HHS Public Access

Author manuscript

Merrill Palmer Q (Wayne State Univ Press). Author manuscript; available in PMC 2023 December 14.

Published in final edited form as:

Merrill Palmer Q (Wayne State Univ Press). 2023 January ; 69(1): 1–29. doi:10.1353/mpq.2023.a909257.

Examining Adolescents' Mental Health Before and During the COVID-19 Pandemic

Heather A. Yarger,
University of Maryland

Deena Shariq,
University of Maryland

Alexandra C. Hickey,
University of South Carolina

Elizabeth Giacobbe,
University of Maryland

Sarah L. Dziura,
University of Maryland

Elizabeth Redcay
University of Maryland

Abstract

The current study characterized the impact of the COVID-19 pandemic and stay-at-home orders on adolescents' internalizing symptoms and assessed predictors of adolescents' internalizing symptoms during the pandemic. Seventy-nine adolescents (18 autistic, 61 nonautistic) and their parents who participated in a previous study and were at least 10 years old (M = 13.8, SD = 1.7) were invited to participate in three online follow-up surveys post-stay-at-home order (May through November 2020). Measures of children's anxiety and depressive symptoms, parenting practices, family togetherness, conflict, financial problems, and parental mental health during the pandemic were collected. Nonautistic adolescents experienced a significant decrease in anxiety symptoms across the beginning of the pandemic and a significant increase in depressive symptoms from pre- to post-stay-at-home order. Permissive parenting and financial problems predicted adolescents' depressive symptoms. Parental mental health difficulties and permissive parenting predicted adolescents' anxiety symptoms. Results underscore the need to support parents and youth.

On March 11, 2020, the World Health Organization (WHO) declared the coronavirus disease (COVID-19) a global pandemic (WHO, 2020), and most states in the United States began implementing stay-at-home orders (SAHOs) to help mitigate community spread (Moreland et al., 2020). Schools, day cares, and businesses closed, bans and/or limits were placed on

Address correspondence to Heather A. Yarger, 3123A Biology–Psychology Building, University of Maryland, College Park, MD 20742. Phone: (301) 458-0685. Hyarger@umd.edu.
Heather A. Yarger and Deena Shariq, Department of Psychology; Alexandra C. Hickey, Communication Sciences and Disorders; and Elizabeth Giacobbe, Sarah L. Dziura, and Elizabeth Redcay, Department of Psychology.

large social gatherings, and sporting events were canceled. Such drastic changes were likely to lead to increased home stress due to factors including, for some, the newfound need to homeschool while balancing working from home or loss of income. In combination with pandemic-related anxiety, these stressors may impact parents' and children's mental health. Currently, there is little research investigating the longitudinal impact that the COVID-19 pandemic and subsequent mitigation efforts have had on adolescents' mental health and family processes (e.g., parenting quality). Further, little work has examined the impact on such processes in families with adolescents already diagnosed with mental health conditions such as autism spectrum disorder (ASD). The current study aimed to (a) investigate how adolescents' (aged 10–17 years old) mental health, specifically internalizing symptoms, changed from preinitiation to postinitiation of SAHOs (i.e., during the pandemic), and (b) how pandemic-related factors (e.g., job loss, conflict, time together, parenting quality during the pandemic, parental mental health) may be associated with adolescents' internalizing symptoms in families with autistic and nonautistic adolescents.

Adolescence as a Sensitive Period During COVID-19

Theoretical evidence suggests that people's lives are impacted by biological time (i.e., aging) and historical time (e.g., societal shifts and changes in one's economic status), which influences how one thinks, feels, and acts (Bronfenbrenner, 1979; Elder, 1998). For example, a cornerstone of life course theory is the premise of *linked lives*, emphasizing the inter-dependence of an individual and those within that individual's social world (e.g., family, peers) as they are impacted by historical and social events. Benner and Mistry (2020) expand upon life course theory within the context of COVID-19 on youth development, suggesting it is also necessary to consider the timing of life disruptions on developmental trajectories, pointing to adolescence as a key sensitive period that may have both short- and longer-term impacts on development over time. Changes within a child's proximal context, including family disruptions due to illness or death, financial instability, and educational disruptions, may be potential risk factors as a direct result of the pandemic. The inter-dependent experience of the sociohistorical events within one's larger context is also consistent with family systems theory, which theorizes that social disruption (e.g., resulting from COVID-19) will have cascading impacts on the family, on the parent–child relationship, and on both child and parent adjustment independently, all of which impact each other in turn (Prime et al., 2020).

More broadly, adolescence is thought to be a period of development that is particularly susceptible to these social environment disruptions and resulting short- and long-term consequences of the pandemic (Benner & Mistry, 2020). This is partly because adolescence is a sensitive period of social, emotional, and neurobiological development (Choudhury et al., 2006; Collins & Steinberg, 2006; Fuhrmann et al., 2015). Further, adolescence is a period when individuals progressively rely more heavily on peer relationships for social support and interaction rather than parent–child relationships. Overall, life course theory and family systems theories emphasize that adolescence is an important time to understand the impact of the pandemic on adolescent development and individual factors within adolescents' environment.

Impact of COVID-19 on Adolescents' Mental Health

Global research regarding the pandemic's impact on adolescents' and parents' mental health, as well as the provision of recommendations for providers and parents to prevent negative impacts, has been conducted at a rapid rate since the beginning of the pandemic. Cross-sectional online studies have highlighted mental health impacts such as higher levels of anxiety and depression in children and adolescents compared to general rates prior to the pandemic (Duan et al., 2020; Giannopoulou et al., 2021; Racine et al., 2020; Yeasmin et al., 2020). Longitudinal studies following children and adolescents before and during the pandemic have also indicated negative impacts on children's mental health. In Germany, 40% of children aged 7–17 reported low levels of quality of life during the pandemic compared to 15% prior, as well as more mental health problems, including anxiety (Ravens-Sieberer et al., 2021). In Australia, a prepandemic to during the pandemic longitudinal study of adolescents aged 13–16 revealed significant increases in depressive symptoms and anxiety and decreases in life satisfaction (Magson et al., 2021). Worries related to COVID-19, online learning difficulties, and increased conflict with parents were associated with increases in mental health problems (Magson et al., 2021). Alternatively, adherence to the SAHO and reported social connection was identified as protective against poor mental health.

Not all studies observed increases in mental health problems since the start of the pandemic. For example, according to a cross-sectional survey of 6- to 17-year-olds in China, youth reported being generally satisfied with life during the pandemic, and 21% became more satisfied during school closures (Tang et al., 2021). Further, a nationally representative study in the United States of both parents and children aged 0–17 found that approximately 5% of children and 10% of parents reported improvements in mental health outcomes since the pandemic began, albeit approximately 4% and 18% reported worsening symptoms (Patrick et al., 2020). Within a predominantly Hispanic/Latinx sample of adolescents (M_{age} = 11.99 years), significant reductions in mental health problems within multiple domains (i.e., internalizing, attention, externalizing, total problems) were observed from pre- to post-SAHO (Penner et al., 2021). Overall, the pandemic's impact on the mental health of children and adolescents in the general population is mixed, suggesting a need to identify specific predictors of mental health during the pandemic.

Less research has investigated the pandemic's impact on the mental health of youth with neurodevelopmental disorders, who are more likely to experience co-occurring mental health problems compared to the general population (Rosen et al., 2018). Of the studies that have examined the impact of the pandemic on adolescent mental health in this population, the majority have focused on externalizing problems more specifically, suggesting that youth diagnosed with neurodevelopmental disorders (e.g., autism, attention-deficit/hyperactivity disorder, or both) are exhibiting high levels of behavior problems during the pandemic (Colizzi et al., 2020; Nonweiler et al., 2020; Tokatly Latzer et al., 2021). Further, families of autistic children specifically (M_{age} = 11.8 years, SD = 6.6) have reported significant disruptions in services and therapies for their children because of the pandemic, which has negatively impacted their child's autism symptoms and behaviors (White et al., 2021). We were unable to find any studies reporting on adolescents with neurodevelopmental disorders'

internalizing symptoms more specifically during the pandemic, yet internalizing conditions have been found to co-occur with ASD 42%–79% of the time (Kent & Simonoff, 2017). Thus, additional work needs to examine the impact the pandemic is having on internalizing symptoms (i.e., anxiety and depression) in children at increased risk for experiencing them, as well as predictors that confer risk or resilience (e.g., parental mental health, parenting quality).

Parenting Quality, Parental Mental Health, and Children's Mental Health

Decades of research have identified parenting styles as predictors of children's development and functioning, including their mental health and well-being (Scott, 2012). Parenting styles include authoritative (marked by parental warmth, support, and autonomy-granting behavior), authoritarian (marked by harsh control, psychological control), and permissive (marked by allowing high autonomy and low demands) (Baumrind, 1971). Children who experienced authoritarian parenting styles tend to have higher levels of depressive symptoms relative to those who experienced authoritative parenting styles (King et al., 2016). A recent meta-analysis demonstrated that aspects of authoritative parenting were associated with decreases in internalizing (i.e., both depressive and anxiety) symptoms longitudinally, whereas aspects of authoritarian parenting were predictive of increases in internalizing symptoms (Pinquart, 2017). Although these studies provide insight into the influence of parenting quality on children's mental health, they were investigated outside of the impact of chronic stress (i.e., a pandemic). Thus, it is important to examine the pandemic's effects on these relationships.

Studies have begun examining the impact of pandemic-related stressors (e.g., worries about getting COVID-19) and mitigation efforts (e.g., implementing SAHOs) on family outcomes such as parenting quality, child behavior, and child mental health (e.g., Connell & Strambler, 2021; Neubauer et al., 2021; Tang et al., 2021), but few have investigated the impact that parenting quality has on children's mental health during the pandemic, which is important for intervention efforts and in planning for the response to future chronic stressors or systemic stressors such as a global pandemic. One large survey of parents of children less than 18 years old in the United States indicated that, shortly after implementation of COVID-19 mitigation efforts (in April and June 2020), parents engaged in higher levels of neglectful and harsh parenting practices (Connell & Strambler, 2021). Greater levels of parent distress were identified as predictors of engaging in higher levels of neglectful or harsh parenting. These increases in neglectful and harsh parenting practices underscore the need to examine how parenting quality subsequently impacts children's mental health.

Studies examining the impact of parenting on children's outcomes emphasize the protective effect that authoritative parenting continues to have during the pandemic. For example, Neubauer et al. (2021) examined parenting quality, parents' well-being, parent reports of children aged 6–19's behavior, and the family environment by using a daily diary across 3 weeks during the pandemic once SAHOs were in place. Parents' well-being, child behavior, and family environment did not show overall changes during the pandemic; however, autonomy-supportive parenting, an aspect of authoritative parenting, was positively associated with better child well-being on the same day. Further, daily autonomy-supportive

parenting was associated with greater family cohesion. Another recent study indicated that parent–child discussions lowered the risk of school-aged children and adolescents meeting the threshold of depressive, anxiety, and stress symptoms during the pandemic (Tang et al., 2021), whereas the absence of parent–child discussion was associated with higher levels of symptoms.

Preliminary findings suggest that parental mental health may also impact youth's own mental health and functioning during the pandemic. In a large population-based study of children aged 3–12 in China, parental mental health and harsh parenting were two predictors of increased child mental health problems (Li et al., 2021). A recent meta-analysis found significant increases in anxiety and stress in parents of autistic children during the pandemic and more difficulty coping (Yilmaz et al., 2021). This is consistent with the broader literature demonstrating that parents of autistic children report experiencing higher levels of mental health difficulties and parenting stress compared to parents of nonautistic children (Enea & Rusu, 2020). However, research should continue to investigate the potential developmental cascades that this change in parenting stress and parental mental health has on autistic adolescents.

Taken together, these data suggest there have been significant changes in children's and parents' mental health during the pandemic. The current study addressed gaps in previously described studies by (a) evaluating change in adolescents' internalizing symptoms (anxiety, depression) from pre- to post-SAHO through 5 months during the pandemic and (b) examining predictors of adolescents' internalizing symptoms during the pandemic, when mitigation efforts were in place. We used the SAHO as our marker of when data collection during the pandemic began and to help orient others to the timing of our study (i.e., during the first 5 months that the pandemic was occurring and mitigation efforts were in place). We hypothesized that there would be an increase in internalizing symptoms (i.e., anxiety, depression) from pre- to post-SAHO for both autistic and nonautistic adolescents given the significant disruption and uncertainty caused by the pandemic. Regarding predictors of adolescents' internalizing symptoms during the pandemic, we predicted that higher levels of parental mental health problems, higher levels of authoritarian parenting (similar to harsh parenting discussed earlier), and higher levels of family conflict would predict higher levels of internalizing symptoms. We also predicted that higher levels of family togetherness would be associated with lower levels of adolescents' internalizing symptoms.

Methods

Data Collection Procedure

The current data were collected in two phases (see Figure 1). The first phase was collected prior to the COVID-19 pandemic and was part of an ongoing study investigating the neural correlates of social interaction in children and adolescents on the autism spectrum. The second phase of data in this study was collected starting in May 2020, shortly after Maryland, Virginia, and Washington D.C. enacted SAHOs in March because of the outbreak of COVID-19. In these states, the SAHO prohibited large social gatherings, closed schools, and advised all individuals to stay home except to conduct essential activities. All participants resided in the Washington D.C. metropolitan area, with residency spanning

across Maryland, Virginia, and Washington D.C. Enactment of the SAHOs in each of these states differed by a maximum of 2 days.

Parents of both autistic and nonautistic adolescents were invited via e-mail to participate in the second phase of the study (i.e., the online follow-up) if they and their child had previously participated in a research study in our lab within the past 2 years (Phase 1) and had a child 10–17 years of age. These participants previously participated in one or more ongoing studies investigating the neural and behavioral correlates of social interaction in autistic and nonautistic children and adolescents. We did not have permission to invite a subset of autistic participants from our prior studies because they were part of a larger cohort study that we initially recruited from. Eligibility criteria for prior studies required that autistic participants have a clinical diagnosis of autism spectrum disorder and meet research-diagnostic criteria for autism spectrum based on the Autism Diagnostic Observation Schedule, second edition (ADOS-2; Lord et al., 2012). The ADOS-2 was conducted in a lab visit with a clinical psychologist (or clinical psychology doctoral student) who was research reliable in administration. To be included, both nonautistic and autistic participants had to have a minimum IQ of 80, which was assessed using the Kaufman Brief Intelligence Test (KBIT-2; Kaufman & Kaufman, 2004). Families interested in participating in the online study gave written informed consent and assent. After consenting, families were e-mailed separate links for parents and adolescents to complete questionnaires. Questionnaires were e-mailed approximately 1 month apart three times. Participant's prepandemic baseline visit was completed 1–22 months (M = 8.78, SD = 4.99) prior to the SAHO, with dates ranging from May 2018 through March 2020 (right before the SAHO). Children were 9–16 years old (M = 12.93, SD = 1.67) at the baseline/pre-SAHO visit. Adolescents were 10–17 years old (M = 13.8, SD = 1.7) at the time of the first follow-up visit and 10–17 years old (M = 14.1, SD = 1.8) at the time of the last follow-up. All data during the follow-ups were collected between May and November 2020. This study was approved by the University of Maryland Institutional Review Board.

Participants

Participants were 79 parent–child dyads that completed at least one follow-up questionnaire after enactment of the SAHO. A total of eighteen 10- to 17-year-old (M = 14.37, SD = 2.01; 3 females) autistic adolescents and their parents participated. Additionally, sixty-one 10- to 17-year-old (M = 13.65, SD = 1.63; 28 females) nonautistic adolescents and their parents participated. The majority of the sample consisted of participants whose household incomes were greater than $100,000 (67.1%), indicating that a majority of families were of upper-middle-class and upper-class socioeconomic status. See Table 1 for demographic variables by group (i.e., autistic or nonautistic), as well as descriptive information of study variables. A total of 65 participants completed all three follow-ups (16 autistic, 49 nonautistic) and 73 (17 autistic, 56 nonautistic) completed only two.

Survey Measures

Parental Report of Adolescents' Internalizing Symptoms

Depressive symptoms.: These were assessed by using the parental report form of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) for ages 6–18 years. Specifically,

the *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition (DSM-5) Depression Scale was used, which consists of 13 items. Prior to the pandemic, parents were asked to report how well each item describes their child now or within the past 6 months. During the pandemic, parents were asked to report on their child's depressive symptoms now or within the past month. Internal consistencies (ICCs) for each time point were acceptable: pre-SAHO α = .79, first follow-up: α = .78, second follow-up: and α = .77, third follow-up: α = .77. Raw scores (i.e., the sum of the 13 items) were used in the current analyses. Higher scores indicate higher levels of depressive symptoms. Depression symptoms were highly correlated (*r*s ranging .73–.84) during the follow-up period and therefore an average was calculated for regression analyses.

Anxiety symptoms.: These were assessed by using the parental report version of the Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1997). The SCARED includes 41 items and yields a total sum score and five subscales. The current project focused on the overall sum of anxiety symptoms. Prior to the pandemic, the SCARED asked parents to report how often their children demonstrated anxiety-related behaviors over the past 3 months. During the pandemic, parents were asked to report on behaviors within the last month. ICCs were excellent at each time point: pre-SAHO α = .92, first follow-up: α = .92, second follow-up: and α = .93, third follow-up: α = .93. Raw scores (i.e., the sum of the 41 items) were used in the current analyses. Higher scores indicate higher levels of anxiety symptoms. Anxiety symptoms were highly correlated (*r*s = .86) during the follow-up period, and therefore an average was calculated for regression analyses.

Adolescent Self-Report of Internalizing Symptoms and Impact of COVID-19

Adolescent mental health.: This was assessed by using the Combined COVID Health, Emotional, and Lifestyle Changes (Pfeifer, 2020). Specifically, adolescents were asked to report on how they have been feeling in the past 2 weeks because of the COVID-19 outbreak and the resulting changes to daily life (e.g., anxious, worried, hopeless, sad) on a 6-point Likert scale. As this is not a validated scale, we report descriptive information of the four items that we felt most matched the parental report of adolescents' mental health (i.e., anxiety and depression) shown in Table 2. Adolescents were also asked how much the COVID-19 outbreak and resulting changes in daily life affected their life in a positive way with an opportunity to indicate what specifically led to the positive impact.

Self-Reported Parenting Quality and Mental Health

Parenting quality.: This was assessed by using the Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson et al., 1995). In the PSDQ, parents report on their own parenting practices. This questionnaire taps into three dimensions of parenting: authoritative, authoritarian, and permissive. Parents were asked to report how often they currently exhibit each behavior with their child. Authoritative parenting consisted of 27 items. ICCs for the authoritative parenting scale ranged from good to excellent: pre-SAHO α = .93, first follow-up: α = .86, second follow-up: α = .89, and third follow-up: α = .89. Authoritarian parenting consisted of 20 items. ICCs were acceptable: first follow-up: α = .79, second follow-up: α = .77, and third follow-up: α = .79. Permissive parenting consisted of 14 items. ICCs ranged from poor to acceptable: first follow-up: α = .55, second follow-up: α

= .75, and third follow-up: α = .66. Higher levels on each scale indicate higher levels of engaging in that specific parenting quality. Each subscale was highly correlated with itself across the follow-up period (*r*s ranging .70–.88), and therefore average levels of parenting quality for each subscale were calculated to represent average levels of parenting quality post-SAHO. These averages were used when investigating predictors of adolescents' mental health post-SAHO.

Parental mental health.: To assess this, parents reported how often over the past week they felt anxious, depressed, lonely, or had physical reactions such as sweating when thinking about their experience with the COVID-19 pandemic, as collected in other research investigating the impact of the COVID-19 pandemic in parents of autistic children and adolescents (Bhat, 2021). The sum of these four questions was calculated for each time point. Parents' mental health was highly correlated at each follow-up (*r*s = .59 − .71), and therefore an average of the three time points was used in the current analyses. In cases when only one time point was completed, that data was used.

Impact of COVID-19 on Families

Family togetherness and conflict.: This was assessed by using the COVID-19 Household Environment Scale (Behar-Zusman et al., 2020). Parents reported if they felt there was more togetherness in the household now compared to before the pandemic. Items on the togetherness scale included things such as spending leisure time together or getting involved in the children's education. Parents' report of togetherness was highly correlated at each follow-up (*r*s = .41 − .49), and therefore an average of the three time points was used in the current analyses. In cases when only one time point was completed, that data was used.

Parents were also asked whether there were more conflicts in the home now compared to during the pandemic. Example items included conflict regarding how to spend leisure time or decisions about visitors to the home. Due to the variation in the type of items in the family conflict portion, we developed two subcategories based on bivariate correlations of the items and whether the items would be theoretically related. This approach yielded two separate categories used in the current analysis: conflict regarding finances and conflict regarding activities. Parents' report of conflict related to activities and finances were highly correlated at each follow-up (*r*s = .35 to .51; *r*s = .22 to .44, respectively) and therefore an average of the three time-points was used for each subcategory in the current analyses. In cases when only one time point was completed, that data was used.

Financial impact.: The COVID-19 Adolescent Symptom and Psychological Experience Questionnaire (CASPE; Ladouceur, 2020) was used to measure the impact of the pandemic on family finances, including changes in employment and income. Parents reported on any changes to their financial status at each time point. The total number of financial problems reported by parents was used in the current analyses.

Statistical Analysis—Descriptive statistics (see Tables 1 and 2), bivariate correlations, and chi-square tests were completed by using the Statistical Package for the Social Sciences version 24.0. Hierarchical Linear Modeling (HLM) Student Version 7.03 software was used

for piecewise linear growth models. To reduce the risk of a Type 1 error, piecewise linear growth models were used to investigate change in adolescents' mental health from pre- to post-SAHO rather than separate analyses for each time point (Raudenbush & Bryk, 2002). These analyses allowed for variability in the number and spacing of time points and accounted for the nonindependence of repeated measures. Full maximum likelihood was used to account for missing data. Age at time of data collection was explored as a potential covariate. Age was not significantly associated with any of the outcomes (ps > .05) and was therefore not included as a covariate. Further, to assess whether there were differences between experiences of families with and without a child with autism with regard to parental mental health, family togetherness, or conflict, we conducted independent samples t-tests on our variables of interest (Table 1).

The first linear component (Piece 1) of the piecewise hierarchical linear growth model captured change between prepandemic and the first follow-up survey completed approximately 1 month after the SAHO was enacted. The second linear component (Piece 2) captured change in each measure across all follow-up surveys after the SAHO was enacted, approximately 1–4 months post-SAHO. Time was recoded with respect to time since the SAHO in 1-month intervals rather than based on survey number.

The Level-1 (within persons) variable was time. The Level-2 variable (between persons) was group (0 = *nonautistic*, 1 = *autistic*). Models were estimated by using the following equations:

$$\text{Level-1 model:}\quad \text{Behavior}_{ti} = \pi_{0i} + \pi_{1i}(\text{Piece } 1_{ti}) + \pi_{2i}(\text{Piece } 2_{ti}) + e_{ti}$$

$$\text{Level-2 model:}\quad \pi_{0i} = \beta_{00} + \beta_{01}(\text{Group}_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{Group}_i) + r_{1i}$$
$$\pi_{2i} = \beta_{20} + \beta_{21}(\text{Group}_i) + r_{2i}$$

Finally, to assess predictors of changes in children's mental health during the SAHO, a linear regression model for each dependent variable (i.e., depression, anxiety) was conducted with predictors including sum of financial problems, parenting quality variables, parental mental health, and conflict variables. Due to the multicollinearity of the variables, z-scores were computed for each of the independent variables.

Results

Two-Piece Model of Change in Adolescents' Internalizing Symptoms

Change in adolescents' depressive symptoms.—Autistic adolescents were reported to have significantly more depressive symptoms (M = 4.73) than nonautistic adolescents prior to the pandemic (M = 0.61; p < .01; Figure 2). The rate of change from pre- to post-SAHO was statistically significant for both groups. Nonautistic adolescents showed a 0.73-unit *increase* in depressive symptoms from pre- to post-SAHO (p = .01), whereas autistic adolescents showed a 0.64-unit *decrease* in depressive symptoms from pre- to post-SAHO (p = .03). The slope, or rate of change, of depressive symptoms across the

course of the follow-up period (i.e., over the 5 months after the SAHO was enacted) was not statistically significant for either group.

Change in adolescents' anxiety symptoms.—Autistic adolescents were reported to have significantly more anxiety symptoms ($M = 22.83$) than nonautistic adolescents prior to the pandemic ($M = 11.02$; $p < .01$; Figure 1). The slope, or rate of change, from pre- to post-SAHO (Piece 1) was not statistically significant for either group. A significant decrease in the rate of change in anxiety symptoms across the course of the follow-up period (i.e., over the 5 months after the SAHO was enacted (Piece 2)) was observed in nonautistic adolescents. Specifically, parents reported, on average, a 0.70-unit decrease ($p = .02$) per month in anxiety symptoms.

Assessing Predictors of Adolescent Depressive Symptoms Post-SAHO

We ran analyses both with and without covariates (i.e., time since baseline visit, baseline/prepandemic levels of depressive symptoms). Results indicated that higher levels of permissive parenting were associated with higher levels of adolescents' depressive symptoms during the pandemic (see Figure 3). Specifically, 1-*SD* increase in permissive parenting was associated with a 0.78-unit increase in depressive symptoms ($p = .01$). Further, higher levels of financial problems were also a significant predictor of higher levels of adolescents' depressive symptoms during the pandemic, with 1-*SD* increase in financial problems associated with a 0.58-unit increase in depressive symptoms ($p = .02$; Table 3). Results were similar when controlling for baseline levels of depressive symptoms and time since baseline visit such that permissive parenting and financial problems remained significant predictors. See Table 4 for a breakdown of the types of financial problems that were reported by our sample. Further, as expected, adolescents' baseline/pre-pandemic levels of depressive symptoms ($B = 0.67$, $p < .01$) and time since baseline visit ($B = -0.04$, $p = .02$) were significant predictors of adolescents' depressive symptoms during the pandemic.

Assessing Predictors of Adolescent Anxiety Symptoms Post-SAHO.—Again, we ran analyses both with and without covariates (i.e., time since baseline visit, baseline/prepandemic levels of anxiety symptoms). Results indicated that higher levels of parental mental health difficulties were associated with higher levels of adolescents' anxiety symptoms. Specifically, 1-*SD* increase in parental mental health symptoms was associated with a 3.55-unit ($p < .01$) increase in children's anxiety symptoms. Further, higher levels of permissive parenting were associated with higher levels of children's anxiety symptoms, such that a 1-*SD* increase in permissive parenting was associated with a 2.79-unit increase in children's anxiety symptoms ($p = .05$). Results were similar when controlling for baseline levels of anxiety symptoms and time since baseline visit, such that parental mental health and permissive parenting remained significant predictors of adolescents' average levels of anxiety during the pandemic. Additionally, there was a trend for financial problems as a significant predictor of adolescents' anxiety symptoms ($B = 0.13$, $p = .05$). Further, as expected, baseline/prepandemic levels of anxiety ($B = 0.73$, $p < .01$) and time since baseline visit ($B = -0.04$, $p = .01$) were significant predictors of adolescents' anxiety during the pandemic.

Discussion

The current study assessed changes in adolescents' internalizing symptoms from pre- to post-SAHO (i.e., during the pandemic). Family processes, parental mental health, and financial stressors were also evaluated as predictors of adolescents' internalizing symptoms during the pandemic. We hypothesized that there would be an increase from pre- to post-SAHO in anxiety and depressive symptoms for both autistic and nonautistic adolescents. We also hypothesized that higher levels of parental mental health, authoritarian parenting, and family conflict would predict higher levels of adolescents' anxiety and depression, whereas higher levels of family togetherness would be associated with lower levels of adolescents' anxiety and depression.

Overall, our findings support growing evidence that for many children and adolescents there was an increase in mental health problems from prepandemic to during the pandemic, such that nonautistic adolescents demonstrated *increases* in depressive symptoms (Magson et al., 2021; Ravens-Sieberer et al., 2021). Alternatively, significant *decreases* in anxiety symptoms in nonautistic adolescents and *decreases* in depressive symptoms in autistic adolescents were also observed. These findings regarding adolescents' internalizing symptoms from prepandemic to during the pandemic are consistent with previous literature, where some negative impacts on youth's mental health have been observed (e.g., Patrick et al., 2020; Ravens-Sieberer et al., 2021), but some positive outcomes have also been observed (e.g., Patrick et al., 2020). These mixed results emphasize the need to identify predictors associated with positive and negative outcomes.

As such, we examined whether aspects of the family, as well as consequences of the pandemic, were associated with adolescents' internalizing symptoms during the pandemic. Higher levels of parents' own mental health symptoms were predictive of adolescents' anxiety symptoms. This finding is consistent with similar work that found parent anxiety was associated with increases in children's (aged 7–9 years) internalizing symptoms from pre- to post-COVID-19 (Khoury et al., 2021). In our sample, parents of autistic adolescents reported significantly higher levels of mental health difficulties than did parents of nonautistic adolescents. Parents' mental health problems during the pandemic have been consistently identified as being worse relative to normative data from prior to the pandemic (Calvano et al., 2022; Salari et al., 2020) and especially among parents of autistic youth (Althiabi, 2021; Yilmaz et al., 2021). This increase in mental health difficulties among parents of autistic youth may be due to the significant disruptions in services and therapies that youth were receiving prior to the pandemic, which parents endorsed as adding extreme or moderate levels of distress to their lives (White et al., 2021; Yilmaz et al., 2021). Although these data are informative, we did not use validated measures of parents' own mental health and instead chose to use a brief questionnaire from a larger international study of the impact COVID-19 was having on parents' mental health (Bhat, 2021). Thus, our results should be considered preliminary. However, our research is consistent with other published research that has used briefer measures as indicators of parents' mental health regarding the impact of COVID-19 (e.g., Li et al., 2021). Contrary to previous work (Penner et al., 2021), our study did not find that family togetherness, an indicator of positive family functioning, was associated with lower levels of children's mental health difficulties.

Permissive parenting during the pandemic was also found to be a significant predictor of adolescents' anxiety and depressive symptoms post-SAHO. This is not surprising given that research prior to the pandemic has also demonstrated a link between permissive parenting and internalizing symptoms (e.g., Rose et al., 2018). As our parents reported, the pandemic has influenced one's mental health, and these subsequently have impacted adolescents' anxiety and depression. Although not examined in this study, parental mental health and the demands for many due to the SAHOs (e.g., the need to work from home while also monitoring children or providing schooling) may be related to the permissive parenting practices being reported in the current study. Regardless, our results suggest the need for parents to have access to more supports, both for their own mental health-care treatment as well as ways to help alleviate the additional demands experienced due to both parent and child remaining at home during the SAHO period.

Consistent with other studies (Calvano et al., 2022), financial problems were identified as predictive of negative outcomes. Although we do not have sufficient information regarding participant socioeconomic status (SES) to examine it as a specific predictor of adolescents' mental health during the pandemic, two studies within the United States—one with a primarily Hispanic/Latinx group of adolescents (Penner et al., 2021)—and one with a primarily Black American group of children (Bhogal et al., 2021), demonstrated that children with lower SES reported decreases in mental health problems from prepandemic to during the pandemic. Potential reasons for this decrease in mental health problems discussed included the potential reduction of peer stressors and academic pressures given the SAHOs, as well as a general *return to baseline* for youth that had higher levels of mental health problems prior to the pandemic.

Interestingly, our study identified different trajectories of change in internalizing symptoms for autistic adolescents relative to the nonautistic adolescent group. Specifically, autistic adolescents were reported to have decreases in depressive symptoms, whereas nonautistic adolescents were reported to have increases in depressive symptoms. Given the small sample size, we can only speculate as to why there may be these different trajectories related to depressive symptoms from pre-SAHO to during the pandemic (i.e., post-SAHO). In a large study of autistic adults, themes regarding having more time for themselves to enjoy what they want to engage in, having more control over their daily structure, and decreases in social stressors of everyday life were reported as positive impacts from the COVID-19 pandemic and SAHOs (Oomen et al., 2021). In our own qualitative examination of the data collected from our autistic adolescents, similar themes were reported (e.g., getting more time on phone/computer, not having to deal with kids at school, getting more sleep, and open-ended responses, including "more time for self-exploration," "read more books," and "more relaxation at home"). These reported positive changes due to the pandemic and SAHOs may explain why autistic adolescents experienced decreases in depression. These results are also consistent with Lugo-Marín et al.'s (2021) data finding decreases (although not statistically significant) in broad psychopathology of autistic youth from prepandemic to post-SAHO.

Returning to life course theory, our results suggest that some children are showing resiliency during the pandemic; however, it is also possible that, given these data were collected early

on during the pandemic, declines in mental health may not have occurred yet. Future work should continue to examine the impact the pandemic has on youths' development over time, considering the age at which one experienced these disruptions, as well as whether these disruptions lead to ongoing developmental cascades across multiple domains of functioning (Benner & Mistry, 2020).

Future Directions and Limitations

The current study had several strengths and limitations. This is one of the few studies that included an assessment of adolescents' internalizing symptoms prior to the pandemic, enabling us to look directly at changes in internalizing symptoms from prepandemic to during the pandemic. Further, our sample includes autistic adolescents, a group at increased risk of experiencing mental health difficulties and co-occurring conditions, and who may be more susceptible to declines in mental health due to the inability to access ongoing services in and out of school. However, this sample is small, so our findings regarding the impact of the pandemic may not be representative of other families with autistic youth. Further, our sample is predominantly of non-Hispanic origin, high SES, and 49.4% White, which are significant limitations for the generalizability of our findings. Research has shown that socioeconomic disadvantage and having a historically marginalized racial identity (e.g., Black) are associated with experiencing greater levels of negative pandemic-related outcomes, including resource losses, less access to health care, and greater psychological distress relative to non-Hispanic White counter-parts (Clawson et al., 2021).

A significant limitation is the use of parent report as a measure of adolescents' internalizing symptoms. While some research has documented the difficulty of collecting accurate self-reports regarding mental health symptoms in autistic populations (Kerns et al., 2021), the best practice would be to collect both parent report and self-report. We did, in fact, collect some self-report data regarding adolescents' feeling anxious, worried, hopeless, and sad because of changes in their life from the COVID-19 pandemic, albeit not from a validated measure. (See Table 2 for means across time by group.) Given there is no direct way to compare these unvalidated, single-item, brief adolescent self-report responses of affect during the pandemic to the validated parent-report measures of anxiety and depression, we cannot statistically test whether similar trajectories were observed. However, we conducted post-hoc repeated measures analyses of variance to examine change in self-report across these items during the pandemic (not including group as a covariate) and observed nonsignificant decreases (ps > .05) in self-reported levels of *hopeless, sadness, worried*, and *anxious* feelings across the follow-up time points. These results emphasize the importance of including both parent-report and self-report measures of adolescents' internalizing symptoms.

Conclusions

Consistent with life course and family systems theories (Benner & Mistry, 2020; Prime et al., 2020), our results demonstrate that the pandemic has impacted the family unit in both positive and negative ways, and that aspects of the dyad (i.e., parental mental health, parenting quality) directly impacted children's mental health. These impacts on the family unit point to a need for family-based interventions that address all aspects of the family,

including parental mental health, parenting quality, and children's mental health (Prime et al., 2020). Specifically, providing opportunities for parents to receive access to their own mental health care especially during stressful periods extending even beyond a pandemic (e.g., loss of a loved one) is crucial in helping to support the well-being of parents and children. Further, regardless of which theoretical perspective one is using, researchers should continue to measure aspects of each of the contexts that influence adolescents' development.

Acknowledgments

The research reported in this publication was part of an ongoing study investigating the neural correlates of social interaction in children diagnosed with autism and was supported in part by the National Institute of Mental Health of the National Institutes of Health under Award Number R01MH107441. We then followed children who participated in this larger study during the pandemic. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The authors thank the families that participated in this research and the research assistants and staff that helped collect these data.

References

Achenbach TM, & Rescorla L (2001). Manual for the ASEBA school-age forms & profiles: An integrated system of multi-informant assessment. ASEBA.

Althiabi Y (2021). Attitude, anxiety and perceived mental health care needs among parents of children with Autism Spectrum Disorder (ASD) in Saudi Arabia during COVID-19 pandemic. Research in Developmental Disabilities, 111, 103873. 10.1016/j.ridd.2021.103873 [PubMed: 33540358]

Baumrind D (1971). Current patterns of parental authority. Developmental Psychology, 4(1, Pt. 2), 1–103. 10.1037/h0030372

Behar-Zusman V, Chavez JV, & Gattamorta K (2020). Developing a measure of the impact of COVID-19 social distancing on household conflict and cohesion. Family Process, 59(3), 1045–1059. 10.1111/famp.12579 [PubMed: 32621755]

Benner AD, & Mistry RS (2020). Child development during the COVID-19 pandemic through a life course theory lens. Child Development Perspectives, 14(4), 236–243. 10.1111/cdep.12387 [PubMed: 33230400]

Bhat A (2021). Analysis of the SPARK study COVID-19 parent survey: Early impact of the pandemic on access to services, child/parent mental health, and benefits of online services. Autism Research, 14(11), 2454–2470. 10.1002/aur.2618 [PubMed: 34591364]

Bhogal A, Borg B, Jovanovic T, & Marusak HA (2021). Are the kids really alright? Impact of COVID-19 on mental health in a majority Black American sample of schoolchildren. Psychiatry Research, 304(46), 114146. 10.1016/j.psychres.2021.114146 [PubMed: 34419705]

Birmaher B, Khetarpal S, Brent D, Cully M, Balach L, Kaufman J, & Neer SM (1997). The screen for child anxiety related emotional disorders (SCARED): Scale construction and psychometric characteristics. Journal of the American Academy of Child & Adolescent Psychiatry, 36(4), 545–553. 10.1097/00004583-199704000-00018 [PubMed: 9100430]

Bronfenbrenner U (1979). The ecology of human development: Experiments by nature and design. Harvard University Press.

Calvano C, Engelke L, Di Bella J, Kindermann J, Renneberg B, & Winter SM (2022). Families in the COVID-19 pandemic: Parental stress, parent mental health and the occurrence of adverse childhood experiences—results of a representative survey in Germany. European Child & Adolescent Psychiatry, 31(7), 1–13. 10.1007/s00787-021-01739-0

Choudhury S, Blakemore S-J, & Charman T (2006). Social cognitive development during adolescence. Social Cognitive and Affective Neuroscience, 1(3), 165–174. 10.1093/scan/nsl024 [PubMed: 18985103]

Clawson AH, Nwankwo CN, Blair AL, Pepper-Davis M, Ruppe NM, & Cole AB (2021). COVID-19 impacts on families of color and families of children with asthma. Journal of Pediatric Psychology, 46(4), 378–391. 10.1093/jpepsy/jsab021 [PubMed: 33738483]

Colizzi M, Sironi E, Antonini F, Ciceri ML, Bovo C, & Zoccante L (2020). Psychosocial and behavioral impact of COVID-19 in autism spectrum disorder: An online parent survey. Brain Sciences, 10(6), 341. 10.3390/brainsci10060341 [PubMed: 32503172]

Collins WA, & Steinberg L (2006). Adolescent development in interpersonal context. In Handbook of child psychology: Social, emotional, and personality development (6th ed., Vol. 3, pp. 1003–1067). John Wiley & Sons.

Connell CM, & Strambler MJ (2021). Experiences with COVID-19 stressors and parents' use of neglectful, harsh, and positive parenting practices in the Northeastern United States. Child Maltreatment, 26(3), 255–266. 10.1177/10775595211006465 [PubMed: 33787377]

Duan L, Shao X, Wang Y, Huang Y, Miao J, Yang X, & Zhu G (2020). An investigation of mental health status of children and adolescents in china[1] during the outbreak of COVID-19. Journal of Affective Disorders, 275, 112–118. 10.1016/j.jad.2020.06.029 [PubMed: 32658812]

Elder GH (1998). The life course as developmental theory. Child Development, 69(1), 1–12. 10.2307/1132065 [PubMed: 9499552]

Enea V, & Rusu DM (2020). Raising a child with autism spectrum disorder: A systematic review of the literature investigating parenting stress. Journal of Mental Health Research in Intellectual Disabilities, 13(4), 283–321. 10.1080/19315864.2020.1822962

Fuhrmann D, Knoll LJ, & Blakemore SJ (2015). Adolescence as a sensitive period of brain development. Trends in Cognitive Sciences, 19(10), 558–566. 10.1016/j.tics.2015.07.008 [PubMed: 26419496]

Giannopoulou I, Efstathiou V, Triantafyllou G, Korkoliakou P, & Douzenis A (2021). Adding stress to the stressed: Senior high school students' mental health amidst the COVID-19 nationwide lockdown in Greece. Psychiatry Research, 295, 113560. 10.1016/j.psychres.2020.113560 [PubMed: 33187723]

Kaufman AS, & Kaufman NL (2004). Kaufman Brief Intelligence Test (2nd ed.). Pearson.

Kent R, & Simonoff E (2017). Chapter 2—Prevalence of anxiety in autism spectrum disorders. In Kerns CM, Renno P, Storch EA, Kendall PC, & Wood JJ (Eds.), Anxiety in children and adolescents with autism spectrum disorder (pp. 5–32). Academic Press. 10.1016/B978-0-12-805122-1.00002-8

Kerns CM, Winder-Patel B, Iosif AM, Nordahl CW, Heath B, Solomon M, & Amaral DG (2021). Clinically significant anxiety in children with autism spectrum disorder and varied intellectual functioning. Journal of Clinical Child & Adolescent Psychology, 50(6), 780–795. 10.1080/15374416.2019.1703712 [PubMed: 31971849]

Khoury JE, Kaur H, & Gonzalez A (2021). Parental mental health and hostility are associated with longitudinal increases in child internalizing and externalizing problems during COVID-19. Frontiers in Psychology, 12(3132). 10.3389/fpsyg.2021.706168

King KA, Vidourek RA, & Merianos AL (2016). Authoritarian parenting and youth depression: Results from a national study. Journal of Prevention & Intervention in the Community, 44(2), 130–139. 10.1080/10852352.2016.1132870 [PubMed: 26939843]

Ladouceur CD (2020). COVID-19 Adolescent Symptom & Psychological Experience Questionnaire—Parent. Unpublished manuscript. Downloaded from https://www.phenxtoolkit.org/, University of Pittsburgh.

Li W, Wang Z, Wang G, Ip P, Sun X, Jiang Y, & Jiang F (2021). Socioeconomic inequality in child mental health during the COVID-19 pandemic: First evidence from China. Journal of Affective Disorders, 287, 8–14. 10.1016/j.jad.2021.03.009 [PubMed: 33761325]

Lord C, Rutter M, DiLavore PC, & Risi S (2012). Autism diagnostic observation schedule, second edition (ADOS-2). Western Psychological Services (WPS).

Lugo-Marín J, Gisbert-Gustemps L, Setien-Ramos I, Español-Martín G, Ibañez-Jimenez P, Forner-Puntonet M, Arteaga-Henríquez G, Soriano-Día A, Duque-Yemail JD, & Ramos-Quiroga JA (2021). COVID-19 pandemic effects in people with Autism Spectrum Disorder and their caregivers: Evaluation of social distancing and lockdown impact on mental health and

[1]·This is spelled with a lowercase "c" in the original.

general status. Research in Autism Spectrum Disorders, 83, 101757. 10.1016/j.rasd.2021.101757 [PubMed: 33649707]

Magson NR, Freeman JYA, Rapee RM, Richardson CE, Oar EL, & Fardouly J (2021). Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. Journal of Youth and Adolescence, 50(1), 44–57. 10.1007/s10964-020-01332-9 [PubMed: 33108542]

Moreland A, Herlihy C, Tynan MA, Sunshine G, McCord RF, Hilton C, Poovey J, Werner AK, Jones CD, Fulmer EB, Gundlapalli AV, Strosnider H, Potvien A, García MC, Honeycutt S, Baldwin G, Program CPHL, Team CC-R, & Unit MPA (2020). Timing of state and territorial COVID-19 stay-at-home orders and changes in population movement—United States, March 1–May 31, 2020. Morbidity and Mortality Weekly Report, 69(35), 1198–1203. 10.15585/mmwr.mm6935a2 [PubMed: 32881851]

Neubauer AB, Schmidt A, Kramer AC, & Schmiedek F (2021). A little autonomy support goes a long way: Daily autonomy-supportive parenting, child well-being, parental need fulfillment, and change in child, family, and parent adjustment across the adaptation to the COVID-19 pandemic. Child Development, 92(5), 1679–1697. 10.1111/cdev.13515 [PubMed: 33462836]

Nonweiler J, Rattray F, Baulcomb J, Happé F, & Absoud M (2020). Prevalence and associated factors of emotional and behavioural difficulties during COVID-19 pandemic in children with neurodevelopmental disorders. Children, 7(9), 128. 10.3390/children7090128 [PubMed: 32899799]

Oomen D, Nijhof AD, & Wiersema JR (2021). The psychological impact of the COVID-19 pandemic on adults with autism: A survey study across three countries. Molecular Autism, 12(1), 21. 10.1186/s13229-021-00424-y [PubMed: 33658046]

Patrick SW, Henkhaus LE, Zickafoose JS, Lovell K, Halvorson A, Loch S, Letterie M, & Davis MM (2020). Well-being of parents and children during the COVID-19 pandemic: A national survey. Pediatrics, 146(4), e2020016824. 10.1542/peds.2020-016824

Penner F, Hernandez Ortiz J, & Sharp C (2021). Change in youth mental health during the COVID-19 pandemic in a majority Hispanic/Latinx US sample. Journal of the American Academy of Child & Adolescent Psychiatry, 60(4), 513–523. 10.1016/j.jaac.2020.12.027 [PubMed: 33359408]

Pfeifer JH (2020). Adolescent social connection and coping during Covid questionnaire. https://osf.io/jakg5/. Available in the Open Science Framework (OSF) repo Assessment of COVID 19 Experiences (ACE) for Adolescents Research Tracker and Facilitator. 10.17605/OSF.IO.PY7VG

Pinquart M (2017). Associations of parenting dimensions and styles with internalizing symptoms in children and adolescents: A meta-analysis. Marriage & Family Review, 53(7), 613–640. 10.1080/01494929.2016.1247761

Prime H, Wade M, & Browne DT (2020). Risk and resilience in family well-being during the COVID-19 pandemic. The American Psychologist, 75(5), 631–643. 10.1037/amp0000660 [PubMed: 32437181]

Racine N, Cooke JE, Eirich R, Korczak DJ, McArthur B, & Madigan S (2020). Child and adolescent mental illness during COVID-19: A rapid review. Psychiatry Research, 292(6), 113307. 10.1016/j.psychres.2020.113307 [PubMed: 32707216]

Raudenbush SW, & Bryk AS (2002). Hierarchical linear models: Applications and data analysis methods. SAGE.

Ravens-Sieberer U, Kaman A, Erhart M, Devine J, Schlack R, & Otto C (2021). Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. European Child & Adolescent Psychiatry, 31(6), 879–889. 10.1007/s00787-021-01726-5 [PubMed: 33492480]

Robinson CC, Mandleco B, Olsen SF, & Hart CH (1995). Authoritative, authoritarian, and permissive parenting practices: Development of a new measure. Psychological Reports, 77(3, Pt. 1), 819–830. 10.2466/pr0.1995.77.3.819

Rose J, Roman N, Mwaba K, & Ismail K (2018). The relationship between parenting and internalizing behaviours of children: A systematic review. Early Child Development and Care, 188(10), 1468–1486. 10.1080/03004430.2016.1269762

Rosen TE, Mazefsky CA, Vasa RA, & Lerner MD (2018). Co-occurring psychiatric conditions in autism spectrum disorder. International Review of Psychiatry, 30(1), 40–61. 10.1080/09540261.2018.1450229 [PubMed: 29683351]

Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, Rasoulpoor S, & Khaledi-Paveh B (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. Globalization and Health, 16(1), 57. 10.1186/s12992-020-00589-w [PubMed: 32631403]

Scott S (2012). Parenting quality and children's mental health: Biological mechanisms and psychological interventions. Current Opinion in Psychiatry, 25(4), 301–306. 10.1097/YCO.0b013e328354a1c5 [PubMed: 22634522]

Tang S, Xiang M, Cheung T, & Xiang YT (2021). Mental health and its correlates among children and adolescents during COVID-19 school closure: The importance of parent-child discussion. Journal of Affective Disorders, 279, 353–360. 10.1016/j.jad.2020.10.016 [PubMed: 33099049]

Tokatly Latzer I, Leitner Y, & Karnieli-Miller O (2021). Core experiences of parents of children with autism during the COVID-19 pandemic lockdown. Autism, 25(4), 1047–1059. 10.1177/1362361320984317 [PubMed: 33435701]

White LC, Law JK, Daniels AM, Toroney J, Vernoia B, Xiao S, SPARK Consortium, Feliciano P, & Chung WK (2021). Brief report: Impact of COVID-19 on individuals with ASD and their caregivers: A perspective from the SPARK cohort. Journal of Autism and Developmental Disorders, 51(10), 3766–3773. 10.1007/s10803-020-04816-6 [PubMed: 33387233]

World Health Organization. (2020). Listings of WHO's response to COVID-19. WHO. https://www.who.int/news/item/29-06-2020-covidtimeline

Yeasmin S, Banik R, Hossain S, Hossain MN, Mahumud R, Salma N, & Hossain MM (2020). Impact of COVID-19 pandemic on the mental health of children in Bangladesh: A cross-sectional study. Children and Youth Services Review, 117, 105277. 10.1016/j.childyouth.2020.105277 [PubMed: 32834275]

Yilmaz B, Azak M, & şahin N (2021). Mental health of parents of children with autism spectrum disorder during COVID-19 pandemic: A systematic review. World Journal of Psychiatry, 11(7), 388–402. 10.5498/wjp.v11.i7.388 [PubMed: 34327131]

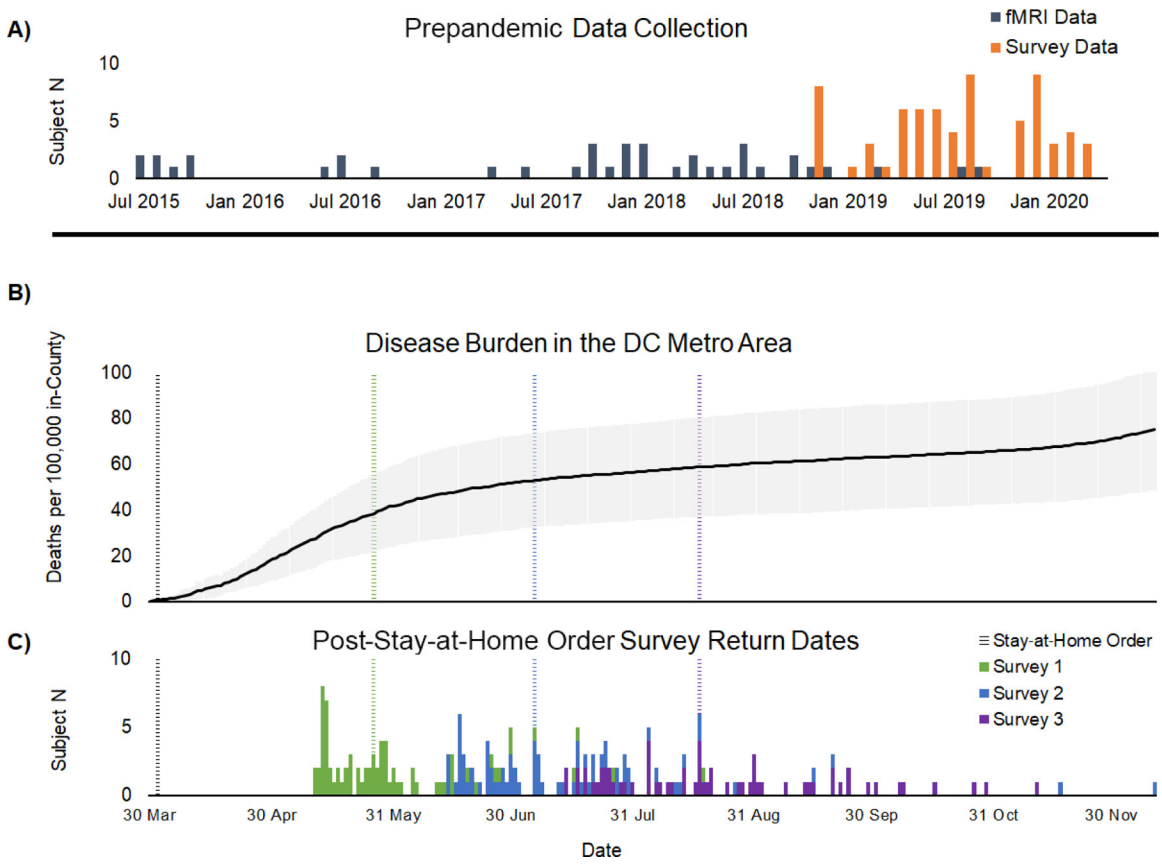

Figure 1.
Data collection timeline. SAHO = stay-at-home order,

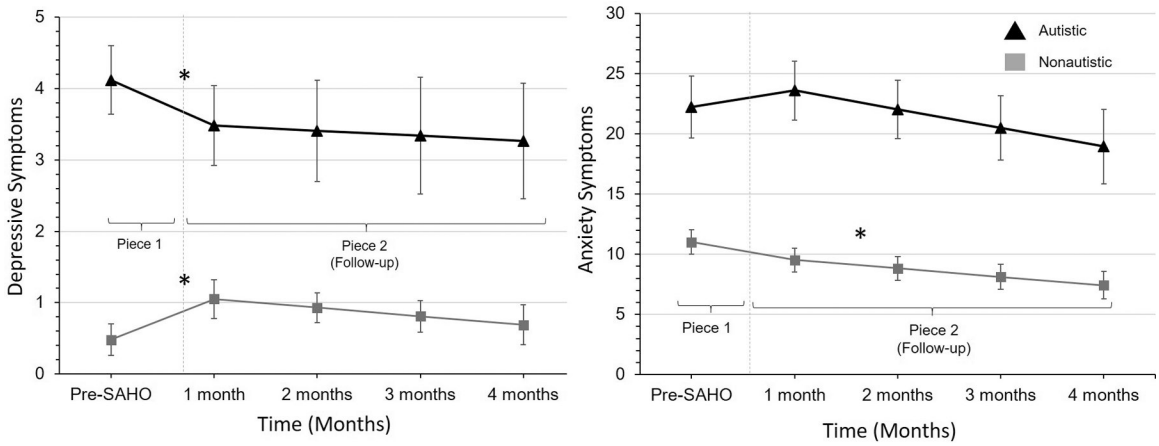

Figure 2.

Model-estimated intercepts and slopes of children's depression and anxiety symptoms from prepandemic to the first few months of the pandemic. SAHO = stay-at-home order. *Significant rate of change in symptoms during the piece indicated.

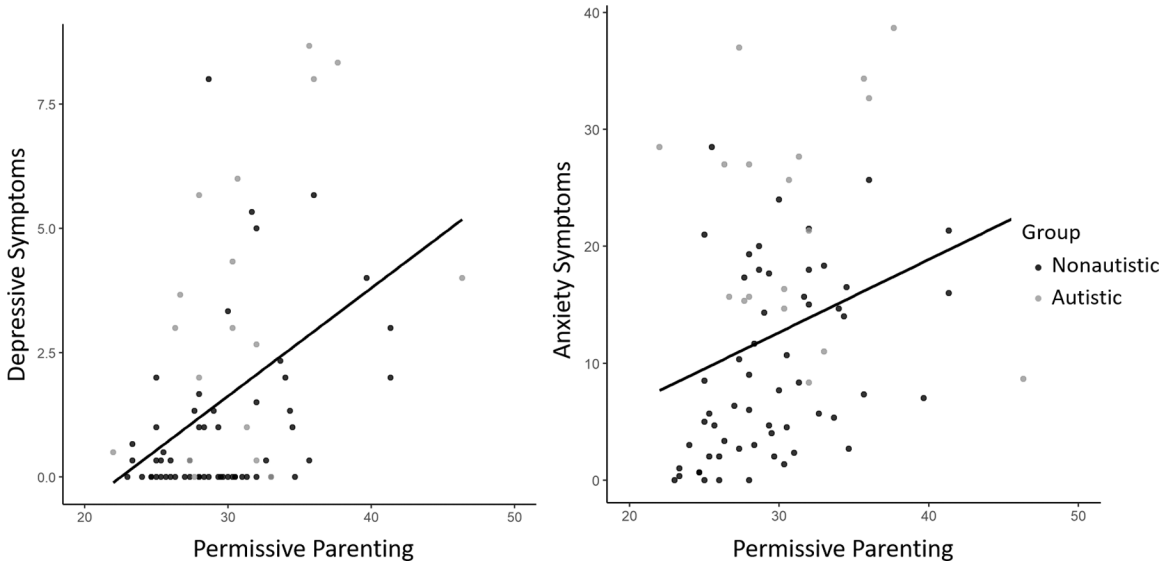

Figure 3.

Associations between permissive parenting and children's depressive and anxiety symptoms post-SAHO (stay-at-home order). Raw data are shown.

Table 1.

Demographic characteristics and descriptive information of key study variables

	Nonautistic (*n* = 61)	**Autistic (*n* = 18)**
	% (*n*)	% (*n*)
Child age at pre-SAHO visit, mean (*SD*)	12.77 (1.65)	13.47 (1.70)
Child age at first follow-up visit, mean (*SD*)	13.65 (1.63)	14.37 (2.01)
Parent-reported child gender	33 M/28 F	15 M/3 F
Child race		
American Indian or Alaska Native	0	0
Asian	1.6 (1)	5.6 (1)
Black or African American	21.3 (13)	0
Native Hawaiian or other Pacific Islander	0	0
White	44.3 (27)	66.7 (12)
Multiracial	19.7 (12)	5.6 (1)
Missing	13.1 (8)	22.2 (4)
Child ethnicity		
Hispanic or Latino	8.2 (5)	—
Not Hispanic or Latino	80.3 (49)	72.2 (13)
Missing	11.5 (7)	27.8 (5)
Parent Education		
High-school diploma	1.64 (1)	0
Some college education	8.20 (5)	5.56 (1)
Degree from 4-year college or more	88.5 (54)	94.4 (17)
Missing	1.64 (1)	0
Household income		
Less than $20,000	3.28 (2)	5.56 (1)
$21,000–35,000	1.64 (1)	0 (0)
$36,000–50,000	3.28 (2)	0 (0)
$51, 000–65,000	1.64 (1)	0 (0)
$66,000–80,000	3.28 (2)	5.56 (1)
$81,000–100,000	6.56 (4)	0 (0)

$101,000–130,000	18.03 (11)	33.33 (6)	
$131,000–160,000	14.75 (9)	22.22 (4)	
Over $161,000	31.15 (19)	22.22 (4)	
Missing	16.39 (10)	11.11 (2)	
Key study variables			**Test of difference**
Average parent mental health post-SAHO, *M* (*SD*)	5.67 (1.76)	7.69 (2.38)	$t(75) = -3.92$, $p < .001$
Average positive parenting post-SAHO, *M* (*SD*)	108.50 (10.26)	103.10 (11.48)	$t(73) = 1.89$, $p = .06$
Average permissive parenting post-SAHO, *M* (*SD*)	29.43 (4.31)	31.19 (5.41)	$t(73) = -1.42$, $p = .16$
Average harsh parenting post-SAHO, *M* (*SD*)	34.04 (5.47)	35.15 (5.63)	$t(73) = -.74$, $p = .46$
Average financial problems post-SAHO, *M* (*SD*)	1.08 (1.01)	1.33 (0.97)	$t(77) = -.94$, $p = .35$
Average conflict over finances post-SAHO, *M* (*SD*)	3.39 (0.70)	3.46 (0.47)	$t(75) = -.38$, $p = .70$
Average conflict over time spent post-SAHO, *M* (*SD*)	3.21 (0.62)	3.40 (0.50)	$t(75) = -1.19$, $p = .24$
Average togetherness post-SAHO, *M* (*SD*)	3.79 (0.57)	3.55 (0.62)	$t(76) = 1.50$, $p = .14$

Note. SAHO = stay-at-home order.

Table 2.

Means and standard deviations of relevant variables by time and group

	Pre-SAHO		Time 1		Time 2		Time 3	
	Nonautistic	**Autistic**	**Nonautistic**	**Autistic**	**Nonautistic**	**Autistic**	**Nonautistic**	**Autistic**
Parent-reported measures								
Anxiety	11.0 (8.0)	22.2 (10.3)	10.3 (8.2)	23.9 (10.1)	9.10 (8.5)	24.2 (10.6)	7.7 (7.5)	20.3 (10.2)
Depression	0.5 (1.2)	4.1 (3.1)	1.2 (2.2)	3.4 (2.7)	1.0 (2.0)	3.8 (3.2)	0.8 (1.4)	3.6 (3.1)
Authoritative	117.7 (10.8)	109.5 (11.4)	108.9 (10.0)	103.4 (11.2)	109.2 (11.2)	101.4 (13.6)	106.2 (12.0)	102.9 (10.9)
Authoritarian	—		34.3 (6.0)	35.8 (5.5)	33.4 (5.0)	34.9 (6.1)	33.7 (5.2)	34.1 (5.9)
Permissive	—		29.5 (4.4)	31.1 (5.1)	29.7 (5.0)	31.4 (6.8)	29.6 (4.8)	31.4 (5.1)
Adolescent self-reported measures								
Anxious			2.8 (1.5)	2.7 (1.4)	2.5 (1.4)	2.6 (1.5)	3.0 (1.5)	2.4 (1.4)
Worried			2.9 (1.3)	2.7 (1.5)	2.8 (1.5)	2.7 (1.4)	2.6 (1.3)	2.7 (1.2)
Sad			2.8 (1.4)	2.7 (1.3)	2.7 (1.4)	2.5 (1.5)	2.6 (1.3)	2.3 (1.1)
Hopeless			2.0 (1.3)	2.2 (1.6)	1.9 (1.1)	2.1 (1.7)	1.9 (1.2)	2.1 (1.2)

Note. SAHO = stay-at-home order.

Merrill Palmer Q (Wayne State Univ Press). Author manuscript; available in PMC 2023 December 14.

Table 3.

Regression coefficients of predictors of adolescents' internalizing symptoms

	Anxiety			Depression		
	B	**β**	***SE***	***B***	**β**	***SE***
Parent mental health	3.55**	.36	1.26	.34	.15	.27
Permissive	2.79*	.28	1.38	.78*	.34	.29
Positive	.04	.00	1.18	−.38	−.16	.25
Harsh	.19	.02	1.45	.07	.03	.31
Finance problems	.54	.06	1.17	.58*	.25	.25
Conflict over finance	−1.39	−.14	1.48	−.57	−.25	.31
Conflict over time	−1.15	−.12	1.58	.27	.12	.33
Togetherness	−.10	−.01	1.13	−.33	−.14	.24

Note. Results shown are when not controlling for baseline/prepandemic levels of internalizing symptoms or time since baseline visit. *B* = unstandardized beta; β = standardized beta.

* $p < .05$.

** $p < .01$.

Table 4.

Parent-reported financial problems during the pandemic by group

	Nonautistic (*n* = 61)	Autistic (*n* = 18)
Job loss by one adult (caregiver)	18.0	27.8
Job loss by two adults (caregivers)	3.3	0.0
Difficulty paying bills or buying necessities	9.8	11.1
Adult having to work longer hours	31.1	33.3
Adult filing for unemployment	9.8	5.6
Applied for public assistance (e.g., food stamps)	4.9	5.6
Loss of equity in the stock market	31.1	50.0
Total financial problems, *M* (*SD*)	1.1 (1.0)	1.3 (1.0)

Note. Reported results show percent of parents reporting that the specific financial problem occurred during at least one of the data collection time points unless otherwise noted.