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Psychological impact of the covid-19 infection on children

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Introduction

The spread of the new coronavirus SARS-CoV-2, discovered in China in January 2020, has led to a pandemic as early as March 2020, forcing every healthcare system in the affected countries to adapt quickly. To better cope with this major health crisis. (1)

Several studies have investigated the evolutionary profile of SARS-CoV-2 infection in patients under 15 years of age.

Symptomatic SARS-Cov-2 infection appears to be uncommon in this population: indeed, children under 10 years of age represented only 1% of the 44,672 confirmed cases in the study by Wu and McGowan. (2) But on the other hand, the current singular context can be difficult to live with for the youngest children, who have difficulty understanding the seriousness of the health crisis.

The psychological impact on hospitalized children and adolescents is perhaps a more important but easily overlooked problem. Stressors such as prolonged hospitalization, fears of infection, frustration and boredom, inadequate information, lack of face-to-face contact with classmates, friends, and teachers, lack of personal space in the hospital, and financial loss to the family may have even more problematic and lasting effects on children and adolescents (3).

Studies to date have focused on situations of infectious isolation (a sick person isolated) or quarantine (exposed persons isolated) for the most part, not the impact of hospitalization or containment on the general population and more specifically the pediatric population during the SARS-CoV-1 outbreak in 2002, H1N1 in 2009 or MERS-CoV in 2012, or covid-19 currently (4)

A preliminary study conducted in Shaanxi province during the covid-19 outbreak by the China-EPA-UNEPSA collaborative working group in the second week of February 2020, which aimed to screen for behavioral and emotional problems as a "first step" approach, showed that the most common psychological and behavioral problems in 320 children and adolescents (168 girls and 142 boys)

aged 3-18 years were clinginess, distractibility, irritability, and fear of asking questions about the outbreak. (5)

Thus, the objective of this article is to identify the potential effects of the covid-19 pandemic on children, whether during hospitalization or confinement.

Results

Main characteristics

Age: Our series included **51.85% male, 48.14%** female, with a sex -ratio of **1.07.**

The average age of our patients was 8 years, with extremes of maximum age of 15 years and minimum of 4 months.

Environments and schooling: Most of the children lived in urban areas with a rate of **96.29%.** Regarding school level, **37** children were enrolled in school (nursery: 5, primary: 22, middle school:13, high school:2), **17** children were not.

Background: The history analysis noted the presence of physical history in 4 children: HIV+, ANP, appendectomy and right hydrocele, with absence of psychiatric history in all children.

Almost all **(92.59%)** were asymptomatic, **7.40%** were symptomatic (**5.55%** mild, **1.85%** moderate)

The duration of hospitalization varied between 11 and 35 days (average duration = 16 days) with a cure rate of 100%.

About half of the children had both parents Covid 19 + (55.55%) without any notion of loss of a relative by the infection.

Sleep disorders: During their hospitalization, sleep disorders were found in 29.62% of the children in the form of:

Irregularity of schedules (18.75%)

Insomnia (31.25%)

Night awakenings (12.5%)

Nightmares (6.25%), or even enuresis (31.25%)

Eating disorders: In our study, the eating disorders noted were either loss of appetite, bulimia, change of schedules or skipping meals.

Among 54 children included in the study, only 17 children (31.48%) had these eating disorders:

Loss of appetite was estimated at 82.35%

2 children (11.76%) had bulimia

Only 1 child changed his meal times (5.88%)

On the other hand, the vast majority of children: 38 children (70.37%) declared the absence of eating disorders

Feeling of fear

- 75.92% of children did not express the feeling of fear.
- For the remaining 28.30% :

- 46.66% spoke of fear of dying.
- 26,66% fear of losing a pocket
- 13,33% fear of being locked up
- 6,66% fear of masked faces
- 6,66% fear of medical and nursing staff

Table 1: Proportion of sleep disorders, eating disorders and anxiety during hospitalization.

Sleep disturbance	Number	Percentage
No sleep disturbance	**40**	**74.07%**
Presence of sleep disturbance	**16**	**29.62 %**
Insomnia	**5**	**31.25%**
Reduction/increase in number of hours of sleep	**3**	**18.75 %**

Night awakenings	**2**	**12.5 %**
Nightmares	**1**	**6.2%**
Notion of bedwetting	**5**	**31.25 %**
Eating disorder		
No eating disorder	**38**	**70.37 %**
Presence of eating disorder	**17**	**31.48%**
Change in schedules	**1**	**5.88%**
Loss of appetite	**14**	**82.35%**
Bulimia	**2**	**11.76 %**
Skipped a meal	**0**	**0%**
Feeling of fear		
No feelings of fear	**41**	**75.92%**
Presence of fear:	**15**	**28.30**
of medical staff	**1**	**6.66%**
of being locked up	**2**	**13.33 %**
of dying	**7**	**46.66 %**
of masked faces	**1**	**6.66 %**
of losing a loved one	**4**	**26.66 %**
not seeing your classmates again	**0**	**0%**

Expressions of emotions

64.81% of the children expressed their emotions whether fear, anxiety or stress by crying fits by confiding in an adult, 7.40% choose their peers to confide in, and 24.07% prefer to isolate themselves when it goes wrong.

Understanding of Covid 19 pandemic, main sources of information, activities.

68.52% did not understand what a Covid 19 infection is or its mechanism of infection.

However, 68.51% understood the importance of barrier measures (wearing masks, hand washing), 55.55% understood school closures, 57.40% understood containment.

Parents were considered the only source of information for 46.29% of children, followed by the media 33.33%.

59.25% were occupied during their hospitalization by video games or TV, and 40.75% by reading or doing their homework.

Discussion

The coronavirus (COVID-19) disease pandemic spread rapidly across the globe beginning in January 2020, confining entire populations. (6)

The world's attention is currently focused on measures to mitigate the transmission and economic effects of the new pandemic. In this rapidly evolving situation, media and social conversations are entirely dominated by the epidemic, and children are exposed to large amounts of information and high levels of stress and anxiety in the adults around them. (7)

At present, little data from the literature have been collected on the psychological impact of hospitalization

for COVID-19 infection on the general population especially children.

This impact is likely to be devastating even though children who contract the coronavirus appear to develop fewer severe symptoms and have lower mortality rates than other age groups. (6)

Simultaneously, children, and especially those who have contracted the disease, undergo significant changes in their daily routines and social infrastructure, which generally promotes resilience to difficult events. (7) (8)

For many children, the COVID-19 crisis will mean stopping or restricting their schooling, or falling behind others. More than 91% of the world's students, and 68.51% of our series (100% of patients in school) are out of school, as schools have closed in at least 188 countries.

The crisis has revealed huge disparities in countries' emergency preparedness, children's access to the Internet, and the availability of educational materials. While there is much talk of online learning platforms, many public schools are not organized to use them and lack the technology and equipment to deliver education via the Internet. (6)

In our series 40.75% of hospitalized children continued to do their homework, read or follow their school programs remotely.

Although the measure of school closure to prevent the spread of infection is necessary, prolonged closure, combined with home or facility confinement, can have negative effects on children's physical and psychological health, especially if the value of these measures is not well understood by the children. (7)

In our series, 68.51% of children understood the importance of barrier measures (wearing masks, hand washing, social distancing, etc.) in preventing the disease, 55.55% understood the importance of closing schools, and 57.40% understood the principle of confinement.

Even though there are few studies specifically on the impact of confinement in children, the studies that have explored the consequences of periods without school, such as weekends and summer vacations, show that weight gain during these periods is linked to a decrease in physical activity, irregular sleep schedules and increased screen time. It is likely that confinement, whether at home or in hospital, is a factor that aggravates the negative effects of these periods without school. (7) (8)

Lack of routine is probably one of the main factors affecting children. Routines (e.g., getting up at 6:30 a.m., kindergarten/school from 8:00 a.m. to 3:00 p.m., meeting friends, dinner, going to bed at 8:00 p.m.) give children a structure and framework that they can rely on, which is very important. Routine and structure give them a sense of security and comfort. (7) (8) (9)

This concept of the Structured Days Hypothesis (SDH) was described by Brazendale et al.(8) and is based on the need for a routine to structure the day, dividing it into times and spaces that follow much the same previous pattern, allowing for a planned, segmented and adult-supervised organization that plays a role in the overall protection of the child.(8) (9)

This conceptual model is structured around four factors: physical activity, inactivity/screen time, sleep and nutrition. And this concept can be extended to sleep disturbance but also to the overall health of children in this confined environment. (10) (11)

The 24-hour sleep-wake rhythm is regulated by two distinct processes: the sleep pressure (or homeostatic process) and the biological clock-dependent circadian system (or circadian process). (12) The optimal interaction between these two processes allows a good quality of

wakefulness during the day and a good quality of sleep during the night (13). Sleep-wake rhythms depend on a number of environmental parameters ("Zeitgeber" or time-givers) in order to function properly: notably exposure to daylight (12), which is by far the most important synchronizer, but also physical activity during the day and especially in the morning, regular meal times and social interactions (14). In a confinement situation, the majority of these synchronizers (light, physical activity, food, social interactions) are strongly modified or even suppressed - as a consequence, sleep disorders and sleep-wake rhythms may appear.

Moreover, exposure to some of these Zeitgebers may also occur at the wrong time of day (e.g., exposure to screens late at night, and particularly to blue light), which may have a deleterious impact on sleep-wake rhythms, comparable to what is observed during jet lag: in particular, difficulty in falling asleep, emotional disturbances, and drowsiness during the day. (4)

Sleep disturbances in children and adolescents have an impact on the quality and quantity of parental sleep, but also on overall family functioning (15) (7).

29.62% of the children in our series had sleep disorders such as irregular sleep schedules in 18.75%, insomnia in 31.25%, nocturnal awakenings in 12.25%, nightmares in 6.25%, and even enuresis in 31.25% of the hospitalized children.

Parents who are also at risk of sleep disorders in this context must suggest behaviors that promote sleep for their child. It is therefore crucial to propose to parents strategies that promote their child's sleep, such as regular sleep and wake-up times, paying attention to environmental factors (such as light, noise and temperature), and proposing adequate conditions for sleep (7).

With regard to eating disorders, the recent nature of the epidemic does not allow us to have specific data on the impact of confinement and hospitalization related to COVID-19 on eating disorders (ED), especially in children. Nevertheless, the literature suggests a risk of aggravation of pre-existing EDs and an increased risk of de novo EDs. (7)

In both children and adults, confinement can be accompanied by negative emotions that correspond to risk factors for eating disorders, namely food restriction, emotional eating or hyperphagic episodes. (16) (17)

In our series, only 31.48% of the children had eating disorders, with loss of appetite in 82.35%, bulimia in 11.76%, and only 5.88% noted a change in their mealtimes

Two other risk factors are added, firstly, the availability and accessibility of food due to food storage, and secondly, greater exposure to food advertising (via increased exposure to the media), which can be expressed in some cases by more intense food cravings, food compulsions and short and long-term weight gain. (17) (18) (7).

Separation of children from their families puts them under stress and may increase the risk of psychiatric disorders. (19) (20) Sprang and colleagues (21) reported that children isolated or quarantined during pandemics were more likely to develop acute stress disorder, adjustment disorder and grief. 30% of isolated or quarantined children met clinical criteria for post-traumatic stress disorder (21). In addition, parental separation or loss of a parent or loved one during childhood also has long-term adverse effects on mental health, including a higher risk of developing mood disorders, psychoses, and death by suicide in adulthood. (22) (23)

46.29% of the children interviewed in our series considered parents to be the only reliable source of information, and 1.85% of them were afraid of losing a loved one to illness.

Thus, children separated from their parents require special attention, whether they are infected or suspected of being infected, and who are quarantined in hospital facilities; and children whose parents are infected with Covid-19 or who have died of the disease may be more susceptible to mental health problems because of their higher risk of infection, grief and fear caused by parental loss or separation. (19) (21)

29.62% of our patients expressed a feeling of fear, of which 46.66% were afraid of dying, 26.66% were afraid of not seeing their peers again, 13.33% were afraid of being locked up, 6.66% were afraid of losing a loved one, and 1.85% were afraid of the medical and nursing staff and their suits.

The impact of the media can have a negative effect on children, as well as adults. First, isolation leads to a loss of contact with the reality of external events. The media becomes the main source of information, but is saturated with stories about the epidemic. Constant exposure to information about the virus can increase anxiety, especially since this information may be erroneous or contradictory. (4) (24)

Thus in 33.33% of our patients the media was the primary source of information, and 59.25% of them occupied themselves during their hospitalization with TV or video games compared to 40.75% who read or did their homework.

Children need honest information about changes in their family, their environment, and the world. When this information is lacking, children try to make sense of the situation on their own. (25) (26) This was the case for our patients, 68.52% of whom did not understand what a Covid 19 infection was or its mechanism of infection, and sometimes had their own interpretations of what was happening.

Consideration of the child's developmental stage is crucial to ensure that communication is effective and does not underestimate or overestimate their understanding. (27) Communication with young children should not be based solely on simplifying the language or concepts used, but should also take into account children's understanding of illness and causality. Between about 4 and 7 years of age, understanding is strongly influenced by magical thinking, a concept that describes a child's belief that unrelated thoughts, wishes or actions can cause external events-for example, an illness can be caused by a particular thought or behavior. The emergence of magical thinking occurs around the same time that children develop a sense of awareness, yet have a poor understanding of how illness spreads. (26)

Adults must ensure that children do not wrongly blame themselves or feel that the illness is a punishment for past bad behavior. (26) (28) Therefore, it is essential to listen to what children think about COVID-19 transmission; providing children with an explanation that is accurate and meaningful to them will ensure that they do not feel unnecessarily scared or guilty. (26)

Conclusion

Uncertainty about the personal and global effects of COVID-19 creates great anxiety, so adults' preoccupation with the implications of COVID-19 could compromise their ability to recognize and respond sensitively to the signals of children in distress. (27)

Parents would do anything to protect their children from distress and may avoid talking about difficult feelings and events. However, research shows that even children as

young as 2 years old are aware of the changes around them. (28)

Providing information and prioritizing communication with children about COVID-19 is an essential component of any universal, community-based response to the pandemic. Health care workers are facing unprecedented demands to care for a predominantly adult patient population, amplifying the invisibility of children's urgent psychological needs. However, ignoring the immediate and long-term psychological effects of this global situation would be unconscionable, especially for children and youth, who comprise 42% of the world's population. (29)

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