The Effect of Risk and Protective Factors on Primary School Students’ COVID-19 Anxiety: Back to School After the Pandemic

Durmuş Burak

Accepted: 7 September 2022 / Published online: 15 October 2022
© The Author(s), under exclusive licence to Springer Nature B.V. 2022

Abstract
This study aimed to analyze the risk and protective factors affecting the COVID-19 anxiety of primary school students after the reopening. It was investigated how primary school students’ parents’ vaccination, and COVID-19 cases seen at school, knowledge and awareness directly or indirectly explained their individual and social COVID-19 anxiety. The data were obtained from 227 primary school students living in different regions of Turkey. Pandemic Awareness Scale, Pandemic Anxiety Scale, Pandemic Information Test and Information Form were used to obtain the data. The data were analyzed by path analysis. According to the results, the case seen at school, knowledge and awareness of COVID-19 directly and significantly predicted primary school students’ individual and social COVID-19 anxiety. Vaccination of parents, on the other hand, directly significantly predicted social COVID-19 anxiety of primary school students, but did not significantly predict individual COVID-19 anxiety. In addition, in this effect, awareness of COVID-19 mediates the knowledge of COVID-19, and cases seen at school mediate the vaccination of parents. The obtained model showed a good fit. According to the results, primary school students’ knowledge and awareness about COVID-19 and parents’ vaccination reduced their anxieties, and COVID-19 cases seen at school increased their anxiety.

Keywords COVID-19 · Pandemic · Anxiety · Awareness · Vaccine · Elementary School Students · Reopening School

Durmuş Burak
dburak@kilis.edu.tr

1 Faculty of Education, Department of Elementary Education, Kilis 7 Aralik University, No: 134, 79100 Kilis, Turkey
1 Introduction

The COVID-19 pandemic, which significantly affected adults in terms of health, deeply affected children physically, emotionally and academically. At the beginning of the pandemic, children went through an intense isolation period where they were deprived of school and social life; they learned that COVID-19 affected adults more than themselves and became more sensitive to the adults around them (Akanca, 2021). In the following process, they realized that adults could be infected through themselves and that they could make them sick and get worried about their elder family members. The new information that COVID-19, which mutated in the process, could affect children and adults (Figueiredo et al., 2021; Leung et al., 2021) caused children to experience fear and anxiety for their health. Vaccination efforts against COVID-19 generally provided emotional relief for adults (Karayürek et al., 2021; Nguyen, 2021); however, children under 12 were excluded from this vaccination in many countries.

Similarly, no vaccination study was conducted for children under 12 in Turkey (Dayan, 2021). In addition, the education at schools, which were suspended on March 16, 2020, and were periodically maintained with gradual, hybrid and diluted practices, were restarted in September 2021 with a full-time and face-to-face education process with the new normalization period (Akanca, 2021). It is estimated that, with the opening of schools, the transmission of COVID-19 in children increased by around 5% (Bülbü & Hacımustafaoğlu, 2020). Moreover, while the average number of daily cases was around 8 thousand a few months before the opening of schools in Turkey, this number increased in the first months following the opening and reached an average of 30 thousand (Ministry of Health, 2022). However, in some studies conducted during the reopening of schools, parents stated that they were concerned about both their children and their health (Avan et al., 2021; Yurttaş & Kesik, 2022). It could be thought that the reopening of schools increased the number of children and overall cases, and thus, a more significant concern for children about COVID-19 than in the past (Akanca, 2021; Yurttaş & Kesik, 2022). In this process, it was a matter of curiosity about the risk that triggered the anxiety experienced by children and the protective factors that would reduce the anxiety and how they affected children’s anxiety.

In previous studies, it was found that COVID-19 generally caused problems such as stress, worry, anxiety, fear, depression and post-traumatic disorders in individuals (Arslan et al., 2020; Asmundson & Taylor, 2020; Rubin & Wessely, 2020), caused mental disorders such as anxiety, worry and fear in children (Sarı & Nayır, 2020). Therefore, primary school children generally have negative feelings towards COVID-19, and anxiety is one of them. Many studies reported that children experience significant anxiety due to COVID-19. In one of these studies, Aydın (2021) found that 69.8% of children aged 7–11 in Turkey experienced more intense anxiety than before the pandemic. In another study conducted in Brazil, it was stated that approximately 20% of children aged 6–12 years (Garcia de Avila et al., 2020), and in another study conducted in Germany, 24.1% of children over 7 experienced high levels of anxiety (Ravens Sieberer et al., 2022). In another study conducted with only 7–11 year old girls in Iran, it was found that these children experienced intense anxi-
The Effect of Risk and Protective Factors on Primary School Students’ Anxiety due to COVID-19 (Mangolian Shahrbabaki et al., 2022). Therefore, COVID-19 causes significant anxiety on primary school children. In addition, previous studies revealed that the feeling of doubt, fear, or stress was strongly associated with anxiety about COVID-19 (Çıkrıkçı et al., 2022; Karakose, 2022), and that stress and fear caused by compulsorily living with infected individuals were important factors in anxiety about COVID-19 (Cao et al., 2020). With the opening of schools, the probability of primary school children to encounter infected individuals and consequently to experience stress, fear and anxiety increased. Therefore, the cases seen in their school can be considered as an important risk factor for primary school children’s anxiety about COVID-19.

Previous studies showed that having knowledge of COVID-19 (Hamilton et al., 2020; Sharma et al., 2020; Wang et al., 2020; Zhou et al., 2020) and showing awareness of protective behaviors reduce anxiety (Kurtuluş & Düşünceli, 2021; Xue et al., 2021; Zhou et al., 2020). It was stated that there is a strong relationship between having knowledge about COVID-19 and experiencing anxiety and fear (Lee et al., 2020). In addition, it was expressed that having knowledge about COVID-19 is associated with showing awareness in the context of protective behaviors (Ampofo & Aidoo, 2022; Lee et al., 2020). From another point of view, some studies revealed that COVID-19 vaccines provide comfort in terms of mental health (Nguyen, 2021; Perez-Arce et al., 2021) along with their protective effect (Mahase, 2020). Therefore, it can be thought that the vaccine has a therapeutic effect on the anxiety experienced about COVID-19 and has a reducing effect on the cases seen at schools. Considering that adults are currently vaccinated, it can be thought that the vaccination of parents may have an effect on the anxiety experienced by children about COVID-19. Therefore, vaccination of their parents, their knowledge of COVID-19 and their awareness of protective behaviors can be considered as important protective factors about the anxiety of primary school children about COVID-19. Awareness of these factors may act as a mediator between the anxiety experienced about COVID-19 and the knowledge, and the fact that the cases seen at school may act as a mediator between the vaccination of parent and the anxiety about COVID-19.

Based on previous studies in the literature, the risk of experiencing COVID-19 case in children’s schools after the reopening of schools can be defined as the risk for their anxiety, their parents’ being vaccinated, having knowledge about COVID-19 and being aware of performing protective behaviors can be expressed as protective factors in terms of their anxieties. This study aimed to analyze the risk and protective factors affecting the COVID-19 anxiety of primary school students after the reopening. For this purpose, it was investigated how primary school students’ parents’ vaccination status, COVID-19 cases seen at school, and knowledge and awareness of COVID-19 directly or indirectly explained individual and social COVID-19 anxiety. The study focused on primary school students aged 8–12 due to their lack of general protective measures such as vaccination, their need to attend school, and data collection processes. The researcher thinks that this study is essential in reducing students’s anxiety during the COVID process, which continues with the school and creating measures to support their mental well-being in possible pandemics.
1.1 Anxiety of COVID-19

Anxiety is accepted as an emotional reaction that an individual creates against a threat to some values that he deems necessary for his existence (May, 1977). Anxiety is also a significant mental health problem that rises during pandemics (Asıcı, 2020). Individuals also experienced high levels of anxiety, stress, trauma, and suicidal tendencies in epidemics before COVID-19 (Goodwin et al., 2011). Therefore, it is expected that individuals will experience negative emotions such as anxiety during the COVID-19 pandemic. Many studies were conducted on COVID-19 as an object of concern. In these studies, it was stated that individuals from different age groups and countries generally had high levels of anxiety toward COVID-19 (Lakhan et al., 2020; Öz-Ceviz et al., 2020; Wang et al., 2020), this anxiety created stress and affected psychological problems such as depression moderately (Arslan et al., 2020), and it evolved into generalized anxiety by negatively affecting habits (Çıtak & Pekdemir, 2020). Although anxiety about COVID-19 has many social, emotional, economic and health reasons, the root of this anxiety is the fear of getting sick (Wang et al., 2020) or the worry of family members’ getting (Li et al., 2020). Studies also support this. In a study conducted by Karaman (2020) with 89 individuals between the ages of 18-and 65 who had COVID-19, the participants stated that they generally experienced emotions such as fear-anxiety (fear of death, not healing) infecting other people), despair and sadness.

On the other hand, individuals may fear contacting people with COVID-19 in social environments and getting sick, leading to behaviours such as not socializing and avoiding social environments. Cao et al., (2020) found that approximately 25% of university students experienced intense anxiety due to COVID-19, and the fact that they had to live with infected people around them was a significant risk factor. It was shown in different studies that COVID-19 also caused intense anxiety in children (Yılmaz et al., 2020; Xue et al., 2021). However, the focus of children’s anxiety during the COVID-19 process changed. Initially, this anxiety, which included being separated from school and friends, a long isolation process and the fear of losing family members, was fed by worries and fears such as contacting sick people, getting sick, not healing and infecting family elders with the changes experienced in the process. After the reopening of schools, it can be thought that the fear of contacting ill students or teachers, fear of getting sick, and carrying the disease to their homes are related to the anxiety of primary school students. Therefore, in the current situation, it can be said that primary school students experience personal and social anxiety against COVID-19.

1.2 The Cases Seen at School

Schools are important social spaces where hundreds of students and employees share the same environment. In an ordinary school day, students and staff have to stay together for a long time, share the same environment and have frequent contact with each other. It is almost impossible for students who participate in teaching activities, playgrounds, and nutrition activities in or outside the classroom to stay out of touch. Considering the transmission and the rate of spread of COVID-19, at the beginning
of the pandemic face-to-face education was suspended in most countries, including Turkey, and some periods were reopened; however, schools were closed for a long time (Akanca, 2021). In a study conducted during the period when schools were open periodically, Ceylan et al. (2021) stated that schools were environments that had a significant risk for the transmission of COVID-19. In the same study, 14,608 contact cases were followed in a region of Turkey and it was reported that the risk of contracting COVID-19 in social environments such as school was 21.5%. Schools were reopened in many countries over the past few years. As of September 2021 in Turkey, full-time and face-to-face education was started at schools. There was a partial increase in the number of cases with the opening of schools in the past (Bülbüloğlu & Hacımustafaoğlu, 2020). In addition, these environments were regarded as the compulsory social environments and were defined as places with a considerable risk of COVID-19 (Ceylan et al., 2021). In this context, after the opening of schools, the probability of primary school students meeting individuals infected with COVID-19 and sharing the same environment increased. Previous studies revealed that sharing an environment with individuals infected with COVID-19 caused anxiety because of getting sick or transmitting the disease to other individuals (Cao et al., 2020; Li et al., 2020). In this context, it can be said that the case seen at school is a risk factor for primary school students’ anxiety about COVID-19.

1.3 Vaccine of COVID-19

Vaccination is an effective method that is used for protection against infections. In the past years, many different vaccines have been developed against COVID-19. It was reported that vaccines developed in different studies provided high protection against COVID-19 infection (e.g. Knoll & Wonodi, 2021; Mahase, 2020). Vaccines can relieve individuals emotionally and protect them from diseases (Karayürek et al., 2021). In a study by Nguyen (2021), it was found that individuals who were vaccinated with COVID-19 had 24% less anxiety about getting sick or making others sick. In this context, it can be thought that being vaccinated or knowing that the other person is vaccinated can provide emotional relief.

Starting from the first months of 2021, COVID-19 vaccines were used in Turkey and adults were vaccinated rapidly. As of March 2022, the rate of first dose vaccination of individuals who were expected to be vaccinated was 93%, and the rate of second dose vaccination was 85% (Ministry of Health, 2022). As in most countries in the world, children over 12 years of age were partially vaccinated (with chronic illnesses who want to be vaccinated) in Turkey, and it was apparent that this vaccination process was effective in children aged 12–15 (Dayan, 2021). However, no vaccination study was conducted for children under 12. Therefore, it can be thought that primary school students, whose risk of getting sick or carrying the disease increases with the reopening of schools, experience anxiety. However, even if the primary school student is not vaccinated, family elders may be vaccinated. In this context, vaccination of family elders can reduce the anxiety experienced by primary school students both on behalf of their health and on behalf of family elders. Therefore, it can be thought that parents’ vaccination is an essential factor in coping with the anxiety experienced by primary school students. On the other hand, the protective efficacy of COVID-19
vaccines against infection is known. In this context, it is expected that fewer cases are seen in the schools of primary school students whose parents are vaccinated. For this reason, the cases seen at school may act as a mediator between vaccination of parents and anxiety.

1.4 Knowledge of COVID-19

Knowledge is a prerequisite for forming positive attitudes and encouraging positive behaviours (McEachan et al., 2016). Previous studies revealed a strong relationship between knowledge about infectious diseases and negative feelings towards the disease (de Zwart et al., 2009). It is stated that individuals who have sufficient knowledge of pandemics protect themselves better, have higher awareness and can cope with negative emotions (Yıldırım et al., 2020). Many studies were conducted to reveal what individuals know and what their level of knowledge was within the scope of COVID-19 (Baloran, 2020; Sharma et al., 2020; Wang et al., 2020; Yıldırım & Güler, 2020; Zhou et al., 2020). Some of these studies state that individuals have the good and correct information, while others have insufficient and incorrect information. In addition, it is seen that individuals who have information about COVID-19 experience less anxiety (Wang et al., 2020; Zhou et al., 2020), while those who have incomplete or incorrect information experience more anxiety (Hamilton et al., 2020; Sharma et al., 2020). Therefore, it can be considered that primary school students’ knowledge is an essential factor in coping with their anxiety.

1.5 Awareness of COVID-19

Awareness is generally defined as perceiving objective reality, taking action against reality, and being able to control emotions and thoughts (Burak, 2021). Awareness of COVID-19 is expressed as adopting and showing behaviors that will protect oneself and other individuals from the disease (Bilgin, 2020; Büyükbeşe & Dikbaş, 2021). In general, protection behaviors from COVID-19 are explained as mask, distance and cleaning. Therefore, it can be said that individuals who use masks when needed, pay attention to social distance rules and take care of their personal hygiene have awareness of COVID-19. In previous studies, individuals who take care to comply with preventive rules such as mask, distance and cleaning were defined as people with COVID-19 awareness (Chen et al., 2020; Kurtuluş & Düşünceli, 2021). Based on this, it can be said that awareness of COVID-19 is a behavioral phenomenon.

There are many studies related to the awareness of individuals in the context of adopting and implementing protective behaviors towards COVID-19 (Alicilar et al., 2020; Baloran, 2020; Das et al., 2020; Kurtuluş & Düşünceli, 2021; Xue et al., 2021; Zhou et al., 2020). In a study carried out in Turkey, it was found that the awareness of individuals was high, it was reported that 98% of the participants washed hands, 91% of them ventilated indoor environments, 83% of them used masks and 77% of them paid attention to the social distance rule (Alicilar et al., 2020). In another study conducted on primary school students in China, it was seen that approximately 90% of the students showed awareness by washing hands (Xue et al., 2021). Therefore, awareness of COVID-19 includes behaviors such as wearing a mask, obeying the
social distance rule, washing hands, avoiding sick people or staying away from other people in case of illness (Arpaci et al., 2021; Bilgin, 2020). However, being able to show the specified protective behaviors is closely related to knowing about COVID-19, how it is transmitted and how it can be protected. Being aware of a disease is expressed as knowing and recognizing the disease as a threat (Arpaci, 2021; Hopman & Rijken, 2015) and beyond that, taking action against the disease (Arpaci, 2021). Therefore, awareness of COVID-19 is related to knowledge about COVID-19. Some previous studies confirm this relationship, and it is stated that there is a relationship between knowledge about COVID-19 and awareness in the context of protective behaviors (Ampofo & Aidoo, 2022; Lee et al., 2020). Therefore, it can be thought that primary school students’ awareness of COVID-19 is related to the knowledge they have about COVID-19.

### 1.6 Present Study

It is inevitable for primary school students to contact other individuals and have social relations in the new process that started with the reopening of schools. So, the risk of students being infected with COVID-19 and transmitting the disease to other individuals increased. Being deprived of protective factors such as vaccination against this risk made primary school students even more disadvantaged. It was

---

**Fig. 1** Tested Hypothesis Model
stated in previous studies that primary school students experienced intense anxiety since the beginning of the pandemic (Aydın, 2021; García de Avila et al., 2020). However, empirical investigation of the risks that trigger anxiety or the protective factors that reduce the anxiety of these students, who have different responsibilities such as not getting sick and not carrying the disease to their homes with the opening of schools, may be helpful in order to eliminate the disadvantages they experience. As a result, this study investigated how primary school students’ parents’ vaccination, COVID-19 cases seen in their school, and knowledge and awareness of COVID-19 directly or indirectly explained individual and social COVID-19 anxiety. In this context, a hypothesis model was created and tested. The hypothetical model is presented in Fig. 1.

### 2 Method

#### 2.1 Participants and Procedure

Necessary ethics committee and research permissions were obtained before the study. In order to reach the participants, primary school teachers working in different places were reached first. The teachers were informed about the study, and the parents’ permission was obtained to collect data from the students the help the teachers. Parents and students were informed about the study via social media. Data were obtained from the students who volunteered to participate between October, 25, 2021, and November, 8, 2021, by online methods. The participants of the study consisted of 282 primary school students studying in different cities of Turkey (Adana, Adıyaman, Aydın, Batman, Gaziantep, Hatay, İstanbul, Kahramanmaraş, Kayseri, Kilis, Konya, Mardin and Sinop). However, 55 of the participants from whom the data were obtained had previously COVID-19 disease. These students were likely to receive therapy during the time. Therefore, 55 students who had COVID-19 were excluded from the study due to the possibility of distorting the research results. In this direction, the study was carried out with the data obtained from 227 primary school students. Diagnostic information of the participants is presented in Table 1.

| Variables                  | Sub variables | n   | %  |
|----------------------------|---------------|-----|----|
| Gender                     | Female        | 109 | 48.0|
|                            | Male          | 118 | 52.0|
| Age                        | 8             | 94  | 41.4|
|                            | 9             | 81  | 35.7|
|                            | 10            | 52  | 22.9|
| Location                   | City (+100k)  | 97  | 42.2|
|                            | Town (+50k)   | 111 | 48.9|
|                            | Village (+2k) | 19  | 8.4 |
| Vaccination of Parents     | No            | 25  | 11.0|
|                            | Yes           | 202 | 89.0|
| Cases Seen at School       | No            | 108 | 47.6|
|                            | Yes           | 119 | 52.4|
2.2 Measurement

2.2.1 Pandemic Awareness Scale

The Pandemic Awareness Scale developed by Burak (2021) was used to measure the awareness level of primary school students towards COVID-19. The scale is unidimensional and consists of 12 items. Some of the sample items included are “I use a handkerchief or my arm while sneezing” and “I stay away from people who have corona symptoms (cough, fever, etc.)”. A minimum of 12 and a maximum of 48 points can be obtained from the Likert-type scale with 4 categories (Never (1), Sometimes (2), Often (3) and Always (4)). A high score on the scale means high awareness of COVID-19. The Croanbach’s alpha coefficient, which indicates the internal consistency of the scale, was calculated as 0.88. In this study, the alpha coefficient of the scale was found to be 0.83. The total scores obtained from this scale were defined as the mediating variable.

2.2.2 Pandemic Anxiety Scale

The Pandemic Anxiety Scale developed by Burak et al., (2021) was used to measure the anxiety levels of primary school students towards COVID-19. The scale consisted of 11 items in two dimensions as individual and social anxiety. Individual anxiety was measured with 6 items and social anxiety was measured with 5 items. Some of the sample items included are “If I feel a little tired, I think I have corona” and “I do not want to play with my friends in case I am infected with Corona”. A minimum of 11 and a maximum of 44 points could be obtained from the Likert-type scale with 4 categories (Never (1), Sometimes (2), Often (3) and Always (4)). A high score on the scale means high anxiety of COVID-19. The Croanbach’s alpha coefficient, which indicates the internal consistency of the scale, was calculated as 0.88 in the individual anxiety dimension and 0.80 in the social anxiety dimension. In this study, the alpha coefficient of the individual anxiety dimension was calculated as 0.82 and the alpha coefficient of the social anxiety dimension was calculated as 0.78. The total scores obtained in the individual and social anxiety dimensions were defined as external variables.

2.2.3 Pandemic Information Test

A Pandemic Information Test (PIT) was developed to determine primary school students’ knowledge of the COVID-19 disease. In order to determine the outcomes and scope of PIT and to create its items, expert opinions were first consulted (primary school teachers, paediatricians, guidance and psychological counselling service, primary school education, measurement and evaluation). Three outcomes were determined, and items with four options suitable for these outcomes were written. These outcomes are respectively expressed as i) defines the COVID-19 infection, ii) knows the ways of transmission of the COVID-19 virus from person to person, and iii) explains the ways of protection from the transmission of COVID-19. 14 items written following the outcomes were structured according to expert opinions, and it was
decided that the test would consist of 10 items. The item discrimination indexes (rj) of the items in the test range from 0.33 to 0.77, and the item difficulty indexes (pj) range from 0.24 to 0.88. In addition, the mean distinctiveness (r) of the test was calculated as 0.41, and the difficulty (p) was calculated as 0.59. The KR-20 value calculated for the reliability of the test was determined as 0.79. In scoring the test, only one option was accepted as correct according to the item, correct answers were evaluated as “1”, and incorrect answers were evaluated as “0”. The total score obtained from the test was defined as the internal variable.

2.2.4 Information Form

A short information form was used in the study to describe the positive or negative experiences of primary school students and other individuals around them during the COVID-19 process. The form included items with two options (1 = no; 2 = yes) to determine whether the student himself or those around him had COVID-19 infection and the vaccination status of the parents. The data obtained from the form were defined as an external or mediating variable in this study.

2.3 Preliminary Analysis

The hypothesis model in Fig. 1 was created based on the literature and observations. In the model, “Vaccination of Parents”, and “COVID-19 Knowledge” were defined as external variables, while the others were defined as internal variables. It is assumed that two external variables directly affect four internal variables. It was predicted that the external variables “COVID-19 Knowledge” and “Vaccination of Parents” affected the “Individual and Social Anxiety” variable through the “Awareness of COVID-19” and “The Case Seen at School” variables. Path analysis techniques analyzed the hypothesis model.

Before the path analysis, all scores that formed the data set were analyzed in terms of unidirectional and multidirectional extreme values. It was observed that all scores analyzed in terms of one-sided extreme values were ±3 standard deviations from the mean. In addition, scores were checked with Mahalanobis distance (p < .001) in terms of versatile extreme values (Karagöz, 2017). There was no data loss at this phase. The data set was also analyzed using a univariate and multivariate normal distribution. For the univariate normal distribution, each variable’s skewness and kurtosis coefficients were calculated. It was seen that the skewness ranged between 1.27, 2.43, and the kurtosis ranged between 2.86 and 3.41. Kline (2011) states that the skewness and kurtosis coefficients should not exceed these values |3.0| and |10.0|, respectively. Mardia’s normalized multivariate kurtosis coefficient was calculated for the multivariate normality assumption. It was observed that the Mardia coefficient was between −9.46 and 12.31 for the sub-variables, and it was 7.88 for all the variables (multivariate). Karagöz (2017) states that kurtosis values greater than 5, 10 or 20 are critical values for multiple normal distributions. Kline (2011), on the other hand, states that if these values are greater than 20, it is a severe problem for multiple normal distributions. Thus, it can be said that the variables could provide the assumption of univariate and multivariate normality.
The Effect of Risk and Protective Factors on Primary School Students’…

In the path analysis, the hypothesis model in Fig. 1 was tested. The bivariate correlations values of all the variables in the model are given in Table 2. Paths that did not directly affect anxiety were excluded from the model. The standardized path coefficients of the reached research model are given in Fig. 2. The model’s fit was evaluated according to the following criteria: $\chi^2/df \leq 3.00$, root mean square error of approximation (RMSEA) $\leq 0.05$, standard root mean square root (SRMR) $\leq 0.05$, comparative index of fit (CFI) $\geq 0.95$, and Tucker-Lewis index (TLI) $\geq 0.95$ (Browne & Cudeck, 1993; Kline, 2011; Özdamar, 2016). Path analysis was made with Mplus 7 package program. As a result of the analysis, the direct, indirect and total effects of external variables on internal variables were presented in Table 3, and the diagram of the research model reached was given in Fig. 2. Bootstrap 95% confidence intervals computing 1000 samples were used to determine the direct, indirect and total effects of “The Case Seen at School”, “Vaccination of Parents”, “COVID-19 Knowledge”, “Awareness of COVID-19” and on “Individual and Social Anxiety”.

### 3 Results

#### 3.1 Result of Model Fit

The fit index of the hypothetical model is as follows: $\chi^2 (3)=9.85$ and $p=.02$, CFI=0.98, TLI=0.92, RMSEA=0.08, and SRMR=0.04. The fit index of the hypothesis model is within acceptable limits. However, path coefficients were not significant in the hypothesis model. These coefficients were removed from the model, and modifications were made. The fit index of the research model reached after this process is as follows: $\chi^2 (4)=10.01$ and $p=.04$, CFI=0.99, TLI=0.95, RMSEA=0.05, and SRMR=0.04. The fit index of the research model can be regarded as very good. The amounts of external variables in the research model to explain the internal variables of the Cases Seen at School, Awareness, Social Anxiety, and Individual Anxiety are as follows, respectively: 0.03, 0.34, 0.40, 0.39.

### Table 2 Bivariate Correlations, Means, and Standard Deviations among the Observed Variables

| Variables                        | 1   | 2   | 3   | 4   | 5   | 6   | $M$  | $SD$ |
|----------------------------------|-----|-----|-----|-----|-----|-----|------|------|
| 1. Vaccination of Parents        | --  | 1.89| 0.31|     |     |     |      |      |
| 2. The Cases Seen at School      | -0.16*| --  |     |     |     |     | 1.52 | 0.50 |
| 3. COVID-19 Knowledge            | 0.44*| -0.21*| --  |     |     |     | 8.18 | 1.44 |
| 4. Awareness of COVID-19         | 0.36*| -0.16*| -0.58*| --  |     |     | 36.00| 4.00 |
| 5. Social Anxiety                | -0.41*| 0.33*| -0.45*| -0.47*| --  |     | 10.62| 3.13 |
| 6. Individual Anxiety            | -0.29*| 0.44*| -0.50*| -0.48*| 0.63*| --  | 12.63| 4.30 |

*p < .05
3.2 Result of the Total, Direct and Indirect Effects of Social and Individual Anxiety

3.2.1 The Cases Seen at School

The cases seen at school has significant effects on social anxiety ($\beta = 0.22$, 95% CI [0.12, 0.33], $p < .001$) and individual anxiety ($\beta = 0.34$, 95% CI [0.23, 0.44], $p < .001$). Therefore, cases seen at school has a direct positive effect on social anxiety ($\beta = 0.22$, 95% CI [0.12, 0.33]) and individual anxiety ($\beta = 0.34$, 95% CI [0.23, 0.44]).

3.2.2 Vaccination of Parents

Vaccination of parents has significant effects on cases seen at school ($\beta = -0.17**$, 95% CI [-0.05, -0.28], $p < .05$) and social anxiety ($\beta = -0.20$, 95% CI [-0.06, -0.35], $p < .05$). It also has an effect on individual anxiety as predicted in the hypothesis model ($\beta = -0.03$). However, this effect is not significant. Vaccination of parents indirectly effects social anxiety ($\beta = -0.04$, 95% CI, [-0.01, -0.07], $p < .05$) and individual anxiety ($\beta = -0.06$, 95% CI [-0.01, -0.10], $p < .05$) through the cases seen at school. The cases seen at school mediates the vaccination of parents. Thus, vaccination of parents has a direct ($\beta = -0.20$, 95% CI [-0.06, -0.35]), indirect ($\beta = -0.04$, 95% CI, [-0.01, -0.07]) and total ($\beta = -0.24$, 95 CI, [-0.10, -0.38]) effects on social

| Table 3 | The Sizes and 95% Confidence Intervals of Total, Direct and Indirect Effects of Exogenous Variables to Endogenous Variables in the Accepted Path Model |
|---------|--------------------------------------------------------------------------------------------------|
| **Endogenous Variables** | **Effect** | **ExogeneousVariables** | **The Cases Seen at School** | **Awareness of COVID-19** | **Social Anxiety** | **Individual Anxiety** |
| The Cases Seen at School | Direct | -- | -- | 0.22* [0.12, 0.33] | 0.34* [0.23, 0.44] |
| Indirect | -- | -- | 0.22* [0.12, 0.33] | 0.34* [0.23, 0.44] |
| Total | -- | -- | -- | -- |
| Vaccination of Parents | Direct | -0.17** | -- | -0.20* [-0.06, -0.35] | -0.03 |
| Indirect | -- | -- | -0.04** [-0.01, -0.07] | -0.06** [-0.01, -0.10] |
| Total | -0.17** | -- | -0.24* [-0.10, -0.38] | -0.06** [-0.01, -0.10] |
| COVID-19 Knowledge | Direct | -- | 0.58* [0.49, 0.68] | -0.17** [-0.03, -0.31] | -0.29** [-0.15, -0.42] |
| Indirect | -- | -- | -0.16** [-0.07, -0.25] | -0.15** [-0.06, -0.23] |
| Total | -- | 0.58* [0.49, 0.68] | -0.33** [-0.20, -0.44] | -0.44** [-0.34, -0.53] |
| Awareness of COVID-19 | Direct | -- | -- | -0.21* [-0.11, -0.31] | -0.27* [-0.13, -0.41] |
| Indirect | -- | -- | -- |
| Total | -- | -- | -0.21* [-0.11, -0.31] | -0.27* [-0.13, -0.41] |

* $p < .001$ ** $p < .05$
anxiety, it has an indirect ($\beta = -0.06$, 95% CI $[-0.01, -0.10]$) negative effect on individual anxiety.

### 3.2.3 COVID-19 Knowledge

COVID-19 knowledge has significant effect on awareness of COVID-19 ($\beta = 0.58$, 95% CI $[0.49, 0.68]$, $p < .001$), social anxiety ($\beta = -0.17$, 95% CI $[-0.03, -0.31]$, $p < .05$) and individual anxiety ($\beta = -0.29$, 95% CI $[-0.15, -0.42]$, $p < .001$). COVID-19 knowledge indirectly effects social anxiety ($\beta = -0.16$, 95% CI $[-0.07, -0.25]$, $p < .001$) and individual anxiety ($\beta = -0.15$, 95% CI $[-0.06, -0.23]$, $p < .001$) through awareness of COVID-19. Awareness of COVID-19 mediates the level of COVID-19 knowledge. Thus, COVID-19 knowledge has direct ($\beta = -0.17$, 95% CI $[-0.31]$, indirect ($\beta = -0.16$, 95% CI $[-0.07, -0.25]$) and total ($\beta = -0.33$, 95 CI, $[-0.20, -0.44]$, $p < .001$) effects on social anxiety, and it has direct ($\beta = -0.29$, 95% CI $[-0.15, -0.42]$), indirect ($\beta = -0.16$, 95% CI $[-0.07, -0.25]$) and total ($\beta = -0.44$, 95 CI, $[-0.34, -0.53]$, $p < .001$) negative effects on individual anxiety.
3.2.4 Awareness of COVID-19

Awareness of COVID-19 has a significant effect on social anxiety ($\beta = -0.21$, 95% CI $[-0.11, -0.31]$, $p < .001$), and individual anxiety ($\beta = -0.27$, 95% CI $[-0.13, -0.41]$, $p < .001$). Therefore, awareness has a direct negative effect on social anxiety ($\beta = -0.21$, 95% CI $[-0.11, -0.31]$ and individual anxiety ($\beta = -0.27$, 95% CI $[-0.13, -0.41]$).

4 Discussion

In this study, it was investigated to what extent the cases seen at primary school students’ school, vaccination of their parents, their knowledge and awareness of COVID-19 directly and indirectly explained their individual and social anxiety towards COVID-19. Therefore, the risk and protective factors for COVID-19 anxiety experienced by primary school students individually and socially were tried to be revealed. According to the model reached in the study, the case seen at school, knowledge of COVID-19 and awareness of COVID-19 directly and significantly predicted primary school students’ individual and social COVID-19 anxiety. Vaccination of parents, on the other hand, directly significantly predicted social COVID-19 anxiety of primary school students, but did not significantly predict individual COVID-19 anxiety. In addition, the case seen at school mediated significantly between vaccination of parents and individual and social COVID-19 anxiety, and awareness of COVID-19 mediated significantly between knowledge of COVID-19 and individual and social COVID-19 anxiety. Therefore, the proposed hypothesis model was generally confirmed and the accepted research model was reached.

According to the results, the cases seen at school increases individual COVID-19 anxiety of primary school students. This result confirms previous studies in terms of results (Baloran, 2020; Cao et al., 2020; Liv et al., 2020), and differs in terms of sample and context. In a study conducted in the Southern Philippines, it was found that 27% of university students had anxiety about contacting someone infected with COVID-19 and 52% of them had anxiety about getting sick individually (Baloran, 2020). In another study conducted in China, it was revealed that the presence of an infected person in the immediate environment of individuals (home, etc.) was an important factor causing anxiety (Cao et al., 2020). Therefore, it is seen that being in the same environment with infected individuals causes intense anxiety for primary school students. On the other hand, in some studies conducted before the opening of schools, it was reported that primary school students experienced intense anxiety (Aydın, 2021; Garcia de Avila et al., 2020). In these studies, the anxiety causes of primary school students were mostly associated with social isolation processes such as staying away from school and friends and the necessity of being at home all the time. In this study, individual COVID-19 anxiety was mostly associated with the thought and indicators of contracting the disease. It can be said that the cases in primary school students’ schools affect individual COVID-19 anxiety in relation to the fear of getting sick. In some studies with adults, it was seen that there was a strong relationship between fear of contracting COVID-19 and anxiety (Harper et
al., 2020; Mertens et al., 2020; Yalçın, 2020). Therefore, it can be thought that fears of COVID-19 may be a mediating variable between the cases seen at school and individual COVID-19 anxiety. In addition, according to the results of the study, the cases seen at school of primary school students also increases social COVID-19 anxiety. Similarly, in previous studies, it was reported that the presence of a case in the immediate environment had an effect on social COVID-19 anxiety (Karaman, 2020; Yalçın, 2020). Therefore, primary school students, like university students (Yalçın, 2020) and adults (Karaman, 2020), also experience social COVID-19 anxiety due to the presence of infected people around them. In this study and other studies (Karaman, 2020; Yalçın, 2020), social COVID-19 anxiety is defined as carrying the disease to others. Therefore, the cases seen at school caused primary school students to worry about the risk of carrying the disease to their families. Baloran (2020) stated in his study that 52% of university students were concerned about the health of their family members due to COVID-19. In another study, it was reported that 54% of primary school students in Turkey were concerned about the health of their family members (Üstündağ, 2021). It can be said that primary school students are concerned about the health of their family members and at this point, they have the thought that they can make them sick with their carrier role.

The cases at school are an important risk factor that increases social and individual COVID-19 anxieties of primary school students, according to the study results. In previous different modeling studies on COVID-19 anxiety, it was revealed that anxiety significantly predicted longer-term mental problems such as hopelessness (Kasapoğlu, 2022) and depression (Çıkırcı et al., 2022; Karakoş, 2022). Childhood is one of the critical periods in development and perhaps the most important one. Intense anxiety experienced during this period also negatively affects future lives (Courtney et al., 2020). Therefore, primary school students are going through a critical period in terms of academic, social and psychological development. The fact that these students have long-term anxiety for the health of both themselves and their families can also cause important mental problems such as hopelessness and depression. It is thought that it is important to apply measures to calm the individual and social COVID-19 anxiety, which increases with the occurrence of cases at school. Especially primary school teachers and school psychological counselors should play an active role in case of a COVID-19 case, they need to take action and measures that will reduce the anxiety of the students. Because, in case of a case seen at school, face-to-face education is interrupted in the classrooms where the case is seen, the transition to the distance education process is made and the students experience the compulsory social isolation process at home. Some previous studies pointed out that the compulsory social isolation process was an application that triggered the anxiety of COVID-19 in adults (Robb et al., 2020; Sieg mund et al., 2021) and primary school students (Üstündağ, 2021). Therefore, the case seen at school can be defined as a risk factor that triggers the individual and social COVID-19 anxiety of primary school students in relation to the compulsory social isolation process experienced after this situation. In addition, the negative situations experienced during the social isolation process may also be a risk in terms of returning to school after isolation. Despite this risk factor, it is stated that the practices that reduce the anxiety of COVID-19 are that teachers and school psychological counselors make interviews with their stu-
udents during the compulsory social isolation process, inform them by counseling and are open to communication with them (Asıcı, 2020). In this context, primary school teachers’ designing and implementing activities related not only to academic but also to social and psychological processes, following the process, and being open to communication and interaction by the school psychological counselor, may contribute to primary school students to overcome this process with the least damage. It can also make it easier to return to school after compulsory isolation.

At the time this study data was obtained, 90.5% of adults aged 18 years and older in Turkey were vaccinated with a single dose and 81.3% were vaccinated with two doses of COVID-19 vaccine (Ministry of Health, 2022). As in most countries, primary school students in Turkey were not vaccinated against COVID-19 infection because they were under the age of 12 (Dayan, 2021). According to the results of the study, vaccination of parents reduces primary school students’ social COVID-19 anxiety directly. In some studies conducted after the COVID-19 vaccine, it was seen that vaccination provided emotional relief in adults (Karayürek et al., 2021; Nguyen, 2021). Therefore, COVID-19 vaccines reduce the anxiety of adults and also reduce the anxiety of primary school students. On the other hand, contrary to the hypothesis model proposed in the research model, vaccination of parents did not directly predict the individual COVID-19 anxiety of primary school students. However, it directly and significantly predicted social COVID-19 anxiety. In a study conducted before the opening of schools, it was revealed that 17% of primary school students in Turkey experienced COVID-19 anxiety for their own health and 54% of them had anxiety for the health of their family members (Üstündağ, 2021). Therefore, it can be thought that primary school students are more anxious about the health of their parents and that they regard vaccination more beneficial for their parents’ health than theirs. These results of the study also indicate that primary school students’ anxiety about their parents’ health decreased compared to the past. At this point, it is thought that the attitude towards COVID-19 vaccines is important. Previous studies also state that primary school students’ attitudes towards vaccination are related to parents’ attitudes (Tanrıkuşlu & Tanrıkuşlu, 2021). The vast majority of adults in Turkey had COVID-19 vaccine. This situation shows that the society’s attitude towards the COVID-19 vaccine is generally positive, and primary school students also have a positive attitude towards the vaccine. Cases at school mediated between vaccination of parents and individual and social COVID-19 anxiety. It is known that COVID-19 vaccines protect against infections in adults (Knoll & Wonodi, 2021; Mahase, 2020), and it is stated that they have a preventive and protective effect on the spread of the disease (Dayan, 2021). Therefore, according to the results of the study, vaccination of parents directly reduces the probability of cases seen at schools. It also indirectly contributes to the reduction of individual and social COVID-19 anxiety. In some previous studies, it was reported that the general public had a positive attitude towards the COVID-19 vaccine, and that some adults were hesitant about the vaccine (İlke-Yılmaz et al., 2021; Sallam, 2021; Troiano & Nardi, 2021). In these studies, it was stated that distrust of COVID-19 vaccines caused vaccine hesitations. The current study also reveals that vaccinating parents is important for the emotional and physical health of primary school students. Therefore, in order to encourage parents who
are hesitant about vaccination, the importance of vaccination for the mental health of primary school students, who are a disadvantaged group, can be emphasized. According to the results, knowledge of COVID-19 reduces primary school students’ individual and social COVID-19 concerns directly and indirectly through awareness. Although the context is different, previous studies showed that adults with sufficient knowledge about contagious diseases in general (de Zwart et al., 2009) and COVID-19 in particular had less anxiety (Yıldırım et al., 2020) and it was found that having knowledge reduced anxiety (Wang et al., 2020; Zhou et al., 2020). On the other hand, in different studies modeling the COVID-19 anxiety of adults, it was found that knowledge of COVID-19 directly reduced anxiety (Lee et al., 2020) and positively affected awareness in the context of protective behaviors (Ampofo & Aidoo, 2022; Lee et al., 2020; Li et al., 2022). Therefore, the results of this study confirm previous studies in terms of results and differ in terms of sample and context. Therefore, it is seen that knowledge of COVID-19 is a factor that reduces anxiety and affects awareness in the context of protective behaviors for primary school students as well as in adult life. In this study, correct and valid information such as the recognition of COVID-19 by primary school students and their knowledge of transmission and prevention methods were emphasized. In previous studies, it was reported that adults who had incorrect or incomplete information about COVID-19 experienced higher anxiety (Hamilton et al., 2020; Sharma et al., 2020). Therefore, the result in this study revealed the importance of having accurate information about COVID-19 for primary school students. Schools and teachers have important duties in providing primary school students. Access to the correct information about COVID-19 and to reduce their COVID-19 anxieties through correct information. In this context, school administrators can provide environments that will inform students and even parents correctly about COVID-19. Support from health professionals can also be obtained after a needs analysis at school. Similarly, primary school teachers’ detecting their students’ misinformation about COVID-19 and organizing activities that will provide accurate information can reduce students’ anxiety. In addition, in the context of awareness, masks can make it easier for them to behave in accordance with the rules of distance and cleaning. According to the results, awareness of COVID-19 directly reduces the individual and social COVID-19 anxiety of primary school students. Previous studies revealed that awareness of COVID-19 reduced the anxiety of adults (Zhou et al., 2020) and primary school students (Xue et al., 2020). In some studies modeling the anxiety of COVID-19 in adults, it was found that awareness directly reduced anxiety in the context of protective behaviors (Ampofo & Aidoo, 2022; Lee et al., 2020; Li et al., 2022). Therefore, results of this study confirm previous studies. In this context, it is seen that primary school students’ awareness of COVID-19 is a protective factor that reduces their anxiety. In this study, awareness of COVID-19 is defined as acting in accordance with behaviors that protect both oneself and other individuals from disease (e.g. wearing a mask, washing hands, avoiding sick people or staying away from other people in case of illness) (Burak, 2021). It is stated in different studies that awareness in the context of protective behaviors is a very important factor in order to be protected from COVID-19 individually and socially, and to avoid possible health
and mental problems (Asıcı, 2020; Chen et al., 2020). Therefore, with the opening of schools, it became very important to raise awareness of primary school students, to provide environments where they can display their awareness and even to be a role model for them within the scope of protective behaviors. In this context, school administrators and teachers have different duties. It is necessary for the administrators to provide the necessary materials and environment in order for primary school students to show awareness in their schools. For example, it can be ensured that protective tools such as cleaning materials, disinfectants and masks are complete and sufficient in schools, and environments in accordance with social distance rules can be prepared in common areas (dining hall, gymnasium, library, etc.). These measures can contribute to the reduction of COVID-19 anxiety of primary school students who want to show awareness. In addition, students with awareness can be a role model for those who do not. Providing an environment and opportunities that will support the awareness of students in the context of protective behaviors (mask, distance, cleaning) by primary school teachers can also help reduce students’ anxiety about COVID-19. For example, practices such as providing materials that primary school students can use for hand cleaning (cologne, disinfectant, etc.), ensuring the ventilation of the classroom, not being forced by students to overcome social distance in activities and classes can increase awareness. However, it should not be forgotten that going too far in trying to raise awareness may cause primary school students to experience stress, anxiety and fear in different ways (Asıcı, 2020). Therefore, classroom teachers’ creating an extraordinary situation may cause negative effects on the COVID-19 concerns of primary school students. For this reason, it is necessary to present the activities and practices as a normal situation, to explain them as a necessity of daily life and to realize them by gaining positive attitudes.

5 Limitations and Suggestions

This study is important in terms of conducting time and its results. However, the interpretability and generalizability of the results of the study have some limitations. First of all, primary school students between the ages of 8–12 were selected, taking into account the process of obtaining data from children under the age of 12, which is the focus of the study. Therefore, the results can be partially generalized to primary school students studying in second grade and above. Secondly, the present study has a cross-sectional character. Therefore, causal relationships cannot be established in the model reached, since no interpretation can be made about the temporal change of the variables used in the study. For example, in the context of protective behaviors, high awareness may contribute to individual or social COVID-19 anxiety, while low COVID-19 knowledge may create higher individual and social COVID-19 anxiety. For this reason, alternative models and longitudinal studies can be done in future studies in order to establish causal relationships in the research model. Thirdly, although the current study explains a significant portion of the variances of primary school students’ COVID-19 anxieties (approximately 40%), the amount of unexplained variance requires further investigation of risk and protective factors. Fourthly, even if similar problems were experienced all over the world during
the COVID-19 process, an emotional feature such as anxiety is open to being affected by cultural elements. In this context, the study includes primary school students in Turkey. Similar models in this study can be tested in different cultures. Fifthly, there is no information about the COVID-19 anxieties of the primary school students who formed the sample before the schools opened. For this reason, some special situations (e.g. hospitalization, loss of family members, chronic illness, etc.) have the risk of bias. According to the results obtained in the study, the following academic and practical suggestions can be made.

- The relationship between fear of COVID-19 and the compulsory social isolation process, which may be a risk factor for primary school students’ anxieties about COVID-19, can be analyzed with alternative models in future studies.
- Studies related to depression and hopelessness can be conducted to determine whether COVID-19 anxiety causes damage to the mental health of primary school students.
- Before a possible vaccination study, the COVID-19 vaccination attitudes of primary school students and the factors affecting these attitudes can be investigated.
- In case of cases at schools, students can be provided with psychological support during the compulsory social isolation process.
- Screening studies can be conducted in schools to determine the level of COVID-19 knowledge and awareness of primary school students. According to the results of the research, support can be provided to schools in need.
- Tools can be prepared for primary school students to gain accurate knowledge of COVID-19 for use in schools (animation, video, game, etc.). Environments which are sensitive to the awareness of primary school students can be prepared in schools and classrooms (social distance, hygiene materials, etc.).

6 Conclusion

The study results show that after the opening of schools, primary school students experience COVID-19 anxiety individually and socially. Vaccination of parents and having knowledge and awareness about COVID-19 are protective factors in the anxiety experienced. In addition, the parents’ vaccination partially contributes to the protection of the student from COVID-19. In this context, the importance of the vaccination process is seen in terms of individual health and related to social responsibility. In addition, knowing COVID-19 is beneficial for primary school students to provide emotional relief and adopt protective behaviours such as awareness.

On the other hand, the cases seen at school and having COVID-19 are risk factors for students’ anxiety. Considering the social and physical structure of the school and the contagious power of the disease, cases seen at school are a threat to primary school students. This study empirically showed the reality of this risk. As a result, the risk factors that trigger the COVID-19 anxiety of primary school students seem strong enough to affect students in the short and long term negatively. This risk can create adverse effects in terms of physical and emotional health and academic dimen-
sions such as success and making the most of education. Many academic outcomes in primary school deeply affect future life and teaching. For this reason, it is crucial to use protective factors revealed in this study immediately and minimize the risk factors.

**Declarations**

**Disclosure of Potential Conflicts of Interest** The author declares that he has no conflict of interest.

**Research involving Human Participants.**
The ethical permission of this study was obtained from the Research Ethics Committee of Kilis 7 Aralik University. All ethical procedures of confidentiality, anonymity, and informed consent were followed. Participants were involved in the study during their leisure time and with the consent of the parents.

**Informed Consent** Informed consent was obtained from all individual participants and parents in the study. The data collection was carried out in accordance with the ethical standards set out in the Ministry of National Education and, Kilis 7 Aralik University in Turkey.

**References**

Akanca, N. (2021). Salgın sürecinde erken çocukluk eğitimi [Early childhood education during the pandemic]. A. Çoruk (Ed.), COVID-19 salgının Türk eğitim sisteminde yansımları [Reflections of the COVID-19 pandemic on the Turkish education system] in (pp. 15–27). Pegem.

Akcılar, H. E., Güneş, G., & Çöl, M. (2020). Evaluation of awareness, attitudes and behaviors related to COVID-19 pandemic in society. ESTÜDAM Halk Sağlığı Dergisi, 5, 1–16.

Ampofo, R. T., & Aidoo, E. N. (2022). Structural equation modelling of COVID-19 knowledge and attitude as determinants of preventive practices among university students in Ghana. Scientific African, 16(2022). https://doi.org/10.1016/j.sciaf.2022.e01182

Arpaci, I. (2021). Relationships between early maladaptive schemas and smartphone addiction: The moderating role of mindfulness. International Journal of Mental Health and Addiction, 19(3), 778–792. https://doi.org/10.1007/s11469-019-00186-y

Arpaci, I., Seong, M., & Karataş, K. (2021). Pandemic awareness scale (PAS): Evidence of validity and reliability in a Turkish sample during the COVID-19 pandemic. Trends in Psychol, 30,316-327. https://doi.org/10.1007/s43076-021-00113-y

Arslan, G., Yıldırım, M., & Wong, T. P. (2020). Meaningful living, resilience, affective balance, and psychological health problems during COVID-19. PsyArxiv. https://doi.org/10.31234/osf.io/wsr3e

Ascı, E. (2020). Effects of the pandemic on mental health. TYB Akademi Dil Edebiyat ve Sosyal Bilimler Dergisi, 30, 123–142.

Asmundson, G. J. G., & Taylor, S. (2020). How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. Journal of Anxiety Disorders, 71, 102211. https://doi.org/10.1016/j.janxdis.2020.102211

Avan, H., Koç, E. T., & Vural, B. (2021). Determining the anxiety levels of parents whose children will start school in the epidemic process: The example of 6–12 years old. J Health Pro Res, 3(2), 65–74.

Aydın, O. (2021). Effects of COVID-19 pandemic on children. Temel Eğitim Araştırmaları Dergisi, 1(2), 163–195. https://doi.org/10.29228/tead.11

Baloran, E. T. (2020). Knowledge, attitudes, anxiety, and coping strategies of students during COVID-19 pandemic. Journal of Loss and Trauma, 25(8), 635–642. https://doi.org/10.1080/15325024.2020.1769300

Bilgin, O. (2020). Development of coronavirus (Covid-19) awareness scale: Validity and reliability study. Turkish Studies, 15(6), 237–245. https://doi.org/10.7827/TurkishStudies.44168

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.), Testing structural equation models (pp. 136–162). Sage.
Bübül, B., & Hacmustafaoğlu, M. (2020). The impact of the opening of the schools on COVID-19 epidemiology. *Clinical Clues*, 14(4), 257–260.

Burak, D. (2021). Psychometric properties of pandemic awareness scale for students aged 8–12: Case of COVID-19. Manuscript under review.

Burak, D., Karaman, M. A., & Javier, C. V. (2021). Psychometric properties of pandemic anxiety scale for students aged 8–12: Case of COVID-19. Manuscript under review.

 Büyükböse, T., & Dikbaş, T. (2021). COVID-19 awareness scale development study. *Abant Sosyal Bilimler Dergisi*, 21(2), 21–40. https://doi.org/10.11616/basbed.vi.858037

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, 287. https://doi.org/10.1016/j.psychres.2020.112934

Ceylan, Ş., Mertoğlu, S., & Tertemiz, İ. H. (2021). Characteristics of COVID-19 contacts and conversion rates to positive cases. *Türk Aile Hek Derg*, 25(4), 128–136. https://doi.org/10.54308/tahd.2021.22931

Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., & Han, Y. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. *The Lancet*, 395(10223), 507–513. https://doi.org/10.1016/S0140-6736(20)30211-7

Çiçekçi, Ö., Çiçekçi, N., & Griffiths, M. (2022). Fear of COVID-19, stress and depression: A meta-analytic test of the mediating role of anxiety. *Psychol Psychother*, 7(10), https://doi.org/10.1111/papt.12406

Çiçek, Ş., & Pekdemir, Ü. (2020). An analysis on sleep habits and generalized anxiety levels of individuals during COVID-19 pandemic. *Journal of Family Counseling and Education*, 5(1), 60–73.

Courtney, D., Watson, P., Battaglia, M., Mulsant, B. H., & Szatmari, P. (2020). COVID-19 impacts on child and youth anxiety and depression: Challenges and opportunities. *The Canadian Journal of Psychiatry*, 65(10), 688–691. https://doi.org/10.1177/0706743720935464

Cui, Y., Li, Y., & Zheng, Y. (2020). Mental health services for children in China during the COVID-19 pandemic: Results of an expert-based national survey among child and adolescent psychiatric hospitals. *Eur. Child Adolesc. Psychiatry*, 29(2020), 743–748. https://doi.org/10.1007/s00787-020-01548-x

Das, D., Shenoy, R., Mukherjee, M., Unnikrishnan, B., & Rungta, N. (2020). Awareness among undergraduate students of Mangalore city regarding novel coronavirus (COVID-19): A questionnaire study. *Brief Report*, 15(1), 1–4.

Dayan, S. (2021). COVID-19 ve aşş [COVID-19 and vaccine]. *Dicle Med J*, 48, 98–113. https://doi.org/10.5798/dicletip.1005040

de Zwart, O., Veldhuijzen, I. K., Elam, G., Aro, A. R., Abraham, T., Bishop, G. D., Voeten, H. A. C. M., Richardus, J. H., & Brug, J. (2009). Perceived threat, risk perception, and efficacy beliefs related to SARS and other (emerging) infectious diseases: Results of an international survey. *International Journal of Behavioral Medicine*, 16(1), 30–40. https://doi.org/10.1007/s12529008-9008-2

Figueiredo, C. S., Sandre, P. C., Portugal, L. C. L., de-Oliveira, T. M., Silva Chagas, L., Raony, et al. (2021). COVID-19 pandemic impact on children and adolescents’ mental health: Biological, environmental, and social factors. *Progress in Neuropsychopharmacology & Biological Psychiatry*, 106, 1–8.

Garcia de Avila, M. A., Hamamoto Filho, P. T., Jacob, F. L., Alcantara, L. R. S., Berghammer, M., Jenholt Nolbris, M., Olaya-Contreras, P., & Nilsson, S. (2020). Children’s anxiety and factors related to the COVID-19 pandemic: An exploratory study using the children’s anxiety questionnaire and the numerical rating scale. *International Journal of Environmental Research and Public Health*, 17(16), 5757. https://doi.org/10.3390/ijerph17165757

Goodwin, R., Gaines, S. O. Jr., Myers, L., & Neto, F. (2011). Initial psychological responses to swine flu. *International Journal Of Behavioral Medicine*, 18(2), 88–92. https://doi.org/10.1007/s12529-010-9083-z

Hamilton, J. L., Nesi, L., & Choukas-Bradley, S. (2020). Teens and social media during the COVID-19 pandemic: Staying socially connected while physically distant. https://doi.org/10.31234/osf.io/5tx4

Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-020-00281-5

Hopman, P., & Rijken, M. (2015). Illness perceptions of cancer patients: Relationships with illness characteristics and coping. *Psycho-Oncology*, 24(1), 11–18. https://doi.org/10.1002/pon.3591

İlke-Yılmaz, H., Turğut, B., Çitlak, G., Mert, O., Parali, B., Engin, M., Aktaş, A., & Alimoğlu, O. (2021). People's view of COVID-19 vaccine in turkey. *Dicle Med J*, 48(3), 583–594.
Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus. Journal of Anxiety Disorders, 13, 312–329.

May, R. (1977). The meaning of anxiety. Norton.

McEachan, R., Taylor, N., Harrison, R., Lawton, R., Gardner, P., & Conner, M. (2016). Meta-analysis of the reasoned action approach (RAA) to understanding health behaviors. Annals of Behavioral Medicine, 50, 592–612.

Mertens, G., Gerritsen, L., Duinjdam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. Journal of Anxiety Disorders, 18, 102253.

Nguyen, M. (2021). The psychological benefits of COVID-19 vaccination. Advances in Public Health, 2021, 557891.

Özdamar, K. (2016). Eğitim, sağlık ve davranış bilimlerinde çok ve test geliştirme yapışsal eşitlik modellemesi: IBM SPSS, IBM SPSS AMOS ve MINITAB uygulamalı [Scale and test development structural equation modeling in education, health and behavioral sciences: IBM SPSS, IBM SPSS AMOS and MINITAB applied]. Nisan.

Perez-Arce, F., Angrisani, M., Bennett, D., Darling, J., Kapteyn, A., & Thomas, K. (2021). COVID-19 vaccines and mental distress. Plos One, 16(9), https://doi.org/10.1371/journal.pone.0256406
The Effect of Risk and Protective Factors on Primary School Students’…

Ravens Sieberer, U., Kaman, A., Erhart, M., Devine, J., Schlack, R., & Otto, C. (2022). Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. *European Child And Adolescent Psychiatry, 31*(6), 879–889. https://doi.org/10.1007/s00787-021-01726-5

Robb, C. E., de Jager, C. A., Ahmadi-Abhari, S., Udeh-Momoh, G. P., McKeand, C., Price, J., G., et al. (2020). Associations of social isolation with anxiety and depression during the early COVID-19 pandemic: A survey of older adults in London, UK. *Frontiers In Psychiatry, 11*, 591120. https://doi.org/10.3389/fpsyt.2020.591120

Rubin, G. J., & Wessely, S. (2020). The psychological effects of quarantining a city. *Bmj*, 368, https://doi.org/10.1136/bmj.m313

Sallam, M. (2021). COVID-19 vaccine hesitancy worldwide: A concise systematic review of vaccine acceptance Rates. *Vaccines, 9*, 160. https://doi.org/10.3390/vaccines9020160

Sharma, V ., Reina Ortiz, M., & Sharma, N. (2020). Risk and protective factors for adolescent and young adult mental health within the context of COVID-19: A perspective from Nepal. *J. Adolesc. Health, 67*(2020), 135–137. https://doi.org/10.1016/j.jadohealth.2020.04.006

Siegmund, L. A., Distelhorst, K. S., Bena, J. F., & Morrison, S. L. (2021). Relationships between physical activity, social isolation, and depression among older adults during COVID-19: A path analysis. *Geriatric Nursing (New York, N.Y.), 42*(5), 1240–1244. https://doi.org/10.1016/j.gerinurse.2021.08.012

Tanrıkuş, Y ., & Tanrıkuş, G. (2021). Vaccine hesits and parents attitudes. *Balıkesir Sağlık Bilimleri Dergisi, 10*(2), 199–204. https://doi.org/10.53424/balisokesird.777829

Troiano, G., & Nardi, A. (2021). Vaccine hesitancy in the era of COVID-19. *Public health, 194*, 245–251. https://doi.org/10.1016/j.puhe.2021.02.025

Üstündağlı, A. (2021). Investigation of the effect of COVID-19 quarantine on children’s daily life and habits. *Ankara Üniversitesi Sosyal Bilimler Dergisi, 12*(2), 14–22.

Wang, R., Pan, X., Wan, Y., Tan, L., Xu, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int. J. Environ. Res. Publ. Health, 17*(2020), 17–29. https://doi.org/10.3390/ijerph17051729

Xue, Q., Xie, X., Liu, Q., Zhou, Y ., Zhu, K., & Wu, H. (2021). Knowledge, attitudes, and practices towards COVID-19 among primary school students in Hubei Province, China. *Children and Youth Services Review, 120*, 1–6. https://doi.org/10.1016/j.childyouth.2020.105735

Yalçın, İ. (2020). Moderator roles of protective and risk factors in the relationship between COVID-19 fear and mental health variables. https://dspace.ankara.edu.tr/xmlui/handle/20.500.12575/72777

Yıldırım, M., & Guler, A. (2020). COVID-19 severity, self-efficacy, knowledge, preventive behaviors, and mental health in Turkey. *Death Studies. https://doi.org/10.1080/07481187.2020.1793434

Yıldırım, M., Gecer, E., & Akgul, O. (2020). The impacts of vulnerability, perceived risk, and fear on preventibe behaviours against COVID-19. *Psychology Health & Medicine, 1–9*. https://doi.org/10.1080/13548506.2020.1776891

Yurttaş, A., & Kesik, F. (2022). The paradox that COVID-19 pandemic has created: Should the schools be reopened or closed? *Milli Eğitim, 233*, 373–398. https://doi.org/10.37669/milliegitim.787806

Zhou, S. J., Zhang, L. G., Wang, L. L., Guo, Z. C., Wang, J. Q., Chen, J. C., Liu, M., Chen, X., & Chen, J. (2020). Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19, Eur. *Child Adolesc. Psychiatr, 29*(2020), 749–758. https://doi.org/10.1007/s00787-020-01541-4

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.