

# ■ The impact of the initial COVID-19 lockdown on the mental health and lifestyle of children in Turkey

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## Abstract

The COVID-19 lockdown and subsequent school closures increased children's mental health difficulties and associated risk of school exclusion. The present study examined the changes in children's daily habits, and emotional and behavioral symptoms during the first national lockdown in 2020 as compared to before. A total of 854 caregivers living in Turkey with children aged 5 to 12 years completed a survey. The results showed that children spent significantly more time using screens, and less time engaging in physical activity during the lockdown compared to before. Additionally, one in three children were reported as feeling bored. Approximately half of the children were reported to show signs of nervousness, anger, anxiety, worry, restlessness, irritability, argumentativeness, and fear of infection. The children whose caregivers reported more family coexistence difficulty, higher risk of COVID-19 infection, poorer mental health, and high parenting role stress experienced higher levels of emotional and behavioral difficulties during the lockdown as compared to before. Children's pandemic-related emotional symptoms increased with age. Our findings suggested that the COVID-19 lockdown in Turkey had a negative impact on children's socioemotional and behavioral wellbeing with pre-adolescents being at higher risk of emotional change during the lockdown. These findings can guide early prevention and intervention programs to address child mental health symptoms in Turkey.

*Keywords:* COVID-19, children, families, psychological impact, lockdown, school closure, Turkey.

## Resumen

*Impacto del confinamiento por COVID-19 en los cambios de salud mental de los niños en Turquía.* La pandemia de la COVID-19 y el posterior cierre de las escuelas aumentaron las dificultades de salud mental de los niños y el riesgo asociado de exclusión escolar. El presente estudio examinó los cambios en los hábitos diarios de los niños y los síntomas emocionales y conductuales durante el primer cierre nacional de 2020 en comparación con el anterior. Un total de 854 cuidadores que viven en Turquía con niños de 5 a 12 años completaron una encuesta. Los resultados mostraron que los niños pasaron significativamente más tiempo usando pantallas y menos tiempo realizando actividades físicas durante ese tiempo en comparación con el anterior. Además, el 78,5% de los niños fueron reportados por sus cuidadores como aburridos. Aproximadamente la mitad de los niños mostraron signos de nerviosismo, enfado, ansiedad, preocupación, inquietud, irritabilidad, discusiones y miedo a las infecciones. Los hijos de los cuidadores que declararon tener más dificultades de convivencia familiar, peor salud mental y un elevado estrés en el rol de padres experimentaron mayores niveles de dificultades emocionales y de comportamiento durante el encierro en comparación con los anteriores. El alto riesgo de infección por COVID-19 por parte de los cuidadores se asoció con mayores niveles de dificultades emocionales y conductuales en los niños durante el encierro que antes. Nuestros resultados sugieren que el bloqueo por COVID-19 en Turquía tuvo un impacto negativo en el bienestar socioemocional y conductual de los niños.

*Palabras clave:* COVID-19, niños, familias, impacto psicológico, cierre de escuelas, Turquía.

The coronavirus disease-2019 (COVID-19) pandemic has had an unprecedented impact on children and families across the world. Turkey has been one of the seriously affected countries worldwide with

high number of reported cases (Worldometer Statistics, 2021). To manage the rapid spread of the virus, the Turkish government ordered strict quarantine measures, including self-isolation at home, social

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distancing precautions, and full closures in elementary, middle, and high schools starting from March 16, 2020, continuing until June 2020 (Turkish Government Ministry of Health, 2020). Turkey is among the top five OECD (Organization for Economic Co-operation and Development) countries that have closed its schools the longest during the pandemic (Turkish Government Ministry of Education, April 2021). Compelling evidence has shown that child and young people's mental health and wellbeing was negatively influenced by the pandemic-related school closures and associated lack of peer interaction, worries about education and disruption in daily routines (Pfefferbaum, 2021; Viner et al., 2022).

It is widely known that children and young people with poor social and emotional wellbeing (i.e., anxiety, challenging behavior, and poor concentration) are disproportionately excluded from schools (Sadler et al., 2018). For example, disruptive behavior is the most common reason of permanent exclusions and suspensions in the UK (Office for National Statistics, 2021). Additionally, all forms of school absenteeism (unexcused absences/truancy, school refusals) are a lot more common amongst young people with poor social and emotional wellbeing than without across North America, Europe, and Asia (Finning et al., 2019). Children and young people who drop out of school often have poor mental health and wellbeing, may engage in antisocial behavior and be at risk of long-term disadvantage such as unemployment, and welfare dependence in New Zealand and the UK (Ferguson, et al., 2005; Tejerina-Arreal et al., 2020). Compared to the other countries, school exclusion rates in Turkey are considerably high (Maya, 2014; Yıldız & Eldeleklioğlu, 2018). According to Maya's comparative analysis of this situation (2014), rate of out of school children and drop out problems in Turkish education system were found to be higher than the rates in the other countries (i.e., the EU countries, the United States, and Japan). Students at the higher risk of dropping out of school in Turkey were found to be those who have emotional problems (Şirin, et al., 2009), alcohol use and substance dependence, early pregnancy (Aydın, 2006; Şirin et al., 2009; Yüner & Özdemir, 2017), behavioral problems (Çimen, 2022; Doğruyol, 2007) and socio-economic difficulties (MoNE & UNICEF, 2013; Özer, 1991). It clearly shows that children's emotional, behavioral, and familial difficulties play a major role in the school exclusion process. Since the COVID-19 lockdown and subsequent school closures increased children's mental health difficulties and associated risk of school exclusion, the present study examined the level of changes in Turkish children's daily habits and socioemotional and behavioral symptoms during the first national lockdown in 2020 as compared to before.

The unexpected and rapid changes in children's social life and daily routines brought by the lockdown and associated school closures resulted in restricted physical and social activity, increased screen time and disrupted sleep patterns (Caroppo et al., 2021). These pandemic-related disruptions were associated with poorer mental health and wellbeing outcomes in children (Orgilés, et al., 2020; Scapatucci et al., 2022; Tandon, Zhou, Johnson, Gonzalez, & Kroshus, 2021). A few studies have examined lifestyle changes in small samples of Turkish children and young people during the pandemic (Atakan, Aktitiz, & Kayhan, 2021; Esentürk, 2020; Oflu, et al., 2020; Top & Cam, 2021; Zengin, et al., 2021). To understand the scale of the disruption, we extended these studies by examining the changes in daily routines in a large sample of Turkish children during the first national lockdown.

Büber and Terzioğlu (2022) reported numerous symptoms of behavioral and emotional problems (i.e., anhedonia, getting easily angry, being fidgety, impulsivity) among Turkish primary school children during the COVID-19 outbreak. Kılınçel, et al., (2020) found that

home-quarantine and school closures were associated with an increase in anxiety symptoms and loneliness in a sample of 745 young people in Turkey. Moreover, children with pre-existing mental health difficulties were more likely to experience psychological difficulties during the lockdown across the world (Alghrani & Byrne, 2020; Asbury, et al., 2021; Morgül, et al., 2022). However, there is limited research that examines the association between children's lockdown-related psychological changes and their mental health difficulties in the Turkish child population. Previous studies examined children with autism spectrum disorder (ASD) (Bozkus-Genc & Sani-Bozkurt, 2022; Mutluer, et al., 2020; Türkoğlu, et al., 2020) who may unsurprisingly struggle with changes, overreact, and already have behavior problems. However, the examination of the association between pandemic-related emotional and behavioral changes and mental health difficulties in the general child population is still lacking in Turkey. In this study, we aim to contribute to the literature by exploring these changes in a large community sample of young Turkish children.

Although we are still in the process of understanding the impact of COVID-19 school closures, emerging evidence shows that children's psychological wellbeing was worse in a context of poor parental mental health (Racine et al., 2022). We are aware of only one study that has examined the association between increase in children's pandemic-related social and emotional symptoms and family stress in Turkey (Büber & Terzioğlu, 2021). In a sample of Turkish caregivers, Büber and Terzioğlu (2021) found an association between a range of child COVID-19 pandemic-related psychological symptoms (i.e., anhedonia, getting angry easily, fidgeting around, impulsivity, appetite and sleep problems, restlessness or nervousness, and feeling sad) and caregivers' overall life stress (the degree of stress caused by unpredictable and uncontrollable life events). As well as general life stress, *stress with the parenting role* is an important determinant of parenting and child mental health and wellbeing. For instance, high levels of *parenting role stress* were related to lower levels of parental sensitivity to the child, poorer child behavior and lower quality of parent-child interaction (Berry & Jones, 1995). Moreover, high parenting role stress significantly influences the quality of family relationships making patient and empathic parenting challenging at times (Osborne et al. 2008). The lockdown and its associated consequences including having to look after children while working, depleted parental emotional reserves leading many parents to struggle with coping with the parenting role (Bernhardt, et al., 2022). Several studies have shown that increased parenting role stress during the pandemic was associated with an increased risk of mental health difficulties in children (e.g., Babore et al., 2021; Lee et al., 2021; Sorbring, et al., 2022). To add to our understanding of the impact of intra-family stressors on the psychological wellbeing of children in Turkey, we extended Büber's findings by examining children's level of emotional and behavioral pandemic-related changes in relation with *parenting role stress* during school closures.

Children's wellbeing during the lockdown has also been reported to be influenced by the pandemic-related factors experienced by their caregivers. Families in several countries (i.e., Italy and Spain, Belgium, the UK) stated that lockdown interfered with family life, and they experienced difficulties with co-existence during the home confinement (Morgül, et al., 2020; Orgilés et al., 2020; Stassart, et al., 2021). Families who reported high co-existence difficulty were more likely to report that their children's behavior and emotional state had changed for the worse since the lockdown. In addition to family co-existence difficulty, adults with high COVID-19 infection risk had poorer social and emotional wellbeing (i.e., depressive symptoms,

emotional distress, suicidal ideation, low general mood) during the lockdown across different countries including Turkey (Kim, et al., 2020; Xin et al., 2020; Yıldırım & Güler, 2021). In the present study one of our aims was to examine the association of family co-existence difficulty and caregiver COVID-19 infection risk with change in children's emotional and behavioral symptoms during school closures as compared to before.

The prevalence of mental health difficulties changes with increasing age (Ghandour et al., 2019). For example, emotional difficulties (i.e., depression, substance use, suicide) are more common among adolescents whereas behavioral difficulties (i.e., oppositional defiant disorder, conduct disorder) are more prevalent in younger children (Egger & Angold, 2006). Previous research has noted trends of increasing internalizing problems in relation with increasing age. During the pandemic older children were more likely to develop internalizing difficulties. For instance, Zhou and colleagues (2020) showed that senior graders were at risk of depressive and anxiety symptoms during the lockdowns compared with junior graders. Chen and colleagues (2020) found that symptoms of depression and anxiety were more common in a group of 13-15-year-old adolescents compared with a group of younger children. Nonetheless, Jiao and colleagues (2020) found mixed results for age effect during the pandemic, whereas another study found no effect of age or grade on mental health outcomes of children during the lockdowns (Liu, et al., 2020). Studies with Turkish populations during the first national COVID-19 lockdown examining the association between children's pandemic-related emotional and behavioral symptom changes and increasing child age are scarce. In a sample of Turkish children aged between 3-18, Çoban and Kaptan (2022) found that children in adolescence (ages 13–18) and middle childhood showed more mood-related psychological symptoms (e.g., sadness, loneliness, frustration, anxiety) than younger children during the pandemic. However, the study does not report which phase of the pandemic the data had been collected which makes the interpretation of the findings difficult. Additionally, we are aware of no study that examined the outcomes of pre-adolescent children during the lockdown in Turkey. The *pre-adolescence period* of human development is the period between middle childhood and adolescence and coincides with the transition of children from primary to secondary school (Bathelt, et al., 2021). The dramatic physical, cognitive, and socioemotional change that comes with pre-adolescence (Bathelt et al., 2021), combined with the challenges associated with the educational shift (Riglin, et al., 2013) and the negative consequences of the lockdown for child social and emotional wellbeing (Gambin et al., 2021) may increase the risk of poor mental health among pre-adolescents compared to younger children. Therefore, we aim to examine the impact of the lockdown on the emotional and behavioral symptoms of pre-adolescent children compared to children in middle and early childhood.

To summarize, the study examined the following objectives in a large sample of Turkish children aged between 5 and 12 and their caregivers: (a) the changes in children's daily habits during the lockdown as compared to before; (b) the caregiver perceived pandemic-related changes in children's emotional and behavioral symptoms; (c) the association of these changes with family mental health (i.e., child and caregiver mental health, and parenting role stress) and lockdown-related stressors (coexistence difficulty and caregivers' COVID-19 infection risk); (d) the lockdown-related emotional and behavioral changes in children at three different developmental stages.

## Method

### Participant characteristics

As shown in Table 1, participants ( $n = 854$ ) were caregivers primarily of Turkish ( $n = 772$ , 90.4%) or Kurdish ( $n = 26$ , 3%) and other ethnic background ( $n = 56$ , 6.6%). Most caregivers were mothers ( $n = 792$ , 92.7%), married ( $n = 811$ , 95.0%), in employment ( $n = 496$ , 58.6%), and had at least a university degree ( $n_{TR} = 665$ , 78.4%). Mothers ( $n = 58$ , 6.8%) were more likely than fathers ( $n = 22$ , 2.6%) to work part-time and have a higher education degree (77.1%). Children's mean age was 7.86 years ( $SD = 2.2$ ; range: 5 – 12 years), half of them were boys ( $n_{boys} = 423$ , 49.5%), and were attending independent schools (49.1%). Most of the families were living in houses with access to outside space where children can play or hang out (91.0%) which in most cases (55.3%) was a balcony or a terrace. Three in four families were living in houses with three or four rooms (77.3%), and only

Table 1. Caregiver and child sociodemographics and other characteristics in Turkey

	<i>Participants (n=854)</i>
Sociodemographics	<i>f (%)</i>
Ethnic background	772 (90.4)
Mother/Father <sup>a</sup>	848 (99.3)
Married <sup>b</sup>	811 (95.0)
Higher education <sup>c</sup>	665 (78.4)
In employment <sup>d</sup>	496 (58.6)
Boys	423 (49.5)
State School <sup>e</sup>	403 (47.2)
Age	<i>M (SD)</i>
Caregiver	38.25 (4.7)
Child	7.86 (2.2)
Housing Conditions	<i>f (%)</i>
Small family <sup>f</sup>	17 (2.0)
Fewer rooms <sup>g</sup>	9 (1.1)
Outdoor access <sup>h</sup>	777 (91.0)
Type of outdoor access	
Windows/another exit	34 (4.4)
Terrace/balcony	430 (55.3)
Garden	313 (40.3)
Family mental health and wellbeing	<i>M (SD)</i>
Child mental health (SDQ)	10.92 (5.2)
Caregiver mental health (K6)	9.96 (4.7)
Parenting stress (PSS)	40.17 (8.8)
Family co-existence difficulty	2.93 (1.2)
High COVID-19 infection risk group <sup>i</sup>	<i>f (%)</i> 217 (25.4)

Note:

a Mother/Father vs caregiver/step-parent.

b Married vs widowed/divorced/separated/never married.

c No qualifications vs non-higher education (up to high school at 16 years and college education) or higher education/postgraduate.

d In employment vs not in employment/lost job due to COVID-19/other

e State school vs independent school

f Small family (1 or 2 members) vs medium (3 or 4 members) or large (more than 5 members)

g Fewer rooms (1 or 2 rooms) vs average (3 or 4 rooms) or more (equal or more than 5 rooms)

h Outdoor access vs. no outdoor Access

i High-risk (I am at risk/member of household at risk) vs low-risk (not know anyone at risk/household member not at risk)

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

1.0 % were living in houses with only one or two rooms. Majority of the caregivers (80%) belonged to a medium household of 3 - 4 members in the family whereas only 2% of the families belonged to a small household of 1 -2 members.

### Procedure

Between the 14th of July 2020 and the 14th of August 2020, caregivers of primary school children (5 - 12 years old) in Turkey were invited to complete a 20 -minutes electronic survey on child and family wellbeing distributed via social networks (e.g., Facebook, Instagram), e-mail, and messaging groups (e.g., WhatsApp) using a snowball sampling strategy. Information about the objectives of the study was provided and informed consent was requested. Ethical approval was granted by the University of Roehampton Research Ethics Committee (PSYC 20/ 367).

### Measures

**Sociodemographic information:** The first part of the survey included children's and families' sociodemographic characteristics (e.g., participant age, marital status, education level, ethnicity and child age, gender, school type) and questions about housing conditions (e.g., outdoor access, number of rooms and number of people living-in at home during the lockdown). Childhood can be explored in three different development stages (early childhood: 0-6, middle childhood: 6-10, and pre-adolescence: 10-13) (Hatfield, 2008). In our study, childhood stages were organized accordingly: early childhood 5-6 years, middle childhood 7-9 years, and pre-adolescence 10-12 years.

**COVID-19 pandemic-related questionnaire:** This questionnaire consists of four sections. Section 1 measures 'the change in children's daily activities during the lockdown as compared to before'. Section 2 measures 'the change in children's emotional and behavioral states during the lockdown as compared to before'. Section 3 and Section 4 measures 'family coexistence difficulty' and 'caregivers' perceived COVID-19 infection risk', respectively. Please find the details of the sections in the COVID-19 pandemic-related questionnaire below:

**Section 1 - Change in children's patterns of daily activities during the lockdown as compared to before:** Caregivers indicated how much they thought their children's daily time of screen use and physical activity changed during the lockdown compared to before on a 6-point rating scale (1=*less than 30 minutes* - 6=*more than 180 minutes*). Caregivers were also asked to report the change in their children's daily sleep duration in hours.

**Section 2 - Change in children's emotional and behavioral states during the lockdown as compared to before:** The 23-item parent-reported questionnaire was used to assess the change in children's emotional and behavioral symptoms during the COVID-19 lockdown compared to before (Morgül et al., 2020; Orgilés et al., 2020). It includes the items rated on a five-point scale (1 = *much less compared to before quarantine*; 2 = *somewhat less compared to before quarantine*; 3 = *stayed the same*; 4 = *somewhat more compared to before quarantine*; 5 = *much more compared to before quarantine*). Example items are "My child is anxious", "My child is angry" and "My child is afraid of COVID-19 infection".

**Section 3 - Family coexistence difficulty:** Caregivers indicated their perception of family coexistence difficulty during the lockdown on a 5-point rating scale (1=*very easy* - 5=*very difficult*).

**Section 4 - Perceived COVID-19 infection risk:** Caregivers were asked whether they belong to a COVID-19 risk group. They indicated

their COVID-19 infection risk on a single multiple-choice question of four options (1= low risk: *I do not know anyone who belongs to a risk group or There are friends/family being at-risk group, but not living with them*; 2 = high risk: *I belong to an at-risk group or People belonging to an at-risk group live with me*).

**Child mental health:** The 25-item parent-reported *Strengths and Difficulties Questionnaire (SDQ)* was used to assess emotional and behavioral wellbeing of children between 4 and 17 years old (Goodman, 2001). It comprises five subscales of five items each (emotional symptoms, conduct problems, hyperactivity, peer problems, and pro-social behavior) rated on a three-point scale (0 = *not true* - 2 = *certainly true*). Example items include "Considerate of other people's feelings", "Restless, overactive, cannot stay still for long", and "Often has temper tantrums or hot tempers". A total difficulty score (range: 0-40) was generated by adding all the subscales, except for the pro-social behavior. Higher scores suggest a higher degree of difficulties. The Turkish version of the SDQ is publicly available at <https://www.sdqinfo.org/py/sdqinfo/b0.py>. The scale demonstrated good internal consistency and reliability in the Turkish sample (Cronbach's  $\alpha = .78$ ).

**Caregiver mental health:** The 6-item *Kessler Psychological Distress Scale (K6)* was used to assess caregiver's psychological distress and well-being (Kessler et al., 2002). It includes the items rated on a five-point scale (1= *all of the time* to 5= *none of the time*). Example items include "How often did you feel nervous?" and "How often did you feel hopeless?". Positive valence items were reverse coded. A total score of psychological distress was generated by adding all the items (range: 6-30). Higher scores reflect higher levels of psychological distress (Kessler et al., 2002). The Turkish version of the Kessler scale is publicly available at <https://toad.halileksi.net/olcek/psikolojik-sikinti-olcegi-2>. The scale demonstrated excellent internal consistency and reliability in the Turkish sample (Cronbach's  $\alpha = .86$ ).

**Parenting role stress:** The 18-item self-administered *Parental Stress Scale (PSS)* was used to assess caregivers' feelings about their parenting role (Berry & Jones, 1995). It comprises four subscales that examine parenting stressors (6 items), loss of control (3 items), satisfaction (3 items), and rewards (6 items) rated on a 5-point scale (1= *strongly disagree* to 5= *strongly agree*). Example items include "I enjoy spending time with my children" (rewards), "The major source of stress in my life is my children" (stressors), "I feel overwhelmed by the responsibility of being a parent" (loss of control), and "I am happy in my role as a parent" (satisfaction). Eight items are reverse scored. A total parenting stress score was calculated by adding the subscales (range: 18-90). Higher scores indicate higher levels of parenting role stress. The PSS was translated into Turkish from the original language (English) by the first author who is a native Turkish speaker and fluent in English, and it was checked for accuracy in meaning and cultural sensitivity by a translator who is a native English speaker and fluent in Turkish. Discrepancies were discussed and resolved by joint agreement of both translators. The scale demonstrated good internal consistency and reliability in the Turkish sample (Cronbach's  $\alpha = .80$ ).

### Data Analyses

Statistical analyses were performed using the IBM SPSS (Statistical Package for the Social Sciences) software version 17.0. Because of missing data on a few emotional and behavioral symptom-items ( $\leq 5\%$  of values were missing across 23 symptom - items), multiple imputation was performed using the Markov Chain Monte Carlo procedure in SPSS (Graham, 2012). Imputation of missing values was performed for symptom-items only.



Frequency distributions were used to examine the participants' sociodemographic characteristics and responses to survey questions. For categorical variables, we used the McNemar test to examine the differences in the distribution of participant responses on children's screen use and physical activity time; and for continuous variables the paired samples t-test was used to examine the differences in children's average daily sleep time before and during the quarantine. The effect size of the before-during group differences was calculated using Cohen's *d* for continuous variables, and Cramer's *V* for categorical variables, respectively. To examine the associations between intra-family stressors and the change in children's emotional and behavioral symptoms before and during the quarantine, we used Pearson correlations. We used one-way ANOVA to analyze differences in child pandemic-related emotional and behavioral changes across three different developmental stages (i.e., early childhood, middle childhood, and pre-adolescence). Bonferroni test was used for multiple pairwise comparisons across three different groups.

**Results**

Children's patterns of use of screens, daily physical activity, and hours of sleep before and during the lockdown

Table 2 presents children's patterns of screen use, daily physical activity, and sleep time before and during the lockdown. The analysis showed that children spent significantly more time using screens including iPads, TVs, mobiles, or computers during the lockdown than before ( $\chi^2(15, n=854) = 724.62, p < .001$ ). The proportion of children using screens for 1.5 - 2 hours increased from 10.0% before the lockdown to 21.4% during the lockdown. Additionally, the daily rate of screen use for more than 180 minutes increased from 1.3% to

28.5% and use for less than 30 minutes decreased from 15.2% to 2.3%. The analysis showed that children spent significantly less time engaging in physical activity ( $\chi^2(15, n=854) = 337.53, p < .001$ ) during the lockdown. The proportion of children engagement in low physical activity (30 mins <) increased from 17.7% to 56.9%, and the proportion of children reported to be engaged in physical activity between 1.5 - 2 hours as well as of those highly engaged (> 3 hours) was nearly halved down from 12.3% to 5.0% and from 3.3% to 1.8%, respectively. The difference in sleep time before and during the lockdown was statistically significant with children sleeping slightly more during than before the lockdown ( $t = 2.63, p < .01$ ).

**Caregiver perception of the emotional and behavioral changes in children during the lockdown as compared to before**

Caregivers noticed changes in their children's behavior and emotional states in the following ways: they felt more bored (78.5%) and nervous (45.6%), sadder (42.5%), were more irritable (48.2%), reluctant (43.8%), restless (47.8%), worried (54.7%), angry (45.8%), lonely (42.7%), uneasy (40.2%), anxious (52.2%), afraid of being infected (46.1%), were more likely to argue with the rest of the family (47.0%), and had more concentration difficulties (44.4%). Details were presented in Table 3.

[ Insert Table 3 here ]

**Association of child emotional and behavioral change during the lockdown with child and caregiver mental health difficulties, parenting stress, family co-existence difficulty and caregiver COVID-19 infection risk**

Table 4 presents the association of child emotional and behavioral change with child and caregiver mental health difficulties, parenting stress, family co-existence difficulty and caregiver COVID-19 infection risk during the lockdown. Children's emotional and behavioral difficulties score on the SDQ showed that on average children experienced moderate levels of mental health difficulties ( $M = 10.92, SD = 5.22; 0 < SDQ \text{ total score} < 13$ ). There were significant associations between children's total mental health score on the SDQ and change in 20 of the 23 socioemotional symptoms ( $r \text{ range} = .07 - .33$ ) with associations with: feeling worried, restless, anxious, sad, reluctant, lonely, uneasy, nervous, angry, frustrated, bored, irritable, arguing with the family, crying easily, being afraid of COVID-19 infection, worried when parents leave home and dependent on the caregivers, having nightmares, concentration difficulties and behavioral problems.

Additionally, caregivers' psychological distress score on the K6 scale showed that on average caregivers experienced moderate levels of psychological distress ( $M = 9.96, SD = 4.71; 4 < K6 \text{ score} < 13$ ). There were significant associations between psychological distress score on the K6 and change in 21 of the 23 socioemotional symptoms ( $r \text{ range} = .07 - .25$ ) with associations with the following symptoms: feeling worried, restless, anxious, sad, reluctant, lonely, uneasy, nervous, angry, frustrated, bored, irritable, arguing with the family, crying easily, being afraid of COVID-19 infection, worried when parents leave home and dependent on the caregivers, having nightmares, concentration difficulties and behavioral problems and no appetite.

Furthermore, caregivers' parenting role stress score on the PSS scale showed that on average caregivers reported moderate levels of parenting distress ( $M = 40.17, SD = 8.79; 18 < PSS \text{ score} < 90$ ). There were significant associations between parenting role stress score on

Table 2. Children's patterns of daily screen use, physical activity, and hours of sleep before and during the lockdown according to caregiver report

	Before lockdown n (%)	During lockdown n (%)	Test	Effect size <sup>a</sup>
Use of screens (mins per day)			<i>McNemar</i>	<i>Cramer's V</i>
			724.62***	0.28
Less than 30	130 (15.2)	20 (2.3)		
From 30 to 60	392 (45.9)	65 (7.6)		
From 60 to 90	207 (24.2)	149 (17.4)		
From 90 to 120	85 (10.0)	183 (21.4)		
From 120 to 180	29 (3.4)	194 (22.7)		
More than 180	11 (1.3)	243 (28.5)		
Physical activity (mins per day)			337.53***	0.18
Less than 30	151 (17.7)	486 (56.9)		
From 30 to 60	277 (32.4)	224 (26.2)		
From 60 to 90	247 (28.9)	67 (7.8)		
From 90 to 120	105 (12.3)	43 (5.0)		
From 120 to 180	46 (5.4)	19 (2.2)		
More than 180	28 (3.3)	15 (1.8)		
Sleeping pattern (hours per day)			<i>T-test</i>	<i>Cohen's d</i>
	M (SD)	M (SD)	2.63**	0.09
Sleep duration	9.36 (1.3)	9.48 (1.5)		

<sup>a</sup> Effect size = Cramer's *V* for multi-categorical variables and Cohen's *d* for continuous variables.

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$  (2-tailed).

Table 3. Caregiver perception of the change in child emotional and behavioral symptoms before and during lockdown

Child symptoms change	M	SD	Much more n (%)	Somewhat more n (%)	Same n (%)	Somewhat less n (%)	Much less n (%)
My child is worried	3.54	0.94	117 (13.7)	350 (41.0)	293 (34.3)	65 (7.6)	29 (3.4)
My child is restless	3.41	0.94	89 (10.4)	319 (37.4)	341 (39.9)	67 (7.8)	38 (4.4)
My child is anxious	3.48	0.91	91 (10.7)	354 (41.5)	315 (36.9)	62 (7.3)	32 (3.7)
My child is sad	3.33	0.95	84 (9.8)	279 (32.7)	371 (43.4)	76 (8.9)	44 (5.2)
My child has nightmares	3.05	0.86	45 (5.3)	128 (15.0)	577 (67.6)	32 (3.7)	72 (8.4)
My child is reluctant	3.40	0.92	91 (10.7)	283 (33.1)	401 (47.0)	36 (4.2)	43 (5.0)
My child feels lonely	3.37	1.05	126 (14.8)	238 (27.9)	380 (44.5)	43 (5.0)	67 (7.8)
My child is uneasy	3.30	0.87	52 (6.1)	291 (34.1)	421 (49.3)	45 (5.3)	45 (5.3)
My child is nervous	3.45	0.94	115 (13.5)	274 (32.1)	385 (45.1)	43 (5.0)	37 (4.3)
My child argues with the family members	3.47	0.90	104 (12.2)	297 (34.8)	386 (45.2)	32 (3.7)	35 (4.1)
My child is very quiet	2.79	0.74	9 (1.1)	48 (5.6)	635 (74.4)	75 (8.8)	87 (10.2)
My child cries easily	3.22	0.86	66 (7.7)	187 (21.9)	522 (61.1)	31 (3.6)	48 (5.6)
My child is angry	3.46	0.91	106 (12.4)	285 (33.4)	396 (46.4)	28 (3.3)	39 (4.6)
My child feels frustrated	3.26	0.82	47 (5.5)	240 (28.1)	494 (57.8)	32 (3.7)	41 (4.8)
My child is bored	4.09	0.92	327 (38.3)	343 (40.2)	137 (16.0)	31 (3.6)	16 (1.9)
My child is irritable	3.51	0.91	119 (13.9)	293 (34.3)	377 (44.1)	33 (3.9)	32 (3.7)
My child has no appetite	2.94	0.86	39 (4.6)	98 (11.5)	567 (66.4)	75 (8.8)	75 (8.8)
My child has concentration difficulty	3.46	0.81	86 (10.1)	293 (34.3)	428 (50.1)	25 (2.9)	22 (2.6)
My child is afraid of COVID-19 infection	3.37	0.92	66 (7.7)	328 (38.4)	366 (42.9)	44 (5.2)	50 (5.9)
My child is very dependent on us	3.18	0.83	58 (6.8)	163 (19.1)	548 (64.2)	41 (4.8)	44 (5.2)
My child has behavioral problems	3.08	0.77	33 (3.9)	138 (16.2)	602 (70.5)	29 (3.4)	52 (6.1)
My child eats a lot	3.17	0.84	55 (6.4)	179 (21.0)	524 (61.4)	51 (6.0)	45 (5.3)
My child worries when we leave the house	3.18	0.78	42 (4.9)	187 (21.9)	550 (64.4)	36 (4.2)	39 (4.6)

Table 4. Correlations between child emotional and behavioral symptom change during the lockdown and child and caregiver mental health, parenting stress, family co-existence difficulty and caregiver COVID-19 infection risk

Child symptoms change	Family mental health		Pandemic related factors		
	Child mental health	Caregiver mental health	Parenting stress	Coexistence difficulty	COVID-19 infection risk
My child is worried	.16**	.19**	.09**	.23**	.11**
My child is restless	.20**	.22**	.10**	.23**	.10**
My child is anxious	.17**	.20**	.10**	.17**	.09*
My child is sad	.19**	.18**	.13**	.22**	.08*
My child has nightmares	.20**	.10**	.09**	.16**	.07
My child is reluctant	.18**	.21**	.17**	.26**	.02
My child feels lonely	.13**	.18**	.14**	.19**	.04
My child is uneasy	.18**	.19**	.08*	.15**	.06
My child is nervous	.26**	.23**	.20**	.28**	.05
My child argues with family members	.27**	.25**	.23**	.31**	.03
My child is very quiet	-.03	.02	.00	.05	-.05
My child cries easily	.23**	.14**	.18**	.19**	.02
My child is angry	.29**	.22**	.23**	.24**	.04
My child feels frustrated	.15**	.13**	.11**	.19**	.07*
My child is bored	.16**	.16**	.12**	.23**	.05
My child is irritable	.33**	.25**	.25**	.31**	.04
My child has no appetite	.06	.11**	.04	.10**	.07*
My child has concentration difficulty	.32**	.24**	.22**	.22**	.05
My child is afraid of Covid-19 infection	.10**	.08*	.00	.09*	.02
My child is dependent on us	.19**	.11**	.10**	.12**	.02
My child has behavioral problems	.24**	.17**	.22**	.20**	.00
My child eats a lot	.03	-.04	.01	.05	-.01
My child worries when we leave house	.07*	.07*	.04	.07	.01

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$  (2-tailed).

Table 5. Group differences between children's pandemic-related responses at three different developmental stages

<i>Child symptoms change</i>	<i>Early childhood (1) M (SD)</i>	<i>Middle childhood (2) M (SD)</i>	<i>Pre adolescence (3) M (SD)</i>	<i>ANOVA Test (F)</i>	<i>Post-hoc (Bonferroni)</i>
My child is worried	3.43 (.92)	3.57 (.93)	3.65 (.96)	3.67*	3 > 1
My child is restless	3.26 (.92)	3.45 (.95)	3.56 (.92)	7.04***	2 > 1 3 > 1 3 > 2
My child is anxious	3.41 (.88)	3.46 (.93)	3.59 (.93)	2.73	-
My child is sad	3.24 (.94)	3.35 (.98)	3.42 (.92)	2.41	-
My child has nightmares	2.98 (.85)	2.99 (.83)	3.22 (.88)	6.13**	3 > 1 3 > 2
My child is reluctant	3.25 (.85)	3.40 (.96)	3.59 (.91)	9.26***	3 > 1 3 > 2
My child feels lonely	3.31 (1.10)	3.30 (1.00)	3.52 (1.04)	3.59*	3 > 2
My child is uneasy	3.19 (.86)	3.27 (.86)	3.50 (.86)	8.69***	3 > 1 3 > 2
My child is nervous	3.41 (.95)	3.42 (.92)	3.56 (.94)	2.01	-
My child argues with family members	3.41 (.93)	3.49 (.87)	3.54 (.91)	1.44	-
My child is very quiet	2.74 (.72)	2.72 (.73)	2.94 (.76)	7.36***	3 > 1 3 > 2
My child cries easily	3.28 (.88)	3.24 (.83)	3.13 (.87)	2.30	-
My child is angry	3.41 (.94)	3.46 (.92)	3.52 (.88)	1.01	-
My child feels frustrated	3.24 (.84)	3.23 (.79)	3.32 (.83)	.97	-
My child is bored	4.07 (.98)	4.07 (.89)	4.15 (.89)	.53	-
My child is irritable	3.49 (.96)	3.49 (.88)	3.56 (.89)	.48	-
My child has no appetite	3.05 (.82)	2.85 (.87)	2.94 (.87)	4.30*	1 > 2
My child has concentration difficulty	3.31 (.77)	3.50 (.81)	3.60 (.85)	8.81***	2 > 1 3 > 1
My child is afraid of Covid-19 infection	3.21 (.87)	3.40 (.89)	3.52 (.99)	7.92***	2 > 1 3 > 1
My child is dependent on us	3.22 (.87)	3.14 (.81)	3.16 (.80)	.68	-
My child has behavioral problems	3.09 (.75)	3.05 (.74)	3.12 (.82)	.56	-
My child eats a lot	3.07 (.79)	3.20 (.78)	3.26 (.97)	3.39*	3 > 1
My child worries when we leave house	3.12 (.65)	3.17 (.78)	3.29 (.92)	3.20*	3 > 1

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$  (2-tailed).

the PSS and change in 18 of the 23 socioemotional symptoms ( $r$  range = .08 - .25) with associations with the following symptoms: feeling worried, restless, anxious, sad, reluctant, lonely, uneasy, nervous, angry, frustrated, bored, irritable, arguing with the family, crying easily, and dependent on the caregivers, having nightmares, concentration difficulties and behavioral problems.

On average, caregivers reported that family coexistence during the lockdown was moderately difficult ( $M = 2.93$ ,  $SD = 1.17$ ; range = 1-5). Most caregivers reported some level of difficulty with approximately 1 in 3 (32.5%) feeling that it was difficult or very difficult and 1 in 3 (32.8%) feeling that it was moderately difficult. Small to strong significant correlations ( $r$  range = .09 - .31) were found between caregivers' perception of how hard it was for the family to live together during the lockdown and most of the child symptoms (i.e., 20 of the 23 symptoms). Caregivers who rated having more family coexistence difficulty during the lockdown tended to rate their children as more worried, restless, anxious, sad, reluctant, lonely, uneasy, nervous, angry, frustrated, bored, irritable, more likely to have nightmares, concentration difficulties, behavioral problems, and no appetite, also more likely to argue with the rest of the family, cry easily, be afraid of COVID-19 infection and dependent on the caregivers.

One quarter (25.4%) of the caregivers reported either belonging to a high-risk group or living with people who belong to a risk

group, and 41.2% of the caregivers reported that they had either friends or family members who were at-risk of COVID-19 infection but were not living with them. Small to strong significant correlations ( $r$  range = .07 - .11) were found between caregivers' COVID-19 infection risk status and several of children's symptoms (i.e., 6 of the 23 symptoms). Caregivers who reported being at high risk of infection tended to report that, during the lockdown, their children were more worried, restless, anxious, sad, frustrated, and had no appetite compared to before the lockdown.

#### **Child emotional and behavioral change during the lockdown at different developmental stages**

Table 5 presents the significant group differences between children's pandemic-related responses at *early childhood*, *middle childhood*, and *pre-adolescence*. Compared to children in early childhood, pre-adolescents were more worried [ $F(2,851) = 3.67$ ,  $p < .05$ ], restless [ $F(2,851) = 7.04$ ,  $p < 0.001$ ], reluctant ([ $F(2,851) = 9.26$ ,  $p < 0.001$ ]), uneasy [ $F(2,851) = 8.69$ ,  $p < 0.001$ ], quiet [ $F(2,851) = 7.36$ ,  $p < 0.001$ ], afraid of COVID-19 infection [ $F(2,851) = 7.92$ ,  $p < 0.001$ ], and more worried when one of the parents left the house [ $F(2,851) = 3.20$ ,  $p < 0.05$ ], and they were eating a lot more [ $F(2,851) = 3.39$ ,  $p < 0.05$ ], and having more nightmares [ $F(2,851) = 6.13$ ,  $p < 0.01$ ] and concentration difficulties [ $F(2,851) = 8.81$ ,  $p < 0.001$ ].

Compared to children in middle childhood, pre-adolescents were more restless [ $F(2,851) = 7.04, p < 0.001$ ], reluctant ( $[F(2,851) = 9.26, p < 0.001]$ ), lonely [ $F(2,851) = 3.59, p < 0.05$ ], uneasy [ $F(2,851) = 8.69, p < 0.001$ ], and more quiet [ $F(2,851) = 7.36, p < 0.001$ ], and they were having more nightmares [ $F(2,851) = 6.13, p < 0.01$ ].

Compared to children in early childhood, children at middle childhood were more restless [ $F(2,851) = 7.04, p < 0.001$ ], and afraid of COVID-19 infection [ $F(2,851) = 7.92, p < 0.001$ ], and they were having more concentration difficulties [ $F(2,851) = 8.81, p < 0.001$ ], and less loss of appetite problems [ $F(2,851) = 4.30, p < 0.05$ ].

## Discussion

The study examined the changes in children's daily habits and emotional, and behavioral symptoms during the initial COVID-19 lockdown in Turkey as compared to before and its association with family mental health and pandemic-related stressors. The findings showed that the caregivers reported significant changes in their children's patterns of daily habits. Specifically, during the lockdown, children were nearly 22 times more likely to use screens for more than 3 hours, the chance of children engaging in physical activity for 1 to 1.5 hours fell into one third, and children slept slightly more than before the lockdown. The findings agree with the studies of other COVID-19 affected countries on the impact of the lockdown on children's screen use time and physical activity (Moore et al., 2020; Morgül et al., 2022; Orgilés et al., 2020;) and confirm the negative association between lockdown-related restrictions and Turkish children's disrupted lifestyle. Further research is needed to examine if the magnitude of change in children's daily activities was caused by the caregiver and/or child characteristics, housing conditions, COVID-19 infection risk, and coexistence difficulty, and whether the reported changes increased the risk of children's mental health difficulties in the long-term.

In addition to the changes in children's daily habits, our findings revealed that majority of the caregivers observed considerable significant increases in a range of child behavior and emotional difficulties during the lockdown as compared to before. This finding is in agreement with previous studies that have shown negative lockdown effects on children and young people in Turkey (Büber & Terzioğlu, 2021; Kılınçel et al., 2020). Moreover, our findings indicated that children in Turkey experienced higher levels of *boredom* during the pandemic. Schools were closed for several months in Turkey after the COVID-19 outbreak in March 2020. The quarantine resulted in an abrupt and prolonged reduction in physical activity and disruption to close social relationships that potentially contributed to the increase in symptoms of boredom among Turkish primary school children. However, an interesting result was that despite more than 90% of the families in Turkey reported having access to an outside space (i.e., garden, terrace, balcony) for children to play, increase in boredom was the most prominent change in children's behavior reported by majority of the caregivers. Thus, even having an outside space may not have helped to decrease boredom in Turkish children during the first national lockdown. Another novel finding of our study is that a large proportion of our sample was reported to exhibit high levels of *reluctance* compared to before the lockdown. Reluctance in children is defined as unwillingness or hesitancy to get involved in an activity (Penza-Clyve & Zeman, 2002). Discourses around the major global threat to children, sudden school closures and the strict age-specific stay-at-home orders of Turkish Government might have increased children's fear of

COVID-19 infection, and in turn, reluctance of children might stem from being afraid of getting infected or fear of the unknown. Research suggested that strict lockdown restrictions and related fear tactics of governments may lead to worsened mental health, especially heightened anxiety, in the public (Guttman & Lev, 2021).

Internalizing problems (e.g., symptoms of depression and anxiety) were more prevalent in adolescents before (Herpertz-Dahlmann, Bühren, & Remschmidt, 2013; Durbeek et al., 2019) and during the pandemic (Lavigne-Cerván et al., 2021; Jiao et al., 2020). In line with our prediction, pre-adolescents were more likely to experience higher levels of internalizing difficulties during the lockdown (e.g., being more worried, restless, reluctant, lonely, uneasy, quiet, more afraid of COVID-19 infection, having more nightmares, concentration difficulties and getting more worried when parents leave home) compared to younger children. Therefore, our findings suggest that older primary school children in Turkey experienced a higher level of emotional difficulties during the COVID-19 lockdown compared to younger children. Moreover, the findings indicated that children in pre-adolescence and middle childhood experienced a higher level of concentration difficulties compared to children in early childhood. Previous research has found that older children tend to use screens more often (Livingstone, Ólafsson, & Staksrud, 2011). Additionally, attentional difficulties in children have been linked to high screen exposure (Santos, Mendes, Marques Miranda, & Romano-Silva, 2022). It is plausible that an explanatory factor in the association between increasing age and concentration difficulties is the increase in screen use amongst older children that was noted during the lockdown (Bergmann et al., 2022).

The families who reported higher levels of difficulty with coexistence compared to before and those with poor child and caregiver mental health and parenting stress were more likely to perceive negative changes in their children's emotional and behavioral functioning during the lockdown. This relationship is in line with literature showing an association between family coexistence difficulty during the pandemic, higher level of family stress, and increased emotional and behavioral problems in children (Orgilés et al., 2020; Spinelli, et al., 2020). Additionally, our findings suggest that in households with families who were at high risk of COVID-19 infection, children were at higher risk of developing emotional problems, including anxiety and worry, during the lockdown. These findings can be interpreted as children whose caregivers have been infected with COVID-19 or who have died from the disease might be more susceptible to mental health problems because of their higher risk of infection, and the grief and fear caused by parental loss or separation (Liu, Bao, Huang, Shi, & Lu, 2020). Our results are compatible with the literature showing that adults' risk of COVID-19 infection has been consistently associated with poor social and emotional wellbeing during the lockdown across different countries (Kim et al., 2020; Xin et al., 2020; Yıldırım & Güler, 2021). However, further research is necessary to explore if the level of change in children's emotional and behavioral symptoms was caused by the caregiver's COVID-19 infection risk in the long-term.

Our study has some limitations which need to be considered when interpreting the findings. Because the participants were primarily university educated married Turkish mothers, generalization of the findings to other ethnic and/or socioeconomic groups should be approached with cautiousness. Since this study is cross-sectional, it was not possible to examine the long-term impact of the changes in children's emotional and behavioral functioning before and during the quarantine on children's outcome. Moreover, the study relied on perceived caregiver report and not on independent observations.



Finally, the assessment of change in children's emotional and behavioral functioning was based on caregivers' perceptions at one point in time and towards the end of the lockdown when the society had started opening-up. Therefore, the findings should be interpreted with caution as opening-up may help people feel less pressured and they may reflect lower scores on their answers. Replication studies should include a longitudinal design and multi-informant assessment methods of children's emotional and behavioral difficulties. Notwithstanding, our findings have important implications for supporting young children and their families.

### Implications for practice

In conclusion, our findings proposed that according to caregiver perception, the initial COVID-19 lockdown in Turkey had a negative impact on children's social and emotional wellbeing, and adoption of daily habits. Changes in children's behavior and emotional states during the lockdown in Turkey were associated with child and caregiver mental health and parenting stress, and pandemic related stressors. Our findings suggest that post-pandemic recovery measures in Turkey should consider following up mental health outcomes in the school population and the outcomes of children who were at high risk for poor mental health and wellbeing due to age and family adversity as a result of caregiver poor mental health, COVID-19 related stressors and coping with the demands of parenting. Ongoing efforts to support children in a post-pandemic world should consider supporting child mental health by integrating evidence-based programs for social and emotional wellbeing in schools with emphasis on the social and emotional needs of older children. For instance, school-based psychological counselling (Bathelt et al., 2021) and cognitive-behavior therapy (CBT) (Essau et al., 2014) can be effective in supporting social and emotional skills in young people. Finally, because poor family mental health was related with worse psychological wellbeing in children, post-pandemic family policy in Turkey should consider how to best support parental mental health and family relationships.

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### Conflict of Interest

All authors declare no conflict of interest.

### Data Availability Statement

The data that support the findings of this study are available from the authors upon reasonable request. Requests to access the datasets should be directed to the corresponding author of the article.

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