



Predictors of mental health worsening among children and adolescents during the coronavirus disease 2019 pandemic

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Purpose of review

Restrictions put in place to contain the spread of coronavirus disease 2019 (COVID-19) have significantly affected the lives of children and adolescents worldwide. School closure, home confinement and social distancing have the potential to negatively impact the mental health of this population. Several risk factors seem to contribute to worsening mental health of children and adolescents, with an increase of anxiety and depression symptoms. This review aims at exploring research available on risk factors that may worsen the mental health among children and adolescents during the pandemic.

Recent findings

Some of these predictors in worsening the effects are social isolation, screen time and excessive social media use, parental stress and poor parent–child relationship, low socioeconomic status, preexisting mental health conditions and/or disabilities.

Summary

Further research is needed in order to understand mental health effects of the COVID-19 pandemic, as well as risk factors associated with negative consequences. New findings will help in targeting evidence-based interventions to prevent and mitigate the negative effects of COVID-19 on the mental health of children and adolescents.

Keywords

adolescents, children, coronavirus disease 2019, mental health, risk factors

INTRODUCTION

Coronavirus disease has significantly changed life and habits around the world. Measures taken to contain the spread of the virus had a severe impact on children's and adolescents' lives, potentially negatively affecting their mental health and well being. Several studies conducted at different stages of the pandemic and in different countries found high rates of depressive, anxiety and posttraumatic stress disorders (PTSD) symptoms in children and adolescents of all ages [1[•]]. School closures and limited outdoor leisure time activities have strongly restricted youngsters' social interactions with their friends, which can be a risk factor for children's and adolescents' psychological well being, as peer relationships play a key role in their development [2[•]]. Children have been confined at home with their parents for a relatively long period of time, which can be a protective factor for children's well being [3^{••}] but in some cases, this has led to frictions and distress [1[•]]. Financial loss and uncertainty for

the future because of the economic recession added further pressure on parents, potentially worsening children's well being [2[•]]. Some children may, therefore, be more vulnerable than others to negative psychosocial effects of the pandemic and some factors seem to impact more than others on the well being of children and adolescents. The purpose of this brief review is to outline the major risk factors associated with the current pandemic that may worsen the mental health of children and adolescents.

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KEY POINTS

- Several risk factors seem to increase anxiety and depression symptoms caused by the COVID-19 pandemic.
- Parental stress, poor parent–child relationship, low socio-economic status may worsen negative outcomes.
- Preexisting mental health conditions and/or disabilities could be further aggravated by restrictions, or the limitations of mental health services and rehabilitation pathways.
- There may have been a worsening of mental health related to an increase of child abuse and neglect within the families.

FINDINGS

Age and gender

Research suggests that the effect of the COVID-19 pandemic may affect children and adolescents differently according to sex. McKune *et al.* [4[■]] examined risk factors for psychological outcomes, such as anxiety, depressive and obsessive compulsive disorders (OCD)-related symptoms, in a group of school-aged children during the early phase of the pandemic. Results showed that female individuals were at higher risk of presenting these symptoms of depression, anxiety and OCD. Similarly, Zhou *et al.* [5[■]] in a sample of more than 8000 adolescents aged 12–18 years, found that being a female was a risk factor for depressive and anxiety symptoms. A study conducted by Magson *et al.* [6[■]] also showed greater depressive symptoms and anxiety in adolescent girls (13–16 years). In another study [7[■]], male individuals showed increased oppositional-defiant and aggressive problems than female individuals. This is in line with previous studies indicating that female individuals tend to manifest more internalizing disorders, whereas male individuals exhibit more externalizing disorders [8]. Research also suggests that symptoms of mental health problems may be more likely to increase with age. Zhou *et al.* [5[■]] demonstrated that attending senior grades, compared with junior grades, was a risk factor for depressive and anxiety symptoms. Chen *et al.* [9[■]] also found more depressed and anxious adolescents in 13–15 years old group compared with 6–8 and 9–12 years old group (21.15 vs. 3.21 vs. 9.68% for depression; and 23.5 vs. 12.54 vs. 20.32% for anxiety, respectively). Nonetheless, with respect to age, research is not consistent. Jiao *et al.* [10] found mixed results for age effect, whereas a second study found no effect of age or grade on mental health

outcomes [11]. Schmidt *et al.* [7[■]] compared the effects of COVID-19 pandemic on mental health in three age groups: preschool children (1–6 years old), school children (7–10 years old) and adolescents (from 11 years old), founding that all age groups showed worsening mental health, although symptoms differed by age.

School closure, social isolation and loneliness

School closures have affected more than 150 countries, with 214 million children worldwide losing at least three quarters of classroom instruction time [12]. Since the beginning of the pandemic, it has been argued that school closures represent one of the most disruptive events for youngsters during the COVID-19 pandemic [13]. School is a place where children and adolescents spend a large amount of their lives [14], and its importance for children's and adolescents' development goes beyond its educational function. In fact, for many students, school is the only way to access health and mental health services [15], and there is also evidence that school closure is affecting children's nutrition as school meals are often the only source of food for many vulnerable children around the world, which in turn can affect their cognitive and learning abilities [16]. Moreover, school represents a central development context for children and adolescents, and school-based relationships with peers and teachers play an important role in the well being of young people [17].

During the lockdown and the coronavirus pandemic, children and adolescents lived in a prolonged state of physical isolation from their social connections: peers, teachers, relatives and community networks [18[■]]. Coronavirus restrictions are likely to result in increased loneliness [18[■]]. Loneliness is a subjective perception, defined as a discrepancy between the social contacts a person would like to have and the social contacts he or she actually has [1[■],18[■],19]. Loneliness has been associated with a greater probability of developing mental health problems [18[■],20]. For instance, there is evidence showing that a sustained experience of loneliness during childhood predicts symptoms of depression reported during adolescence [21]. Although social isolation and loneliness are not necessarily co-existent, some studies indicated that adolescents and young people reported high levels of loneliness during lockdown [18[■]]. For example, more than 31% of parents ($n = 1143$) interviewed by Orgilés *et al.* [22[■]] reported feelings of loneliness as one of the symptoms most frequently experienced by their children during the very early phase of the pandemic. The negative effects

of social and physical distancing might be particularly present in adolescents and young adults as adolescence is a crucial period for social interactions [23,24]. Cooper *et al.* [3^{***}] conducted an online survey on adolescents aged 11–16 years ($n = 894$) to investigate the association between perceived loneliness during the pandemic and various symptoms of poor mental health, including internalizing and externalizing problems and psychological distress. Higher levels of loneliness were correlated with higher levels on all mental health scales.

Similar results are reported by Rauschenberg *et al.* [25^{**}], in Germany. The authors, in a sample of adolescents and young adults aged 16–25 years, found a higher likelihood of experiencing psychological distress during the pandemic in people who reported subjective experiences of social isolation. Specifically, individuals who reported being 'often' or 'very often' socially isolated were respectively 22 and 42 times more likely to experience psychological distress than those who reported 'never' being socially isolated (*ibidem*).

Severity of restrictions

Harshness of restrictions adopted by governments and differences in confinement rules could also have determined differences in mental health outcomes of children and adolescents. One study [39^{**}] examined the prevalence of depressive and anxiety symptoms in a sample of Spanish, Italian and Portuguese children and adolescents (3–18 years old). Spanish and Italian children showed higher levels of depression compared with Portuguese children whereas Spanish children reported more symptoms of anxiety compared with both Italian and Portuguese children. According to the authors, this could be explained by the fact that in Italy and Spain, confinement was mandatory, whereas in Portugal, it was only recommended. Moreover, at the time of data collection, Italian children had been allowed to go out for walks for several weeks, whereas Spanish children had only been allowed to go out for 1 week (*ibidem*).

Screen time and social media use

There is evidence that screen time and social media use have increased during the pandemic [26–28]. This was to be expected as many activities have been carried out remotely, starting with school. Social media has been helpful during confinement in maintaining social relationships with relatives and peers and helping to cope with loneliness and anxiety [26]. However, excessive Internet use may also have negatively affected children and adolescents' well being. For example, Cauberghe *et al.* [26] found

an increased use of social media among adolescent girls to keep in touch with friends and family, especially those who experienced higher levels of loneliness; however, this finding was not associated with a heightened feeling of happiness (*ibidem*). Muzi *et al.* [28] found higher levels of problematic social media use during the pandemic in a sample of Italian adolescents, compared with prepandemic levels. Increased problematic social media use was associated with more emotional and behavioural symptoms, such as delinquent and attention problems, and binge eating behaviour (*ibidem*). Previous research has found that excessive screen time may be associated with several health risks, including poor sleep quality, cardiovascular diseases, and mental health problems, such as depression, anxiety and suicide [29]. Moreover, uncontrolled Internet use may have exposed children and adolescents to online risks, such as cyberbullying, cyber predators and exposure to inappropriate content (e.g. sexual or violent material) [30].

The Internet and social media have also been an important source of information on the pandemic, especially during these past months. At the same time, the overabundance of information on coronavirus has generated an 'infodemic' that can be harmful to people's mental health [31]. One study conducted in China found that the exposure to radio reports around COVID-19 was associated with greater depression and anxiety [32]. Similarly, Magson *et al.* [6^{**}] found that COVID-19-related distress and feeling socially disconnected from others were significantly associated with viewing posts about coronavirus on social media.

Orben *et al.* [23], however, observed that in order to understand how digital technologies impact young people who are physical distancing, we need to differentiate between connection promoting (i.e. active and communicative) and nonconnection promoting (i.e. passive) uses of social media, and not focusing uniquely on the time spent online. Furthermore, consequences of the use of social media and digital technologies during the pandemic should also consider individual differences (*ibidem*).

Parent-child relationship and parental stress

A good parent-child relationship can be an important protective factor for children's mental health when coping with natural disasters [33] and this also seems to apply to COVID-19 pandemic. Cooper *et al.* [3^{**}] found that adolescents who reported being closer to their parents showed fewer symptoms related to mental disorders and feelings of loneliness. Wang *et al.* [34] found a lower prevalence of depressive symptoms in adolescents with good parent-child

relationship, compared with those with poor parent-child relationship (16.3 vs. 52.4%). On the contrary, parental distress and poor mental health can predict a worsening in children's mental health (*ibidem*).

Overall, the COVID-19 pandemic has led to a reorganization of habits and rules within the family. The families had to cope with the stress of quarantine and social distancing, with home-schooling and home-working and in most cases, this situation resulted in a considerable amount of stress and psychological distress [2^o]. Not only fear of the disease itself, fear of losing family members but also grief and mourning may lead to adjustment problems, posttraumatic stress disorder and other mental health issues (*ibidem*). Caffo *et al.* [35] report results from a national Italian survey conducted by Telefono Azzurro and DoxaKids during the quarantine. A sample of 291 Italian parents, with at least one son aged from 0 to 18 years old, was interviewed. According to the results, 61% of the participants declared that their involvement in their sons' school activities had been increased. Moreover, 23% of them experienced difficulties at home during the quarantine, 18% found it difficult to find adequate spaces inside the house and 20% found it difficult to coordinate between homeworking and their children's online school activities (*ibidem*). One study found that parents with higher distress and anxiety were more likely to observe distress in their children [36^o]. Findings from a longitudinal study conducted in the UK suggest that young women living with children, especially school age children, are more likely to show an increase of mental distress during the pandemic [37]. In one study, children and adolescents reported higher mental and social health complaints during the lockdown if they were part of a single-parent family or if there were three or more children in the family [38^o]. Orgilés *et al.* [39^o] found that anxiety and depressive symptoms were higher in those children whose parents reported higher levels of stress during the COVID-19 pandemic. Poor parental mental health was found to be one of the main factors to influence mental health outcomes in preschool and school children but not in adolescents [7^o].

Socioeconomic status and economic challenges

As the pandemic extended to low-income and middle-income countries (LMICs), there have been growing concerns about the risks of coronavirus disease [40]. In these countries, reduced access to care, poverty and other factors may lead to delays in seeking care for sick children (*ibidem*). All over the globe, during the pandemic, low-income families

faced additional threats and consequences on children's health, well being and learning gap [41]. Before the COVID-19 outbreak, one study had already found that school closure during summer holidays could lead students, especially those coming from poorer families, to experience more feelings of loneliness, which can negatively impact their mental well being [42]. In Europe, 5% of children live in homes in which they have no place to do homework and 6.9% have no access to the Internet [41,43]. This can lead to difficulties in accessing alternative modalities, like home-schooling or telemedicine [2^o].

Furthermore, the pandemic is causing a serious economic recession, adding pressure on low-income families, which in turn can negatively affect children's well being [2^o,44]. In a study conducted in the United States [36^o], financial difficulties predicted higher anxiety and depressive symptoms. McKune *et al.* [4^o] also found an association between loss of household income and increased risk of depressive, anxiety and OCD symptoms in school-aged children and adolescents. Moreover, Zhou *et al.* [5^o] found higher rates of both anxiety and depressive symptoms in adolescents (12–18 years old) living in rural areas than those living in urban areas (40.4 vs. 32.5% and 47.5 vs. 37.7%, respectively), suggesting that families living in rural areas are more economically disadvantaged than those living in cities (i). Therefore, during the ongoing pandemic, socioeconomic status and social factors can be predictors of poor mental health in children and adolescents [2^o,45].

Children with disabilities and/or preexisting mental health conditions and reduction in health services activity

Since the beginning of COVID-19 pandemic, researchers and mental health professionals have expressed particular concern for children with prior mental illness, whose lives may have been highly impacted by restrictive measures. For example, the UK charity organization YoungMinds [46] interviewed adolescents with psychiatric disorders, and 83% of them reported a worsening in their mental health. In a study conducted in Turkey by Tanir *et al.* [47^o], children and adolescents (aged 6–18 years) with a previous diagnosis of OCD reported an increase in the frequency of contamination obsessions and cleaning/washing compulsions during the pandemic period.

Of particular concern are children and adolescents with autism spectrum disorder (ASD), whose development could deteriorate because of uncertainty and social restrictions, which may also cause more intense and frequent behaviour problems, as shown by Colizzi *et al.* [48^o]. Masi *et al.* [49^o] also examined the mental health of children (2–17 years

old) with neurodevelopmental disabilities (NDD), such as ADHD and ASD, through an online survey distributed to parents and caregivers ($n = 302$). More than 76% of respondents reported a worsening in overall children's well being, whereas 64.7% reported a deterioration of NDD or comorbidity symptoms. Additionally, the condition of children and adolescents with preexisting conditions could be further aggravated by the limitations of mental health services and rehabilitation pathways [1[■],2[■],50]. In the study by Masi *et al.* [49[■]], parents reported low effectiveness of services and support received during the pandemic: 68.8% used telehealth services during this period, but only 30% said telehealth worked well for their children. Furthermore, 41.3% reported that telehealth services for therapy were not an option for their children (*ibidem*). However, not everyone agrees on the fact that the pandemic is worsening the clinical condition of these patients. For example, Lavenne-Collot *et al.* [51] found no worsening in the clinical condition of children and adolescents with psychiatric disorders during lockdown. According to the authors, having to remain confined at home with their family may have been a protective factor for these patients.

Domestic violence and child maltreatment

An important risk factor that should be further investigated is the worsening of mental health of children and adolescents related to an increase of child abuse and neglect within the families. Since the beginning of the pandemic, authors have drawn attention to the risk of an increase in child abuse and maltreatment [2[■],52,53]. Mandatory stay-at-home, school closures and movement restrictions, although necessary to reduce the spread of the virus, left many children and adolescents confined with violent adults increasingly frustrated by stress and other risk factors related to pandemic, such as unemployment or increased consumption of alcohol [52]. Research conducted after natural disasters or conflicts reports a surge in cases of domestic violence [54], and there is already evidence that this is also occurring during the COVID-19 pandemic. Kovler *et al.* [55], for example, reported an increase in trauma attributable to child physical abuse at the Johns Hopkins Children's Center paediatric trauma centre. Specifically, in 2020, 13% of total trauma patients were identified as victims of child physical abuse, compared with 4 and 3% in the same period in 2019 and 2018, respectively. The average age of these patients was 11.5 months. Children victims of abuse have a higher probability of suffering from several psychological problems, such as depression, anxiety and PTSD that may persist into adulthood

[2[■]], therefore, it is essential to intervene early. However, during the pandemic, many cases of abuse may have gone unnoticed as many community services, starting with schools, remained closed.

CONCLUSION

Studies conducted during the pandemic found increased symptoms of mental health problems in youngsters, such as anxiety and depressive symptoms. School closures and physical distancing in many cases generated a feeling of loneliness in children and adolescents [39[■]], which could cause psychosocial distress [18[■]]. A good parent-child relationship may have acted as a protective factor against loneliness and other symptoms of poor mental health [3[■]] but on the other hand, children of parents who reported high distress showed increased levels of anxiety and depression [39[■]]. Children and adolescents living in poor socioeconomic conditions could be more negatively impacted by the pandemic. These children had less opportunity to study from home and access mental health services, increasing preexisting social and learning gaps. Children's and adolescents' mental health may have suffered of COVID-19 changes in the presence of preexisting mental health conditions or disabilities [48[■],49[■]]. Future and more accurate research should be implemented to better understand how the pandemic is impacting children's and adolescents' mental health, what are the risk factors that could worsen the outcomes, and if these consequences will last in the mid-long term. New findings will help in targeting evidence-based interventions to prevent and mitigate the negative effects of COVID-19 on the mental health of children and adolescents.

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Conflicts of interest

There are no conflicts of interest.

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- of special interest
- of outstanding interest

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