

Anxiety in Children and Adolescents in the Covid-19 Pandemic: A Systematic Review

Covid-19 Salgınında Çocuk ve Ergenlerde Anksiyete: Sistematik Derleme

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ABSTRACT

The aim of this study was; to define the anxiety and anxiety-related factors experienced by children/adolescents during the Covid-19 pandemic on a global scale. Study data were collected between 15.04.2021 and 30.04.2021 by using keywords (child, children, adolescents, adolescents, mental health, anxiety, anxiety and stress) in Turkish and English. The data sources of this study are PubMed, Web of Science, and Google Scholar. As a result of the evaluations, a total of n=6185 articles were reached from all databases. After the evaluation of the full texts, the study was completed with n=31 articles. Eleven of the articles evaluated in this study were published in China. The anxiety prevalence of children and adolescents varies between 1.84-45.0%. As a result of the evaluated studies; It has been observed that women, those with chronic-psychiatric diseases, those who are older, separated from family members, migrant children and adolescents are more likely to experience anxiety. Some of the anxiety symptoms of children and adolescents are nervousness, irritability, anxiety, and suicidal ideation. In conclusion, anxiety levels and anxiety-related factors of children and adolescents living in various countries of the world during the Covid-19 pandemic were determined.

Keywords: Covid-19, child, adolescent, anxiety

ÖZ

Bu çalışmada amaç; Covid-19 pandemisi sürecinde çocuk/ergenlerin deneyimlediği anksiyete ve anksiyeteyle ilişkili faktörleri küresel boyutta tanımlamaktır. Çalışma verileri 15.04.2021 ve 30.04.2021 tarihleri arasında, anahtar kelimeler (çocuk, çocuklar, ergen, ergenler, adolesanlar, akl sağlığı, anksiyete, kaygı ve stres/ child, children, adolescent, adolescents, adolescents, mental health, anxiety, anxiety and stress) Türkçe ve İngilizce kullanılarak toplanmıştır. Bu çalışmanın veri kaynakları; PubMed, Web of Science, ve Google Akademiktir. Değerlendirmeler sonucunda tüm veri tabanlarından toplam n=6185 makaleye ulaşılmıştır. Tam metinlerin değerlendirilmesinin ardından n=31 makale ile çalışma tamamlanmıştır. Bu çalışmada değerlendirilen makalelerin n=11'i Çin'de yayınlanmıştır. Çocuk ve ergenlerin anksiyete preveransları %1,84-45,0 arasında değişmektedir. Değerlendirilen çalışmalar sonucunda; kadınların, kronik-psikiyatrik hastalığı bulunanların, büyük yaşıta olan, aile üyelerinden ayrı kalan, göçmen çocuk ve ergenlerin anksiyete yaşama ihtimallerinin yüksek olduğu görülmüştür. Çocuk ve ergenlerin anksiyete semptomlarının bazıları, gerginlik, sınırlılık, endişe ve intihar düşünceleridir. Bu derleme çalışması sonucunda, Covid-19 pandemisi sürecinde dünyanın çeşitli ülkelerinde yaşayan, çocuk-ergenlerin anksiyete düzeyleri ve anksiyete ile ilişkili faktörler belirlenmiştir.

Anahtar sözcükler: Covid-19, çocuk, ergen, anksiyete

Introduction

Coronavirus disease (Covid-19), which results in a severe disease process or death in adult and elderly individuals, has affected the world since 2019 (Tokur et al. 2021, WHO 2022). The interesting thing about the disease is that it affects children and adolescents less. Children showed fewer symptoms and had lower hospitalizations and mortality compared to adults (Lymperepolous 2021). Many governments in the world have taken measures at different levels in order to reduce the spread of the epidemic and to ease the burden of health centers. These measures are; curfews have been implemented in the form of practices that prevent mass gatherings, such as the transition to online education and the indefinite closure of schools (Kılınçel et al. 2021). On the other hand, staying indoors for a long time, changing lifestyles with the decrease in socialization, fear of illness and death, uncertainties about when the pandemic will end and treatment methods have affected the mental health of children and adolescents as well as adults (Alves et al. 2021). Children and adolescents who are in a developmentally vulnerable period are highly vulnerable to these problems (Duan et al. 2020, Hafstad et al. 2021). It is stated that there has been an increase in the prevalence of these problems with the effect of the

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pandemic. According to one study, 18.9% of children and adolescents showed anxiety symptoms during the Covid-19 process (Meherali et al.2021), while in another study, it was recorded that primary school students experienced anxiety related to their health status, daily routines and prevention and control of Covid-19 disease (Kilinçel et al.2021). Sometimes the measures taken regarding Covid-19 can also cause mental health problems. For example, in the pandemic, it is often stated in the media that paying attention to social distance is effective in preventing the transmission of the disease. However, it was seen that anxiety symptoms were more experienced among adolescents who paid attention to social distancing (Lu et al. 2020). During the Covid-19 period, children and young people have suddenly lost many activities that are meaningful to them and maintain order in their daily lives, such as school, extracurricular activities, social interactions and physical activity. Long-term losses, uncertainty, and frightening situations can worsen anxiety symptoms and further increase the social withdrawal and hopelessness that are part of these disorders. The fear of contracting Covid-19 can lead to an increase in children and adolescents of various types of psychiatric disorders, including obsessive-compulsive disorder, post-traumatic stress disorder. On the other hand, in children and adolescents with social anxiety, anxiety about school performance or agoraphobia, being away from school and social environments due to Covid-19 suggests an improvement in mental problems, but this improvement is a gateway and when everything returns to normal, anxiety symptoms may start again and symptoms may worsen (Yue et al. 2020). In this context, various studies have been carried out to determine the anxiety level of children and adolescents in the world and in Turkey. It has become important to make a general inference from these studies, to determine effective nursing interventions and to conduct further studies (Loades et al.2020, Spoorthy et al. 2020, Zengin et al.2021). This review aims to identify the level of anxiety and associated factors of the Covid-19 pandemic on the global child and adolescent population

Method

The systematic review was reported in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al. 2022). The data of this systematic review were collected between 2019 and 30.04.2021 using Pubmed, Web of Science, Ovid-Medline and Google Scholar search engines. The study was also evaluated by using "child, children, adolescents, adolescents, mental health, anxiety, anxiety and stress" as key words and "child, children, adolescent adolescents, mental health, anxiety and stress" separately and together. As a result of the evaluations, a total of n=6185 articles were reached from all databases. After the inclusion and exclusion criteria were applied, the full texts of n=83 studies were reached. Following the evaluation of the full texts, 49 selected articles, one systematic review and two recursive studies were excluded in the child and non-adolescent population. The study was completed with a total of 31 articles. Figure 1 presents the Preferred Reporting Elements for Systematic Reviews and Meta-Analyses (PRISMA) diagram (Figure 1). The inclusion and exclusion criteria are presented in Table 1.

Repeated studies were not included in the study. The identification of studies that met the inclusion criteria took place in two stages. Stage 1, screening of titles and abstracts: In the first phase of the research, the researchers scanned the titles and summaries of all the records determined independently of each other. Stage 2, screening of full texts: The full texts of all selected studies in the second review process were independently evaluated by two workers. A computer program was used to collect the works and store copies of them (Mendeley Cite). The findings obtained from the studies; collected through a predetermined research form. Form; article name, first author-country-database, study type-publication date, age-data collection group, mental health outcomes are questioned (Table 2). The method was resolved by discussing the appropriateness of the study content etc. between the two authors. The data were analyzed according to the results and objectives of the study. Descriptive (narrative) analyses of the included studies were performed.

No permission of any institution and ethics committee has been obtained for this study. Studies with access to full text or abstract text were included in the study and abstract texts were not included in the study. No external evaluators have been contacted. It should be kept in mind that this study is limited to 31 articles accessed between the data collection dates.

Results

Article Features

The majority of the studies on the anxiety levels of children and adolescents during the Covid-19 pandemic period (Table 1) were planned in a cross-sectional type. The data collection process of the studies reached within the date range of this study took place between 15.04.2021 and 30.04.2021 (Table 1). In eight (n=8) studies, the

date of data collection of the study was not specified (Table 1). The majority of the studies were conducted in China (n= 11) and Turkey (n=7) (Table 2). The first studies on the anxiety levels of children and adolescents during the Covid-19 pandemic were published in August 2020 and the most published date is October 2020 (n=5) (Table 2).

Table 1. Inclusion and exclusion criteria

Inclusion criteria		Exclusion criteria
Population	Children 06-17 year(s) Living in low, middle or high-income countries with the Covid-19 pandemic	-Be 18 years of age or older
Intervention / exposure	Interventions aimed at improving the psychosocial effects of their condition Types of interventions, for example: (Training courses, exercises, teaching materials and information, support groups) Types of intervention, such as: (Face-to-face, online or smartphone-based, individual, group, population-based, child-based, system-based)	
Control group	Standard treatment -Alternative treatment -Waiting list check -No treatment	
Results	Primary health outcomes, namely: -Self-efficacy -Behavior problems -Mental health problems -Stress -Mistreatment	
Study design	Any study or protocol that uses an experimental study design, including: -Randomized controlled trials -Cohort studies -Cross-sectional studies -Mixed method studies	-Qualitative research -Systematic reviews -Meta-analyses -Reviews -Editorial -Comments -Letters

Individual Factors

In the studies conducted to determine the anxiety level of children and adolescents in the world, there are big differences between anxiety percentages. The prevalences of anxiety in the studies ranged from 1.84% to 45.0%. In a study conducted in Germany, the anxiety levels of children and adolescents were determined as 24.1% (n=1586) (Ravens Sieberer et al. 2021). In a China-based study (n=2330), 37.3% of respondents stated that they had high levels and 24.9% were concerned about moderate Covid-19 (Meherali et al. 2021). In the studies, the results revealing the relationship between gender factor and anxiety level are different from each other. While a significant relationship between gender and anxiety scores was not determined in a study conducted in Turkey (Kilinçel et al. 2021), in another study, the anxiety level of men was calculated to be higher than girls (Zengin et al. 2021). However, in studies conducted in China, Italy, Austria, Germany and Norway (Smirni et al. 2020, F. Zhou et al. 2020, Zhou et al. 2020, Duan et al. 2020, X. Chen et al. 2021, de Pasquale et al. 2021, Dvorsky et al. 2021, Hafstad et al. 2021, Ravens Sieberer et al. 2021) the anxiety level of girls was higher than boys .

Among children and adolescents, older people have a higher risk of experiencing anxiety (Hafstad et al. 2021, Lavigne-Cerván et al. 2021). It was determined that students studying in the upper grades were in a higher risk group in terms of anxiety (Duan et al. 2020, Lu et al. 2020, Tang et al. 2020, Zhou et al. 2020, Chen et al. 2021).

Familial and Environmental Factors

As a result of the studies carried out, it was determined that children and adolescents who have no one to play with at home (Lu et al. 2020), who live with a single parent (Duan et al. 2020, Hafstad et al. 2021), who are left alone at home during working hours and who do not live with their parents during the Covid-19 period experience more anxiety (Zhou 2020, Kilinçel, Altun, et al. 2021). The fact that the child or adolescent provides health care to one of the parents (Liu et al. 2021) and the caregiver has a low level of education and age (Ravens Sieberer et al. 2020) increases the incidence of anxiety symptoms. However; the child or adolescent being subjected to domestic maltreatment (Duan et al. 2020, Hafstad et al. 2021), having a limited living

space/migration history (Ravens-Sieberer et al. 2021), and living in low-income families (Akgül and Atalan 2021, Hafstad et al. 2021, Ravens Sieberer et al. 2021) increase the incidence of anxiety symptoms.

Table 2. Data on article characteristics

First Author-Country-Database	Study design-Publication Date	Age/ Data collection	Mental Health Outcomes
-Nursen Cigerci Günaydin13 -Turkey -Google Scholar	Cross sectional-October 2020	12-18 years n=90 Online	Patients with asthma had high anxiety. Going for a health check lowers anxiety.
-Senay Kilincel 14 -Turkey -Pubmed	Cross sectional-February 2021	8-14 years n=140 Online	It shows that separating children from their parents during the Covid-19 pandemic has negatively affected their mental health and increased anxiety levels.
-Berkan Sahin 15 -Turkey - Google Scholar	Cross sectional-May 2020	8-17 years n=121 Online	In this study, children's anxiety levels were determined at a moderate level. A positive relationship was determined between parent and child anxiety.
-Li Twon 16 -China - Science Direct	Cross sectional-October 2020	13-18 years n=3313 Online	The factors that increase the level of anxiety are; women are those between the ages of 13 and 18, those living with a single parent, those whose family members have been diagnosed with covid-19, those who have been exposed to the internet for a long time, those who live in urban areas, those who have an emotion-oriented coping style.
-Rocio Lavigne Cerván17 -Spain - Google Scholar	Cross sectional-February 2021	6-18 years n=1.028 Online	As a result of the study, the anxiety level of children between the ages of 9-12 was determined to be high. A positive relationship was determined between anxiety scores and sleep time.
-Yan Liu 18 -China - Google Scholar	Cross sectional-April 2021	Children and adolescents n=5175 Online	The prevalence of anxiety in this study was 6.26%. Suicidal ideation for anxiety of the Covid-19 pandemic, fighting with parents, anxious mood, insomnia, depressed mood and inattention during online learning are risk factors.
-Xinyan Xie 6 -China - Google Scholar	Cross sectional-April 2020	2-6th grade student n=2330 Online	In this study, 37.3% stated that they were very worried about covid-19.
-Benjamin Oosterhoff 19 - ABD - Science Direct	Cross sectional-August 2020	13-18 years n=683 Online	As a result of this study, the participants' social distancing/social isolation increased their anxiety levels.
-Shuang-Jiang Zhou 20 -China - Pubmed	Cross sectional-May 2020	12-18 years n=8079 Online	As a result of this study , it was determined that 37.4% of the participants experienced anxiety. Girls, seniors, those with high achievement grades have higher anxiety levels.
-Fangping Chen21 -China - Pubmed	Cross sectional-August 2020	6-15 years n=1036 Online	Anxiety symptoms were determined in 18.92% of the participants. Girls and children who were left alone at home during working hours were found to be at risk for anxiety.
-Ulrike Ravens-Sieberer 22 - Germany - Pubmed	Cross sectional-January 2021	7-17 years n=1586	14.9% of the participants described anxiety symptoms. About half of the participants felt restless, and a significant portion of the sample had sleep problems. Girls are more at risk for these symptoms compared to boys.
-Ulrike Ravens-Sieberer 23 - Germany - Pubmed	Cross sectional-November 2020	11-17 years n = 1040 Online	24.4% of the participants described anxiety symptoms.
-Suqin Tang 24 - China - Science Direct	Cross sectional-January 2021	6-17 years n=4.391 Online	24.9% of the participants described anxiety symptoms. High school and secondary school students have more anxiety compared to primary education.
-Jinming Yue 9 -China - Pubmed	Cross sectional-November 2020	Child (n = 1360) and parent (n = 1360) Online	For children, 1.84% experience moderate anxiety. Social media use is a risk factor for anxiety.
-Senay Kilincel 3 -Turkey - Google Scholar	Cross sectional-August 2020	12 to 18 years Online	For state anxiety, "Old psychiatric referral is 4.39 times, "Having a Covid-19 positive patient in your family or environment is 3.81 times", and "The most

			common environment for obtaining information about Covid-19 is 2.41 times the risk. Closing schools and locking at home during the pandemic increases the level of anxiety and loneliness among young people.
-Jasmine M. Alves 4 - ABD - Pubmed	Cross sectional-October 2020	9-15 years Online	As the quarantine period increases in relation to Covid-19, the level of anxiety increases.
-Peter Smyrna 25 -Italy - Google Scholar	Cross sectional-September 2020	17-19 years n=148 Online	However, girls had a higher level of anxiety compared to boys.
-Marla Andréia Garcia de Avila 26 - Brazil - Pubmed	Cross sectional-August 2020	6-12 years n=289 Online	For children, 19.4% experience moderate anxiety. Children who are away from their parents are at greater risk of anxiety. Those who are younger than the caregiver's age and have a low level of education are at risk for anxiety.
-Ulrike Ravens-Sieberer 27 -Germany - Google Scholar	Cross sectional-January 2021	7-17 years n= 1586 Online	For children, 14.9% to 24.1% experience moderate anxiety. Children with low socioeconomic status, migration background, and limited living space were significantly more affected.
-Concetta De Pasquale 28 - Italy - Pubmed	Cross sectional March 2021	8-12 years n=162 Online	It was determined that the participants had moderate levels of persistent anxiety and low levels of situational anxiety. Girls' mood and sustained anxiety scores are high compared to boys. A positive relationship was found between the participants' use of video games and their statefulness anxiety score.
-Dvorsky MR, 29 -Australia - Google Scholar	Cross-Cross sectional-October 2020	13-16 years n=248 Whatan evrimic	Girls experience more anxiety than boys. It has been determined that simply switching to online learning has no significant impact on anxiety levels. Feeling socially connected during the Covid-19 lockdown period has significantly alleviated anxiety.
-Burcu Pinar Senkalfa 30 -Turkey - Google Scholar	Cross sectional-June 2020	13-18 years n=135 Video response.	They were found to have higher state anxiety scores than age-matched children with CF.
- 31 Xu Chen -China - Pubmed	Cross sectional March 2021	1.Ölçüm n=9554 2.Ölçüm n=3886 Online	In the first survey, the prevalence of anxiety was 19.0%, The prevalence of anxiety in the second survey was 36.7% Group membership in the second survey revealed that female gender, high school seniors, and anxiety about getting into a higher class were positively associated with anxiety.
-Verolien Cauberghe- 32 - Belgium - Pubmed	Cross sectional-April 2021	13-19 years n=2.165 Online	Concerned participants reported actively using social media more often and, to a lesser extent, as a way to communicate with friends and family to look for a way to adapt to the current situation. Those who use social media actively experience more anxiety.
-Gulendam Akgul 33 - Turkey - Pubmed	Cross sectional -January 2021	12-18 years n=155 Parent n=155 children and adolescents Online	It has been shown that parental anxiety and adolescent emotion regulation have significant positive correlations with adolescent anxiety symptoms.
-Meng Qi M.S34 -China- Science Direct	Cross sectional-October 2020	14-18 years n=7.202 Online	Women, those who cannot live with parents, those who live with Covid-19, those residing in rural areas, those with low socio-economic levels are at risk for anxiety.
Saeed Ariapooran 35 - Iran - Pubmed	Cross sectional-February 2021	12 to 18 years n=56 Online	Children with hearing impairment experience more anxiety than those with hearing loss.
-Rui Liu 36 - China - Science Direct	Cross sectional-April 2021	11-20 years n=3.498 Online	The anxiety rate among Chinese adolescents is 45.0%, while anxiety symptoms are common in adolescents with depression during the Covid-19 pandemic. The anxiety found that the number of confirmed Covid-19 cases in geographic areas, in the province

			where the participant was located, was significantly correlated with gender, age, class, number of confirmed Covid-19 cases, parental occupation, daily sleep duration, daily working time, quantity.
-Chunping Lu 8 - China - Pubmed	Cross sectional-December 2020	Adolescent n=965 Online	Covid-19-related anxiety, insomnia among Chinese adolescents, is a risk factor for developing anxiety symptoms.
-Rich in Mentor 11 -Turkey - Google Scholar	Cross sectional-April 2021	9-12 years n=309 Online	As the age of the children increased, their state anxiety levels decreased and their anxiety levels increased continuously ($p < .05$). Boys' mood anxiety levels were significantly higher than girls'. The state anxiety scores of children who could easily communicate with their friends on the internet and the continuous anxiety scores of children who could never communicate with their friends due to the pandemic were found to be significantly higher than the other participants.
-Gertrud Sofie Hafstad 37 -Norway -Pubmed	Cross sectional-June 2021	13-16 years n=3.572 Online	Levels of clinical anxiety and depression increased from 5.5% in T1 to 6.3% in T2. Being a girl, having pre-existing mental health problems and living in a single-parent home, living in a poor family, or having a history of mistreatment pose a risk for anxiety.

The pandemic has affected the mental state of parents, as well as children who internalize their parents. As the anxiety level of the parent increases, the anxiety of the children increases, and a positive relationship between parental anxiety and child anxiety has been determined (Akgül and Atalan 2021 , Kaplan et al. 2021). In studies conducted in Spain (n=1028) and China (n=3254), the presence of a child and adolescent themselves, their family or someone in their family who has been diagnosed with Covid-19 (Qi et al. 2020, Kilinçel et al. 2021), anxiety measurements made later in time compared to the time of the first appearance of the pandemic (Hafstad et al. 2021) and the number of confirmed cases in the regions of residence (Liu et al. 2021) increase the incidence of anxiety symptoms. On the other hand, while the fact that the place of residence is in the urban area is determined as a risk (Duan et al. 2020), another study (Qi et al. 2020) determined that living in a rural area is a risk.

The presence of any chronic diseases of children and adolescents, who are a vulnerable group for psychiatric diseases during the pandemic process, increases the risk of anxiety even more. In this context, the anxiety scores of children and adolescents with asthma (Günaydin and Baykal 2020), cystic fibrosis (Pinar et al.2020), hearing impaired (Ariapooran and Khezeli 2021), depression (Liu et al. 2021) were calculated as high compared to those without chronic diseases. Children and adolescents have been identified as risks for anxiety due to altered sleep patterns (Ariapooran and Khezeli 2021, Lavigne et al. 2021), past psychiatric illness (Kilinçel et al. 2021) and adopting an emotion-oriented coping style (Duan et al. 2020).

Isolation Measures

Social isolation measures have been taken to reduce the risk of transmission during the Covid-19 process. However, social isolation / social distancing (Oosterhoff et al. 2020) / home quarantine (Kilinçel et al. 2021) and prolongation of the quarantine period (Alves et al. 2021) pose an anxiety extender risk to children and adolescents. As a result of social isolation, online learning and distance education processes are actively used. In this context, it was determined that children and adolescents staying away from schools (Kilinçel et al. 2021), experiencing inattention in online learning (Yue et al. 2020), high school grades in formal education (Zhou et al. 2020) pose a risk for anxiety, while the hope of returning to school (Yue et al. 2020) has a protective effect from anxiety. Despite all these results, no significant relationship was determined between the online learning model and anxiety levels (Dvorsky et al. 2021). During the Covid-19 pandemic, the use of media / internet by children and adolescents has increased both due to the online education system and as a result of social isolation. As a result of the studies, long-term internet use (Duan et al. 2020), video game playing (de Pasquale et al. 2021), social media use (Yue et al. 2020) and social media use as a means of communication (Cauberghe et al. 2021, Zengin et al. 2021) increase the incidence of anxiety symptoms, while traditional media (TV, radio, etc.) alleviate the level of anxiety (Dvorsky et al. 2021).

Discussion

In this review, where the studies on determining the anxiety level of children and adolescents in the Covid-19 process were examined, all of the researches were planned in a cross-sectional type (Table 2). A systematic review

of the mental health of children and adults is a similar case (Spoorthy et al. 2020). Cross-sectional research is the work planned in a certain group of people in a certain period of time. These studies are studies that determine the prevalence (population of those who are sick at a certain moment), the diagnosis and mechanism of the disease, and examine the cause and effect relationship on the same plane (Spoorthy et al. 2020). As it is known, Covid-19 disease has started to be seen in the world as of the end of 2019 (World Health Organization 2022). In the early days, scientists did not have enough knowledge about this new disease (Hafstad et al. 2021). For this purpose, scientists have focused on conducting studies on Covid-19, the course of the disease and its effects on the individual, family and society (Tokur et al. 2021). For this reason, it is an important situation in terms of determining the anxiety prevalence and intervention strategies of the studies on the anxiety levels of children and adolescents of the Covid-19 outbreak.

During the Covid-19 period, anxiety prevalences of children and adolescents were calculated between 1.84% and 45.0% (Table 2). Pre-pandemic studies indicate that adolescents and children have a prevalence of anxiety ranging from 15-20% (Spoorthy et al. 2020). In this respect, the Covid-19 outbreak has increased the risk of individuals experiencing anxiety by almost two times. In the process of major pandemics, children and adolescents experience health concerns and fear harm to their loved ones/families (Qi et al. 2020, Kılınçel et al. 2021). However, the daily routines of children and adolescents have been disrupted, and they have spent the majority of their time in their homes/rooms. In addition, a necessary change has been made in the education system (Kılınçel et al. 2021). These situations, which pose a risk for anxiety, have adversely affected child and adolescent mental health. On the other hand, there are big differences between anxiety prevalences in the studies conducted. The research with the lowest prevalence (1.84%) in this study was conducted in a region of China (Jiangsu). The average number of daily new cases in this region during the study date range = 34-35. On the other hand, the study with the highest prevalence (45.0%) was conducted in China as multi-center (34 provinces), with a larger sample and with children/adolescents with depression (Table 2). However, at the time range of the study, the average number of new cases across China was in the range of 6,000-8,000. In this respect, this difference between anxiety levels in children and adolescents may have been caused by differences in the number of new Covid-19 cases in the study time period, the collection of data from different regions, the way health services are provided and access to health services (Akgül and Atalan 2021). On the other hand, considering that there is a risk for anxiety in terms of having a history of past psychiatric illnesses (Tokur et al. 2021), it is acceptable to have a high anxiety insida.

In the studies examined, no consistent conclusion was reached between gender and anxiety. The vast majority of studies state that women and adolescents experience more anxiety. However, the conclusion that women are in the risk group comes to the fore (Table 2). In Pakistani society, after the earthquake, it was determined in the study that women were more likely to experience anxiety compared to men (Loades et al. 2020). In previous studies, it has been stated that being a woman is a risk of experiencing a setback (Liu et al. 2021). On the other hand, a significant relationship between gender and anxiety was not determined in a study conducted with adolescents diagnosed with cystic fibrosis (Pinar et al. 2020). Being a woman poses varying degrees of risk for many diseases, such as noral tube defect, multiple sclerosis, hypertension, ischemic shock, etc. (Gemmati et al. 2019). On the other hand, although the concept of gender and the meanings attached to the sexes vary from society to society, the fact that women are seen as more naïve and the perception of men as strong and warlike can affect the way they express emotions (Pinar et al. 2020). In this respect, children and adolescents whose gender is female may have expressed more anxiety about the Covid-19 Pandemic than men.

In the studies examined, it is stated that older adolescents experience more anxiety (Table 2). Prior to the pandemic, in the United Arab Emirates, a study states that anxiety disorders occur before and during adolescence (Al-Yateem et al. 2020). Pre-adolescence and adolescence period is a period in which physical and mental changes gain speed and individualization comes to the forefront. During this period, adolescents tend to spend more time in friend environments (Yue et al. 2020). However, within the scope of quarantines, they meet their needs for socialization and information on the internet and social media. This causes them to be exposed to more stimuli about the effects and harms of Covid-19. It may have set the stage for adolescents to experience more anxiety (Alves et al. 2021). For these reasons, it is acceptable for children and young adolescents to experience less anxiety and older adolescents to experience more anxiety.

Children whose family members receive intensive care treatment for various reasons may feel excluded, insecure and lonely because they cannot see their family members. These feelings may increase the risk of individuals experiencing anxiety (Hafstad et al. 2021). In addition, the absence of one or both family members can increase family conflicts and can be more destructive (Chen et al. 2020). In this study, the results of which are in parallel with the literature, it was seen that adolescents who lived alone or with a single parent (only mother-only father) at home due to reasons such as being on hospital duty, living apart for precautionary purposes, etc. had a higher

risk of experiencing anxiety (Table 2). Parents' communication with their children in moments of crisis and being with them can reduce the level of anxiety (Alves et al. 2021). However, the daily routines of family members were disrupted, and quarantine processes adversely affected communication within the family (Alves et al. 2021). Changing daily routines and impaired family communication increase the burden on family members and complicate resolution processes in moments of crisis. At this point, it is expected that the anxiety level of children and adolescents will increase.

There are study results that reveal the relationship between socio-demographic characteristics of family members and child-adolescent anxiety level (Table 2). Similar to these findings, children and adolescents born in a migrant family, whose parents have a low level of education, who have a history of domestic violence, and who are born in a divorced family are considered in the risk group in terms of experiencing anxiety (Kilinçel et al. 2021). In society, the upbringing of the child, in the formation of value judgments, personality and autonomy, etc. family experiences, family characteristics, cultural structure, communication and attitude within the family of the child are in an important position (Akgül 2021). The behaviour of family members who spend more time together during Covid-19 due to quarantine measures may have paved the way for children to experience more anxiety.

In the studies examined, the anxiety levels of the parents are high and the anxiety of the child increases (Table 2). The presence of a psychiatric illness by one of the parents increased the likelihood of their child becoming ill and the study in which they revealed the genetic and environmental link in terms of anxiety increased the likelihood that the parent would experience anxiety in the child (Akgül 2021). It is known that the child learns anxiety behavior by observing it from parents (Akgül 2021) The relationship between child and parent anxiety can be explained by genetic inheritance, the influence of the behavior of children and parents on each other, environmental mechanisms, developmental process and a shared negative environment (Liu et al. 2021).

During the pandemic period, having parental anxiety and having children and adolescents diagnosed with covid-19 themselves or someone in their close environment increases the risk of anxiety (Table 2). Contracting Covid-19 disease has consequences such as endangering life for individuals, quarantine of individuals or hospitalization. These situations are factors that disrupt family integrity and reveal the feeling of loss (Hafstad et al. 2021). In this respect, the risk of receiving a positive diagnosis increases anxiety. On the other hand, the high severity of the pandemic in the region where we live causes more comprehensive protection measures to be taken and information to be provided. Media-broadcasts-programs offered through social media can cause information load and pollution. This information pollution can cause confusion and ultimately cause individuals to experience more anxiety (Tokur et al. 2021). Children and adolescents who are exposed to more risks and stimuli are expected to experience more anxiety.

Children and adolescents with chronic or psychiatric illnesses have an increased risk of experiencing anxiety (Table 2). In the study in which individuals with chronic diseases determined their anxiety and depression levels, those with chronic diseases stated that they experienced more anxiety than those without it (Lavigne et al. 2021). Covid-19 disease is more frequently hospitalized in individuals with chronic diseases compared to those who do not have it, and these hospitalizations can last longer. In addition, high mortality and morbidity rates are seen in those with chronic diseases (Lympereopoulos 2021). This may cause children and adolescents with chronic illnesses to experience more health concerns (Lavigne et al. 2021).

Children and adolescents who use social media during Covid-19 may experience more anxiety (Table 2). In their study to determine the level of setback in Turkish society, Tokur et al. (2021) stated that increasing the duration of media-social media use increases the risk of experiencing anxiety (Tokur et al. 2021). The isolation measures taken during the Covid-19 process have changed the shape of the education system and face-to-face education has been replaced by online education. This has increased the amount of time children and adolescents spend time in the media and social media. However, there is unsubstantiated information pollution in the media and social media about Covid-19 that will cause mental turmoil. This complex information pollution can cause children and adolescents to have increased anxiety about Covid-19 (Tokur et al. 2021). It was observed that children and adolescents with disrupted sleep patterns during the Covid-19 process had high anxiety levels (Table 2). During Covid-19; The increase in the use of the internet and social media by children and adolescents and their exposure to the artificial light of technological devices for a long time have adversely affected the sleep patterns/quality (Tokur et al. 2021). There is a vicious cycle between sleep patterns and quality and anxiety. While the deterioration of the sleep quality of children and adolescents can cause anxiety, high anxiety can disrupt sleep patterns and quality (Tokur et al. 2021).

Conclusion

The results of this review show the impact of the Covid-19 pandemic on the anxiety levels of children and adolescents around the world. As a result of the evaluated studies; It has been determined that women, those with chronic-psychiatric diseases, those who are older, separated from family members, have low-educated parents and migrant children and adolescents are more likely to experience anxiety. During and after the pandemic, it is recommended to conduct cohort studies with strong methodology for determining the anxiety levels of children and adolescents. In addition, it would be useful to conduct further systematic reviews to assess over time how children and adolescents have affected their anxiety levels from the beginning to the end of the pandemic process. It is also advisable to monitor these factors in the years following the end of the pandemic.

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