

Editorial Perspective: COVID-19, ADHD management and telehealth: uncertain path

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COVID-19 has been associated with a range of detrimental and even some positive effects on children and adolescents with attention deficit hyperactivity disorder (ADHD). We are just now beginning to assess the acute impact on children, families, providers, and health care systems. Observational studies have reported worsening in ADHD (Zhang et al., 2020), more internalizing symptoms, as well as increases in negative health behavior such as increased screen time, less physical activity, and irregular sleep habits (Chafouleas & Iovino, 2021; Sibley et al., 2021). Not surprisingly, risk factors such as less sleep and more screen time are correlated with depressive symptoms (Chafouleas & Iovino, 2021, p. 4; Swansburg, 2021, p. 5). Thus, ADHD symptom severity, internalizing comorbidity, and negative health behaviors have increased for ADHD youth during the initial phase or first year of the COVID-19 pandemic.

While attempting to manage their child's ADHD, comorbid conditions, and impairments, families and caretakers are also experiencing increased stress and burden. Furthermore, many parents of children with ADHD have ADHD themselves that is often not identified or treated. Parental ADHD can influence parenting and child treatment as parents play a key role in both pharmacological and behavioral interventions (Chronis-Tuscano, Wang, Woods, Strickland, & Stein, 2017). Parental ADHD, especially untreated, is also a risk factor for COVID-19 infection (Merzon et al., 2021), further increasing family burden and risk for direct and indirect effects of COVID-19 on families.

In response to COVID-19 and stay at home orders, a range of mitigating strategies have been quickly adopted by providers and health care systems to provide care virtually, either through phone or telehealth (Cortese et al., 2020). Telehealth delivery models had previously demonstrated efficacy in delivering multimodal ADHD treatment to underserved families without access to specialist providers. For example, the CAATS study was a randomized control trial conducted in rural areas in Washington state (Myers, Vander Stoep, Zhou, McCarty, & Katon, 2015). Pharmacotherapy was delivered through videoconferencing while caregiver behavior training was provided in person by community therapists who were supervised remotely. This hybrid telehealth intervention resulted in more

improvements in ADHD and externalizing symptoms relative to enhanced care as usual. A medium effect size reduction in impairment was detected on the Vanderbilt Caregiver Role Performance Score (Cohen's *d* 0.38) and Columbia Impairment Scale, Parent Version (0.44) between baseline and 25-week follow-up.

Despite these promising results and the obvious need to reduce barriers to care in geographically areas without access to mental health providers, telehealth had grown slowly in the pre-COVID era outside of research or demonstration projects. However, recent utilization indicates that remote evaluation and treatment services for ADHD and other neurobehavioral disorders can be delivered quickly and efficiently. For example, at a large pediatric academic center in Washington DC, there were only 1654 telehealth visits during a 4-year span from 2016 to March 2020. During 3 months of the pandemic, visits increased to 45,236 (Norman et al., 2021). When the first COVID-19 case was identified in Washington State in January 2021, by March 2021 technological, administrative, credentialing, and training issues were resolved, and the vast majority of patient visits were delivered remotely including group behavioral parent training (Sharma, Sasser, Schoenfelder Gonzalez, Vander Stoep, & Myers, 2020). At this center, behavioral parent training is the first-line treatment for ADHD and externalizing disorders. In a survey conducted in spring 2021, 90% of providers reported that efficacy of telehealth is the same or slightly less compared with on-site care. Providers noted advantages, such as being able to see patients who live further away in their own homes, and reducing logistical barriers for families. These measures resulted in an increase in access for some families and also helped providers support their own families at home with less commute times. Disadvantages include technological challenges, increased administrative time, 'Zoom' fatigue from consecutive sessions, and inability to conduct in-person evaluations for disorders such as autism spectrum disorders or to conduct neurocognitive assessments.

Training and billing models have also been rapidly modified allowing for providers to provide and bill across state lines for services and for training to occur remotely. It remains to be seen if these emergency changes in licensure requirements,

billing, and supervision will be maintained in the post-COVID area, but they are viewed positively by providers since they remove barriers to access and continuity of care.

Viewed through an equity lens, however, the rapid move to telehealth during COVID-19 has left some of the neediest families behind. Indeed, parents from ethnic and racial minorities with less economic resources are also less likely to have the option of working at home, may not be available for sessions, or have access to WIFI or a private space. This uneven access to treatment during COVID-19 can further widen gaps in educational achievement between more and less resourced families with untreated ADHD youth who are losing ground in multiple domains. This disparity in access to treatment, magnified during the pandemic, has long been a concern of ADHD treatment (and ADHD clinical research) (Visser, 2015).

As we begin the third year of the pandemic, we have obtained a more thorough understanding of the range and variation in acute effects (Breux et al., 2021). In the second phase of the pandemic, we saw the residual and cumulative effects as more children return to school. As yet, we do not know how many will struggle with the transition back to 'normal' participation in educational and social activities. In the face of uncertainty regarding new variants and risks to unvaccinated children, some parents will continue to embrace home schooling, resulting in mixed or uneven effects on academic achievement and socialization. Those children (or parents) with comorbid anxiety symptoms are at great risk for school phobia and resisting coming back to school. Although well-resourced parents will be able to provide or obtain educational supports during home schooling, many parents will not have many options.

Given the number of children affected, certainly diagnostic resources will be stressed and prior norms for both symptom and impairment measures require validation. A diagnostic challenge for clinicians is distinguishing situational ADHD symptoms during COVID-19 from cross situational and persistent ADHD which can only better evaluated after children return to school. Even when problems are identified, educational, behavioral, and medical treatment options are severely limited due to work-force shortages exacerbated by the pandemic. For those that return, special education services and budgets will be overwhelmed. Wait list for providers who can help address the multiple impairments associated with ADHD after the pandemic are likely to be long lasting. As difficult it is for children with ADHD to receive treatment, parents with ADHD are likely to have more difficulty given the relative scarcity of adult providers comfortable with treating ADHD.

ADHD syndromes have historically been linked with pandemics. Years after the 1919 pandemic,

viral infection was recognized as an etiological factor associated with hyperactivity and a range of cognitive problems. Although 'brain fog' and fatigue have been reported in adults with long haul COVID-19, we do not yet know the direct effects of COVID-19 on children, and whether there will be a new ADHD-like neurodevelopmental disorders (Swanson & Volkow, 2021) emerging or novel ADHD phenocopy.

There have also been some positive effects noted. The pandemic has had a beneficial impact on health care systems that have rapidly developing novel delivery systems employing telehealth. This has improved access, especially for families from rural areas. Although we do not have effectiveness data for ADHD delivered remotely, there are also no new safety concerns that have emerged. The pandemic has demonstrated the flexibility of the work force and the ability of administrative and bureaucratic limitation to be adjusted during a crisis. The pandemic has also given children and families and opportunity to spend more time together in academic and recreational activities.

Hopefully, some positive trends will continue as health care systems adjust. These include the move to making telehealth an option that is more easily available to all families. There is also an opportunity for large scale, transdiagnostic preventive efforts targeting malleable risk factors so prominent during this first phase of COVID-19, such as physical activity, poor and variable sleep, and social isolation.

In summary, we have observed acute negative effects of COVID-19 on ADHD youth and an increase in negative health behaviors, which themselves are risk factors for internalizing symptoms and impairments in academic, social, and family functioning. Although providers and health care systems have adapted to provide treatment remotely, there is concern about unequal access. As we go beyond cross-sectional data with small or selected samples during the first year of the pandemic and move to longitudinal and big data sets, we will begin to understand its widespread impact on children and families. However, the impact of remote learning in families with ADHD youth represents a challenge now that is expected to increase as we observe more residual and cumulative effects.

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