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EMPIRICAL RESEARCH

COVID-19 Pandemic-Related Financial Hardships and Adolescents' Adjustment: A Longitudinal Family Stress Approach

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Abstract

Restrictions associated with the onset of the COVID-19 pandemic created a host of short- and long-term economic challenges for families. Despite their ubiquity during the early pandemic, knowledge on the developmental impacts of pandemic-related financial hardships on adolescents' adjustment is lacking. Guided by family stress and life course perspectives, this study investigated direct and indirect relations between pandemic-related financial hardships and adolescents' later depressive symptoms, delinquency, and academic performance via parents' depressive symptoms and acceptance. Data were drawn from three waves of a longitudinal study; participants completed online surveys at Wave 1, COVID-19 Wave (seven months later) and Wave 2 (five months later). Participants were two adolescent-aged siblings ($n = 1364$; 50% female; *M*age = 14.45, $SD = 1.55$ years) and one parent ($n = 682$; 85% female; *M*age = 45.15, $SD = 5.37$ years) from 682 families ($N = 2048$). Structural equation modeling results indicated that pandemic-related financial hardships were indirectly linked to greater adolescent delinquency and lower academic performance by adversely shaping parents' mental health and parent-adolescent relationship quality. The findings highlight financial hardships as critical family stressors for adolescent adjustment during the COVID-19 pandemic.

Keywords COVID-19 pandemic · Financial stress · Parenting · Academic performance · Delinquency · Depressive symptoms

Introduction

The COVID-19 pandemic drastically changed the lives of adolescents with ramifications affecting the emotional, social, and academic adjustment of youth around the world (Branje & Morris, 2021). Further, families experienced short- and long-term economic challenges as a result of the pandemic with many U.S. families facing food, housing, and employment difficulties (US Census Household Pulse Survey, 2021). These economic challenges were especially prevalent for adolescents and their families. For instance, over one in three children and adolescents growing up in families with rental households experienced food and/or housing hardships (Center on Budget & Policy Priorities, 2021). Despite the ubiquity of economic difficulties during the COVID-19 pandemic, the developmental impacts of pandemic-related financial hardships on adolescents' adjustment are largely unknown. Conceptually, financial hardships can be detrimental to adolescents' healthy development through cascading effects on family relationships (Conger et al., 2010; Elder, 2018). Indeed, empirical evidence suggests that financial hardships can harm parents' mental health and strain parent-adolescent relationship quality, which can affect multiple forms of adolescents' adjustment such as their depressive symptoms (Kavanaugh et al., 2018), delinquency (Jiang et al., 2020), and academic performance (Mistry & Elenbaas, 2021). Building on this work, the present study investigated the longitudinal implications of pandemic-related financial hardships on adolescents' adjustment outcomes via parent mental health and parent-adolescent relationship processes.

Given the social conditions of the COVID-19 pandemic, including lockdown procedures that closed schools,

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canceled structured leisure activities, and increased work from home, adolescents spent more time at home and with their families, which has been associated with higher levels of parenting stress and poorer adolescent adjustment (Low & Mounts, 2022). These conditions also may have exposed youth to more first-hand knowledge of their families' financial hardship and stress than they would typically experience in their day-to-day lives before the COVID-19 pandemic. Guided by family stress and life course perspectives (Conger et al., 1992; Elder, 1998), this study examined direct and indirect associations between pandemic-related financial hardships and adolescents' later depressive symptoms, delinquency, and academic performance through their parents' depressive symptoms and acceptance. Identifying the family mechanisms that shaped adolescents' responses to the pandemic is critical, so that youth prevention and intervention strategies can be developed to mitigate both short- and long-term effects of future societal events including economic recessions, natural disasters, and public health crises (see Taylor, 2022).

Theoretical Frameworks

Traditional and contemporary stress and coping scholarship (Lazarus & Folkman, 1984; Liu & Doan, 2020) has underscored that stress is detrimental to individuals' adjustment outcomes, particularly if the stressor overwhelms available coping resources. Building on life course developmental theory's tenets of the importance of historical time and space, timing in development, and cumulative disadvantages in health inequities (Elder, 1998; 2018), we explored whether pandemic-related financial hardships affected adolescents' and their parents' behavioral health and adjustment during the 2020 COVID-19 pandemic emergency shutdowns and beyond. Further, the family stress model (Conger et al., 1992; 2010) suggests that economic hardships shape youth adjustment via parental emotional distress, marital conflict, and maladaptive parenting practices. Of particular interest to this study are the parenting mechanisms connecting financial hardships to adolescents' adjustment outcomes. Such economic hardships experienced by families can influence parents' mental health, which, in turn, results in decreased parenting quality, which subsequently predicts increased psychological, behavioral, and academic problems for youth (Conger et al., 2010). Financial hardships were a salient source of psychosocial stress for many families during the COVID-19 pandemic, which was expected to have a stress contagion effect on adolescents and parents (Liu & Doan, 2020; US Census Household Pulse Survey, 2021). Thus, the current study aimed to extend the family stress literature by considering links among COVID-19 pandemic-related financial hardships, parents' depressive symptoms and acceptance, and adolescents' later depressive symptoms, delinquency, and academic performance.

Financial Hardships and Adolescents' Adjustment

Financial hardships can be indexed by various indicators such as the family being unable to meet material needs, falling behind on paying bills, dues, and debts, as well as having to make cutbacks and adjustments in everyday expenditure in order to live within available means (Conger & Donnellan, 2007; Elder, 2018). Such financial hardships can generate socioeconomic strain at the family level, which has cascading effects on youth health and adjustment outcomes (Conger et al., 2010; Van Gundy et al. (2015)). Adolescents experiencing the stress and strain associated with financial hardships may become depleted of cognitive and emotional resources required for healthy psychological functioning (Lazarus & Folkman, 1984). For example, Argabright et al. (2022) found that adolescents' perceptions of their families' COVID-19 financial hardships were associated with increased depressive symptoms. Growing up in low-income households also can place youth at risk for antisocial behaviors through exposure to deviant peers and risky neighborhood settings (Eamon, 2001). Additionally, financial hardships can limit access to instructional, social, and financial supports that are vital for adolescents' academic success (Owens & Candipan, 2019).

In fact, empirical evidence has established robust connections between financial hardships and adolescents' depressive symptoms (Kavanaugh et al., 2018; Viseu et al., 2018), delinquency (Agnew et al., 2008; Jiang et al., 2020), and academic performance (Citarella et al., 2020; Mistry & Elenbaas, 2021). Emerging pandemic-related scholarship has supported some of these direct links between financial hardships and youth depressive symptoms (de Miranda et al., 2020), delinquency (Wallace, 2022), and academic performance (Panagouli et al., 2021). However, most of this research focused on socioeconomic inequalities (e.g., low income) finding that lack of resources and access to resources was especially deleterious for those with low incomes, who were disproportionately impacted by the pandemic's negative effects (National Academies of Science, Engineering, and Medicine (2023)). In contrast, we know little about how pandemic-related financial hardships such as cutting spending or falling behind on bills may have affected family relationships and adolescent adjustment. Given the limitations of family income-related measures as a proxy for financial hardships, we utilized an adapted financial hardships measure (Conger & Elder, 1994) that taps into perceptions of families' financial hardships due to the onset of the COVID-19 pandemic and related emergency shutdowns, starting March 2020. Moreover, it is important to investigate the longitudinal impact of COVID-

19-related financial hardships in the beginning phase of the pandemic on adolescents' adjustment to better understand whether the effects of pandemic-related disruptions were transient or longer lasting in adolescents' lives through the later phases of the COVID-19 pandemic. Finally, extant work has failed to test a full model linking COVID-19-related financial hardships to adolescents' adjustment both directly and indirectly through parenting qualities.

Indirect Relations Via Parents' Depressive Symptoms and Acceptance

The impact of the stressful nature of financial hardships on adolescents' adjustment is exacerbated due to its indirect effects via the responses of family members. Adverse financial conditions, prompted by pandemics and recessions (Conger & Elder, 1994; Mann et al., 2020), can influence parents' emotional state and the quality of everyday interactions with parents. Parents' awareness of and reactions to financial hardships can alter their mental state, which can in turn affect their relationship quality with their children (Conger et al., 1992; 2010). Parents may feel depressed, overwhelmed, and emotionally reactive due to worsening economic conditions, and parents' depressed mood can impair the quality of their parenting behaviors. Greater financial hardships are linked to higher depressive symptoms in parents, which can elicit less nurturant, responsive, and supportive parenting with children and adolescents (Evans et al., 2008; Ponnet, 2014).

Researchers have highlighted parenting quality as a key intervening pathway that links family financial hardships and parental mental health to adolescents' adjustment. Parental acceptance acted as the intervening mechanism through which parents' depressive symptoms affected youth adjustment, with higher depressive symptoms in parents linked to less adaptive parenting behaviors, which ultimately predict youth problem behaviors (Buehler et al., 2006; Buehler & Gerard, 2002). Other evidence highlights parents' depressive symptoms are indirectly linked to adolescents' adjustment outcomes via reduced parental acceptance of their adolescents (Grant et al., 2000; Mistry et al., 2008). Importantly, reduced parental acceptance predicts psychological maladjustment (see Li & Meier, 2017) such as increased depressive symptoms (Garthe et al., 2015; Miranda et al., 2016) and delinquency (Finkenauer et al., 2005; Wang et al., 2014) as well as decreased academic performance (Bi et al., 2020; Lee et al., 2012).

One study testing the family stress model before the pandemic found that economic pressure during early adolescence was indirectly, positively associated with depressive symptoms during young adulthood via mothers' depressive symptoms, couples' conflict, and harsh parenting (Kavanaugh et al., 2018). The indirect pathways from financial hardships to youth adjustment outcomes through parents' depressive symptoms and acceptance also have been replicated longitudinally for delinquency (Simons & Brown, 2022) and academic performance (Simons & Steele, 2020), wherein economic stress was related to increased caregivers' psychological distress, conflict between caregivers, and disrupted positive parenting, which together predicted higher delinquent behaviors and lower academic performance, respectively (Simons & Brown, 2022; Simons & Steele, 2020).

Given this body of work, it is surprising that empirical research testing family-level financial stress in the context of the COVID-19 pandemic is scarce. Some early research suggests that pandemic-related financial hardships were predictors of decreases in school and academic outcomes (e.g., school bonding; Maiya et al., 2021) and increases in depressive symptoms (Low & Mounts, 2022) for adolescents. Consistent with a family stress perspective, a cross-sectional study of 272 families found that the association between financial stress and adolescents' well-being (i.e., internalizing behaviors and loneliness) was mediated by parents' psychological distress and parenting stress during the COVID-19 pandemic (Low & Mounts, 2022). In contrast, another study found little connection between pandemic-related financial hardships and parents' depressive symptoms, though ineffective parenting practices (low levels of monitoring and supervision) were associated more adolescent delinquency (Wallace, 2022). The present study builds on these early cross-sectional studies by utilizing a longitudinal design that specifically investigates parents' mental health and relationship quality with adolescents as indirect pathways that connect early pandemic-related financial hardships to adolescents' later adjustment.

The Present Study

Building on family stress and life course theoretical frameworks and limited pandemic-related empirical scholarship, the present study investigated the direct and indirect effects of pandemic-related financial hardships on adolescents' adjustment outcomes via parent mental health and parent-adolescent relationship processes. First, it was hypothesized that pandemic-related financial hardships would be directly and positively related to later depressive symptoms and delinquency, but negatively linked to academic performance among adolescents. Second, it was hypothesized that pandemic-related financial hardships would be indirectly related to adolescents' depressive symptoms, delinquency, and academic performance via both parents' depressive symptoms and acceptance. Specifically, it was expected that pandemic-related financial hardships would be positively associated with parents'

depressive symptoms, which would subsequently be negatively associated with parents' acceptance. In turn, parental acceptance would be negatively associated with adolescents' later depressive symptoms and delinquency and positively associated with academic performance. Finally, the study accounted for pre-pandemic markers of adolescents' adjustment (controlling for stability), family income (disentangling pandemic-related financial stressors from between-family differences in income), parents' marital status, parents' gender, adolescents' gender and age, and school format (i.e., in person versus other formats) during pandemic as covariates, due to the importance of these factors in predicting family stress, parenting, and adolescent adjustment.

Method

Participants

The current sample was drawn from three-waves of a longitudinal study entitled the Parent, Adolescent, and Sibling Study (PASS). The original study design planned three annual assessments, the first of which (Wave 1) was collected between April 2019 and February 2020 (prior to the COVID-19 pandemic). Given the onset of the pandemic, an unplanned COVID-19 assessment was collected between May 1 and June 15, 2020. Wave 2 followed the original annual assessment schedule and data were collected between Fall 2020 and Winter 2021.

At Wave 1, participants included two adolescent-aged siblings ($n = 1364$) and one parent ($n = 682$) from 682 families ($N = 2046$). Adolescents (50% male, 50% female, <1% transgender) averaged 14.44 ($SD = 1.53$) years of age and parents (85% female, 15% male, < 1% transgender) averaged 45.15 ($SD = 5.37$) years of age. Most parents were married (85%) and biological parents (97%) of adolescents. In terms of their racial-ethnic background, parents identified as White (87%), Black or African American (9%), and other racial groups (4%); five percent identified as Latinx. Parents primarily reported 4-year college degree or higher (71%) education, some college or two-year degree (23%), high school (5%), and less than high school (1%) education. Parents also reported a wide range of household incomes: 21% were below $59,999, 22% between $60,000 and $99,999, 27% between $100,000 and $149,999, and 30% above $150,000.

At the unplanned COVID-19 wave, participants included two adolescent-aged siblings ($n = 1054$) and one parent ($n = 568$) from 596 families ($N = 1622$). Owing to pandemic-related shutdowns, 70% parents were working remotely, 45% reported having an essential worker in the home, and 96% of adolescents were attending online classes. At Wave 2, 1893 (1243 adolescents; 650 parents) completed the surveys. During Wave 2, 24% of adolescents attended school in-person daily, 27% had a hybrid/mixed format in which they attended school in person somedays and virtually/online other days, 45% attended virtually/online (35% synchronous, 10% asynchronous), and 4% attended via another format (e.g., home-schooling).

Procedure

The sample included families with adolescents from five Midwestern states in the U.S.: Illinois, Indiana, Ohio, Pennsylvania, and Wisconsin. A survey research firm with a sampling frame for families with at least one adolescent in 8th, 9th, or 10th grade was used for recruitment purposes. Parents were sent letters with the study purpose and eligibility criteria, including a unique eight-digit to enter on a screening website. Interested parents logged onto this website to share their demographic information, based on which they were provided feedback about their eligibility to participate in the study. Given the goals of the study, which focused on sibling socialization of adolescents' health-related behaviors in the Midwestern US, families were considered eligible if they had one parent as well as two adolescent-aged children with an older sibling in 8th through 10th grades and a younger sibling in 5th through 9th grades. Among the 1448 parents who used the screener website, 1008 parents were found eligible to participate in this study. Finally, 682 families with all three members (i.e., two siblings and one parent) participated in Wave 1. Across the waves, parents provided informed consent for themselves and their participating adolescents. Upon receiving consent, emails with web-based survey links were sent to parents and youth. Adolescents also provided informed assent prior to participating in the survey. Surveys were designed to be completed in 30 to 60 min ($Mdn = 38$ minutes for youth; $Mdn = 38$ min for parents) and each participant received $30 for completing the survey.

As mentioned earlier, an unplanned special assessment to investigate family, school, work, and health-related consequences of the pandemic was conducted in Spring 2020. In this COVID-19 wave, 1054 adolescents and 568 parents from 596 families participated. The median response time for survey completion was 26 minutes for adolescents and 36 min for parents at the COVID-19 wave. All participants received $20 each for survey completion. At Wave 2, 1243 adolescents and 650 parents ($N = 1893$) participated in this study. Similar eligibility screening, parent consent and youth assent, and online survey data collection procedures were used in Wave 2 as in the previous waves. The median response time for Wave 2 surveys was 29 min for adolescents and 38 min for parents. Each participating family

member received $40 for survey completion. All study procedures and protocols were approved by the Institutional Review Board at Utah State University (protocol #11988).

In order to increase survey efficiency and data quality (Raghunathan & Grizzle, 1995) and decrease survey burdens and costs, we utilized a three-form planned missingness data design (Graham et al., 1996; 2006) at both waves. Twenty-five percent of items were missing at random for all measures with greater than four items. This design creates data that are missing completely at random, thereby introducing little-to-no bias (MCAR; Little & Rubin, 2002). The random missingness is, then, addressed analytically by using full information maximum likelihood, which yields unbiased regression estimates (Muthén & Muthén, 1998–2017).

Measures

Financial hardships

At the COVID-19 wave, parents reported on their financial hardships using an adaption of Conger and Elder's (1994) measure of economic hardships. Specifically, items were revised to pertain to economic adjustments or cutbacks for the purpose of saving money and adjusting to financial hardships due to the onset of the pandemic. Utilizing a 0 (*No*) and 1 (*Yes*) response scale, parents were asked 'Since March 1, 2020, have you made any of the following adjustments?' Parents rated nine potential financial adjustments including, 'Have you turned down the heat or air conditioning to save money even though it made the house uncomfortable?' and 'Have you asked relatives or friends for money or food to help you get by?' Higher scores on these items suggested greater pandemic-related financial hardships.

To further increase focus on financial hardships that were specific to the pandemic, three additional items were included in the financial hardship index. From the Pandemic Stress Index (Harkness, 2020), using a 0 (*No*) and 1 (*Yes*) response scale, parents were asked about whether they experienced 'Personal financial loss (e.g., lost wages, job loss, investment/retirement loss, travel-related cancellations)' and 'Not having enough basic supplies (e.g., food, water, medication, a place to stay)' during the COVID-19 pandemic. From the Coronavirus Impact Scale (Stoddard et al., 2023), on a scale from 0 (*No change*) to 4 (*Severe change*) were asked to rate how much the Coronavirus pandemic changed their life in various domains, including 'Family Income/Employment.' To be consistent with the yes/no format of the other items, responses that indicated any changes to 'Family Income/Employment' were coded as 1 (i.e., financial-related changes related to the pandemic). Across all 12 items, this measure demonstrated adequate reliability (KR20 = 0.79) in the current sample.

Parental acceptance

Parental acceptance was assessed using the shortened version of the Children's Report of Parental Behavior Inventory (CRPBI acceptance subscale; Schaefer, 1965) at the COVID-19 wave. On a five-point scale (1 = *Not at all*, 2 = *A little*, 3 = *Some*, 4 = *A lot*, 5 = *Very much*), parents rated eight items on how things have been in their relationship with both of their adolescents separately since March 1, 2020. Example items included, 'I am a person who makes [Child] feel better after talking over his/her worries with me' and 'I am a person who sees [Child] good points more than his/her faults.' Higher scores represented greater parental acceptance. The measure showed adequate reliability ($\alpha = 0.92$) in this study.

Parents' depressive symptoms

Parents self-reported their depressive symptoms at the COVID-19 wave using the Brief Symptom Inventory (BSI-18 depression subscale; Derogatis & Savitz, 2000). Parents rated five items on the degree to which they experienced the listed symptoms over the past week using a five-point scale (1 = *Not at all*, 2 = *A little bit*, 3 = *Moderately*, 4 = *Quite a bit*, 5 = *Extremely*). One item on suicidal ideation was omitted from this study. Example items included were 'Feeling no interest in things' and 'Feelings of worthlessness.' Higher scores indicated higher levels of depressive symptoms. The measure demonstrated adequate reliability ($\alpha = 0.87$) among parents.

Adolescents' depressive symptoms

Similar to parents' reports of depressive symptoms, at Wave 1 and Wave 2, adolescents reported their own depressive symptoms using the Brief Symptom Inventory (BSI-18 depression subscale; Derogatis & Savitz, 2000). Using the same 1 (*Not at all*) to 5 (*Extremely*) response scale, adolescents rated the same five items on the extent to which they felt symptoms over the last week. The same item on suicidal ideation was omitted for adolescents. Example items included were 'Feeling lonely even when you are with people' and 'Feeling blue.' Higher scores indicated higher levels of adolescents' depressive symptoms. The measure demonstrated adequate reliability ($\alpha > 0.90$) among adolescents across waves.

Adolescents' delinquency

Adolescents' delinquency was assessed at Wave 1 and Wave 2 utilizing items from the National Longitudinal Study on Adolescent Health (Add Health; Harris et al., 2009). Adolescents rated ten items about the number of times they engaged in delinquent behaviors in the past 12 months using

the following response scale: 0 = *Never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, and 4 = *5 or more times*. Example items were 'How often did you deliberately damage property that didn't belong to you?' And, 'How often did you lie to your parents or guardians about where you had been or whom you were with?' Higher scores denoted greater delinquency. This measure showed adequate reliability ($\alpha > 0.75$) across waves.

Adolescents' academic performance

Adolescents' academic performance was indexed at Wave 1 and Wave 2 using parent reports of their adolescents' grades. Parents reported their adolescents' grades in four courses (i.e., English, math, social studies/history, and science) as per their most recent report card using the scale: A = 4, B = 3, C = 2, D = 1, and F = 0. The items were worded as follows: 'On their most recent report card, what was [Child's] grade in English/math/social studies or history/science?' Higher scores denoted higher grades and overall academic performance ($\alpha > 0.87$ across waves).

Sociodemographic variables

Parents reported on a range of sociodemographic variables that were included as covariates in this study, namely family income (continuous from 1–14; in $10,000 increments up to $100,000 and $50,000 increments up to > $250,000), parents' marital status (1 = *married*, 2 = *widowed*, 3 = *divorced*, 4 = *separated*, 5 = *single/never-married*, 6 = *living with boy/girlfriend*, 7 = *dating a serious boy/girlfriend*, 8 = *other*), parents' and adolescents' gender (0 = *female*, 1 = *male*, 2 = *other*), and adolescents' age (continuous in years). Family income and adolescents' age were treated as continuous covariates; given their distributions, respectively, parents' marital status (0 = *not married*; 1 = *married*) and parents' and adolescents' gender (0 = *female*; 1 = *male*; the other category with $n < 1\%$ dropped) were dummy-coded. Parents reported how their children attended school at Time 2, and responses were dummy coded such that traditional in person school was coded as 0 (24%) and all other formats, including virtual synchronous, virtual asynchronous, hybrid, and other were coded as 1 (76%). Covariates were temporally matched, such that COVID-19 wave measures were used for variables assessed during the pandemic shutdowns (e.g., financial hardships, parents' depressive symptoms and acceptance) and Wave 2 measures (e.g., child age) were used for youth outcomes at Wave 2.

Analytic Plan

Structural equation modeling was utilized to test prospective direct and indirect relations (via parents' depressive symptoms and acceptance) among financial hardships and adolescents' depressive symptoms, delinquency, and academic performance. All main study variables were modeled as latent variables and demographic covariates were modeled as manifest variables. Planned missingness in the study design as well as potential skewed variable distributions was addressed using the maximum likelihood robust (MLR) estimator in Mplus, version 8.3 (Muthén & Muthén, 1998–2017). The nested nature of the data (i.e., parents and siblings clustered within families) was accounted for using the family identification variable as the clustering variable (i.e., Cluster = FamID).

Measurement models for each latent variable (i.e., financial hardships, parents' depressive symptoms, parents' acceptance, and adolescents' depressive symptoms, delinquency, and academic performance) were established using item-level indicators. Next, a structural model was estimated with financial hardships (COVID-19 Wave) as the predictor, parents' depressive symptoms (COVID-19 Wave) as the first-order mediator, parents' acceptance (COVID-19 Wave) as the second-order mediator, and adolescents' depressive symptoms, delinquency, and academic performance (Wave 2) as outcomes. To account for stability in outcomes, Wave 1 indicators of each outcome as well as family income, parents' marital status, parents' gender, and adolescents' gender, age, and school format were included as control variables. All direct associations among financial hardships, parents' depressive symptoms, parents' acceptance, and adolescents' depressive symptoms, delinquency, and academic performance were specified. Finally, indirect effects were estimated from financial hardships to adolescents' depressive symptoms, delinquency, and academic performance via parents' depressive symptoms and/or parents' acceptance as well as financial hardships to parents' acceptance via parents' depressive symptoms.

Approximate model fit indices were generated in the measurement models for the latent variables. Model fit is considered 'good' in measurement models with a non-significant chi-square test of model fit (acceptable fit: significant chi-square in case of large sample sizes), a Root Mean Square Error of Approximation (RMSEA) less than or equal to 0.06 (acceptable fit: RMSEA ≤ 0.08), a Comparative Fit Index (CFI) ≥ 0.95 (acceptable fit ≥0.90), and a Standardized Root Mean Residual (SRMR) ≤0.06 (acceptable fit: SRMR ≤ 0.08) (Hu & Bentler, 1999; McDonald & Ho, 2002). Information criteria were generated in the main, structural model. Models with lower Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Sample Size Adjusted Bayesian Information Criterion (SABIC) values are considered to fit better (Kline, 2015).

Table 1 Descriptive statistics and bivariate correlations among primary study variables

	1	2	3	4	5	6
1. Financial Hardships (COVID-19 Wave)	--					
2. Parent Depressive Symptoms (COVID-19 Wave)	0.27**	--				
3. Parent Acceptance (COVID-19 Wave)	0.06*	−0.07*	--			
4. Adolescents' Depressive Symptoms (Wave 2)	0.07*	0.11**	−0.12**	--		
5. Adolescents' Delinquency (Wave 2)	0.02	0.01	−0.14**	0.20**	--	
6. Adolescents' Academic Performance (Wave 2)	−0.26**	−0.06	0.14**	−0.11**	−0.24**	--
Mean	0.15	1.48	3.96	1.87	0.15	3.46
SD	0.20	0.64	0.73	1.01	0.29	0.76
Range	0–0.88	1–4.51	1.17–5	1–5	0–3	0–4
Skewness	1.58	1.99	−0.36	1.21	3.55	−1.93

Parents' marital status (0 = *not married*; 1 = *married*), parents' gender (0 = *female*, 1 = *male*), adolescents' gender (0 = *female*, 1 = *male*). *$p < 0.05$, **$p < 0.01$

Results

Preliminary Analyses

Descriptive and correlational analyses for all variables of interest are presented in Table 1. Among the main study variables, financial hardships, parental acceptance, and adolescents' depressive symptoms were approximately normally distributed. Adolescents' delinquency was positively skewed (see Table 1 for descriptive statistics and bivariate correlations). Correlational analyses suggested that financial hardships were positively related to parents' depressive symptoms, parental acceptance, adolescents' depressive symptoms, and negatively related to adolescents' academic performance. Parents' depressive symptoms were negatively related to parental acceptance and positively related to adolescents' depressive symptoms. Parental acceptance was negatively correlated with adolescents' depressive symptoms and delinquency; parental acceptance was positively correlated with adolescents' academic performance. Lastly, there were positive associations between adolescents' depressive symptoms and delinquency as well as negative interrelations between adolescents' academic performance and depressive symptoms and delinquency.

Structural Equation Model

Measurement models

Across the range of indicators, the measurement CFA model for financial hardships at the COVID-19 wave demonstrated adequate model fit: $\chi^2(54) = 210.23$, $p < 0.001$, RMSEA = 0.05, CFI = 0.93, SRMR = 0.10. Importantly, factor loadings for all 12 items were significant ranging from 0.43 to 0.89 ($p < 0.001$). The parents' depressive symptoms CFA model fit the data well: $\chi^2(5) = 5.11$, $p = 0.40$, RMSEA = 0.00, CFI = 1.00, SRMR = 0.02; all five items loaded significantly (factor loadings ranging from 0.69 to 0.85, $p < 0.001$) onto the parents' depressive symptoms latent variable. The parental acceptance CFA model demonstrated adequate model fit: $\chi^2(19) = 197.10$, $p < 0.001$, RMSEA = 0.09, CFI = 0.92, SRMR = 0.07. Factor loadings for all eight items were strong ranging from 0.65 to 0.89 ($p < 0.001$) with one significant inter-item correlation (items 2 and 8; $r = 0.48$). In terms of adolescents' Wave 2 outcomes, the depressive symptoms CFA model demonstrated good model fit: $\chi^2(5) = 10.67$, $p = 0.06$, RMSEA = 0.03, CFI = 0.99, SRMR = 0.02, with five significant factor loadings ranging from 0.79 to 0.89. The model fit for the delinquency CFA model was also adequate: $\chi^2(34) = 51.31$, $p = 0.03$, RMSEA = 0.02, CFI = 0.96, SRMR = 0.05. Importantly, factor loadings for all delinquency items were significant, ranging from 0.42 to 0.76 ($p < 0.001$), with one strong inter-item correlation (items 3 and 7; $r = 0.62$). Finally, the model fit for the academic performance CFA was good: $\chi^2(2) = 2.37$, $p = 0.31$, RMSEA = 0.01, CFI = 1.00, SRMR = 0.01; all four factor loadings were strongly related to the factor ranging from 0.76 to 0.85 ($p < 0.001$).

Structural model

The structural model (see Fig. 1) was estimated with financial hardships as an exogenous variable, parents' depressive symptoms and parents' acceptance as serial mediators at the COVID-19 Wave, and adolescents' depressive symptoms, delinquency, and academic performance as endogenous outcome variables at Wave 2

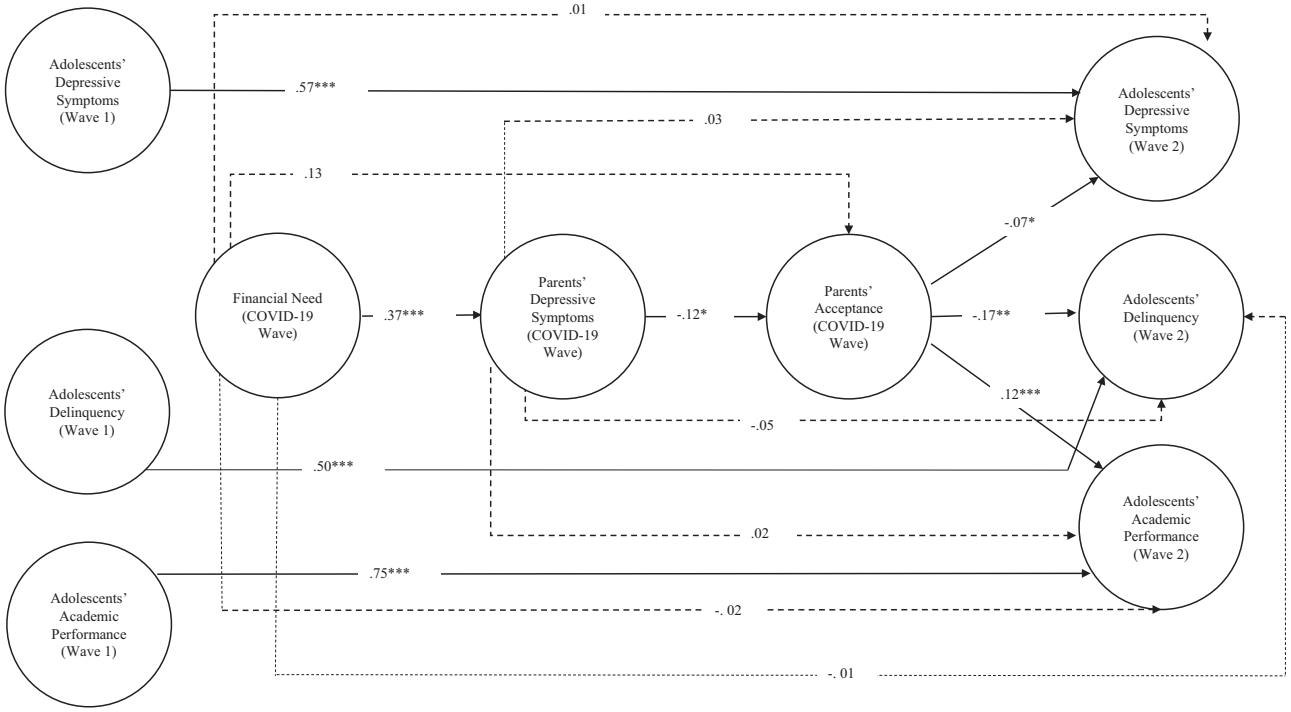

Fig. 1 Standardized direct and indirect effects of financial hardships on adolescents' depressive symptoms, delinquency, and academic performance via parents' depressive symptoms and acceptance. There were significant indirect effects from financial hardships to adolescents' delinquency ($ab = 0.008$, $SE = 0.004$ $p = 0.049$) and academic performance ($ab = -0.005$, $SE = 0.003$, $p = 0.041$) via both parents' depressive symptoms and acceptance. Family income, parents' marital status, parents' gender and adolescents' gender and age, and school format at Wave 2 were included as covariates but were omitted from the figure. *$p < 0.05$, **$p < 0.01$, *$p < 0.001$

(covariates: Wave 1 indicators of each outcome, family income, parents' marital status, parents' gender, and adolescents' gender and age, and school format). The main analytic model yielded the following goodness-of-fit indices: AIC = 116427.37, BIC = 117674.72, and SABIC = 116928.19. The factor loadings for each latent variable in the final model were as follows: financial hardships (0.46–0.88), parents' depressive symptoms (0.69–0.85), parents' acceptance (0.67–0.88), adolescents' depressive symptoms (Wave 1: 0.72–0.86; Wave 2: 0.78–0.89), adolescents' delinquency (Wave 1: 0.32–0.59; Wave 2: 0.44–0.73), and adolescents' academic performance (Wave 1: 0.75–0.83; Wave 2: 0.76–0.85).

Direct effects Structural equation model results indicated stability in youth outcomes over time. Specifically, adolescents' depressive symptoms ($\beta = 0.57$, $p < 0.001$), delinquency ($\beta = 0.50$, $p < 0.001$), and grades ($\beta = 0.75$, $p < 0.001$) at Wave 1 were positively associated with those same constructs at Wave 2. At the COVID-19 Wave, financial hardships were positively associated with parents' depressive symptoms ($\beta = 0.37$, $p < 0.001$), and parents' depressive symptoms were negatively associated with parental acceptance ($\beta = -0.12$, $p = 0.013$) concurrently. Net of earlier assessments of the youth outcomes and other sociodemographic covariates, parental acceptance at the COVID-19 wave was negatively related to adolescents' depressive symptoms ($\beta = -0.07$, $p = 0.05$) and delinquency ($\beta = -0.17$, $p = 0.002$), but positively related to adolescents' academic performance ($\beta = 0.12$, $p < 0.001$) at Wave 2. There were no significant direct links between financial hardships and adolescents' outcomes after accounting for indirect pathways. All direct effects are shown in Table 2.

Indirect effects Using MLR and accounting for stability in youth outcomes over time, there were significant indirect effects from financial hardships to adolescents' delinquency ($ab = 0.008$, $SE = 0.004$, $p = 0.049$) and academic performance ($ab = -0.005$, $SE = 0.003$, $p = 0.041$) via both parents' depressive symptoms and acceptance, but not depressive symptoms. There also were no partial significant indirect effects from financial hardships to adolescents' depressive symptoms, delinquency, and academic performance via only parents' depressive symptoms or acceptance.

Discussion

Understanding the lasting implications of the COVID-19 pandemic on adolescent adjustment remains an important

Table 2 Standardized coefficients for direct associations among financial hardships, parents' depressive symptoms, parents' acceptance, adolescents' depressive symptoms, delinquency, academic performance, and sociodemographic covariates

	β	*SE*	*p*
Financial Hardships (COVID-19 Wave) → Parents' Depressive Symptoms (COVID-19 Wave)	0.37	0.06	<0.001
Financial Hardships (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	0.13	0.07	0.07
Parents' Depressive Symptoms (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	−0.12	0.05	0.01
Financial Hardships (COVID-19 Wave) → Adolescents' Depressive Symptoms (Wave 2)	0.01	0.06	0.91
Parents' Depressive Symptoms (COVID-19 Wave) → Adolescents' Depressive Symptoms (Wave 2)	0.03	0.04	0.38
Parents' Acceptance (COVID-19 Wave) → Adolescents' Depressive Symptoms (Wave 2)	−0.07	0.04	0.05
Financial Hardships (COVID-19 Wave) → Adolescents' Delinquency (Wave 2)	−0.01	0.08	0.94
Parents' Depressive Symptoms (COVID-19 Wave) → Adolescents' Delinquency (Wave 2)	−0.05	0.06	0.44
Parents' Acceptance (COVID-19 Wave) → Adolescents' Delinquency (Wave 2)	−0.17	0.05	0.002
Financial Hardships (COVID-19 Wave) → Adolescents' Academic Performance (Wave 2)	−0.06	0.06	0.29
Parents' Depressive Symptoms (COVID-19 Wave) → Adolescents' Academic Performance (Wave 2)	0.02	0.04	0.63
Parents' Acceptance (COVID-19 Wave) → Adolescents' Academic Performance (Wave 2)	0.12	0.04	0.001
Adolescents' Depressive Symptoms (Wave 1) → Adolescents' Depressive Symptoms (Wave 2)	0.57	0.06	<0.001
Family Income (COVID-19 Wave) → Adolescents' Depressive Symptoms (Wave 2)	−0.02	0.06	0.70
Parents' Marital Status (COVID-19 Wave) → Adolescents' Depressive Symptoms (Wave 2)	0.05	05	0.28
Adolescents' Gender → Adolescents' Depressive Symptoms (Wave 2)	−0.12	0.03	<0.001
Adolescents' Age (Wave 2) → Adolescents' Depressive Symptoms (Wave 2)	0.03	0.03	0.24
School Format (Wave 2) → Adolescents' Depressive Symptoms (Wave 2)	0.03	0.03	0.22
Adolescents' Delinquency (Wave 1) → Adolescents' Delinquency (Wave 2)	0.50	0.09	<0.001
Family Income (COVID-19 Wave) → Adolescents' Delinquency (Wave 2)	−0.11	0.15	0.46
Parents' Marital Status (COVID-19 Wave) → Adolescents' Delinquency (Wave 2)	0.08	0.14	0.55
Adolescents' Gender → Adolescents' Delinquency (Wave 2)	0.02	0.03	0.28
Adolescents' Age (Wave 2) → Adolescents' Delinquency (Wave 2)	−0.02	0.03	0.40
School Format (Wave 2) → Adolescents' Delinquency (Wave 2)	−0.00	0.03	0.93
Adolescents' Academic Performance (Wave 1) → Adolescents' Academic Performance (Wave 2)	0.75	0.04	<0.001
Family Income (COVID-19 Wave) → Adolescents' Academic Performance (Wave 2)	0.18	0.07	0.008
Parents' Marital Status (COVID-19 Wave) → Adolescents' Academic Performance (Wave 2)	−0.10	0.07	0.15
Adolescents' Gender → Adolescents' Academic Performance (Wave 2)	−0.01	0.03	0.61
Adolescents' Age (Wave 2) → Adolescents' Academic Performance (Wave 2)	0.02	0.02	0.39
Family Income (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	0.03	0.07	0.68
Parents' Marital Status (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	−0.10	0.06	0.11
Parents' Gender (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	−0.14	0.5	0.002
Adolescents' Gender (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	−0.09	0.03	0.003
Adolescents' Age (COVID-19 Wave) → Parents' Acceptance (COVID-19 Wave)	−0.09	0.03	0.002
Family Income (COVID-19 Wave) → Parents' Depressive Symptoms (COVID-19 Wave)	0.15	0.07	0.02
Parents' Marital Status (COVID-19 Wave) → Parents' Depressive Symptoms (COVID-19 Wave)	−0.02	0.07	0.78
Parents' Gender (COVID-19 Wave) → Parents' Depressive Symptoms (COVID-19 Wave)	−0.06	0.05	0.23
Financial Hardships (COVID-19 Wave) ←→ Family Income (COVID-19 Wave)	−0.54	0.05	<0.001
Financial Hardships (COVID-19 Wave) ←→ Parents' Marital Status (COVID-19 Wave)	−0.05	0.06	0.43
Financial Hardships (COVID-19 Wave) ←→ Parents' Gender (COVID-19 Wave)	−0.06	0.05	0.25
Adolescents' Depressive Symptoms (Wave 1) ←→ Adolescents' Delinquency (Wave 1)	0.32	0.05	<0.001
Adolescents' Depressive Symptoms (Wave 1) ←→ Adolescents' Academic Performance (Wave 1)	−0.09	0.04	0.01
Adolescents' Delinquency (Wave 1) ←→ Adolescents' Academic Performance (Wave 1)	−0.26	0.05	<0.001

Parents' marital status (0 = *not married*; 1 = *married*), parents' gender (0 = *female*, 1 = *male*), adolescents' gender (0 = *female*, 1 = *male*)

area of research as societal, familial, and individual responses to pandemic-related stressors continue evolve. The present study examined prospective associations between pandemic-related financial hardships and adolescents' depressive symptoms, delinquency, and academic performance, and whether parents' depressive symptoms and parental acceptance intervened on these associations, after accounting for family income, known covariates, and pre-pandemic levels of adolescents' adjustment outcomes. Consistent with a family stress perspective which posits that family stressors spillover into parents' mental health and parenting qualities (Conger et al., 1992; Conger & Elder, 1994), results showed that early pandemic-related financial hardships were indirectly related to multiple indicators of youth adjustment through parents' depressive symptoms and acceptance. Specifically, pandemic-related financial hardships were linked to greater depressive symptoms among parents, and parents' depressive symptoms were related to lesser acceptance in parents; in turn, parental acceptance was linked to higher depressive symptoms and delinquency but lower academic performance among adolescents. It is important to note that although the pathway from parental acceptance to youth depressive symptoms was negative and significant, the indirect effect from financial hardships to youth depressive symptoms was not. In general, this set of findings replicates a key part of the family stress model (Conger et al., 1992) and extends this model to the context of the COVID-19 pandemic in which dramatic, unexpected changes (e.g., immediate loss of income and/or changes in employment status) may have contributed to financial hardships above and beyond family income levels. Given the COVID-19 pandemic lockdown conditions that were in place, adolescents and their parents were forced to spend more time together in close proximity, increasing the potential for "spillover" of financial stressors on adolescents' developmental trajectories (Fegert et al., 2020; Liu & Doan, 2020). The findings also are in accordance with prior research on the effects of general financial hardships (Kavanaugh et al., 2018; Simons & Brown, 2022; Simons & Steele, 2020) and add longitudinal evidence to earlier cross-sectional research on pandemic-related financial hardships during the COVID-19 pandemic on youth adjustment (Argabright et al., 2022; Low & Mounts, 2022).

Importantly, financial hardships in the beginning months of the pandemic were not directly related to adolescents' adjustment in the later months of the pandemic, after accounting for the indirect pathways via parenting processes. Although it was hypothesized that pandemic-related financial hardships would directly predict adolescents' lower academic performance, higher depressive symptoms, and greater delinquency, these direct relations were non-significant after estimating indirect relations via parents' depressive symptoms and acceptance. This set of null findings is surprising in light of the drastic changes in adolescents' home (e.g., confined at home with parents) and schooling environments (e.g., virtual learning) during the COVID-19 pandemic lockdowns; findings are inconsistent with some pre-pandemic research that finds support for direct links between economic stress and adolescents' adjustment (Agnew et al., 2008; Viseu et al., 2018), especially their academic outcomes (Mistry & Elenbaas, 2021). From a life course perspective standpoint (see Elder, 2018), adolescents understand that financial need was a pandemic-related stressor (Argabright et al., 2022) and that financial need was a risk factor for adolescents' outcomes during the COVID-19 pandemic emergency shutdowns (e.g., school bonding, Maiya et al., 2021). However, it is plausible that the study findings may be better explained via the indirect (rather than direct) parenting pathways as hypothesized in the family stress model (see Conger et al., 2010).

Notably, pandemic-related financial hardships indirectly predicted later adjustment in adolescents via both parents' mental health and parent-adolescent relationship quality. Parents' depressive symptoms and acceptance were individually necessary but not sufficient intervening mechanisms between pandemic-related financial hardships and adolescents' adjustment outcomes. That is, financial hardships were detrimental to youth adjustment only if both parents' depressive symptoms and acceptance were adversely affected during the COVID-19 pandemic. As such, targeting both parent mental health and parenting quality may be necessary to ameliorate the negative effects of the COVID-19 pandemic disruptions on adolescent adjustment.

It is important to evaluate the study findings in light of the food, housing and employment-related hardships experienced by many U.S. families during the COVID-19 pandemic (US Census Household Pulse Survey, 2021). Further, these findings delineate the intervening processes of depressive symptoms and parental acceptance that can help explain why (pandemic-related) financial hardships are deleterious to a range of adolescents' adjustment indices. Importantly, the findings in this study accounted for youth earlier (pre-pandemic) adjustment and were net of the covariates of family income, parents' marital status, parents' gender, and adolescents' gender and age. Prior research has identified these factors (see Conger & Elder, 1994) as important predictors of parent-adolescent relationship quality as well as parents' and adolescents' mental health outcomes.

The findings of this study should be interpreted, taking into consideration some limitations. First, the generalizability of the study findings is restricted to a community sample of primarily non-Latinx, White families from the Midwestern US. Although our sample is generally representative of the ethnoracial demographic of the five states families were recruited from (i.e., Illinois, Indiana, Ohio,

Pennsylvania, and Wisconsin; US Census Quickfacts, 2019), future researchers should test COVID-19-based family stress models in more ethnically and racially diverse samples as the COVID-19 pandemic also highlighted inequalities among historically marginalized groups (Lopez et al., 2021). Second, this study solely focused on one critical stressor during the pandemic—financial hardships—and its consequences for youth outcomes. However, exploring the effects of other pandemic-related stressors (e.g., fear of catching or transmitting COVID-19, Luceño-Moreno et al., 2020; role of parents' employment, including remote work and/or essential worker status, Taylor, 2022) on adolescents' adjustment can be an important avenue for future research. Further, this study focused on the indirect links between financial stressors and one measure of parenting, specifically parental acceptance. It is likely that financial-related and pandemic-related stressors shaped multiple family processes including marital conflict (e.g., Lee et al., 2023) and parent-child relationship qualities (e.g., Cassinat et al., 2021). As such, future investigations would benefit from the exploration of the links between pandemic-induced financial strains and youth adjustment via broad set of family processes. Third, although this study accounted for earlier markers of adolescents' adjustment, it is possible that nature and form of some of these constructs changed during the pandemic. Delinquent behaviors, for example, may have shifted from in-person to more online forms that our longitudinal measures may not have captured. Fourth, applying the family stress model to the COVID-19 pandemic, this study only emphasized parents' mental health and an index of parenting quality as intervening mechanisms. Future research may benefit from testing different family stress theories in the context of the COVID-19 pandemic such as the double ABC-X model (e.g., investigating the roles of family members' perceptions of COVID-19 stressors and resources on adolescents' adaptation; McCubbin and Patterson, 1983).

Conclusion

Focusing on the cascading effects of financial stressors on parents' mental health and parenting qualities, the present study found prospective deleterious indirect associations (through parents' depressive symptoms and acceptance) between financial hardships and adolescents' delinquency and academic performance. Further, parental acceptance was prospectively and negatively linked to youth depressive symptoms, however, the indirect pathway from financial hardships to adolescents' depressive symptoms was not statistically significant. Utilizing a longitudinal, multiple-reporter design, these findings extend family stress and life course perspectives as well as advance youth development and family science literature in the context of the COVID-19 pandemic. These findings emphasize pandemic-related financial hardships, above and beyond family income, as a unique family stressor that reflected the economic uncertainties and difficulties experienced by many families during the COVID-19 emergency shutdowns. Additionally, this study addressed critical gaps in scholarship on the stress and disruptions created by the COVID-19 pandemic in the lives of adolescents and their families, particularly the parenting mechanisms that link pandemic-driven financial hardships to adolescents' later adjustment. Together, the results of this study underscored the intersectional processes through which financial stressors during the COVID-19 pandemic reverberated throughout the family and shaped adolescents' later depressive symptoms, delinquency, and academic performance.

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Authors' Contributions S.M. conceived of the study, performed statistical analyses, and drafted the manuscript; A.M.D. conceived of the study, participated in data interpretation, and helped to draft the manuscript; S.S. participated in the design of the study and performed revised statistical analysis; S.D.W. participated in the study design, coordination and interpretation of the data, and revised the manuscript. All authors read and approved the final manuscript.

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Data Sharing and Declaration The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Compliance with Ethical Standards

Conflict of interest The authors declare no competing interests.

Ethical approval This study complies with the APA ethical standards in the treatment of human research participants. All study procedures were approved by the Utah State University Institutional Review Board (protocol #8740).

Informed consent Written informed consent was obtained from parents.

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