Turkish Archives of Pediatrics

REVIEW
DOI: 10.5152/TurkArchPediatr.2023.23044

The Silent Victims of the Pandemic: Children During the Coronavirus Disease 2019 Crisis

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ABSTRACT

The coronavirus disease-19 pandemic has adversely affected children's health since its inception. Apart from the mortality and morbidity due to infection, child health monitoring, vaccination, and nutrition programs, especially in newborns and young children, have been disrupted. Measures such as school closures and curfews to prevent the spread of infection brought along many physical and mental health problems by causing disruption of education, social isolation, and closure of children at home. The possible long-term effects of the delayed implementation of the Sustainable Development Goals in Health have also deeply affected children, who are the most vulnerable victims of the coronavirus disease-19 pandemic.

Keywords: Coronavirus, COVID-19, child health, pandemic

INTRODUCTION

The coronavirus disease-19 (COVID-19) pandemic has affected many people in the World, causing high death rates. We can examine the impact of the pandemic on children's health in 3 sections, which are childhood mortality and morbidity, the impacts of emergency measures to prevent virus transmission on children's lives, and possible long-term effects of delayed implementation of the Sustainable Development Goals in Health.

CHILDHOOD MORTALITY AND MORBIDITY

In Turkey, the first official diagnosis of COVID-19 was announced on March 11, 2020, and the first death was listed on March 17, 2020. Following that, numbers increased rapidly. According to the data of the Ministry of Health of the Republic of Turkey, more than 100 000 deaths have been reported so far; however, it is not clear how many of these cases are child deaths.[1] According to United Nations International Children's Emergency Fund (UNICEF) data, 0.4% (over 16 100) of the 4.1 million COVID-19-related deaths reported worldwide have occurred in children and adolescents under the age of 20. Research shows that the direct impact of COVID-19 on child morbidity and mortality is relatively low and children are minimally susceptible to COVID-19. However, more than 10 million children lost a parent or carer during the pandemic, with countries especially in Southeast Asia and Africa most affected. Loss of a parent can have traumatic impacts on the children's lives going forward such as mental health problems, abuse, and the possibility of chronic illness.[2]

IMPACTS OF EMERGENCY MEASURES ON CHILDREN'S LIVES

Measures taken to eliminate the effects of the virus, such as quarantine practices and social isolation and schools not continuing face-to-face education, also affect children and their parents who care for them. In a study conducted in 41 countries, including many European ones, to evaluate the inference of the effectiveness of government interventions against COVID-19, it was found that curfew had a relatively small effect on transmission, resulting in

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Received: February 24, 2023
Accepted: April 6, 2023
Publication Date: July 11, 2023

Cite this article as: Topçu S, Gür E. The silent victims of the pandemic: Children during the coronavirus disease 2019 crisis. *Turk Arch Pediatr.* 2023;58(5):467-472.

a 13% reduction in *R* (the average number of people a person with COVID-19 will continue to infect), whereas closing schools and universities reduced *R* by 38%, and limiting meetings to 10 or fewer people reduced *R* by 42%.[3] Many scientists feel that measures to contain the spread of COVID-19 infection are necessary to prevent health systems from collapsing. However, it is ignored that the measures taken to slow down the pandemic will affect the children who are already in poor and disadvantaged groups more negatively by causing disruptions in the monitoring of child health. Especially preventive health services such as vaccination can lead to the deterioration of child health and deaths.[4]

CHILD HEALTH FOLLOW-UP AND VACCINATION

The pandemic changed everyday life in many ways and had a profound effect on healthcare services. This situation reflected itself as increased health risks and missed opportunities in child health follow-up. During the curfew periods, vaccination in all age groups, especially routine childhood vaccinations, has come to a standstill. At the beginning of the pandemic in developed countries, it is seen that the frequency of follow-up decreased with the call not to apply to hospitals except for emergencies, but it caught up shortly. However, the situation is much more difficult in underdeveloped and poor countries.[5,6] Especially in poor and uneducated segments, both child health monitoring and vaccination rates decreased significantly and this situation was irreversible. Vaccination rates in all age groups in India have decreased by 70%. The Global Financing Facility foresees a 40% increase in child mortality in India if all key maternal and child health interventions are similarly reduced.[7] When more than 100 000 visits were evaluated in 70 Pediatric Clinics in Chicago, it was reported that there was a decrease of approximately 50% in child health follow-ups in March 2020, but a rapid return of up to 90% compared to March 2019.[8] In a study by Salas et al[9] in the USA, it was reported that there was no change in the health follow-ups of children under 1 year of age, but the frequency of follow-up in children aged 1-4 years decreased temporarily. The researchers interpreted that the short-term decline may have had little effect on health. In a study from Turkey, it was reported that in March–June 2020, 13.5% of children aged 0-24 months were delayed in child health follow-up and vaccinations.[10]

World Health Organization (WHO), UNICEF, and Vaccine Alliance GAVI emphasized that there are problems in the implementation of routine vaccination programs in 68 countries and 80 million children may be affected by this situation.[11] Vaccination campaigns have been delayed in the first months of the pandemic in some countries, notably the measles and measles-containing vaccines in 27 countries and the inactivated polio vaccine in 7 countries. As a result, the measles virus, which has a very high contagious potential, seized the opportunity to continue its spread around the world. Measles outbreaks have been reported in several countries such as Ukraine, the Democratic Republic of the Congo, and Madagascar.[12-15] Similarly, many polio vaccination campaigns have been postponed in 38 countries, particularly in countries on the African continent. During this period, a vaccine-derived variant of poliovirus was documented in more than 30 countries. Polio cases have been reported in countries such as Niger, Pakistan, and Afghanistan.[11] The cessation of education in primary school children in many countries around the world has also tended to reduce the rate of measles vaccination, which is administered as the second dose of school vaccination. In Turkey, as a precaution, school vaccinations started to be done in Family Health Centers with a law published in July 2020.[16] On the other hand, vaccine hesitancy and vaccine refusal opposition, which has already been increasing in the last decade, has come to the fore again with the pandemic.[17] The infodemi and conspiracy theories, which have become widespread with the pandemic, have been on the agenda especially in social media. The rapid development of COVID-19 vaccines has also been made part of a conspiracy theory against vaccines in general. However, studies show that vaccine hesitancy did not significantly lead to a decrease in vaccination rates with routine childhood vaccines.[18,19] A study examining the 3 phases of the lag model in Nigeria reported that factors access to health care is the biggest indicator of the disruptions in immunization and child health monitoring.[20]

The American Academy of Pediatrics Tele-health Guide was published for the continuity of health care in cases where access to health services was disrupted. According to this guideline, even where the circumstances require limited in-person visits, newborn care and health monitoring of children under the age of 2 should be carried on in person. Every child under the age of 2 should have a comprehensive physical examination, screening tests including laboratory, hearing, vision, and oral health screening, and vaccinations. For older children, telemedicine applications may be recommended when conditions are not suitable for in-person visits.[21]

CHILD NUTRITION

Child nutrition, which is one of the most important determinants of child health, was also adversely affected during the pandemic. The comprehensive analytical framework developed by the Agile Core Team for Nutrition Monitoring (ACT-NM) encompasses 6 nutrition targets endorsed by WHA for mothers, for infant, and for young children to eliminate malnutrition in all its forms, which is one of the Sustainable Development Goals.[22] The first goal is to ensure the continuity of breastfeeding for all babies. In the first times of the pandemic, major health authorities warned cautiously, as it was not clear whether there was any transmission of COVID-19 via the breastmilk to their babies. In a review published in Turkey, it was recommended that the mother should continue to breastfeed or breastfeed by expressing by wearing a mask and providing the necessary hygiene rules in case of contact or infection with COVID-19 infection.[23] After that in June 2020, WHO recommended that mothers with COVID-19 should keep breastfeeding.[24] Despite this recommendation, studies have shown that the rate of breastfeeding is lower than in the pre-pandemic period.[25,26] The inability to provide face-to-face breastfeeding counseling services during the pandemic may explain the decrease in breastfeeding rates.[25] The lack of social support and changes in perinatal care during the pandemic may have adversely affected breastfeeding by impairing the mental health of mothers.[27]

In addition to the curfew, the long-term closure of businesses caused economic problems and increased food prices. As

many families became poorer, they were unable to provide the quality food they needed for their children's physical and mental development. In the first year of the pandemic, 6.7 million extra children under the age of 5 were affected by malnutrition, an increase of 14.3% compared to the previous year. This resulted in an estimated 10 000 extra child deaths per month. Child poverty, which was a global problem even before the pandemic, ameliorated with the pandemic causing children to be deprived of basic and vital needs.[28] On the other hand, in hospitalized COVID-19 patients, the probable health impact of vitamin C and D interventions in supportive care was highlighted by demonstrating deficiencies and malnutrition in vitamin C, vitamin D, B12, selenium, iron, omega-3, and medium-/long-chain fatty acids. Despite the lack of convincing evidence, a group also resorted to excessive vitamin and mineral supplements, believing that it protected from COVID-19.[29] In the pandemic, the food crisis also manifested itself in the form of obesity. School-based nutrition is an exclusive source of healthy nutrition for children in developing countries. The closure of schools along with the pandemic, the disruption of school-based nutrition, as well as the restriction of physical activity, excessive consumption of unhealthy snacks, and psychosocial changes played a role in the increase of childhood obesity.[30] In a meta-analysis conducted in China, it was reported that there was a 1.23-fold increase in the prevalence of obesity and overweight in school children.[31]

CHILD PHYSICAL HEALTH EFFECTS

One of the biggest harms of the pandemic to the physical and social health of children is vision problems. The increase in screen time with the online education and an important decrease in outdoor time have caused an increase in the frequency of myopia in children.[32] The deterioration of biological rhythm in children who could not go out into the open air due to lockdowns brought about sleep problems. Increased sleep time during pandemic, late bedtimes, and poor sleep quality have negatively affected children's health. Increased screen exposure also contributed to sleep problems.[33] As a result of online education and constant bad posture in front of the computer, kyphosis, scoliosis, and back pain increased in adolescents. This raised concern about the future musculoskeletal health of these young population and necessitated intervention through posture improvement training.[34]

CHILD DEVELOPMENTAL EFFECTS

Early childhood (0-3 years), which is called the "critical window period" among all stages of development, is the period when neuroplasticity is at its highest level. Experiences in this period have a significant impact on the acquisition of executive functions.[35] Young children, who were in this period at the beginning of the pandemic, were deprived of stimulus due to the quarantine and lockdowns. In addition, screen exposure time increased in children who spend a long time at home. Actually, the American Academy of Pediatrics (AAP) stated that children younger than 18 months should avoid the use of digital media (other than video chat), while 18- to 24-month-old children can use high-quality and educational media provided that their parents accompany them. American Academy of Pediatrics suggested that educational and quality programs can be watched under parental control, provided that children aged 2-5 years do not exceed 1 hour a day.[36] However, screen exposure of young children deviated from the recommendations of AAP.[37] As a result, problems in the language-cognitive development of young children arose. Children born during the COVID-19 pandemic have lower scores on cognitive tests.[38] This problem was even worse for the developing children from families with low socioeconomic status.[39] Therefore, it may be recommended to conduct social and communicative screening in young children after the pandemic and to focus more on the development of language and communication skills. Education is also important about the importance of mother–child involvement, positive relationships, free play and creative exploration, caregiver support, and stress reduction.[39]

EFFECTS ON CHILD EDUCATION

Due to the COVID-19 pandemic, nearly 90% of the world's children could not continue their education face-to-face.[40] Most of the countries have continued the online education system rather than face-to-face education. Students who took the test in the USA in 2021 fell behind by nearly 10 points in math and 9 points in reading compared to matching students in previous years.[41] Disruptions in education led to more severe consequences, especially in developing countries. For example in Urfa, Turkey, where there are 530 000 students in 2020-2021, the rate of participation in distance education was reported as 15% through the Education Information Network (EBA) system (250 000students could not receive education). Around 200 000 seasonal child workers were already far from education. As a result, with the closures, a total of 450 000 students remained away from education in Urfa.[42] The consequences of the long-term closure of schools are shown in Table 1.

The interruption of face-to-face education and the failure of girls to return to school had irreversible consequences. These children were exposed to early marriages due to poverty. In addition to its psychosocial effects, child marriages increase the risk of early and involuntary pregnancy and, accordingly, the risk of maternal and fetal death. Ten million more child marriages could occur in the next 10 years, according to an analysis published by UNICEF.[43] School interruption of face-to-face education due to already existing poverty has exacerbated the problem of child marriages which is the most common child abuse.[43]

Table 1. Consequences of Long School Closures

- Girls are less likely to return to school.
- Migrant/refugee students are more disadvantaged.
- Children from low-income and poor families and seasonal agricultural workers.
- The effect of suspension of school nutrition programs on children's nutrition/health status.
- The effect of stopping the protection and psychosocial support programs offered by schools on the increase in violence.
- Distance Learning; discrepancy in the access to computers and internet led to inequalities in the "Child's Right to Education".

Unemployment and poverty caused by the pandemic caused burnout in parents. With the addition of the closure of schools to this situation, cases of domestic violence and child abuse increased. During the pandemic, the most common form of child abuse was perpetrated by caregivers at home.[44] This situation once again showed that schools have the feature of protection from violence against children. Online education continued with schools taking a break from face-to-face education, but the fact that children spent more time with digital media also increased online violence.[44]

CHILDREN WITH CHRONIC DISEASES AND SPECIAL NEEDS

Children with special needs, who are already disadvantaged, were severely affected by the COVID-19 pandemic. In addition to the health follow-ups of patients who require close follow-up, such as autism spectrum disorder (ASD), special education was also disrupted. The early effect of the COVID-19 pandemic on children with ASD and their families in the SPARK cohort, one of the biggest ASD cohorts in the USA, was examined. When 6393 children and adolescents with ASD between the ages of 19 months and 18 years were evaluated, increased behavioral problems were observed in these children during the pandemic period. Younger children, children from poor families, and children with severe symptoms were more adversely affected by service interruptions. More negative effects on parental mental health were observed. It was found that parent education and online education applied at home were not beneficial enough for children with ASD.[45] These results reveal the necessity of making separate evaluations for children with special needs, even in cases where face-to-face education and health services are interrupted.[45]

Access to and delivery of health services for the care of children with chronic diseases, for example, the treatment of children with cancer, has been disrupted during the pandemic. World Health Organization 2018 Global Initiative for Childhood Cancer (GICC) has set a target of at least 60% survival for children with cancer by 2030. This rate was targeted as 85% survival in developed countries and 30% survival in developing countries. With the pandemic, this inequality is predicted to increase even more.[46]

CHILD MENTAL HEALTH FOLLOW-UPS

In addition to child health follow-ups, there were disruptions in child mental health follow-ups. Along with the disruption in routine follow-ups, decrease in grades in school kids, lack of social relations in adolescents, increase in peer problems, suicide attempts, psychosocial problems due to loss of parents, depression, and anxiety especially in adolescent girls were observed during this period.[47] In a review of children ranging from 4 to 19 years of age, depression, anxiety, toxic stress, and tension are the most reported changes during COVID-19 pandemic.[48] Problems such as acute stress disorder and adjustment disorder were more common in children and adolescents who were placed under curfew and confined to their homes during the pandemic.[48] Adults who were responsible for creating a support network for children during the pandemic were also affected spiritually. This increase reveals the necessity of screening child mental health problems, especially depression, in routine child health follow-ups. Also in child health follow-up visits, parents should be guided about the effects of trauma and toxic stress on children, and the importance of developing positive/reliable relationships in coping.

CONCLUSION

This is not the last pandemic. The pandemic brought with it multidimensional poverty and caused the violation of the most basic children's rights such as nutrition of children, access to clean water and sanitation, the right to education, child abuse, and protection against all kinds of violence. It was stated in the International Society for Social Pediatrics and Child Health (ISSOP) declaration that child deaths in the Covid 19 pandemic will not be directly related to infection, but indirectly due to inadequate access to nutrition, shelter, water and sanitation, vaccines, and health services, which adversely affect children's health.[49] Children who are poor, homeless, immigrants, refugees, disabled, victims of war, and recruited and joined illegal groups constitute the most vulnerable group. From now on, governments should anticipate possible disasters and produce innovative and adaptive services, including digital and face-to-face holistic perinatal monitoring, child health monitoring and vaccination, and mental health and social support services, with action policies.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – S.T., E.G.; Design – S.T., E.G.; Supervision – E.G.; Resources – S.T., E.G.; Materials – S.T., E.G.; Data Collection and/or Processing – S.T., E.G.; Analysis and/or Interpretation – S.T., E.G.; Literature Search – S.T.; Writing – S.T., E.G.; Critical Review – E.G.

Declaration of Interests: The authors have no conflict of interest to declare.

Funding: This study received no funding.

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