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Mental Health Effects of the COVID-19 Pandemic on Children and Adolescents

A Review of the Current Research



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KEYWORDS

- COVID-19 • Child • Adolescent • Mental health • Psychological • Anxiety • Depression

KEY POINTS

- Research is ongoing regarding mental health effects of the coronavirus disease 2019 pandemic on children and adolescents.
- Early studies show children and adolescents experiencing increased anxiety and depression.
- Isolation, loneliness, lack of physical activity, family stress, and racism may contribute to the effects of the coronavirus disease 2019 pandemic on child and adolescent mental health.

BACKGROUND

Coronavirus disease 2019 (COVID-19) has created unimaginable challenges for children, adolescents, and their families around the world. This virus, which was first identified in Wuhan, China, in December 2019,¹ has led to 23,440,774 cases of COVID-19 in the United States (as of January 16, 2021) and has caused more than 390,938 total US deaths.² Pandemic-related school and business closings and community lockdowns have had significant effects on families. The earliest world-wide lockdowns that started in China around January 23, 2020,³ included restrictions on schools and gatherings, and resulted in children being transitioned to online school. In the United States, many school districts began transitioning to online school in March 2020 in conjunction with community closures.⁴ Since then, individual communities and states within the United States have continued to impose and lift restrictions in response to COVID-19 outbreaks. This situation has been and continues to be a constantly changing situation, with new stressors occurring constantly.

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COVID-19-RELATED SOURCES OF STRESS FOR CHILDREN AND ADOLESCENTS

Everyday life for children and adolescents has been significantly disrupted by the COVID-19 pandemic. Potential stressors for children and adolescents during this challenging time could include:

- Increased social isolation
- Heightened concerns over safety and health
- Increased stress of parents and caregivers owing to work, financial, or other impacts
- Increased family conflict, parent–child conflict, and/or child abuse
- Placements with friends or relatives owing to parent work situation
- Loss of prosocial activities (school, sports, social activities, hobbies)
- Adjustment to online schooling processes and demands
- Increased screen time and sedentary behaviors
- Decreased access to medical and mental health care, including exacerbated health disparities

ADDED EFFECTS OF SOCIOPOLITICAL EVENTS

In addition to the pandemic-related changes discussed, co-occurring sociopolitical stressors during this time also likely impact the mental health of children and adolescents. Given that the first cases of COVID-19 were identified in China,¹ some American politicians began referring to it as the “Wuhan virus” or the “Chinese virus,” which led to reports of a racism pandemic against Asian Americans in the United States.⁵ Early research on this topic demonstrated that nearly one-half of Chinese American parents and their children ages 10 to 18 who were surveyed reported being targeted by or witnessing COVID-19 racial discrimination.⁶

Additional racial-based stressors occurred in the United States beginning May 25 with the death of George Floyd at the hands of the police.⁷ Through media coverage and a video of his death, many children were exposed to examples of violence and/or racism. Outrage over police violence focused the country on issues of racial justice and resulted in months of protests and demonstrations, peaking in June 2020.⁸ It is difficult to disentangle the effects of the COVID-19 pandemic stressors from these sociopolitical events in the United States.

EARLY REVIEWS ON COVID-19 AND CHILD MENTAL HEALTH

The earliest identified reviews of original research looking at COVID-19 effects on child and adolescent mental health identified concerns about increasing levels of depression and anxiety⁹ as well as post-traumatic symptoms.¹⁰ A review by Fong and Larocci¹¹ published in November 2020 combined past pandemic research with newly available COVID-19 findings and concluded that pandemic-related social isolation and quarantining is resulting in significant anxiety, post-traumatic stress disorder (PTSD), and fears in children and adolescents. The authors emphasized the importance of reducing barriers to mental health services for children and families.

CURRENT STUDIES

The purpose of this article is to provide an updated review of the current body of research findings to date on the specific impacts of COVID-19 on the mental health functioning of children and adolescents. Original data studies examining mental health outcomes in the general population of children and adolescents during COVID-19

were identified through search engines and publications. **Table 1** provides a summary of studies reviewed, including authors, country of origin, month(s) of data collection, number and ages of subjects, and major findings with regards to child and adolescent mental health. These studies present a snapshot in time, and it will be important that research be ongoing in order to understand the short- and long-term effects of the pandemic on children and adolescents.

Changes in Mental Health Owing to COVID-19

To investigate changes in child/adolescent mental health functioning in relation to the pandemic, studies have examined parent and youth retrospective symptoms reports and have compared current data to that from previous years. Longitudinal data analyses would be ideal, but are not yet available.

Parent and child report of changes

The worsening of child mental health during the pandemic has been reported by parents and children. A US study of 1000 parents with at least 1 child under age 18 years found that 14.3% of parents reported observing worsening in child's behavioral health after March, with little difference in racial, ethnic, income, or education groups.²³ Reported declines in parent and child mental health for these families were linked to having younger children, loss of child care, and reported increased food insecurity. Canadian researchers collected data from both clinical and community samples of youth ages 14 to 28 approximately 1 month after pandemic onset. Both groups reported significant declines in mental health compared with prepandemic functioning, with the community sample reporting the greatest decline. Interestingly, this primarily college-aged sample reported decreased substance use from before to after the onset of the pandemic, possibly owing to a return to parents' homes.

Suicide statistics across times periods

Studies examining large health-related datasets have been able to compare changes in suicide-related behaviors from year to year. Hill and colleagues¹⁷ examined the outcomes of routine screening for suicide in 18,247 youth ages 11 to 21 years in a large US city hospital emergency department (ED), comparing percentage of youth seen reporting recent suicidal ideation and recent attempts from March through July 2020 with the same months in 2019. They found higher rates of both suicidal ideation in March and July 2020 (compared with 2019), and higher rates of recent suicide attempts in February through April and July 2020 (compared with 2019), suggesting that events in 2020 were leading to these increases. In contrast, in Japan researchers used public data to compare rates of completed suicides in youth under age 20 years for March through May of 2019 and the same months in 2020.¹⁸ Although they found that youth suicide in Japan did increase from March to May each year, rates were not worse in 2020. Researchers hypothesized that youth remaining at home with family (owing to COVID-19 restrictions) may have been a protective factor.

Mental health emergency visit rates

Hospital emergency departments are often the site for crisis mental health evaluations of children and adolescents. Using data from the Centers for Disease Control and Prevention reporting general mental health-related visits for children less than 18 years of age at hospital emergency departments across 47 US states, Leeb and colleagues²⁰ examined rates of visits for the period of January through October in 2019 and 2020. When examining proportion of mental health-related visits per 100,000 emergency department visits, sharp increases were found after March 2020, and these increases

Table 1
Research examining mental health impacts of COVID-19 on children and adolescents

Author	Country (Data Collection Dates)	Participants	Findings Regarding Child and Adolescent Mental Health
Cheah et al, ⁶ 2020	United States (March 14 to May 31, 2020)	543 parents in the United States who identify as Chinese and 320 of their children, ages 10–18 y	Majority of parents and children reported directly experiencing or witnessing racial discrimination against Chinese or Asian Americans owing to COVID-19. Both parent report of poorer child well-being and child report of anxiety linked to experiences of racial discrimination.
Chen et al, ¹² 2020	Guiyang, China (April 2020)	1036 children, ages 6–15 y	11.78% rate of depression, 18.92% rate of anxiety, and 6.56% rate of both. Factors linked with depression: being female, being older teen, lower parent education, no companion on weekdays, and less physical exercise. Factors linked with anxiety: being female, no companion on weekdays, and less physical exercise. Some belief physical exercise serves a protective factor.
Duan et al, ¹³ 2020	20 provinces in mainland China (article submitted in April 2020)	3613 children ages 7–18 y	22.28% of sample reported depressive symptoms above clinical threshold. Anxiety in children was 23.87% and 29.27% in adolescents. Increased anxiety linked to being aged 13–18, female, living in urban area, emotion-focused coping style, Increased depression linked to smartphone addiction, Internet addiction. Problem-focused coping and fewer hours on the Internet before pandemic related to decreased depressive symptoms.

Fitzpatrick et al, ¹⁴ 2020	United States (April to July 2020)	133 caregivers of at least 1 child aged 1–19 y	Parents reported top mental health problems in their most challenging child; Results grouped by age: 1–5 y: misbehavior, social isolation, boredom, needing attention, anxiety 6–12 y: academics, misbehavior, anxiety, social isolation, depression 13–19 y: depression, anxiety, misbehavior, social isolation, inattention or impulsivity
Gassman-Pines et al, ¹⁵ 2020	United States (Feb to April 2020)	645 parents of children 5–7 y	In children of hourly service-industry workers, more COVID-related hardships (job loss, loss of income, caregiver burden) resulted in increased children's uncooperative and worry behaviors.
Hawke et al, ¹⁶ 2020	Canada (April 2020)	Clinical sample of 276 youth, and community sample of 346 youth, majority Caucasian, ages 14–28 y.	Significant mental health decline reported by participants across groups. Internalizing disorder: 68.4% of clinical sample and 39.9% youth in the community sample had high likelihood of meeting criteria. Externalizing disorders: 40.2% of clinical and 16.9% of community sample had high likelihood.
Hill et al, ¹⁷ 2020	United States (February to July 2020)	11- to 21-year-old youth seen at a city emergency department	City ED screened youth for reported recent suicidal ideation and suicide attempts; rates were higher in several months of February to July 2020 compared with same period in 2019

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Table 1
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Author	Country (Data Collection Dates)	Participants	Findings Regarding Child and Adolescent Mental Health
Isumi et al, ¹⁸ 2020	Japan (March to May, 2018, 2019, 2020)	Nationwide suicides among youth <20 y	<p>Concluded pandemic did not have significant effect on suicide rates compared with previous years or pre-post school closure.</p> <p>Discussed possible positive connections, cohesion, and social support for children.</p>
Jiao et al, ¹⁹ 2020	Shaanxi Province, China (February 2020)	320 parents of children and adolescents, ages 3–18 y	<p>Younger children (3–6 y) had more clinginess and fear about safety of family members from COVID (compared with older children).</p> <p>Older children (6–18 y) had more inattention and “obsessive request of updates.”</p> <p>Most common symptoms in entire sample were clinging, inattention, and irritability.</p>
Leeb et al, ²⁰ 2020	United States (January to October, 2019 and 2020)	Examined data from the CDC’s National Syndromic Surveillance Program regarding ED visits among children <18 y	<p>Children had fewer total mental health ED visits after lockdown, but percentage of visits that were for mental health-related sharply increased in late March and continued through October.</p> <p>Percentage of mental health-related visits in late March through October was significantly higher than during same months in 2019.</p> <p>Ages 5–11 y: 24% increase in percentage.</p> <p>Ages 12–17 y 31% increase in percentage.</p>

Liu et al, ²¹ 2020	China (February to March 2020)	Grades 5–6 (estimated ages 10–11 y) and college students (estimated ages 17–22y)]	In primary school children, concerns regarding threat to life and health (endorsed by 39.7%) was related to somatic symptoms and anxiety but not depression. Overall rates were low, however.
Liu et al, ²² 2021	Wuhan and Huangshi, China (February to March 2020)	1264 children ages 7–12 y and their parents.	Higher inattention-hyperactivity and problems with prosocial behaviors when children did little or no physical exercise. Children in Wuhan at higher risk for peer problems and overall behavior difficulties vs Huangshi.
Patrick et al, ²³ 2020	United States (June 2020)	1000 parents with ≥ 1 child <18 y households	14.3% reported worsening in child's behavioral health with little difference in racial, ethnic, income, or education groups. Worsening of mental health in parent and child linked to having younger children, loss of child care, and reported increased food insecurity.
Tang et al, ²⁴ 2021	China (March 2020)	4342 Primary and secondary school students, ages 6–17 y	Higher reported depression, anxiety, and stress among senior secondary students, those who saw quarantine having more problems vs benefits, and those whose parents had not discussed COVID with them.

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Table 1
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Author	Country (Data Collection Dates)	Participants	Findings Regarding Child and Adolescent Mental Health
Xie et al, ³ 2020	Wuhan and Huangshi, China (February to March 2020)	1784 children, Chinese grades 2–6 (approx. ages: 7–12 y)	Rates of anxiety and depression higher than previous population studies in China. Higher depression scores found in children from Wuhan vs Huangshi, those who rated themselves as “quite worried” about being affected by COVID-19, or those who rated themselves as “not optimistic about the epidemic.”
Yeasmin et al, ²⁵ 2020	Bangladesh (April to May 2020)	384 parents of children ages 5–15 y	Severity of depressive, anxiety, and sleep symptoms was higher for children in urban area, who had more COVID + family/neighbors, and whose parents had higher education, needed to go to workplace, who smoked, or were at risk of losing job.
Yue et al, ²⁶ 2020	China (February 2020)	1360 children and parents; average child age 10.56 y (SD = 1.79)	Anxiety and PTSD symptoms in children related to spending more time on COVID media reports.
Zhou et al, ²⁷ 2020	China (March 2020)	8079 teens ages 12–18 y	Found higher depressive and anxious symptoms in females, in rural areas, and in higher grades. Protective factors included: knowing more about COVID, taking safety precautions, and being optimistic about pandemic

Abbreviations: CDC, Centers for Disease Control and Prevention; ED, emergency department.

continued through October. Additionally, the proportion of mental health-related visits in late March through October was significantly higher than during same months in 2019. More specifically, the proportion of such visits for ages 5 to 11 demonstrated a 24% increase from 2019 to 2020 (from 783 per 100,000 visits to 972 per 100,000), and the proportion of adolescents aged 12 to 17 years presenting for mental health-related visits increased 31% (from 3098 per 100,000 emergency department visits to 4051 per 100,000). These increases may well reflect increased distress among children and adolescents owing to pandemic-related stressors. Additionally, the authors raised the possibility that these increases are related to the public's difficulties accessing mental health services in the community.²⁰

Predominant COVID-19-Related Mental Health Concerns by Age

Across studies reviewed, rates of mental health symptoms during COVID-19 have varied by age. Findings here are grouped for younger children, school-aged children, and adolescents.

Younger children

Studies examining the most significant mental health concerns in younger children (eg, <7 years of age) during the pandemic have found reports of more clinginess and fear about safety,¹⁹ increased uncooperative and worry behaviors,¹⁵ and misbehavior, boredom, needing attention, and anxiety.¹⁴ Young children of hourly service workers who experienced significant COVID-related stressors displayed increased uncooperative and worry behaviors.¹⁵

School-aged children

Children of elementary school age (approximately 7–13 years) have been reported to display rates of anxiety and depression that are higher than normal during the COVID-19 pandemic.³ Rates of significant depressive symptoms in studies of children during this time have ranged from 2.2%²⁶ to 11.78%.¹² Rates of significant anxiety symptoms have ranged from 1.8%²⁶ to 18.92%¹² to 23.87%.¹³ The rate of PTSD was reported as 3.16%.²⁶ The most problematic behaviors have been reported to be increased inattention and need for reassurance,¹⁹ as well as difficulties with academics, misbehavior, anxiety, social isolation, and depression.¹⁴

Adolescents

Parents have reported that the most significant behavioral concerns in adolescents during the pandemic have included depression, anxiety, misbehavior, social isolation, (poor) attention, and impulsivity.¹⁴ Self-report rates of significant anxiety symptoms have been found to range from 10.4%²⁷ to 29.27%.¹³ Rates of significant depressive symptoms have been reported to range from 17.3%²⁷ to 22.28%¹³ and were found to be higher in female adolescents compared with males.^{12,13,27} Several studies indicated that high school seniors (as compared with younger children) demonstrated the highest ratings for depression,²⁷ anxiety, and stress.²⁴ Mental health-related emergency department visits were more common in ages 12 to 17 during the postpandemic months (March to October, 2020) with females having the higher proportion of visits.²⁰ In a community sample of primarily college-aged youth, 39.9% reported symptoms of an internalizing disorder (eg, depression or anxiety), and 16.9% reported symptoms of an externalizing disorder (eg, aggression, oppositionality).¹⁶ Another study of college age youth indicated high rates of somatic symptoms (34.85%), particularly when worried about necessities of daily life.²¹

Factors Found to Contribute to Mental Health Symptoms

Research on mental health and psychosocial functioning has identified multiple factors that seem to affect rates of mental health symptoms in children and adolescents.

Social isolation

Research has shown that social isolation and loneliness increase the risk of depression and possibly anxiety, with duration of loneliness having the biggest impact on child mental health.²⁸ The COVID-19 studies reviewed here did indeed link social isolation to increased depression and anxiety, including children who were unhappy with home quarantine,²⁴ those whose parents went to work while children stayed at home,²⁵ and children who had no companion on weekdays.¹² Sexual minority youth may be particularly vulnerable to the mental health effects of social isolation. A study by Fish and colleagues²⁹ with lesbian, gay, bisexual, transgender, and youth questioning sexual orientation (LGBTQ) youth identified the challenges of youth being homebound with unsupportive families, as well as loss of in-person support and socialization. Researchers stressed the importance of assisting LGBTQ youth in maintaining social supports and mental health through electronic connections.

Screen time

The use of phones and the Internet have become integral parts of coping with the COVID-19 pandemic. Although some parents reported successfully using media entertainment to soothe children during the initial weeks of the pandemic,¹⁹ a large study of children and adolescents linked smartphone and Internet addiction (defined as excessive use) to increased depression.¹³

Lack of physical activity

Children engaging in regular physical activity during the pandemic seemed to fare better, demonstrating less hyperactive-inattentive behavior and more prosocial behaviors.²² Conversely, a lack of physical exercise during COVID-19 has been linked to higher levels of depression and anxiety, and investigators suggest that physical activity may serve as a protective factor.¹² Mittal and colleagues³⁰ raised concerns about significant negative effects of sedentary behavior on children's mental health, noting that children's play is crucial to meet developmental milestones. They emphasized the importance of alternatives such as zoom to continue physical activity, as well as community and academic partnerships to ensure that children remain active.

Perceived COVID-19 risk

Child and adolescent mental health has been found to vary directly with perceived risks of COVID-19. Two studies examined negative effects of living near high rates of COVID-19 (ie, City of Wuhan compared with other areas in China). Children living near Wuhan displayed higher levels of depression,³ more peer problems, and overall behavior difficulties.³¹ Consistent with this finding, primary school children were found to have increased somatic symptoms and anxiety when experiencing higher concerns regarding threats to their life and health.²¹ Yeasmin and colleagues²⁵ found that children with a greater severity of sleep problems had more COVID-positive family members or neighbors. Fitzpatrick and colleagues¹⁴ examined the effects of community COVID-19 rates and restrictions, finding that number of COVID-19 cases in a family's geographic region was significantly associated with child and adolescent internalizing problems. More leniency in community restrictions was associated with greater child and adolescent internalizing, as well as externalizing problems, suggesting that children felt safer and had better mental health outcomes when community restrictions were in place.

Exposure to COVID-19 information

Some evidence has been found that exposure to COVID-related information can affect mental health. In a large study 1 month after quarantine, grade school children who reported spending more time on COVID-19 media reports also reported higher levels of anxiety and PTSD symptoms. In the same study, the amount of attention paid to such reports was related to PTSD symptoms only.²⁶ In contrast, a separate study found that children seemed to benefit from discussions about COVID-19 with parents; those whose parents did not discuss COVID-19 with them reported higher levels of depression, anxiety, and stress.²⁴ A large study of adolescents found that those reporting greater knowledge about COVID-19, more optimism about it, and engaging in more safety steps reported lower levels of depressive and anxious symptoms.

Parenting stress

It is difficult to separate child and parent well-being from each other. Studies examining parent well-being during the COVID-19 pandemic found that it was directly related to hardships such as decreases in work, incomes and increased caregiving burden.¹⁵ In a US study of 1000 parents, 26.9% reported worsening of their own mental health since onset of the pandemic, especially in mothers, unmarried parents, and families with younger children.²³ Such stressors can lead to increased risks of domestic violence and child abuse.³² Studies during COVID-19 have found that parental depression, job loss, and previous maltreatment predicted higher rates of maltreatment for children ages 4 to 10 years of age.³³ A study examining parenting of a wider range of children (<18 years) found that greater received support and perception of control resulted in parents being less likely to maltreat.³⁴ Rodriguez and colleagues noted that the pandemic serves as a perfect storm, given the economic hardships, effects on parental mental health, and the increased time families are spending together during the COVID-19 restrictions.³⁵ The authors call for investment in primary prevention, rather than a reactive approach, to support and educate families and communities to protect children.

DISCUSSION

Experts have cautioned that the high number of deaths, continued experience of grief and loss, and exacerbation of current mental health disorders mean that a “second wave” of mental health consequences from this pandemic is “imminent.”³⁶ Consequently, the need for effective social supports and mental health interventions is crucial.

Kaslow and colleagues³⁷ proposed a behavioral health response continuum to “flatten the emotional distress curve,” which was inspired by the Centers for Disease Control and Prevention’s pandemic intervals framework. Through strategic planning, behavioral health experts can mobilize and provide large-scale interventions such as education on coping strategies, social connectedness, and other behavioral health education. Continued data gathering and research would then help to identify continued needs and provide information on program effectiveness. Using a public health model to address the mental health needs of a population is a promising approach.

Going forward, the need for accessible mental health services for children and families has never been greater. Decreasing financial and insurance barriers to access will be essential, including continued development of parity for mental health care. The increase in telehealth mental health services in the United States has been dramatic³⁸ and offers one way to expand access to families with distance, safety, or transportation barriers. The disproportionate effect of COVID-19 on communities of Black,

Latino, and Native American families requires collaborative behavioral health care in which experts build capacity around the needs of these communities.³⁹

Medical settings are often the front line with regard to identifying mental health needs. Professionals in these settings will want to assess for depression and anxiety in children and adolescents during this continued pandemic. Standardized, empirically based mental health screening measures can quickly identify those in need of further assessment and/or referrals for mental health services. The American Academy of Pediatrics provides recommended screening measures (Mental Health Tools) within their Mental Health Initiatives website, which can be found here: <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Pages/Primary-Care-Tools.aspx>.⁴⁰ The site provides information on the measures, as well as information on obtaining them. Integrating mental health professionals within medical care can be ideal for assessing and treating overall psychosocial functioning of patients.

As we approach the 1-year anniversary of COVID-19 pandemic, continued research will be critical to understand ongoing impacts to child and adolescent mental health. There is a need for more research within communities disproportionately affected by COVID-19 such as the Black, Latino, and Native American populations. There is also a need for further research of COVID-19 impacts on children and adolescents with disabilities. There is a need to identify effective prevention strategies and treatment interventions.

SUMMARY

Research on the mental health effects of the COVID-19 pandemic on children and adolescents confirms the presence of significant anxiety and depression, as well as increases in these symptoms compared with prepandemic levels. Research reviewed suggests that teenagers, especially females and high school seniors, may suffer the most. There is evidence that social isolation and sedentary behaviors contribute to these mental health problems. Children who feel unsafe with regard to COVID-19 may be more likely to experience somatic symptoms, depression, and anxiety. Exposure to excessive information about COVID without parental communication on the topic may lead to higher anxiety and PTSD symptoms.

Many parents are experiencing significant economic and personal stress along with increasing mental health symptoms, especially single parents and parents of young children. It is clear that parental stress and mental health problems directly affect their children, and some children may be at increased risk for child maltreatment owing to pandemic-related stressors and situations.

Increasing access to mental health services for children and families will be vital. Integrating mental health care into medical settings would be ideal to provide front-line and comprehensive care. Research on the continuing effects of COVID-19 will be necessary as the situation continues to change, and studies of effective prevention and treatments strategies are also needed.

CLINICS CARE POINTS

- Professionals are just beginning to understand how the ongoing COVID-19 pandemic has significantly impacted the lives and mental health of children and adolescents.
- Current research shows children are displaying increased anxiety and depression, and that social isolation and a lack of physical activity may worsen these factors.

- Racial minority children and adolescents may be at even greater risk, given the additive effects of racism on health.
- Health care professionals should screen patients routinely for unmet mental health needs and provide links to care when indicated. Increasing access to mental health care is crucial.

DISCLOSURE

The author has nothing to disclose.

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