

Original Article

The Effects of Quarantine or Hospitalisation on Mental Health of Children and Parents with the COVID-19 Suspicion: A Case-Control Study

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Abstract

Background and Objectives: The aim of our study is to compare the children between the ages of 6 and 16 being in quarantine or hospitalised for at least 14 days with suspicion of COVID-19 and their parents and the children without suspicion of COVID-19 and their parents in terms of their mental exposure level. **Methods:** A list of questions, investigating post-traumatic stress disorder (PTSD) symptoms in children and parents and prepared by arranging DSM-5 diagnostic criteria, The Revised Child Anxiety and Depression Scale – Parent Form, DSM-5 Level 2 Sleep Disorder Scale 6-17 Age Parents Form and Hospital Anxiety Depression Scale, were answered by parents. **Results:** The mean score of DSM-5 Level 2 Sleep Disorder Scale (respectively 16.72±8.31, 14.34±6.37) and the rate of confrontation of DSM-5 PTSD diagnostic criteria (respectively 8.5%, 2.9%) were statistically significantly higher in the study group of children compared to the control group ($p<0.05$). Mean score of the depression scale (respectively 8.37±3.70 and 6.97±3.63) and the rate of confrontation of DSM-5 PTSD diagnostic criteria (respectively 16.3%, 7.9%) were statistically notably higher in the parents of study group compared to the control group ($p<0.05$). In addition to this, a statistically important positive correlation was found between anxiety and depression levels of the parents and anxiety, depression and sleep scores of the children for all of them ($p<0.05$). **Conclusion:** Direct exposure to COVID-19 poses a higher risk for both children and their parents in the emergence of psychiatric symptoms than those without any direct exposure.

Key words

COVID-19; Mental health; Pandemic; Quarantine

Introduction

The COVID-19 outbreak has spread rapidly and widely since the first case was recorded. Studies suggest that children have a lower risk of severe symptoms formation

after being infected with SARS-CoV-2 compared to adults.¹ Many measures (such as lockdowns, suspension of schools) have been carried out worldwide to prevent the pandemic. Isolation and quarantine are also among these measures. Centers for Disease Control and Prevention (CDC) recommends that people with a suspicion of the disease should be isolated for at least 14 days. Those people hospitalising are required to be in quarantine at home to complete the remaining time after discharge.²

Studies has mentioned about the psychological effects related to negative life experiences in children. In a study of 1143 parents in Italy and Spain, 85.7% of the parents reported that their children experienced emotional and behavioural changes with closure during the pandemic period. The most common symptoms were stated as

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difficulty in focusing, boredom, irritability, restlessness, loneliness and anxiety.³ Parents, a group experiencing the direct and indirect effects of pandemic-related stress intensely, have to face the consequences of the pandemic on both their own health and the health of their loved ones. While many parents have been experiencing the stress especially about parenting roles even before the pandemic, this stress level may have increased in the pandemic.⁴ Meanwhile most of the studies on the COVID-19 outbreak examine the psychological effects on the general population, the number of studies investigating the effects on parents and their children is limited. The pandemic process can cause psychological difficulties for parents and their children. In addition to some cases, taking swabs from children and parents with the suspicions of COVID-19 during this period and staying in quarantine or isolation for at least 14 days with suspicion of disease and hospitalisation may have increased the difficulties experienced by both children and their parents. Also, the finding of post-traumatic stress disorder (PTSD) symptoms, which was 4 times higher in those who were quarantined supports this idea in a study comparing quarantined parents and children with those not in quarantine.⁵

The aim of this study is to compare children aged between 6 and 16 staying at home in isolation or quarantine for at least 14 days or treated by hospitalisation after taking a swab with suspicion of COVID-19 and their parents (study group) and again children in the same age range without any suspicion of COVID-19 and their parents (control group) according to their mental exposure level.

Methods

Participants

The study group consists of children aged between 6 and 16 who stayed at home in quarantine for at least 14 days after their swab were taken in our hospital with the suspicion of COVID-19 or who underwent a treatment at hospital and completed the quarantine period at home after discharge and their parents.

The control group, on the other hand, consists of children in the same age range, not suspected with COVID-19 and their parents. Parents of the children in the study group were reached through their phone numbers recorded in the hospital files. The cases in the control group were formed with children aged 6-16 years and their parents who first applied to departments other than child

and adolescent psychiatry (such as paediatrics, eye disease, ear-nose-throat disease, orthopaedics, radiology) for any reason rather than the COVID-19 suspicion.

Questionnaires were answered by 282 participants. Fourteen participants with repetitive responses were excluded from the study. 48.1% (n=129) of the remaining 268 participants formed the study group, and 51.9% (n=139) of them were in the control group. 67.5% (n=181) of the responders to questionnaires were mothers and 32.5% (n=87) were fathers. The mean age of the parents was 40.6 ± 5.65 . 51.1% (n=137) of the children were male and 48.9% (n=131) were female with the average age of $10.8 (\pm 3.37)$.

Procedure

A form, investigating PTSD symptoms in children and parents, prepared with DSM-5 diagnostic criteria in addition to the questions including fields such as sociodemographic information for the study, presence of psychiatric illness in children before the pandemic, swab results of children in the study group for COVID-19, the number of family members having positive swab results and COVID-19 clinical symptoms in children, was formed.

The Revised Child Anxiety and Depression Scale – Parent Version (RCADS-P) was used to determine the risk of anxiety and depression in children and DSM-5 Level 2 Sleep Disorder Scale 6-17 Age Parents Form was used to find out the level of sleep problems in children. Hospital Anxiety Depression Scale (HADS) was used to determine the risk of parents in terms of anxiety and depression. All forms were completed by parents. Measurement tools were made suitable for online application to be sent to the participants by e-mail or message because of face-to-face interaction with the public has been minimised due to restrictive measures taken by the Turkish Government for the COVID-19 outbreak. Ethical approval was received from Uludağ University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee in accordance with the principles in the Declaration of Helsinki. Online informed consent was obtained from all participants.

Tools

DSM-5 Level 2 Sleep Disorder Scale 6-17 Age Parents Form:

The scale is formed up with 8 items. The caregiver is asked to give response to the severity of symptoms related to sleep disorders observed in their child for each item. The total score ranges from 8 to 40, and higher scores show that

symptoms associated with sleep disorders are more severe.⁶

The Revised Child Anxiety and Depression Scale – Parent Version (RCADS-P):

It is a 47-item Likert-type scale designed to evaluate depression and anxiety disorders in children (0=never, 1=sometimes, 2=frequently and 3=always). It gives the depression and anxiety score with the total internalisation (depression + anxiety) scores. Cut-off scores were reported as 9.5 for depressive disorder and 26.5 for anxiety total score.⁷

Hospital Anxiety Depression Scale (HADS):

It was developed to determine the risk in terms of anxiety and depression in the patient and to measure the level and the change in severity.⁸ Cut-off points were determined as 10 for the anxiety subscale and 7 for the depression subscale.⁹

Fifth Edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5) Post-Traumatic Stress Disorder Question List Prepared in Consideration

In our study, in order to investigate the risk of Post-Traumatic Stress Disorder in both parents and children, a question was created to be filled by the parents, with the consideration of the DSM-5 PTSD diagnostic criteria. The question to investigate the symptoms in children was asked as "When you think about the COVID-19 pandemic process for your child, did your child experience one or more of the following symptoms?" and the question for parents was asked as "Thinking about the COVID-19 pandemic process, have you experienced one or more of the following symptoms?" It was informed that parents could choose more than one option from the symptoms listed under the question text. Options for both questions include PTSD diagnostic criteria, such as "Being always alert, not being able to remember an important part of traumatic events, repetitive and distressing dreams associated with events," flashbacks (for example, feeling like reliving a stressful experience you had in the past).

Statistical Analysis

Data entries and analyses were made according to SPSS 25.0. The Kolmogorov Smirnov test was performed to check whether the numerical variables fit the normal distribution. Mann Whitney U test, which is a nonparametric test, was used to compare the means

between groups. Categorical variables were compared by using the Pearson Chi-square test. The relationship between variables was analysed by using Spearman correlation analysis. $P < 0.05$ value was accepted as a statistical significance limit.

Results

In the study group 65.1% (n=84) of the parents work on the other hand this rate was found to be 74.8% (n=104) in the control group. While the occupations of the parents in the study group was reported that 28.7% of them were worker, 12.4% were health worker, 11.6% were officer and 19.4% were self-employment; 35.3% of the parents in the control group were healthcare workers, 24.5% were officer, 8.6% were worker and 8.6% were self-employed. 57.4% (n=74) of the parents have high school and higher education level in the study group and the education levels of the parents 92.0% (n=128) in the control group were high school or higher education. There was no psychiatric disease before the epidemic in 91.5% of the children in the study group and 93.5% of the control group. No statistically significant difference was found between two groups in the aspects of child age, child gender, mother or father filled out the questionnaire, whether the parents work in any job or not, the presence of a psychiatric disease in their children before the pandemic and whether there was a change in the course of the psychiatric disease when the study group and the control group were compared according to sociodemographic variables ($p > 0.05$) (Table 1).

In the study group, being a worker and having a secondary school or lower education level were statistically significantly higher than the control group ($p < 0.05$). The average age of parents in the control group was higher than the study group ($p < 0.05$) (Table 1).

It was specified that 33.3% of the children (n=43) had positive test results, 45.7% (n=59) of them had a member with positive COVID-19 test result except the child in the family, the most frequent positive results were reported by mothers (61.0%) and fathers (59.3%) when the data related to the diagnosis of COVID-19 and the disease process were examined in the study group. While 87.6% of the children (n=113) had symptoms of the illness, the most common symptoms were fever (63.7%) and weakness (45.1%). 76.7% of the children after the swabbing were followed at home in quarantine or under isolation measures and medicine treatment was started for 74.4% of the

children. In 2.3% of the children, it was found that a family member died of COVID-19 (Table 3).

Sleep problem was reported in 70.9% of all children (n=190) unlikely these rates were 73.6% in the study group and 68.3% in the control group. The mean score of DSM-5 Level 2 Sleep Disorder Scale in the study group was 16.72 (± 8.3) as well it was 14.34 (± 6.37) in the control group. The mean score of DSM-5 Level 2 Sleep Disorder Scale was statistically significantly higher in the study group compared to the control group ($p < 0.05$) (Table 2).

A list of questions consisting of DSM-5 PTSD diagnostic criteria was directed to parents in order to investigate the risk of PTSD in their children. 5.6% of all children provided the DSM-5 PTSD diagnostic criteria as this rate was statistically significantly higher in the study group compared to the control group (respectively 8.5%, 2.9%) ($p < 0.05$) (Table 2).

The mean score of RCADS-P anxiety was 24.30 (± 12.35) in all children meantime this rate was higher in the study group compared to the control group (respectively 24.65 ± 12.75 and 23.97 ± 12.01). The rates of children above the cut-off value for anxiety were 42.2% of all children, 43.4% in the study group, 41.0% in the control group. No statistically significant difference was found between two groups in terms of anxiety score and cases above the cut-off value for anxiety ($p > 0.05$) (Table 2).

The mean depression score of RCADS-P was 5.87 (± 3.96) in all children at the same time this rate was higher in the study group compared to the control group (respectively 6.00 ± 4.09 and 5.75 ± 3.85). The rate of children above the cut off value for depression was 18.7% of all cases while this rate was higher in the study group than in the control group (respectively 21.7%, 15.8%). No statistically significant difference was attained between

Table 1 Sociodemographic characteristics

		Study Group n (%)	Control Group n (%)	P	All Cases n (%), SD
Child age (year, mean \pm SD)		10.5 (± 3.76)	11.2 (± 2.93)	0.059	10.8 (± 3.37)
Child gender	Female	66 (51.2)	65 (46.8)	0.472	131 (48.9)
	Male	63 (48.8)	74 (53.2)		
Mean age of parents completing the questionnaires (year, mean \pm SD)		38.5 (± 5.70)	42.5 (± 4.85)	0.000	40.6 (± 5.65)
Parents completing the questionnaires	Mother	80 (62.0)	101 (72.7)	0.063	181 (67.5)
	Father	49 (38.0)	38 (27.3)		
Parent job	Health worker	16 (12.4)	4.9 (35.3)	0.000	65 (24.3)
	Officer	15 (11.6)	34 (24.5)		49 (18.3)
	Worker	37 (28.7)	12 (8.6)	0.000	49 (18.3)
	Self-employment	25 (19.4)	12 (8.6)		37 (13.8)
	Not working	36 (27.9)	32 (23.0)		68 (25.4)
Parent education level	Secondary school and less	55 (42.6)	11 (7.9)	0.000	66 (24.6)
	High school and above	74 (57.4)	128 (92.0)		
Marital status	Married	115 (89.1)	130 (93.5)	0.201	245 (91.4)
	Divorced	14 (10.9)	9 (6.5)		
Parent employment status	Working	84 (65.1)	104 (74.8)	0.101	188 (70.1)
	Not working	45 (34.9)	35 (25.2)		
Presence of psychiatric disease in the child before the pandemic	Exists	11 (8.5)	9 (6.5)	0.523	20 (7.5)
	Does not exist	118 (91.5)	130 (93.5)		
Psychiatric disease in child	Anxiety disorder	3 (27.3)	1 (11.1)		4 (20)
	Depressive disorder	2 (18.2)	–		2 (10)
	Neurodevelopmental disorder	6 (54.5)	8 (88.9)		14 (70)
Change in psychiatric illness during the pandemic	Symptoms got worse	5 (45.5)	4 (44.4)	0.964	9 (45)
	Symptoms have not changed/decreased	6 (54.5)	5 (55.6)		

two groups in terms of depression score and the number of cases above the cut-off value for depression ($p>0.05$) (Table 2).

A list of questions consisting of DSM-5 PTSD diagnostic criteria was directed to research the risk of PTSD in parents. While 11.9% of all parents provide the DSM-5 PTSD diagnostic criteria, this rate was statistically significantly higher in the study group compared to the control group (respectively 16.3%, 7.9%) ($p<0.05$) (Table 2).

The anxiety and depression symptoms of the parents were questioned by using HADS in our study. The mean score of HADS anxiety was 8.52 (± 3.73) for all parents also it was higher in the study group compared to the control group (respectively 8.62 \pm 3.88 and 8.44 \pm 3.61). The rate of responses above the cut-off score for anxiety was found to be 37.7% in all cases and this rate was higher in the study group compared to the control group (respectively 38%, 37.4%). There was no statistically significant difference between two groups in terms of total anxiety score and rates of responds above the cut-off score for anxiety ($p>0.05$) (Table 2).

The mean score of HADS depression for all parents was 7.64 (± 3.72). The mean depression score was statistically significantly higher in the study group compared to the control group (respectively 8.37 \pm 3.70 vs 6.97 \pm 3.63) ($p<0.05$). The rate of responds above the cut-off score for depression was 56.7% in all cases meanwhile this rate was higher in the study group compared to the control group (respectively 58.1%, 55.4%). There was no statistically significant difference in the rate of responses above the cut-off score for depression ($p>0.05$) (Table 2).

Statistical analyses were also made for the study group. There was no statistically significant difference between the situation of the COVID-19 swab result was positive or negative in the child, having a member with positive COVID-19 test except the child at home, presence of disease symptoms in the child and following-up at the hospital or at home during disease and anxiety and depression levels in children and parents ($p>0.05$) (Table 3).

In our study, the relationship between the levels of anxiety and depression in the parents of all cases and the scores of anxiety, depression and sleep in the children was

Table 2 PTSD symptoms, DSM-5 Level 2 Sleep Disorder Scale Score, RCADS-P and HADS data in cases included in the study

		Study Group n (%)	Control Group n (%)	P	All Cases n (%), SD
Did the child have trouble in sleeping?	Yes, he/she did	95 (73.6)	95 (68.3)	0.340	190 (70.9)
	No, he/she did not	34 (26.4)	44 (31.7)		
DSM-5 Level 2 Sleep Disorder Scale Score in the Child (mean \pm SD)		16.72 (± 8.31)	14.34 (± 6.37)	0.042	15.48 (± 7.45)
Does the child provide the DSM-5 PTSD diagnostic criteria?	Yes	11 (8.5)	4 (2.9)	0.044	15 (5.6)
	No	118 (91.5)	135 (97.1)		
Does the parent provide the DSM-5 PTSD diagnostic criteria?	Yes	21 (16.3)	11 (7.9)	0.035	32 (11.9)
	No	108 (83.7)	128 (92.1)		
RCADS-P Anxiety score (mean \pm SD)		24.65 (± 12.75)	23.97 (± 12.01)	0.799	24.30 (± 12.35)
RCADS-P Anxiety score above the cut-off value	Yes	56 (43.4)	57 (41.0)	0.691	113 (42.2)
	No	73 (56.6)	82 (59.0)		
RCADS-P Depression score (mean \pm SD)		6.00 (± 4.09)	5.75 (± 3.85)	0.793	5.87 (± 3.96)
RCADS-P Depression score above the cut-off value	Yes	28 (21.7)	22 (15.8)	0.217	50 (18.7)
	No	101 (78.3)	117 (84.2)		
HADS Anxiety score (mean \pm SD)		8.62 (± 3.88)	8.44 (± 3.61)	0.956	8.52 (± 3.73)
HADS Depression score (mean \pm SD)		8.37 (± 3.70)	6.97 (± 3.63)	0.008	7.64 (± 3.72)
HADS Anxiety score above the cut-off value	Yes	49 (38.0)	52 (37.4)	0.923	101 (37.7)
	No	80 (62.0)	87 (62.6)		
HADS Depression score above the cut-off value	Yes	75 (58.1)	77 (55.4)	0.651	152 (56.7)
	No	54 (41.9)	62 (44.6)		

examined. A statistically significant positive correlation was found between the anxiety and depression levels of the parents and the anxiety, depression and sleep scores of the child ($p < 0.05$) (Table 4).

Discussion

The number of studies, researching whether there is a difference in the mental exposure levels between children and their parents feeling the threat of COVID-19 directly (hospitalised after taking a swab with suspicion of disease or undergone isolation and quarantine measures at home for at least 14 days) and children and their parents not directly affected by the pandemic (no swabs taken from them or their relatives with the suspicion of disease, not isolated at home with the suspicion of disease or not hospitalised) is very limited.

Our study is one of the first studies analysing the prevalence of anxiety, depression, PTSD symptoms and sleep problems in these two groups and also makes comparisons between them.

Sociodemographic Data

Having secondary school or lower education degree and being a worker as a profession were statistically significantly higher within the parents in the study group. There may be several consequences for lower education level and being in a low socioeconomic level in the study group. The knowledge and skill levels of the parents about protection measures against the COVID-19 may increase as well as the education level increases. In addition to this,

being worker as a profession may increase the rate of catching the disease due to the risks such as working conditions (working in crowded environments) and the usage of public transportations.

Sleep Problems in Children

The mean score of DSM-5 Level 2 Sleep Disorder Scale was statistically significantly higher in the study group. It was seen in the literature that there were parallel results to our finding. For instance, one of the most common complaints in COVID-19 positive children were reported to be insomnia in a study carried out in China.¹⁰ It was stated that disruption of the daily routine, especially during the isolation process, effects the biological clock of the child and can cause daytime sleepiness and difficulty on falling asleep at night.¹¹ Disease symptoms, as a result of direct exposure to COVID-19, such as fever, cough, and pain may be associated with more sleeping problems in the study group.

Post Traumatic Stress Disorder Symptoms in Children

The rate of providing DSM-5 PTSD diagnostic criteria was meaningfully higher in the study group compared to the control group (respectively 8.5%, 2.9%) ($p < 0.05$). The prevalence of PTSD was shown as 8.1% in a study consisting of 4023 teenagers aged between 12 and 17 considering similar studies in the literature.¹² The number of children above the cut-off value for PTSD was found higher in isolated children in a study comparing children experiencing isolation or quarantine because of the pandemic and children who were not in quarantine

Table 3 Data related to children with the suspicion of COVID-19

		N (%)	HADS Anxiety Score	HADS Depression Score	RCADS-P Anxiety Score	RCADS-P Depression Score	P
The COVID-19 swab result in child	Positive	43 (33.3)	8.46	8.60	23.63	5.79	$p > 0.05$
	Negative	86 (66.7)	8.70	8.25	25.17	6.12	
Is there any COVID-positive at home except the child?	Yes	59 (45.7)	8.49	8.51	23.95	5.86	$p > 0.05$
	No	70 (54.3)	8.73	8.26	25.26	6.13	
How was the follow-up method after the swab was taken from the child?	Stayed at home in quarantine	99 (76.7)	8.63	7.99	24.38	5.69	$p > 0.05$
	Hospitalised	30 (23.3)	8.60	9.63	25.57	7.07	
Did the child have any complaints about the disease?	Yes	113 (87.6)	8.72	8.47	24.79	6.08	$p > 0.05$
	No	16 (12.4)	7.94	7.69	23.81	5.50	

(respectively 30%, 1.1%).⁵ It was also reported that 14.5% of teenagers with trauma were diagnosed with PTSD in another study.¹³ The prevalence of PTSD was determined as 2.7% in another study conducted with university students quarantined at home due to pandemic.¹⁴ The high level of PTSD existence in the study group is similar with existing studies. These findings make us think that the close following-up process of children treated for the COVID-19 or whose isolation measures are taken due to suspicion of disease is important because of the PTSD risk in the process.

Anxiety and Depression Levels in Children

The rate of children reported above the cut-off value for anxiety was 43.4% in the study group, 41.0% in the control group. The rate of children above the cut-off value for depression was also higher in the study group compared to the control group (respectively 21.7%, 15.8%). There was no statistically significant difference in the rates of cases above the cut-off value between two groups for both anxiety and depression ($p>0.05$). The prevalence of depression and anxiety during the pandemic period was found as respectively 43.7% and 37.4% in a study conducted with 8079 teenagers between the age 12 and 18.¹⁵ Loneliness and isolation periods were reported as important risk factors for the development of depression and anxiety in teenagers in a review where over 60 studies were examined.¹⁶ It was found that the stative anxiety scores increased 2.41 times higher and if there is a

COVID-19 positive relative in the family, it increases 3.81 times higher in a cross-section study in which the anxiety levels of 745 teenagers between the ages of 12-18 were measured in quarantine.¹⁷ No remarkable difference was found in terms of positivity in screening scales in a study examining the levels of mental exposure in 176 students (with the suspicion of disease) and 243 non-quarantined students (without any suspicion of disease) during the H1N1 epidemic.¹⁸ Although depression and anxiety scores were not statistically significant in our study, both of them were higher in the study group. Children in the study group can be separated from their parents owing to the risk of getting the disease and the need for isolation moreover parents can be hospitalised because of infecting them. The sadness and fear caused by all of these circumstances may lead to psychiatric problems and more sensitivity compared to the control group.

Anxiety and Depression Levels in Parents

The mean HADS depression score was statistically significantly higher in the study group compared to the control group (respectively 8.37 ± 3.70 and 6.97 ± 3.63) ($p<0.05$). The mean score of anxiety and the rate of responses above the cut-off score for anxiety (respectively 38%, 37.4%) were higher in the study group compared to the control group. However, both two differences were not statistically significant ($p>0.05$). Studies show that parents react much more mental responses to disasters compared to those having less caring responsibilities.¹⁹ It was

Table 4 Correlations between emotional problems of parents and emotional and sleep problems of children

	HADS/Anxiety Subscale (parent) r (p)	HADS/ Depression Subscale (parent) r (p)	RCADS-P Anxiety Score r (p)	RCADS-P Depression Score r (p)	DSM-5 Level 2 Sleep Disorder Scale Score r (p)
HADS/Anxiety Subscale (parent) r (p)					
HADS/Depression Subscale (parent) r (p)	0.629 (0.01)				
RCADS-P Anxiety Score r (p)	0.388 (0.01)	0.318 (0.01)			
RCADS-P Depression Score r (p)	0.347 (0.01)	0.402 (0.01)	0.674 (0.01)		
DSM-5 Level 2 Sleep Disorder Scale Score r (p)	0.241 (0.01)	0.256 (0.01)	0.404 (0.01)	0.370 (0.01)	

determined that the prevalence of anxiety and depression was statistically significantly higher in the affected group (12.9%, 22.4%) compared to the unaffected group (6.7%, 11.9%) in a study comparing the frequency of anxiety and depression between quarantined (affected group) and unquarantined parents (unaffected group) in China. Low income, low education level and the fear of getting disease were associated with more symptoms.²⁰ The education level was lower in the study group with higher anxiety and depression scores and the higher level of being workers as a profession causing lower income levels supports these results in our study. The notable effect on mental health was reported for all cases on the other hand, there was no statistically significant difference between two groups in a study conducted with 1443 participants who were in quarantine for at least 10 days and not quarantined.²¹ The anxiety and depression scores of the parents whose children were hospitalised during the pandemic period were found to be statistically significantly higher in a study comparing the symptoms of anxiety and depression in parents whose children were hospitalised during the pandemic and pre-pandemic period.²² Also, in another study comparing the cases treated with the diagnosis of COVID-19 and newly recovered and the cases still in quarantine, the depression score was statistically significantly higher in the newly recovered group (respectively 29.2%, 9.8%) ($p < 0.05$) in the meanwhile no difference was found in our study in terms of anxiety levels.²³ The parent depression scores were higher in parents whose children were diagnosed with the COVID-19 or at risk of it similar to the current literature. This gives rise to thought that the supports like financial support, which also the parents need from family or social environment, may contribute to overcome with the process.

Parental Post Traumatic Stress Disorder Symptoms

While 11.9% of all parents provided the DSM-5 PTSD diagnostic criteria, this rate was statistically significantly higher in the study group compared to the control group (respectively 16.3%, 7.9%) ($p < 0.05$). It was reported that 3.53% of the parents provided the PTSD diagnostic criteria in a study working towards mental health symptoms in children and their parents during the quarantine period. In the same study, low education and economic level were stated as risk factors for anxiety, depression and PTSD in parents.²⁴ In another study, patients with the COVID-19 infection had a high level of PTSD (96.2%) during their

hospitalisation.²⁵ This rate (7%) was quite higher than that recorded in the general population.²⁶ Also, in another study, higher rates of PTSD were reported in parents under quarantine or isolation measures than unquarantined ones (respectively 28%, 5.8%).⁵ The stress experienced by children of these parents regarding the disease process, the concerns of parents about themselves and health conditions of other family members, possible economic difficulties, uncertainties about the future in the parents may have caused parents to be in a higher risk of PTSD in the study group compared to the control group.

The Effects of Parental Anxiety Depression Levels on Mental Health of Children

The relationship between anxiety and depression levels of parents and anxiety, depression and sleep scores in children were examined in our study. A statistically significant positive correlation was found between the anxiety and depression levels of the parents and the anxiety, depression and sleep scores of children. It was emphasised that positive or negative exposure on children was closely related to parental exposure in a study investigating the effects of the pandemic on families and children in Spain.²⁷ It was shown that there were important links between disease burden of parents, mental health and stress perception of children during the pandemic process in a study carried out in the United States.¹⁹ It was reported that low perceived social support related to peers and family during the pandemic period increased the risk of depression 4.2 times and the risk of anxiety 3.2 times in a study conducted with 7202 teenagers between the ages of 14 and 18 in China.²⁸ In a study, it was proved that even children suffer less disasters than their parents, they experience similar stress like their parents. Higher levels of stress were seen in children whose parents reported high levels of depression and anxiety during the pandemic period in the same study.^{19,29} United Nations has reported that the intense anxiety and uncertainty experienced by parents can lead to a decrease in the life quality of children and an increase in the risk of anxiety disorders in their report researching the effects of the COVID-19 in children.³⁰ The results of our study are coherent with the literature data. These findings show that one of the most important steps in protecting mental health of children is the interventions aiming the protection of mental health of parents in the situations affecting the whole society deeply, such as pandemic.

Statistical analyses were also done for cases (study group) followed up with the suspicion of COVID-19 in our

study. There was no statistically significant difference between COVID-19 swab result of children, members with positive results of the COVID-19 except the children at home, presence of symptoms, follow-up period during the disease and the levels of anxiety and depression in children and parents ($p>0.05$). Some of the reasons of significant difference deficiency can be lack of severe pain in symptoms of children compared to adults, lack of life threatening in most of them and short hospital stays in also hospitalised children.

Conclusion

The findings of our study show that direct exposure to the COVID-19 (getting the disease or isolation measures with the suspicion of disease) creates a higher risk for both children and their parents in the emergence of psychiatric symptoms than those not directly exposed. For this reason, the mental health needs of children directly exposed to the disease and their families should be considered while planning the measures related to the pandemic.

Limitations

The limitations of this study can be listed as the usage of cross-sectional design and self-reporting data, and the fact that information about teenagers was obtained from their parents. Especially in the study group, PTSD and depression levels were found to be significantly higher in the parents compared to the control group. Subjective stress level of parents may have effected the awareness levels regarding the symptoms of their children in this group. The increase in psychiatric symptoms in the children and their parents compared to the control group could be associated with factors such as suspicion of COVID-19, swabbing, quarantine or isolation process, fear of pandemics, other factors, or a combination of all of these. One of the limitations of our study is that it was not specified which factors were more dominant. In addition to this, also these factors, which could be misunderstood, such as real knowledge level of all the cases about the COVID-19 and social support from family and friends, often thought to be associated with anxiety and the depression should be researched in the future.

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Availability of Data and Material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' Contribution

Baris GULLER designed the study, wrote the protocol, and conducted the survey. FerhatYaylaci performed statistical analysis, and wrote the first draught of the manuscript. All the authors read and approved the submitted version of the manuscript.

Compliance with Ethical Standards

Conflict of Interest

The authors declare that there is no conflict of interest.

Ethics Statement

This cross-sectional study was performed in accordance with the Declaration of Helsinki. Informed consent was obtained from all participants prior to commencing the study. Ethical approval was received from Uludağ University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee

Code Availability

Not applicable

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