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## **Introduction to the Effect of COVID-19 on Child Development**

The COVID-19 pandemic has not only had major effects on the economy and society as a whole but also had a vast impact on children and their developmental processes. The isolation period led to a decrease in social interaction amongst children especially, in schools causing an addiction to social media and mental health issues. Children are growing up in an environment where their everyday life has become dependent on technology which has jeopardized their normal routines. This includes their brain development, thought processes, and physical activity levels which have severely diminished due to learning through online platforms and social isolation. Physical health within children has also taken a turn with an increase in childhood obesity. The pandemic has proposed a major shift within the capacities of emotional and physical growth from infants born during this time to those at age twelve affecting their cognitive development, their mental health, and their physical health as well.

### **Infants and Low IQ Scores**

As studies have shown, the COVID-19 pandemic has put infants born at this time and young children behind in their developmental stages compared to the past. Even in the absence of the virus itself, such environmental and social changes associated with the pandemic had a significant negative impact on these age groups more specifically highlighting their reduced

motor, verbal, and overall cognitive performance. This major change is caught within a study done on the “Impact of the COVID-19 Pandemic on Early Child Cognitive Development”. Since 2011, 1,224 cognitive tests were collected from 672 full-term, healthy, and neurotypically-developing children between 3 months old to 3 years old. Of the dataset, 1,070 assessments were taken prior to March 2020 with 154 between March 2020 and June 2021 which included 39 children born just before the pandemic as well as just after its start. The three primary composite measures used to test the subjects were the early learning composite (ELC), verbal development quotient (VDQ), and non-verbal development quotient (NVDQ). Results concluded that the infants born during the years 2019 and prior had cognitive scores hovering around 100 points, while the scores of those boring during the years of the pandemic fell to around 78 (D’Souza 2021). These scores ranged from a drop of 27 to 37 points lower than what is considered normal. Various factors come into play that led to this decrease in the standards of cognitive development at this age. It must be considered that the first 1,000 days is the most explosive growth for a child’s life where the brain doubles in the first year. The growth of neural connection drives child development allowing for blame to be put on decreased engagement with other children and less parental stimulation which inhibits that growth.

The decline in scores of the ELC assessment mentioned before measures fine and gross motor control, expressive and receptive language, as well as visual reception. The developmental deficit here became much more significant during 2021 as the lack of socialization and interaction has greatly altered a newborn's ability to develop and learn during those crucial early months and years. Within this study, it was also recorded that maternal stress, depression, and anxiety during pregnancy also impacted the evolving infant and fetal brain structure and connectivity which helped lead to these delays in cognitive, motor, and behavioral development.

“It is believed that alterations in fetal exposure to stress-related hormones, including cortisol, affect these changes in brain structure and function” (Deoni 2021). It is a major point to take into consideration in which infants were not only affected by the isolation experienced after birth during the pandemic but also endured chemical changes while in the womb throughout this time as well. Another important factor that presented itself among these studies is that the effects were seemingly greater in boys than girls (Dyer 2021). The developmental deficit for children born during the pandemic compared to others became most significant in 2021 when researchers were able to clearly see the difference between the historical data to now.

### **Early Child Cognitive Development**

Children growing up alongside COVID-19 have endured massive changes that have taken a major social, academic, and emotional toll. Families dealing with pandemic-related stressors have compromised the quality of parent-child relationships which in turn can impact a child’s development. Historically, large-scale events such as the Great Depression, SARS, the 2008 recession, and more have affected children’s developmental trajectories in the long term. The COVID-19 pandemic has taken a similar direction with the global school closures along with the severe disruption to the world’s education systems. One of the first studies to examine the impact of the pandemic across different socioeconomic settings on preschoolers’ educational development was done in Uruguay. Two groups were compared ages 4 to 6 with roughly 34,000 children in each group who attended preschool before the pandemic in 2018 to 2019 and after in 2019 to 2020. The largest deficits between the two groups included language, motor, and logical-mathematical skills. Children were assessed by teachers who rated the child’s frequency of specific behaviors during a typical school day rather than using parental reports to collect data.

“Researchers found that during the pandemic, the cognitive and motor development skills of children at age 5 suffered the most followed by their attitudes towards learning” (Wehrli 2022). Not being able to attend school in person, a drastic decrease in physical activity, and more provide an explanation for the underdevelopment of these motor skills. Preschoolers during the pandemic presented avoidant and anxious behaviors which could not only be a result of parental stress but increased teacher stress as well. An unexpected outcome of the study was that the COVID cohort group exhibited less aggressive behaviors in comparison to the control group. Overall, the control set outperformed the group that was studied a year later which indicates the changes were a result of the pandemic. The measure of cognitive skills within a child at this age when transitioning from preschool to primary school are major predictors of later academic outcomes which is why the effects seen today from COVID should receive recognition.

### **Impacts on Children’s Mental Health**

The daily routines of lives were disrupted all over the world, but the youth took a harder hit than most. Those twelve and under during the pandemic experienced worsened mental health issues due to stressful home environments, social isolation, and more. Amid the pandemic, parents with children ages 5 to 12 “reported their children showed elevated symptoms of depression (4%), anxiety (6%), and psychological stress (9%); and experienced overall worsened mental or emotional health (22%)” (Panchal 2021). This study was observed from October to November of 2020 with 1,290 respondents with a child enrolled in private or public school. This probability survey conducted also took into consideration those who attended school virtually versus those who were in person. The percentage of parents whose children were online for school who reported worsened emotional or mental health was 9% greater than those who

remained in person. Not having that social interaction and connections alter the ability of young minds to cope and adapt to stressors or changes in their lives. Other mental health disorders such as OCD and tic disorders showed an increase specifically for children ages 6 to 12 in 2020 when compared to the prior year 2019. An analysis of private insurance data found that the claim lines from these two less common diagnoses greatly increased from 2019. Another focus worth noting from this data and age group is the discovery that ADHD was the top mental health diagnosis from January to November 2020. However, claim lines for this diagnosis decreased as a percentage of all medical claim lines. This decrease may have been due to the fact “that many children were learning remotely, and teachers observing children in the classroom are typically the first to suggest a diagnosis of ADHD” (FAIR Health 2021). They see the possible signs of the disorder which influenced the many missed diagnoses. The deterioration of mental health among such young demographics is eye-opening and requires greater attention.

Quarantine and social isolation were other major factors that not only put mental stressors on the youth but allowed for instances of child abuse and neglect. As we have seen from previous studies, during the H1N1, SARS, and avian flu pandemics in the U.S., Canada, and Mexico, children who had “experienced quarantine were five times more likely to require mental health services related to the pandemic and experienced higher levels of post-traumatic stress” (Shen 2020). Youth are heavily reliant on peer interaction for identity formation and validation making mandatory social isolation extremely problematic. The duration of loneliness during this time is the factor most strongly associated with depression and anxiety within this developmental stage. During quarantine, children also will face an increased risk of domestic violence and abuse. Existing and new tensions or stressors arise possibly elevating dangerous situations, more specifically families enduring financial insecurity. The pandemic caused employment rates to

plummet resulting in unstable or inadequate financial support for most. The mental burden of this can result in poor mental health in adults, which then translates into secondary stress for the younger ones with a greater risk for child maltreatment. Those instances of abuse or violence adversely affect their development in areas such as attention, emotion regulation, memory, and response inhibition. Going back to virtual schooling, teachers have not been able to file reports of child abuse or neglect since it has become very difficult not to be in person. “Accordingly, reports of child abuse and neglect in Massachusetts initially dropped by 60%” (Shen 2020). This is something that should not be taken lightly as children all over the world who endure these traumatic experiences at home become more common.

### **Developmental Differences Within Ethnicities and Communities**

Moreover, there have been concerning effects on more specific groups of children regarding different ethnicities and communities. Studies conducted on the lesbian, gay, bisexual, transgender, and queer or questioning (LGBTQ) youth show that they may be particularly vulnerable to harmful mental health outcomes during COVID-19. During the Fall of 2020 adolescent respondents (ages 13 to 17) of this community “reported symptoms of anxiety (73%) or depressive (67%) disorder in the past two weeks; and 48% seriously considered attempting suicide in the past year” (Panchal 2021). The LGBTQ youth was already at increased risk for these disorders prior to the pandemic and so these were exasperated as the year unfolded. Even when the COVID-19 pandemic started, there were more than 50% of gender and sexual minority youth in the United States reported increased anxiety or depression symptoms. Some factors that are likely to be the causes of these “findings are isolation from support systems, absence of family support (only 33% of LGBTQ youth report living in an LGBTQ-affirming home during

the pandemic), and disruptions to health services” (Blagden 2022). Spaces that foster resilience and comfort for the LGBTQ youth must be created to protect those who still suffer from the pandemic-related mental health outcomes.

Furthermore, COVID-19 has also had an impact on different ethnicities with different levels of severity. The mental health problems have disproportionately affected children of color in comparison to others. Before the pandemic, children of color already had higher rates of mental illness, however, were less likely to ever receive care. White children have greater access to school health care, including mental health services, so there is such a difference in outcomes. Once the pandemic began, these problems accelerated as school services were limited or suspended. Black, Hispanic, and Indigenous communities have faced the greatest challenges with large opportunity gaps at hand that will translate to wider achievement gaps. A December study in 2020 by consulting firm McKinsey & Co. estimated that last year’s switch to remote learning in the spring set White students back by one to three months while students of color were set back three to five months. As of now Hispanic and Black students also continue to be more likely to remain remote and less likely to have access to the internet, devices, or live contact with teachers. All students suffered a cumulative learning loss, especially in mathematics and those who came into the pandemic with minimal academic opportunities will endure the greatest losses. The McKinsey study found that White students are four to eight months behind compared to students of color who are twelve months behind. To catch up, students, as well as school systems, should be finding opportunities to accelerate learning by preparing post-pandemic strategies to meet their full protentional.

### **Increased Risks of Childhood Obesity & Technology Usage**

Children's physical health also greatly declined alongside the impacts on cognitive development and mental health. When specifically looking at the age range from 7 to 12, various factors have amplified their risk for obesity. Compared to before the pandemic, children increased their screen time, sedentary behavior, and food intake while their physical activity decreases. A study was conducted with the NIH from 2018 to 2020 where smartwatches were provided to children in southeastern U.S. schools collecting data during the spring and summer. Parents also responded to questionnaires frequently about their children's dietary intake and screen time. Obesity-promoting behaviors increased from year to year as the child matured, however, the unhealthiest behaviors had a dramatic increase after the pandemic began. "Compared to spring 2019, spring 2020 sedentary behavior increased by 79 minutes, screen time by 97 minutes, light physical activity decreased by 69 minutes, and moderate to vigorous physical activity by 8 minutes. Consumption of healthy foods increased by 0.3 and unhealthy foods by 1.2" (NIH 2021). In comparison to the spring's prior in 2018 to 2019 sedentary time only increased by 25 minutes, screen time by 8 minutes, and light physical activity only decreased by 17 minutes. These major changes in numbers have concluded the extremely high risk for obesity within this age group. During the pandemic, sleep patterns were also affected as children went to bed later and slept later sleeping an additional 17 minutes per night. From 2018 to 2019 there were no changes in sleep or diet patterns. These health concerns were previously increasing from year to year, however, the pandemic accelerated the severity.

Physical activity is beneficial for sleep quality as well as mental health while the use of technology has the complete opposite effect. The decrease in physical activity and increase in screen time has allowed for great concern among the younger generation. A monitoring company called Bark is used by parents and schools to track over 5 million kids' Internet usage. This



system “found a 144 percent increase in the number of messages children sent and received online in 2020 compared with the year prior. That includes messages on social media sites, Gmail and more” (Kelly 2021). This enhances parents' worry about their children having the ability to maintain friendships as well as other social connections. Children’s technology use was heightened for almost a year allowing them to be so accustomed to and comfortable with excessive usage. Although these devices kept many emotionally and socially connected during this time, it also resulted in experiences of irritability, sleep issues, corona-anxiety, isolation, emotional exhaustion, social media fatigue, and phantom vibration syndrome (Pandya 2021). Even though there has been a steady increase in screen time each year, many should be aware of this drastic rise and the effects that follow among our children.

### **Conclusion to the Effect of COVID-19 on Child Development**

The COVID-19 pandemic has been a massive disruptor of daily routines within the economy and society altogether. The extent of what impact it had on the youth and their developmental processes is one that will need repairing in the long run. The emotional and physical growth of infants born during the pandemic to those under the age of twelve took a major shift by altering their cognitive development, mental health, as well as their physical health. Quarantine and isolation periods were just one major factor that contributed to these issues as well as a new dependency on technology through online schooling. The brain development and thought processes of the youth have been jeopardized by this disruption of their normal routines. This is something that should not be taken lightly as they are the future, and we need to continue to find the next steps of remediating this massive setback.

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