



Review Paper

Psychological Impact of COVID-19 on Children and Adolescents: A Narrative Review



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ABSTRACT

Background: With the global spread of COVID-19, many families have experienced the physical or psychological effects of the disease, which has had a profound impact on children.

Objectives: Given that most studies have assessed the effects of COVID-19 on physical health, this study reviews the psychological and psychosomatic aspects of the disease and possible solutions to improve the condition of children and adolescents regardless of physical problems and complications of COVID-19.

Methods: The data employed in our narrative review were searched for English documents published between 2019 and 2022 in EMBASE, Web of Science, Scopus, Google Scholar, and PubMed databases. Keywords included Mental health, Grief, Anxiety, depression, Children, and COVID-19. After screening the abstracts, the full text of 70 related studies was reviewed, and finally, 52 relevant surveys were selected.

Results: Among the most important issues are the irreparable effects of losing a parent or the death of a loved one due to this disease (loss and grief) and a wide range of other disorders, such as feelings of fear, anxiety, depression, sleep problems, and post-traumatic stress disorder. However, the destructive effects of prolonged school closures and turning to social media without parental supervision and adequate infrastructure for children cannot be ignored.

Conclusions: Children's reactions to stress are different, such as overdependence, anxiety, withdrawal, anger, bedwetting, etc. Long-term quarantine and its consequences have increased anxiety and depression, sleep disorders, and nutritional problems in children and adolescents. Therefore, children need a safe and supportive environment, guidance, and help to express their fear and sadness.

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Introduction

In late 2019, the world faced a new phenomenon called the coronavirus disease 2019 (COVID-19), originating in Wuhan City, China [1, 2]. Due to the rapid spread of this disease globally, the unknown symptoms, and the lack of effective initial treatment by the [World Health Organization \(WHO\)](#), the only way to prevent the spread of the disease was to use preventive methods [1, 3]. During the pandemic, many governments have implemented quarantines to reduce the spread and death of COVID-19, which has had harmful consequences on the mental health of children and adolescents. For this reason, psychological complications are of great importance because COVID-19 mortality in children is rare, and many children of various ages and socioeconomic statuses may experience it [1, 3, 4].

Man is a social being by nature and requires a social connection; school is one of the critical social places where peers influence each other's behavior. Closing the schools, separating from friendly meetings, and domestic isolation put children and adolescents in a situation of stress and fear of the illness, which leads to mental health disorders of various intensities, such as depression, anxiety, distress, frustration, irritability, and insomnia [1, 5]. Furthermore, social distancing hurts emotional behaviors in children and adolescents, which may cause growing violence, self-harm, prolonged screen time, increased risk of physical problems and consequently reduced (health-related) quality of life and individual efficacy [3-5]. Staying at home during the COVID-19 pandemic, spending time on screens for online classes, watching TV, playing games, and increasing leisure time affect speech development in younger children. Social isolation is associated with excessive screen use leading to overeating, immobility, and thus weight gain [1, 4, 5].

Many parents have coped with this situation and, by supporting and reducing their children's fear of infection, have played a key role in improving the quality of life and mental health of their children during the pandemic [1, 3, 5]. However, the loss of income, the recession, and the closure of schools following the outbreak of COVID-19 put parents in a stressful situation, and in particular, disadvantaged families were under considerable pressure [3, 4]. This may lead to an increase in inappropriate behaviors (i.e. domestic violence, emotional abuse, neglect, etc.) against the child, resulting in adverse effects on children's mental health [1].

COVID-19 is usually mild and less fatal in children, but the psychological dimensions of the disease have a significant impact on their individual and social lives. Due to the high mortality rate of this disease worldwide, unfortunately, many children have lost their parents and relatives, which has led to their mental health disorders [1, 3].

Based on a systematic review, Khalil reported that COVID-19 may be an independent risk factor for psychological stress in children and could have a long-term impact on their future psychological, educational, and even social relations [6]. In a systematic review and meta-analyses, Jones et al. found that children and youth exposed to high levels of stress and isolation or experience death anxiety are particularly vulnerable to panic attacks, depression, and so on. If left untreated, mental illness can profoundly affect a child's mental development, which can influence a child's academic achievement and ability to lead an entire and productive life. [7]. According to another systematic review study, the COVID-19 pandemic had a multifaceted and significant effect on children and adolescents' mental health. Also, anxiety, depression, loneliness, stress, and tension are among the most common symptoms [8].

Since children and adolescents are exposed to the long-term psychological consequences of the COVID-19 pandemic, we conducted a comprehensive and non-systematic search of databases to answer our questions. The questions were, what studies have been done on children's mental health during and after the COVID-19 pandemic? Which disorder is more important? Is there a solution to reduce the psychological consequences of this pandemic?

Based on past studies, like other disasters, children's reactions to COVID-19 range from distress to psychiatric symptoms and disorders. This review attempted to discuss the most common psychological reactions of children to this pandemic.

Evidence Acquisition

The data employed in our narrative review were searched for English documents published between 2019 and 2022 in [EMBASE](#), [Web of Science](#), [Scopus](#), [Google Scholar](#), and [PubMed](#) databases. Keywords included mental health, grief, anxiety, depression, children, and COVID-19. Following the initial evaluation of abstracts, the full text of 70 related surveys was reviewed, and finally, 52 eligible studies were selected.

Results

This review study was conducted to determine the psychological and psychosomatic aspects of COVID-19 on children and adolescents. Anxiety, depression, fear, sleep disorders, and eating disorders (ED) can be mentioned among the disorders that were evaluated in similar articles. This study showed that prolonged quarantine and loss of parental jobs severely affected families' livelihoods, leading to increased anxiety, depression, a tendency to domestic violence and suicide, sleep disorders, and nutritional problems, especially in children and adolescents.

Loss and grief

The COVID-19 pandemic has affected people's social and emotional relationships so much that families will be exposed to its effects for many years to come [9, 10].

The world is currently facing more than 2 million deaths due to the coronavirus. Two children and four grandchildren are grieved for every corona death, leading the world to a pandemic of depression and grief [5, 9, 10]. More than 12 million people worldwide have experienced the loss of one person due to the coronavirus [11].

In addition, the recent pandemic has caused many children to lose their parents or loved ones to illness. The experience of losing loved ones is one of the crucial and neglected aspects in the present and one of the problems of the future society [12]. Flexibility in the face of complex life events, including losing loved ones, is a life skill formed during puberty [13].

Sudden confrontation with this issue in the recent epidemic has messed up the balance of life, and this is growing in the long run and has a significant impact on children's personalities [12, 13]. Children and adolescents suffer from emotional effects, including grief, due to insufficient mental development in dealing with COVID-19 [14].

Children's reaction to this issue is entirely different from adults, attracting special attention to children. This reaction can be physical, such as seizures, or it can cause psychological effects, such as depression or anxiety [1, 12, 14].

Various studies have reported that families with a small number of children (less than four) suffer more from grief, which raises the issue of multiple children

and the interaction of family members in facing psychological problems [11, 15].

Fear

Healthy fear is a normal and natural human reaction in the face of the COVID-19 pandemic, which, if not adapted to the new conditions, leads to an obsessive fear of the disease and can turn into physical illness and severe anxiety [16]. News of the increasing number of cases and deaths worldwide has led to a higher prevalence of psychological distress and fear of contracting COVID-19 among the quarantined population [17].

Anxiety, helplessness, and fear are the most common psychological problems among quarantined children (about 60%-70%) during the pandemic, significantly more than among non-quarantined children [18]. Children's adaptation to these conditions and coping with their challenges depends on many factors, the vital of which are the parent's roles and how they communicate with their children. Therefore, as those closest to the child, parents, caregivers, and teachers need to pay attention to children with COVID-19-related fears and identify potential risk factors that may exacerbate and prolong those fears. Parents should be aware of the information about COVID-19 that their children are exposed to from various and indirect sources and talk about them to avoid misunderstanding such information and reduce their children's concerns [19]. Therefore, individuals exposed to more information about COVID-19 without contact with parents are at higher risk of experiencing anxiety and post-traumatic stress disorder (PTSD) [20]. Importantly, parental stress, including financial or occupational problems, and worries about being exposed to COVID-19 and infecting others, generally leads to increased fear of COVID-19 in children and reduced quality of life [1, 19-21]. Moreover, children with this condition often experience somatic symptoms, restlessness, and insomnia [17, 20]. Increased parental fear may reduce the protection of their children's mental health and significantly increase future depression, anxiety, and stress. Children contacted by severely infected patients were at higher risk of psychological disorders [21, 22]. The majority of children and adolescents are worried about their relatives getting infected. Children aged 3-6 years are more prone to clinginess and fear for relatives than older children. Furthermore, children aged 4-10 years began to experience fear, including clinging and requesting sleep in the parent's bed (about 26%), enuresis (3%), worsening of vocabulary (5.5%), and developing inappropriate fears (18%) [18]. The consequences of health fear can have irreversible

effects on children's health in the future, even in those who have no such histories. For instance, chronic stress can harm the connection and activity of the amygdala and prefrontal cortex and causes the extinction of fear memory. In addition, several articles have shown the destructive effects of fear on brain development during the pandemic [1, 21].

Strategies to alleviate fear by increasing awareness and making optimal use of pandemic constraints are as follows:

1- Providing a suitable environment for children to talk freely about their fears and concerns and creating safe and secure conditions for parents to communicate with their children [19].

2- Parents should make optimal use of social isolation by having friendly relations with their children, spending more time playing with them, watching cartoons, drawing, and doing creative and fun activities at home to improve children's cognitive and social development [16, 19, 21].

3- According to social isolation, alternative methods should be considered instead of face-to-face treatment. Governments must provide information and instructional guidelines for parents to cope with the pandemic challenges and to access mental health services [16, 17, 19, 21].

Talking about children's concerns helps them understand this condition, positively affects their perspective, and reduces their fear of COVID-19, especially in children who experience psychological distress during this period. Increased health fears during the pandemic are common and do not require treatment. However, some children struggle with intense fears, which interfere with their daily functioning. For example, COVID-19 may be considered a critical incident that can be treated using cognitive-behavioral models, developing adaptations, and parental cooperation [16, 19].

Anxiety

Health anxiety refers to indescribable worry about one's health [22]. This disorder usually occurs in adulthood, but certain conditions, including the recent pandemic, have caused this disorder among young people, especially those aged 14-18 years [16].

The prevalence of anxiety in children and adolescents in China was reported about 26%, with girls having the

highest percentage [13]. This was especially evident during the early quarantine in Wuhan, where anxiety disorders were more common than in other cities [23]. The prevalence of anxiety among children and adolescents, especially in recent studies in other countries with different percentages has been reported between 25% to 45%, and this statistical difference can be related to the pandemic prolongation and its long-term complications [14].

Another critical point is the need for children's virtual education at home, which has caused parents' anxiety to increase among parents who have not received the proper training to do it and this stress is transferred to children in the learning process [15].

Some studies suggest physical activity as the main protective factor. Sports together with video games and music can be considered a useful combination. Regular daily physical activity reduced the likelihood of anxiety symptoms by 34% to 15% during the pandemic [24-26].

Given the unpredictable and unique nature of the COVID-19 pandemic, the need for psychosocial support systems to diminish the psychosocial consequences of this pandemic with teams of psychiatrists, psychologists, and pediatricians should increasingly be addressed [27-29].

Sleep disorder

It is worth noting that sleep is closely related to mental health, and numerous studies increasingly show a bidirectional relationship between sleep disorders and anxiety. On the other hand, various articles show that sleep and anxiety are affected by the COVID-19 pandemic [30]. The duration and quality of sleep were evaluated in recent studies and showed that children in families with more external stress did not have enough sleep. Children's sleep duration decreased during the pandemic, but this amount did not change significantly in preschool children compared to before [31].

Changes in life routines and stress-induced illness during the COVID-19 pandemic have led to sleep disorders, which recent studies have called the 'coronasomnia' phenomenon [32].

It is essential to pay special attention to sleep health in children, given that sleep plays a significant role in regulating brain function, immunity, hormonal secretion, and the cardiovascular system [33].

In early studies in China, only 18% had poor sleep quality, but in subsequent studies in other countries, this increased to more than 50%, indicating the effects of the coronavirus on mental health [31, 32].

Sleep disturbances, including insufficient sleep, cause inflammation and subsequently increase the permeability of the blood-brain barrier and allowing microbes, viruses, or toxins to enter the brain and cause irreversible complications following brain involvement [32]. Therefore, it is recommended to pay special attention to improving sleep quality in society to prevent physical complications caused by brain conflicts.

Problems with school lockdown

Within a few weeks after the beginning of the pandemic, with the closure of schools, most social activities outside the home were canceled, reducing children's positive interactions in the community and creating a new challenge for parents [34]. Although due to social restrictions and quarantine, the rate of hospitalization due to respiratory infections decreased [35, 36], school closures and reduced physical activity led to an increase in body mass index, as well as an excessive desire for cyberspace with inappropriate content [35, 37]. One of the other negative impacts of school closure is the dependence of children on their parents, therefore the possibility of refusing to go to school after reopening should also be considered [34].

Some studies have questioned school closures to reduce the transmission of COVID-19 and children as the leading cause of the disease spread. Therefore, school closures likely have more limited effects on the transmission of COVID-19 compared to other forms of social distancing. Additionally, several studies clearly show that parents report that homeschooling has had negative effects on them and their children, although some positive experiences have also been reported [38, 39].

It should be noted that in the subsequent periods of the pandemic, the positive and negative effects of closing schools on children and adolescents and their families should be well evaluated, and more deliberate decisions should be made.

Depression and suicide

Depression is an emotional disorder manifested by an unpleasant mood or loss of interest or enjoyment in ordinary activities. The mood disorder is significant and relatively persistent [27]. With the onset of the

pandemic in Wuhan City, China, and the unknown nature of various aspects of the disease, depression and other somatic disorders in children are more prevalent than in other cities [28, 40]. The prevalence of depression in children with an average age of 13-18 years has been higher than less than 12 years, and among them, girls have moderate to severe depression more than boys [20]. Recent studies screening for depression and suicidal ideation in children aged 12 to 21 years have shown an increase in the incidence of depression among children and an increased tendency to commit suicide in adolescents, especially young girls [41]. However, in most studies, when stress due to COVID-19 was greater, more suicidal thoughts were reported, but the overall number of suicides per year did not increase. These results show the great importance of screening and examining children's mental status at every visit by a pediatrician [42, 43].

In some studies, the number of suicides during quarantine and requests for hospitalization due to suicidal thoughts has decreased. One critical reason is the reduced demand for hospitalization due to the fear of COVID-19 [44, 45].

Pandemic-related suicide prevention considerations include social communication through online platforms or applications during quarantine, maintaining evidence-based management of psychiatric symptoms, and reducing unemployment. Timely intervention in people suffering from psychiatric disorders and suicidal behaviors reduces the number of suicides. Psychologists, psychiatrists, and other healthcare professionals should collaborate to control possible suicidal ideation during the COVID-19 outbreak and possible future crises [46].

Eating disorder (ED)

ED is classified into four common types, anorexia nervosa, bulimia nervosa, binge ED, and avoidant restrictive food intake disorder. With the increase in the prevalence of ED, the age of onset has decreased to 5 years. The prognosis is different in patients with ED [47, 48].

During the COVID-19 pandemic, disconnecting from protective factors (social communication, going to school, additional activities) and increasing predisposing factors (social media, eating long-lasting foods, worry about health and fitness) can lead to ED progression in susceptible individuals and decelerate their improvement [47, 49, 50]. According to recent studies, the incidence, prevalence, and severity of ED have in-

creased after the pandemic. Moreover, patients often do not have complete insight into their disease and find it challenging to communicate with others, which lead to delay in care and treatment, resulting in more hospitalizations [48, 50].

Although little information is available about COVID-19's effects on ED, individuals with ED are mostly prone to nutritional deficiencies, such as vitamin D, calcium, and phosphate. At the same time, these nutrients can reduce the risk of developing COVID-19 by their protective effect against infection and inflammation [46]. Also, these patients, especially anorexia nervosa and bulimia nervosa, are at high risk of systemic complications, including weight loss, hemodynamic instability, electrolyte disturbances, and decreased bone marrow function. All this, combined with untreated stress, reduce immunity and increases the need for hospitalization [47, 48, 50].

In the COVID-19 lockdown, due to the limited medical resources available, patients do not seek care until their illness has worsened, while patients with ED need more support in these conditions. Additionally, earlier diagnosis and treatment of ED have better results, and delay in starting treatment could be detrimental to the prognosis of the patients. Therefore, it is crucial to provide and expand care services for these high-risk patients during the COVID-19 pandemic [48]. Although the quality of communication through virtual and online media varies, communicating with practitioners via e-mail, virtual, and telephone is considered a positive change that improves service delivery and responsiveness. On the other hand, face-to-face appointments with families at the beginning of treatment should be provided to plan family-based treatments [51]. Nonetheless, to start proper treatments as soon as possible, online treatments are recommended instead of face-to-face to prevent worsening symptoms in new cases [50]. Various methods seem to be more effective in treating children and adolescents suffering from ED. Of course, the patient's opinion should be prioritized in choosing the appointment method [51]. Further research is required to assess the virtual care services and factors affecting them, such as sex and socioeconomic status among children and adolescents, to clarify the efficient treatment of ED during the pandemic [52].

Limitation

Given the limited number of studies on mental health problems in children during the COVID-19 pandemic compared to adults, it still appears that in many regions

with different levels of socioeconomic development, studies in this field are few, or their articles are published in local languages, we admit that we cannot use all the studies in this topic.

Discussion

This review study was conducted to demonstrate the psychological effects of the COVID-19 pandemic on children and adolescents. This pandemic has affected people's social and emotional relationships so much that families will be exposed to its effects for years to come [9, 10]. The experience of losing loved ones is one of the crucial and neglected aspects of it now. Although the reaction of children in this regard differs completely from that of adults, it is necessary to pay special attention to children. This reaction can be physical, such as seizures, or psychological, such as depression or anxiety [1, 12, 14]. Most people usually experience different fears during childhood and adolescence. During a health crisis, fears, especially health-related fears, tend to increase [19]. Since children and adolescents have a different understanding of the disease than adults, the negative impact of the fear of COVID-19 has been significantly greater than the impact of the disease itself [16, 18]. In addition, changes in lifestyle and stress-related illnesses during the COVID-19 pandemic have led to sleep disturbances, which recent studies have called the phenomenon of "chronosomnia" [32]. Recent studies on screening for depression and suicidal thoughts indicate an increase in the incidence of depression among children and an increase in the tendency to commit suicide in adolescents, especially young girls, which shows the great importance of screening and checking the mental status of children in every visit by a pediatrician [41-43].

One of the problems during the pandemic was the closure of schools and virtual education, which had various effects on children's minds, including the reduction of positive interactions of children in society, excessive desire for cyberspace with inappropriate content, the strong dependence of children on parents, as well as reduction of physical activity and increase in body mass index [34, 35, 37]. Despite many efforts to control and prevent the spread of COVID-19 and the production of effective medications and vaccines, the exact time of the end of this epidemic is still unknown. Therefore, awareness about the psychological effects of this emerging disease will be useful in dealing with it now and similar cases in the future.

Conclusion

Due to the prolongation of this pandemic, psychological issues and their consequences have increased. Prolonged quarantine and loss of parental jobs have severely affected families' livelihoods, leading to increased anxiety, depression, a tendency to domestic violence and suicide, sleep disorders, and nutritional problems, especially in children and adolescents. One of the most climacteric issues facing children is the loss of loved ones and the consequences of mourning. In particular, young children who have lost their parents are vulnerable. It is essential to provide psychosocial support and help bereaved family members. They need the love and care of adults in adverse situations. Parents should keep their children with them as much as possible and contact them regularly if the separation occurs due to hospitalization or similar. Every child who experiences such a trauma needs a safe and supportive environment, guidance, and helps to express their fear and sadness.

Ethical Considerations

Compliance with ethical guidelines

This study was a research project at [Shahid Sadoughi University of Medical Sciences](#) in Yazd City, Iran, the proposal was approved by the Ethics Committee with the code (IR.SSU.REC.1400.220).

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Authors contributions

Conceptualization and project administration: Zahra Nafei; Writing—review and editing: Marzie Vaghefi and Golnaz Samadzadeh.

Conflicts of interest

The authors declared no conflict of personal and organization interests in this study.

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