially during the first outbreak of the epidemic, healthcare workers started to stay in hospitals, dormitories, and hotels to not infect their relatives. In this period, children of almost all ages were separated from their mothers, and the caregiver was mostly either the other parent or the grandparents. Both separation from the parents and the increase of time spent at home due to the closure of schools may have caused an increase in separation anxiety. The research in children with type 1 diabetes mellitus has shown that perceived fear of contacting COVID-19 infection is one of the predictive factors of separation anxiety (21). Also SAAS-C scores were lower in the group where only the father was a healthcare worker in our study, and this outcome is important in terms of showing the role of the mother in attachment.

Parental history of COVID-19 also appears to be another risk factor for the development of anxiety. In children of healthcare workers with a history of COVID-19, state anxiety and SAAS-C scores were higher. STAI state anxiety, trait anxiety, and SAAS-C scores were higher in children of healthcare workers, when the effect of both the parent's COVID-19 history and being children of healthcare workers was examined together. The possibility of hospitalization during the COVID-19 disease, the fact that the parents' quarantine period, and children's separation from the caregiver during this time, being away from their support and attention may increase separation anxiety. In a study conducted in London, the SARS-CoV-2 seropositivity rate was found to be 12% in the children of healthcare workers (22). In the study, in which 126 healthcare workers and their families participated, 21 families tested positive for COVID-19 at least one parent. While 20 of 21 children were seropositive in 9 of these 21 families, none of the 23 children in the other 12 families were seropositive. This study is important in terms of showing familial clustering. The increased risk in children of healthcare workers may be multiplied by familial clustering (23). Having a COVID-19 positive person in the family may increase anxiety by causing the per-

son to be positive afterward, as well as the concern for the health of the sick person and the fear of contagion.

Sleep disturbance was found in all children participating in the study, and it was found to be associated with increased anxiety in children of healthcare workers and deterioration of sleep hygiene in the other group. The deterioration of sleep hygiene was associated with the increase in the time spent at home as a result of the closure of schools. SDSC scores were higher in the control group, and this showed that being a healthcare worker's child had no effect on SDSC scores. There was a correlation between SDSC scores and state anxiety in children of healthcare workers during the first wave pandemic period, and this was not found in the control group. This result indicates that sleep problems may be related to anxiety levels in children of healthcare workers. The higher SDSC scores in those whose both parents were healthcare workers may also be associated with increased separation anxiety. Studies conducted during the pandemic have found similar results in terms of sleep disorders in children. Sleep disturbance in children is a common problem and the pooled prevalence of any sleep disturbance in children was 54% during the pandemic (24). It has been determined that the sleep quality of children aged 6-10 years has deteriorated during the pandemic period, and they have begun to comply with their daily routines less. Increased emotional, behavioral, and hyperactive symptoms were associated with changes in sleep quality (25).

Insufficient number of children in both healthcare workers and control group, and the low number of psychiatric symptoms investigated are among the limitations of the study. The sample has not been evaluated with structured interviews for psychiatric diagnosis. Insufficient data regarding premorbid features, developmental characteristics, and temperament traits of the study and control groups. Also parents' mental status and parenting styles have not been evaluated.

CONCLUSION

It was found that the anxiety levels of the children of health professionals were higher in the first and third waves of pandemic compared to the control group. It was correlated with the working time of the mother in the pandemic, and the history of COVID-19 in the parents. Therefore, it is important to implement preventive mental health services in these groups. To support this vulnerable population physically and mentally, studies with larger samples are needed.

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Conflicts of interest: The authors declare that they have no conflict of interest.

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