Invited Commentary | Pediatrics

Candidate Pathways Underlying Exposure to the COVID-19 Pandemic and Early Child Development—Risk and Resilience

Morgan R. Firestein, PhD; Lauren C. Shuffrey, PhD

The COVID-19 pandemic has drastically affected psychological well-being across multiple generations, with estimates suggesting that up to 25% of youth have experienced anxiety or depression during the pandemic. As a community, we continue to learn how each generation has been affected by the unique and multifaceted pandemic-related societal changes. Some pandemic-related stressors, such as food and financial insecurities, loss of childcare, and increased domestic violence, have exacerbated prepandemic structural inequities. Simultaneously, the COVID-19 pandemic has led to several perceived positive outcomes, such as increased work flexibility and time with family. In this issue of JAMA Network Open, Finegold et al report a similar phenomenon of both deleterious and advantageous outcomes associated with postnatal exposure to the COVID-19 pandemic during early childhood.

Finegold et al examine the association between postnatal COVID-19 pandemic exposure and developmental outcomes among preschool children in a large Canadian birth cohort. Several prior studies have examined associations between exposure to the COVID-19 pandemic with child developmental outcomes, but few have successfully isolated these impacts of postnatal exposure independent of prenatal exposure. Research on the developmental sequelae of natural disasters such as studies of the Quebec Ice Storm or Hurricane Katrina have primarily focused on the associations of prenatal maternal objective or subjective stress with child outcomes under a fetal programming framework. Research on the COVID-19 pandemic and child neurodevelopment is predominantly represented by studies using one of two approaches. The first involves comparing developmental outcomes in children with vs without exposure to prenatal maternal SARS-CoV-2 infection. The second compares developmental outcomes in children born before vs during the COVID-19 pandemic. The interpretation of these findings is limited in that the children born during the pandemic inherently had a different in utero experience than the comparison cohort of children born before the pandemic. Similarly, other studies have compared developmental outcomes between children assessed before vs during the pandemic, but these have not taken into account potential in utero effects.

The findings of Finegold et al highlight the differential associations between postnatal exposure to the COVID-19 pandemic and early child developmental outcomes in a homogeneous, sociodemographically advantaged population. The study authors implemented a study of preschool children assessed at ages 24 and 54 months, all of whom were born before the COVID-19 pandemic began. Some (but not all) children were assessed at both time points; therefore, this study has both longitudinal and cross-sectional features. In each age cohort, some children had been assessed prior to the COVID-19 pandemic, while others were assessed during the pandemic, using March 11, 2020, as the pandemic-exposed cutoff date. The authors observed that the pandemic-exposed cohort had lower rates of problem-solving difficulties and improved fine motor skills but higher odds of personal-social difficulties on a parental-report measure at 24 months of age. Among the children assessed at 54 months of age, the pandemic-exposed cohort had higher vocabulary, episodic memory, and cognitive scores on a direct measure of development, but demonstrated no differences in socioemotional outcomes on a parental-report measure. The authors also examined effects of the duration of pandemic exposure as compared with children with less than 6 months of postnatal pandemic exposure. In the age 24 months cohort, children with 15 months of postnatal pandemic exposure or more had higher problem-solving and fine motor skills, and those with 5 to 10 months of exposure...
exposure had lower personal-social and gross motor skills. Higher problem-solving scores were also observed among children with 10 to 15 months of exposure, whereas in the age 54 months cohort children exposed to the pandemic postnatally for 10 to 15 months had better episodic memory and cognitive scores on an objective assessment.

These findings suggest that the observed developmental differences between the postnatally exposed and unexposed children may be moderated by the duration of the child's exposure to the pandemic environment. It should be acknowledged that interpretation of these results is limited by the fact that each exposure duration group was not compared with the unexposed group but rather to children who were postnatally exposed for less than 6 months. Nonetheless, it is evident that prolonged exposure to the pandemic environment may result in both advantageous and deleterious impacts on child developmental outcomes, and more work is needed to identify the specific postnatal pathways underlying these associations. In the absence of detailed information on individual differences in the family and children's pandemic experience in the Finegold et al study, we can only speculate possible individual or overlapping postnatal factors such as social distancing and isolation, childcare access and quality, and enrichment or deprivation of the home environment.

There is an abundance of validated parental-report questionnaires available to quantify children's home or school environments such that the quality and quantity of stimulation in the home or household unpredictability. Changes in a family's social environment are among the most ubiquitous COVID-19-related factors, yet there is a lack of measures developed to assess pandemic-related changes to the home environment experienced by toddlers and young children.

Lockdowns during the pandemic led to young children being socially isolated from peers and a lack of normative daily social experiences (eg, visits to the grocery store or playground) coupled with increased time with caregivers, reflecting a drastic shift in their social world. Social deprivation and parental emotional availability are two candidate risk and resilience pathways by which COVID-19 pandemic exposure might affect child developmental outcomes. Empirical evidence reliably demonstrates that social deprivation during early development has profound effects on child developmental outcomes. As an extreme example, causal evidence from Bucharest Early Intervention Project (BEIP) has demonstrated both the detrimental effects of early life neglect on child behavioral and cognitive outcomes, and intervening pathways to resilient outcomes. In brief, BEIP was a randomized clinical trial of young Romanian children abandoned and placed in institutional care where children were randomized between ages 6 and 31 months to receive quality foster care or continue in institutional care. Children assigned to receive foster care had lower internalizing and externalizing problems as compared with children who experienced institutional rearing, demonstrating that a more enriched and stable home environment has the capacity to buffer the effects of early life neglect. Research on less extreme forms of early life adversities similarly demonstrate effects on child behavioral and cognitive outcomes. However, fewer studies have explored moderating factors associated with resiliency in the context of early life adversity. One possible moderating factor is parental emotional availability. Data from the 2011 Queensland Australia floods have demonstrated increased maternal structuring, defined as the mother's ability to scaffold the child's activity by providing developmentally appropriate guidance and limits, resulted in improved cognitive outcomes among toddlers. The COVID-19 pandemic provides an opportunity to further examine how variability in parental emotional availability and other indicators of the quality of parent-child interactions contributes to pathways of both risk and resilience.

Emerging data from studies like that of Finegold et al emphasize the extent to which COVID-19-related changes to a child's postnatal environment can affect a wide array of neurocognitive and social-emotional outcomes. It is critical that we gain a deeper understanding of the pathways underlying these findings to mitigate the specific environmental changes associated with developmental decrements (eg, socioeconomic strain) and learn from those associated with developmental resilience (eg, increased high-quality parent-child interactions). With this information, we stand to gain unique insight into early childhood social policies and intervention that may confer great benefit to the next generation.
REFERENCES