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## Exploring the association between parenting stress and a child's exposure to adverse childhood experiences (ACEs)

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### Abstract

Nearly half of U.S. children age 0–17 have been exposed to adverse childhood experiences (ACEs), accounting for over 34 million of children nationwide. Parenting stress (negative feelings related to the demands of parenting) is a primary risk factor for child maltreatment and neglect; yet has been an overlooked factor for ACEs. Understanding the degree of parenting stress and its subsequent associations with ACEs will facilitate future designations of relevant interventions to keep children safe. We analyzed 2016 data from the National Survey of Children's Health to examine whether increased levels of parenting stress are associated with higher counts of ACEs among children. About 4.4% of caregivers reported “high parenting stress” and children living with them were three times more likely (OR: 3.05; 95% CI: 2.23–4.15) to experience four or more ACEs by the age of 18. Lowering parenting stress through parenting interventions could decrease the level of childhood trauma experienced by a child or may lessen one type of stress in a home where many other stressors exist.

### Keywords

Parenting; Childhood trauma; Stress; Childhood adversity

## 1. Introduction

Early experiences in childhood impact how adults later parent their own children (Letourneau et al., 2019). Some adults may have experienced adverse childhood experiences (ACEs), events that occur in a child's life before the age of 18 and include trauma related to household dysfunction, neglect, or abuse (Felitti et al., 1998). Parents who have been exposed to ACEs are more likely to expose their own children to ACEs (Felitti et al., 1998;

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Conflict of interest

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Larkin, Shields, & Anda, 2012; Letourneau et al., 2019). The effects of ACEs may be long-term, with poorer mental, physical, and behavioral outcomes in adulthood (Anda et al., 2006; Crouch, Stropolis, Bennett, Morse, & Radcliff, 2017; Felitti et al., 1998). Exposure to ACEs may also lead to a heightened propensity for various chronic conditions such as diabetes, heart disease, cancer, and depression (Anda et al., 2008; Brown et al., 2009; Brown et al., 2010; Brown, Thacker, & Cohen, 2013; Chapman et al., 2004; Chapman et al., 2013; Ford et al., 2011). ACEs may also lead to riskier behaviors in adulthood, increasing the likelihood of substance use, multiple sexual partners, domestic violence (victimization and perpetration), and suicide (Anda et al., 2008; Brown et al., 2010; Brown et al., 2017; Brown, Perera, Masho, Mezuk, & Cohen, 2015; Cannon, Anderson, Rivara, & Thompson, 2010; Chapman et al., 2004; Chapman et al., 2011; Crouch, Radcliff, Stropolis, & Wilson, 2018a; Crouch, Radcliff, Stropolis, & Wilson, 2018b; Danese et al., 2009; Felitti et al., 1998; Horwitz, Widom, McLaughlin, & White, 2001). Repeated and unmitigated exposure to adverse events during childhood may activate stress-related hormones in the brain, which may lead to toxic stress and the disruption of healthy brain development in children and adolescents (Shonkoff, 2016; Shonkoff et al., 2012).

Parenting stress, negative feelings related to the demands of parenting, is a well-documented risk factor for child maltreatment, neglect, and exposure to multiple traumatic events (Gonzalez & MacMillan, 2008). This stress has direct impacts on parenting behavior, the emotional health of the child, and the quality of caregiving (Bailey, DeOliveira, Wolfe, Evans, & Hartwick, 2012; Crnic, Gaze, & Hoffman, 2005; Deater-Deckard, 1998; Figner, Mackinlay, Wilkening, & Weber, 2009; Pereira et al., 2012; Whiteside-Mansell et al., 2007). Higher levels of parental stress may lead to a more chaotic family environment, contributing to behavior problems for children (Bagner et al., 2009; Coldwell, Pike, & Dunn, 2008). This parental stress can hinder the child's emotional development, as children in households with higher parental stress may experience lower levels of self-esteem and heightened anxiety levels (Fiese & Winter, 2010).

However, studies on the association between parenting stress and ACEs have largely focused on the parental exposure to ACEs, a parent's exposure to ACEs, leaving the relationship between parenting stress and their child's exposure to ACEs unanswered. Two studies found that parental exposure to ACEs was associated with parental stress (Ammerman et al., 2013; Steele et al., 2016). Parents who have had exposure to four or more ACEs were more likely to have difficulty with attachment to their children, which may result in child neglect (Murphy et al., 2014). Mothers with exposure to child maltreatment have been found to be less responsive to their infants, with the level of responsiveness mediated by parenting stress (Pereira et al., 2012). Yet, despite the essential role of caregivers' stress to children's safety, limited research has examined the association between parenting stress and the exposure of children to ACEs.

The purpose of this study was to examine whether increased levels of parenting stress are associated with higher counts of ACEs among children. "Parenting stress", a type of overall parental stress, quantifies stressors resulting from individual child differences, such as children with difficult temperaments or children that are more reactive and not as adaptable (Ramos, Guerin, Gottfried, Bathurst, & Oliver, 2005). We hypothesized that children of

parents experiencing parenting stress will be more likely to have four or more ACEs. Counts of ACEs with and without economic hardship ACE, are included, as parenting stress may be uniquely associated with economic hardship in the household (Reitman, Currier, & Stickle, 2002; Whiteside-Mansell et al., 2007). Research examining ACEs among children, rather than interviewing adults retrospectively, is helpful in developing current policy to mitigate ACE exposure. The findings from this study will advise and assist prevention and intervention efforts for parents, children, and families in the United States.

## 2. Methods

This cross-sectional study used data from the 2016 National Survey of Children's Health (NSCH), which is a mail and online survey conducted by the Data Resource Center for Child and Adolescent Health (DRC). Respondent eligibility requirements included being a parent or caregiver of at least once child between the ages of 0 and 17 who resided in the home at the time of the interview. When a parent or caregiver had more than one child, then the interviewer randomly chose a single child for the purposes of the interview. Further information on the sampling methods and selection can be found on the DRC website (<http://www.childhealthdata.org/learn/NSCH>). The 2016 NSCH included 50,212 complete interviews. From the 50,212 interviews, 4381 total interviews were excluded for not answering all of the ACE questions, incomplete demographic information, or for not answering the parenting stress questions. The final study sample included 45,831 respondents.

The NSCH measures nine ACEs that include parental separation or divorce, parental death, witnessing household violence, witnessing neighborhood violence, household mental illness, household incarceration, household substance abuse, racial/ethnic mistreatment, and economic hardship (Table 1). We tabulated individual ACEs and also collapsed ACEs into counts with the following categories: less than four ACEs, and four or more ACEs, as previous evidence demonstrated a particularly high risk of child health outcomes among children with four or more ACEs (Dong et al., 2004; Felitti et al., 1998).

Our measure of parenting stress was based on the caregiver's responses to three survey questions: 1) how often during the past month the caregiver felt it was much harder to care for his or her child than most children of the same age, 2) how often during the past month the caregiver felt the child did things that bothered him or her, and 3) how often during the past month the caregiver felt angry with the child (NSCH 2016). Response options were never, seldom, usually, always. If caregivers responded "usually" or "always" to any one of the three questions, they were considered to have "high parenting stress"; if caregivers responded "seldom" or "never" to all questions, they were considered to have "low parenting stress". These measurements of parenting stress quantify stressors resulting from individual differences in one's child, such as children with difficult temperaments or children that are more reactive and not as adaptable (Ramos et al., 2005).

Selected covariates were included in the analysis using the developmental-ecological child maltreatment model, which encompasses characteristics of the caregiver, child, sociodemographic, household, caregiver-child interaction, and neighborhood characteristics

(Belsky, 1993). Child characteristics included sex, age, race/ethnicity, and whether the child had special healthcare needs. The age of the child was divided into three categories: 0 to 5, 6 to 12, and 13 to 17, as these are NSCH interview questionnaire ages. Race/ethnicity of the child included four groups: Non-Hispanic White, Non-Hispanic Black, Hispanic, and Multi-racial/Other, non-Hispanic. The special healthcare needs screening tool in the NSCH, a five-item tool reported by the parent, was used to determine whether or not a child had special healthcare needs. This tool determines whether the child has special healthcare needs based on the use of the following: prescription medication, elevated use of services, functional limitations, specialized therapy, and ongoing emotional, developmental, or behavioral conditions (<http://www.childhealthdaa.org/learn/NSCH>).

Caregiver characteristics included the respondent's relation to the child, primary language spoken in the home, the highest educational attainment of a parent or guardian in the household, family structure, and poverty/income level. Relationship to the child was characterized as mother, father, or other. Primary language spoken in the home was dichotomized: English or Other. The highest educational attainment of the parent or guardian was categorized into those with less than or equal to high school degree/GED and those with at least some college education. The family structure of the household included the following categories: two parents, currently married; two parents, not currently married; and single mother/other. The poverty/income levels were 0–99% of the federal poverty level (FPL), 100%–199% FPL, 200%–399% FPL, and 400% FPL or above.

Our analyses used survey sampling weights, cluster, and stratum, as outlined in the NSCH SAS codebook. These sampling weights, cluster, and stratum were used to account for the distributions in race, ethnicity, and gender of children in the United States. The weights, cluster, and stratum were also used to adjust for nonresponse. Further information on the sampling plan can be found on the DRC website (<http://www.childhealthdaa.org/learn/NSCH>).

Descriptive and bivariate analyses were conducted using Chi-square tests to examine differences in each child and caregiver characteristic and parenting stress. Multivariable logistic regression models were used to examine the association between parenting stress and ACEs of four or more (Model 1). The second model examining the association between parenting stress and exposure to ACEs of four or more, did not include economic hardship in the count of ACEs. This was done in order to avoid potential collinearity between economic hardship as an ACE and poverty level (Model 2).

All analyses were conducted using statistical software (SAS, version 9.3; SAS Institute Inc.). Since the sample size was large, the alpha value was set at 0.01. This study was approved by the [name concealed for review] institutional review board as exempt.

According to the NSCH guidance, we report our results in terms of the child rather than in terms of the caregiver or family, even in cases where the question refers to the caregiver or family. This reporting guidance is based on the fact that the NSCH population weights are designed to reflect the child population and not the population of parents or families (<http://www.childhealthdaa.org/learn/NSCH>).

### 3. Results

The majority of our sample was male (50.9%), between 6 and 17 years of age (67.4%), and non-Hispanic white (53.6%, Table 2). Almost 20% (19.3%) of children had special healthcare needs. Approximately 13.6% of children lived in a home where English was not the primary language. The majority of children lived with caregivers who were their mothers (64.3%), with caregivers who had at least some college education (72.4%), and in households with two parents who were currently married (67.6%). One in five children lived in households with income below the federal poverty line.

Approximately 4.4% of children lived with caregivers who reported experiencing “high parenting stress”, with significant differences in parenting stress reported by the following characteristics: sex, age, race/ethnicity, and special healthcare needs (Table 2). A higher percentage of male children lived with caregivers reporting “high parenting stress” than female children (5.7% versus 4.1%,  $p = .0015$ ). A higher percent of older children had caregivers who reported “high parenting stress” compared to younger children (6.6%, 5.1%, and 3.3% for children 13 to 17, 6 to 12, and 5 years old or less, respectively,  $p < .0001$ ). Six percent of Hispanic children had a parent who reported “high parenting stress”, compared to 4.3% of Non-Hispanic white children ( $p = .04$ ).

Significant differences in parenting stress by characteristics of parent/household included the survey respondent’s relation to the child, family structure, and poverty/income level. A higher percentage of children who lived in homes with a non-parent had caregivers who reported reporting “high parenting stress” compared to children who lived with mothers and fathers (7.1% versus 5.1% for mothers and 4.0% for fathers). A higher percentage of children who resided in households with single mother/other had caregivers who reported “high parenting stress” than children whose resided with parents who were currently married (6.8% versus 4.2%,  $p = .0006$ ). A higher percentage of children who lived in households with incomes below the federal poverty line also lived with caregivers who reported “high parenting stress” (6.6%), compared to 3.8% of children living in households with an income at 400% above the federal poverty line ( $p = .0011$ ).

The most prevalent types of ACE exposure experienced by children in households where caregivers reported “high parenting stress” were economic hardship (44.0%), parental separation/divorce (35.4%), household mental illness (21.2%), and household substance abuse (20.9%, Table 3). Children in households with reported “high parenting stress” had a higher prevalence of each type of ACE than children in households with “low parenting stress” ( $p < .001$ ). Children in households where caregivers reported “high parenting stress” were more likely to have four or more ACEs (19.9% versus 5.3%,  $p < .001$ ) than their counterparts in households reporting “low parenting stress”.

In model 1, multivariable analysis including economic hardship as an ACE, children in households with reported “high parenting stress” had higher odds of exposure to four or more ACEs than children in households reporting “low parenting stress” (aOR 3.05; 95% CI 2.23–4.15; Table 4). Children 13 to 17 and 6 to 12 years of age were more likely to have exposure to four or more ACEs than children five years or younger (aOR 4.07; 95% CI

3.12–5.31; and aOR: 2.82; 95% CI: 2.15–3.70, respectively). Children with special healthcare needs were also significantly more likely to have exposure to four or more ACEs than children without special healthcare needs (aOR 1.79; 95% CI 1.46–2.20). A child whose respondent was “other”, whose guardian had less than a high school or high school education, or who lived in a family structure with two parents not currently married or a single mother was more likely to have reported exposure to four or more ACEs. A child whose caregiver’s primary language was not English was less likely to have been exposed to four or more ACEs (aOR 0.32; 95% CI 0.18–0.53). There was no significant association between race/ethnicity and experiencing four or more ACEs. The results from model two were qualitatively similar and are shown in Table 4.

#### 4. Discussion

National initiatives have called for addressing ACEs given its longstanding effects on a child’s physical, emotional, and social well-being. This study examined the role of parenting stress in ACEs. We found that children living in homes where caregivers reported “high parenting stress” were more likely to experience 4 or more ACEs by the age of 18. Our finding adds to the existing guidelines and suggest a need to address parenting stress, especially among low-income caregivers. Lowering parenting stress could decrease the level of childhood trauma experienced by a child or might lessen one type of stress in a home where many other stressors exist. Screening and interventions for parenting stress can be a promising avenue to further reductions of ACEs.

In addition, children with challenging temperaments, as described by the parenting stress measure, may experience higher rates of abuse and neglect than children with less challenging temperaments (Harrington, Black, Starr Jr, & Dubowitz, 1998; Thomas, Leicht, Hughes, Madigan, & Dowell, 2004). This previously established knowledge is important to our findings because the NSCH does not ask about abuse and neglect as an ACE. Thus, these children may have an even higher ACE exposure than reported in our study findings.

Our results, which indicate that children with special healthcare needs are more likely to be exposed to four or more ACEs, are consistent with previous findings (Hibbard, Desch, & Committee on Child Abuse and Neglect, 2007). Parents of children who have developmental delays, special healthcare needs, or other physical or mental disabilities are more likely to experience parenting stress (Berry, 2009; Dumas, Wolf, Fisman, & Culligan, 1991; Woodman, 2014). Family structure (single or other parenting) was also significant when predicting ACE count. This finding is consistent with previous research that suggests “parenting solo” is associated with higher levels of parental stress than co-parenting (Waldfoegel, Craigie, & Brooks-Gunn, 2010).

ACE count with economic hardship was run separately, as economic hardship and poverty may uniquely affect child adjustment and early research has shown that this may be moderated by parental stress (Conger, Ge, Elder Jr, Lorenz, & Simons, 1994; Steele et al., 2016). Parental stress from economic hardship is unique from the type of parenting stress measured in this study, but economic hardship may exacerbate existing parental stress. In the model not including economic hardship in the count of ACEs, both parenting stress and



poverty were associated with four or more ACEs. Lack of reliable transportation, residing in a high crime neighborhood, and the stress of being unable to pay bills may levy an even larger burden on a parent's cognitive and emotional resources (Conger & Donnellan, 2007). The cumulation of these stressful events for both the parent and child can put these children cognitively and emotionally disadvantaged, relative to their peers (Berk, 2013). In addition, the relationship between education and ACEs became non-statistically significant when economic hardship was excluded from the model. This finding highlights that higher parental educational attainment may play a crucial role in reducing the odds of children's exposure to ACEs, specifically those associated with economic hardship.

The association between race and ACEs (with and without economic hardship) was not statistically significant. Previous research has shown that race/ethnicity has been shown to moderate the association between ACEs and heavy drinking (Lee & Chen, 2017) and racial differences in ACE exposure have been found with lower ACE exposure reported among White children compared to Black and Latino children (Maguire-Jack, Lanier, & Lombardi, 2019). These differences in findings could have been due to differences in the categorization of ACEs where the current study operationalized ACEs as a binary variable and Maguire-Jack and colleagues operationalized ACEs based on a latent class analysis.

In households where English was not the primary language, children were less likely to be exposed to four or more ACEs. This finding implies that even though families where English is the primary language may benefit from ACE intervention programs, cultural differences should be considered in research and intervention programs geared towards understanding and reducing exposure of children to ACEs.

#### 4.1. Strengths and weaknesses

The current study interviews parents, who may underreport childhood adversity due to social desirability and detection bias. The ACE questions in the NSCH do not ask about emotional, physical, or sexual abuse like the original Kaiser ACE study. From the questions asked in the NSCH, the severity and frequency of a specific ACE could not be examined. The NSCH uses an address-based sample, which may miss families that are currently homeless or transient. Finally, the measure of parenting stress is based on three questions from the NSCH. It does not encompass questions that capture both the positives and negatives of parenting, such as the Parental Stress Scale (Berry & Jones, 1995) or the Parenting Stress Index-Short Form (Abidin, 1995).

Nevertheless, this study has several strengths. The current study uses a large and nationally representative data set, weighted to represent the nation's children. This is the first study, to our knowledge, to investigate the relationship between parenting stress and the ACE count of the child. Adjusted analyses controlled for sex, age, race/ethnicity, and special healthcare needs of the child, as well as parent/household characteristics including relation to the child, primary language, guardian education, family structure, and poverty/income level, which may alter the "true association" between ACEs and parenting stress. We examined the ACE count, which has been shown to be reflective of the interplay of ACEs than just examining specific types of ACEs separately, which rarely occur separately (Dong et al., 2004).

## 4.2. Public health applications

Our study findings may be of particular use for policy makers and program developers who support interventions designed to improve parenting skills, mitigate parenting stress, and reduce child maltreatment. Effective prevention programs, such as Triple P (the Positive Parenting Program) and Strengthening Families, assist families in building strong ties with healthy relationships, and provide parents with strategies to effectively manage their children's behavior (Triple, 2019; Center for the Study of Social Policy, 2019). These and similar evidence-based parenting programs should be supported, and their reach expanded. Additionally, the U.S. Health Resources and Services Administration (HRSA)'s Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program takes professional parent and health educators into the homes of at-risk families. (Harper, 2014; HRSA, 2017; Olds, 2006). One primary goal of the MIECHV program is to reduce childhood trauma (HRSA, 2017). Among many other services provided, these home visitors screen for maternal depression and other families risks, teach about appropriate developmental milestones and positive parenting skills, and link families to needed community resources (HRSA, 2017; Ramey, Ramey, Gaines, & Blair, 1995). While the current MIECHV program is funded in all 50 states, because of capacity and funding limitations, it was able to serve only 36% of urban and 22% of rural counties nationwide in 2017 (HRSA, 2017). Continued and expanded funding for the MIECHV program will be important to improving the well-being of our at-risk families.

## 4.3. Conclusions and future research

A better understanding of parenting stress and its association with children's experiences of trauma is important to supporting healthy families and children. Future research, which examines the causal pathways between parenting stress and ACE can help inform ways to identify families in crisis and inform more targeted program delivery. Supporting families is an investment in the future of children's health.

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## References

- Abidin RR (1995). Manual for the parenting stress index. Odessa, FL: Psychological Assessment Resources.
- Ammerman RT, Shenk CE, Teeters AR, Noll JG, Putnam FW, & van Ginkel JB (2013). Multiple mediation of trauma and parenting stress in mothers in home visiting. *Infant Mental Health Journal*, 34, 234–241. 10.1002/imhj.21383.
- Anda RF, Brown DW, Dube SR, Bremner JD, Felitti VJ, & Giles WH (2008). Adverse childhood experiences and chronic obstructive pulmonary disease in adults. *American Journal of Preventive Medicine*, 34(5), 396–403. [PubMed: 18407006]
- Anda RF, Felitti VJ, Bremner JD, Walker JD, Whitfield CH, Perry BD, & Giles WH (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174–186. 10.1007/s00406-005-0624-4. [PubMed: 16311898]



- Bagner DM, Sheinkopf SJ, Miller-Loncar C, LaGasse LL, Lester BM, Liu J, & Das A (2009). The effect of parenting stress on child behavior problems in high-risk children with prenatal drug exposure. *Child Psychiatry and Human Development*, 40(1), 73–84. [PubMed: 18626768]
- Bailey HN, DeOliveira CA, Wolfe VV, Evans EM, & Hartwick C (2012). The impact of childhood maltreatment history on parenting: A comparison of maltreatment types and assessment methods. *Child Abuse & Neglect*, 36(3), 236–246. [PubMed: 22444714]
- Belsky J (1993). Etiology of child maltreatment: A developmental–ecological analysis. *Psychological Bulletin*, 114(3), 413. 10.1037/0033-2909.114.3.413. [PubMed: 8272464]
- Berk LE (2013). *Child development* (9th ed.). Upper Saddle River, NJ: Pearson.
- Berry JO (2009). *Lifespan perspectives on the family and disability* (2nd ed.). Austin, TX: Pro-ed.
- Berry JO, & Jones WH (1995). The parental stress scale: Initial psychometric evidence. *Journal of Social and Personal Relationships*, 12(3), 463–472.
- Brown DW, Anda RF, Felitti VJ, Edwards VJ, Malarcher AM, Croft JB, & Giles WH (2010). Adverse childhood experiences are associated with the risk of lung cancer: A prospective cohort study. *BMC Public Health*, 10(1), 20. 10.1186/1471-2458-10-20. [PubMed: 20085623]
- Brown DW, Anda RF, Tiemeier H, Felitti VJ, Edwards VJ, Croft JB, & Giles WH (2009). Adverse childhood experiences and the risk of premature mortality. *American Journal of Preventive Medicine*, 37(5), 389–396. 10.1016/j.amepre.2009.06.021. [PubMed: 19840693]
- Brown MJ, Masho SW, Perera RA, Mezuk B, Pugsley RA, & Cohen SA (2017). Sex disparities in adverse childhood experiences and HIV/STIs: Mediation of psychopathology and sexual behaviors. *AIDS and Behavior*, 21(6), 1550–1566. 10.1007/s10461-016-1553-0. [PubMed: 27688144]
- Brown MJ, Perera RA, Masho SW, Mezuk B, & Cohen SA (2015). Adverse childhood experiences and intimate partner aggression in the US: Sex differences in psychosocial mediation. *Social Science and Medicine*, 131, 48–57. 10.1016/j.socscimed.2015.02.044. [PubMed: 25753285]
- Brown MJ, Thacker LR, & Cohen SA (2013). Association between adverse childhood experiences and diagnosis of cancer. *PLoS One*, 8(6), e65524. 10.1371/journal.pone.0065524. [PubMed: 23776494]
- Cannon EA, Anderson ML, Rivara FP, & Thompson RS (2010). Adult health and relationship outcomes among women with abuse experiences during childhood. *Violence and Victims*, 25(3), 291. 10.1891/0886-6708.25.3.291. [PubMed: 20565002]
- Center for the Study of Social Policy (2019). Strengthening families. Retrieved from <https://cssp.org/our-work/project/strengthening-families/>.
- Chapman DP, Liu Y, Presley-Cantrell LR, Edwards VJ, Wheaton AG, Perry GS, & Croft JB (2013). Adverse childhood experiences and frequent insufficient sleep in 5 US States, 2009: A retrospective cohort study. *BMC Public Health*, 13(1), 3. 10.1186/1471-2458-13-3. [PubMed: 23286392]
- Chapman DP, Wheaton AG, Anda RF, Croft JB, Edwards VJ, Liu Y, & Perry GS (2011). Adverse childhood experiences and sleep disturbances in adults. *Sleep Medicine*, 12(8), 773–779. 10.1016/j.sleep.2011.03.013. [PubMed: 21704556]
- Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ, & Anda RF (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders*, 82(2), 217–225. 10.1016/j.jad.2003.12.013. [PubMed: 15488250]
- Coldwell J, Pike A, & Dunn J (2008). Maternal differential treatment and child adjustment: A multi-informant approach. *Social Development*, 17(3), 596–612.
- Conger RD, & Donnellan MB (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*, 58, 175–199. 10.1146/annurev.psych.58.110405.085551.
- Conger RD, Ge X, Elder GH Jr., Lorenz FO, & Simons RL (1994). Economic stress, coercive family process, and developmental problems of adolescents. *Child Development*, 65(2), 541–561. 10.1111/j.1467-8624.1994.tb00768.x. [PubMed: 8013239]
- Crnic KA, Gaze C, & Hoffman C (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development: An International Journal of Research and Practice*, 14(2), 117–132. 10.1002/icd.384.

- Crouch E, Radcliff E, Strompolis M, & Wilson A (2018a). Adverse childhood experiences (ACEs) and alcohol abuse among South Carolina adults. *Substance Use & Misuse*, 53(7), 1212–1220. 10.1080/10826084.2017.1400568. [PubMed: 29185846]
- Crouch E, Radcliff E, Strompolis M, & Wilson A (2018b). Examining the association between adverse childhood experiences and smoking-exacerbated illnesses. *Public Health*, 157, 62–68. 10.1016/j.puhe.2018.01.021. [PubMed: 29500945]
- Crouch E, Strompolis M, Bennett KJ, Morse M, & Radcliff E (2017). Assessing the interrelatedness of multiple types of adverse childhood experiences and odds for poor health in South Carolina adults. *Child Abuse & Neglect*, 65, 204–211. 10.1016/j.chiabu.2017.02.007. [PubMed: 28189958]
- Danese A, Moffitt TE, Harrington H, Milne BJ, Polanczyk G, Pariante CM, ... Caspi A (2009). Adverse childhood experiences and adult risk factors for age-related disease: Depression, inflammation, and clustering of metabolic risk markers. *Archives of Pediatrics & Adolescent Medicine*, 163(12), 1135–1143. 10.1001/archpediatrics.2009.214. [PubMed: 19996051]
- Deater-Deckard K (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice*, 5(3), 314–332.
- Dong M, Anda RF, Felitti VJ, Dube SR, Williamson DF, Thompson TJ, & Giles WH (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse & Neglect*, 28(7), 771–784. 10.1016/j.chiabu.2004.01.008. [PubMed: 15261471]
- Dumas JE, Wolf LC, Fisman SN, & Culligan A (1991). Parenting stress, child behavior problems, and dysphoria in parents of children with autism, down syndrome, behavior disorders, and normal development. *Exceptionality: A Special Education Journal*, 2(2), 97–110.
- Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, & Marks JS (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. 10.1016/S0749-3797(98)00017-8. [PubMed: 9635069]
- Fiese BH, & Winter MA (2010). The dynamics of family chaos and its relation to children's socioemotional well-being In Evans GW, & Wachs TD (Eds.). *Decade of behavior (science conference). Chaos and its influence on children's development: An ecological perspective* (pp. 49–66). Washington, DC: American Psychological Association 10.1037/12057-004.
- Figner B, Mackinlay RJ, Wilkening F, & Weber EU (2009). Affective and deliberative processes in risky choice: Age differences in risk taking in the Columbia card task. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35(3), 709.
- Ford ES, Anda RF, Edwards VJ, Perry GS, Zhao G, Li C, & Croft JB (2011). Adverse childhood experiences and smoking status in five states. *Preventive Medicine*, 53(3), 188–193. 10.1016/j.ypmed.2011.06.015. [PubMed: 21726575]
- Gonzalez A, & MacMillan HL (2008). Preventing child maltreatment: An evidence-based update. *Journal of Postgraduate Medicine*, 54(4), 280. [PubMed: 18953147]
- Harper BC (2014). *The strengthening families approach and protective factors framework: Branching out and reaching deeper*. Washington, DC: Center for the Study of Social Policy Retrieved from [https://www.cssp.org/reform/strengtheningfamilies/2014/The-Strengthening-Families-Approach-and-Protective-Factors-Framework\\_Branching-Out-and-Reaching-Deeper.pdf](https://www.cssp.org/reform/strengtheningfamilies/2014/The-Strengthening-Families-Approach-and-Protective-Factors-Framework_Branching-Out-and-Reaching-Deeper.pdf), Accessed date: 15 August 2018.
- Harrington D, Black MM, Starr RH Jr., & Dubowitz H (1998). Child neglect: Relation to child temperament and family context. *American Journal of Orthopsychiatry*, 68(1), 108–116. [PubMed: 9494647]
- Hibbard RA, Desch LW, & Committee on Child Abuse and Neglect (2007). Maltreatment of children with disabilities. *Pediatrics*, 119(5), 1018–1025. [PubMed: 17473105]
- Horwitz AV, Widom CS, McLaughlin J, & White HR (2001). The impact of childhood abuse and neglect on adult mental health: A prospective study. *Journal of Health and Social Behavior*, 42, 184–201. 10.2307/3090177. [PubMed: 11467252]
- HRSA, Maternal and Child Health Bureau (2017). *The maternal, infant, and early childhood home visiting program: Partnering with parents to help children succeed*. Retrieved from <https://mchb.hrsa.gov/sites/default/files/mchb/MaternalChildHealthInitiatives/HomeVisiting/pdf/programbrief.pdf>.

- Larkin H, Shields JJ, & Anda RF (2012). The health and social consequences of Adverse Childhood Experiences (ACE) across the lifespan: An introduction to prevention and intervention in the community. *Journal of Prevention & Intervention in the Community*, 40(4), 263–270. 10.1080/10852352.2012.707439. [PubMed: 22970779]
- Lee RD, & Chen J (2017). Adverse childhood experiences, mental health, and excessive alcohol use: Examination of race/ethnicity and sex differences. *Child Abuse & Neglect*, 69, 40–48. [PubMed: 28448813]
- Letourneau N, Dewey D, Kaplan BJ, Ntanda H, Novick J, Thomas JC, ... APrON Study Team (2019). Intergenerational transmission of adverse childhood experiences via maternal depression and anxiety and moderation by child sex. *Journal of Developmental Origins of Health and Disease*, 10, 1–12. 10.1017/S2040174418000648. [PubMed: 30919803]
- Maguire-Jack K, Lanier P, & Lombardi B (2019). Investigating racial differences in clusters of adverse childhood experiences. *American Journal of Orthopsychiatry*. 10.1037/ort0000405 Advance online publication.
- Murphy A, Steele M, Dube SR, Bate J, Bonuck K, Meissner P, & Steele H (2014). Adverse childhood experiences (ACEs) questionnaire and adult attachment interview (AAI): Implications for parent child relationships. *Child Abuse & Neglect*, 38(2), 224–233. [PubMed: 24670331]
- National Survey of Children's Health (2016). Codebook. <https://www.childhealthdata.org/learn-about-the-nsch/nsch-codebooks>.
- Olds DL (2006). The nurse–family partnership: An evidence-based preventive intervention. *Infant Mental Health Journal*, 27(1), 5–25. [PubMed: 28640426]
- Pereira J, Vickers K, Atkinson L, Gonzalez A, Wekerle C, & Levitan R (2012). Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. *Child Abuse & Neglect*, 36(5), 433–437. 10.1016/j.chiabu.2012.01.006. [PubMed: 22633056]
- Ramey CT, Ramey SL, Gaines KR, & Blair C (1995). Two-generation early intervention programs: A child development perspective Series Ed. Vol. Ed. In Sigel I, & Smith S (Vol. Eds.), *Two-generation programs for families in poverty: A new intervention strategy*. *Advances in applied developmental psychology*. Vol. 9. Two-generation programs for families in poverty: A new intervention strategy. *Advances in applied developmental psychology* (pp. 199–228). Norwood, NJ: Ablex Publishing.
- Ramos MC, Guerin DW, Gottfried AW, Bathurst K, & Oliver PH (2005). Family conflict and children's behavior problems: The moderating role of child temperament. *Structural Equation Modeling*, 12(2), 278–298. 10.1207/s15328007sem1202\_6.
- Reitman D, Currier RO, & Stickle TR (2002). A critical evaluation of the Parenting Stress Index-Short Form (PSI-SF) in a head start population. *Journal of Clinical Child and Adolescent Psychology*, 31(3), 384–392. [PubMed: 12149976]
- Shonkoff JP (2016). Capitalizing on advances in science to reduce the health consequences of early childhood adversity. *JAMA Pediatrics*, 170(10), 1003–1007. 10.1001/jamapediatrics.2016.1559. [PubMed: 27548291]
- Shonkoff JP, Garner AS, Siegel BS, Dobbins MI, Earls MF, McGuinn L, ... Committee on Early Childhood, Adoption, and Dependent Care (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, 129(1), e232–e246. 10.1542/peds.2011-2663. [PubMed: 22201156]
- Steele H, Bate J, Steele M, Dube SR, Danskin K, Knafo H, & Murphy A (2016). Adverse childhood experiences, poverty, and parenting stress. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 48(1), 32.
- Thomas D, Leicht C, Hughes C, Madigan A, & Dowell K (2004). *Emerging practices: In the prevention of child abuse and neglect*. Washington, DC: US Department of Health and Human Services.
- Triple P (2019). Triple P implementation. Retrieved from <https://www.triplep.net/gloen/home/>.
- Waldfoegel J, Craigie TA, & Brooks-Gunn J (2010). Fragile families and child well-being. *The Future of Children*, 20(2), 87 Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3074431/>. [PubMed: 20964133]

- Whiteside-Mansell L, Ayoub C, McKelvey L, Faldowski RA, Hart A, & Shears J (2007). Parenting stress of low-income parents of toddlers and preschoolers: Psychometric properties of a short form of the Parenting Stress Index. *Parenting: Science and Practice*, 7(1), 26–56. 10.1080/15295190709336775.
- Woodman AC (2014). Trajectories of stress among parents of children with disabilities: A dyadic analysis. *Family Relations*, 63(1), 39–54.

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ACE survey and supplemental questions included in the 2016 National Survey of Children’s Health.

**Table 1**

<b>Adverse childhood experience</b>	<b>Survey questions</b>
To the best of your knowledge, has this child experienced any of the following?	
Parental separation/divorce	1. Parent or guardian divorced or separated?
Parental Death	2. Parent or guardian died
Household incarceration	3. Parent or guardian served time in jail?
Witnessing household violence	4. Saw or heard parents or adults slap, hit, kick, punch one another in the home?
Witnessing neighborhood violence	5. Was a victim of violence or witnessed violence in the neighborhood?
Household mental illness	6. Lived with anyone who was mentally ill, suicidal, or severely depressed?
Household substance use	7. Lived with anyone who had a problem with alcohol or drugs?
Racial/ethnic mistreatment	8. Treated or judged unfairly because of his or her race or ethnic group?
Economic Hardship	9. Hard to get by on family’s income- hard to cover basics like food or housing?

ACE, adverse childhood experience; National Survey of Children’s Health.

**Table 2**

Characteristics of respondents to the 2016 National Survey of Children's Health, n = 45,831.

Characteristic	All (%)	Parenting stress %	P-value
Characteristics of child		4.4	
Sex of child			0.0015
Male	50.9	5.7	
Female	49.1	4.1	
Age of Child			<0.0001
5 years old or younger	32.6	3.3	
6 to 12 years old	39.3	5.1	
13 to 17 years old	28.1	6.6	
Race/Ethnicity of Child			0.04
Non-Hispanic White	53.6	4.3	
Non-Hispanic African-American	12.2	5.7	
Hispanic	23.3	6.0	
"Other" Non-Hispanic	10.8	5.2	
Special health care needs			<0.0001
Yes	19.3	17.0	
Characteristics of Parent/Household			
Respondent's relation to child			0.003
Mother	64.3	5.1	
Father	28.0	4.0	
Other	7.7	7.1	
Primary Language			0.0689
Not English	13.6	6.5	
Guardian Education			0.0715
Less than high school or high school	27.6	5.7	
Some college or more	72.4	4.6	
Family Structure			0.0004
Two parents, currently married	67.6	4.2	
Two parents, not currently married	9.0	5.6	
Single mother/Other	23.3	6.8	
Poverty/ Income Level			0.0011
0–99% Federal Poverty Level	20.0	6.6	
100%–199% Federal Poverty Level	21.6	5.1	
200%–399% Federal Poverty Level	27.6	4.8	
400% Federal Poverty Level or above	30.8	3.8	



**Table 3**

Types and numbers of ACEs reported by respondents to the 2016 National Survey of Children’s Health, n = 45,831.

ACE exposure	Total sample Weighted %	High Parenting Stress	Low Parenting Stress	P-value
ACE summary score				< 0.0001
Zero	54.2	33.0	55.3	
One to three	39.7	47.0	39.3	
Four or more	6.0	19.9	5.3	
ACE Types <sup>a</sup>				
Parental separation/divorce	24.1	35.4	23.5	< 0.0001
Parental death	3.2	5.0	3.1	0.0018
Household incarceration	7.7	17.3	7.3	< 0.0001
Witness household violence	5.5	15.5	5.0	< 0.0001
Witness neighborhood violence	3.7	12.6	3.2	< 0.0001
Household mental illness	7.8	21.2	7.1	< 0.0001
Household substance use	8.9	20.9	8.3	< 0.0001
Racial/ethnic mistreatment	3.6	9.3	3.3	< 0.0001
Economic hardship <sup>b</sup>	25.3	44.0	24.3	< 0.0001

<sup>a</sup>First eight items are responses to the stem question, “Has this child ever experienced...”.

<sup>b</sup>The final item asks, “since this child was born, how often has it been very hard to get by on your family’s income – hard to cover the basics like food or housing?”. If the parent/guardian answered “somewhat often/Very often hard to get by on family income” then the answer was coded as a yes. Answers of “never/rarely hard to get by on family income” were coded as a no.

Table 4

Adjusted odds ratios<sup>a</sup> and 95% Wald confidence intervals predicting counts of four or more Adverse Childhood Experiences (ACEs) (with and without economic hardship), among respondents to 2016 National Survey of Children's Health survey, n = 45,831.

Variable	Four or more ACEs		Four or more ACEs (without economic hardship)	
	Point estimate	95% CI <sup>2</sup>	Point estimate	95% CI <sup>2</sup>
Seldom/No Parenting Stress	Referent		Referent	
Parenting Stress	<b>3.05</b>	<b>2.23–4.15</b>	<b>2.99</b>	<b>2.11–4.25</b>
Characteristics of child				
Sex of child				
Male	Referent		Referent	
Female	1.09	0.89–1.33	1.16	0.92–1.46
Age of Child				
5 years old or younger	Referent		Referent	
6 to 12 years old	<b>2.82</b>	<b>2.15–3.70</b>	<b>2.82</b>	<b>2.05–3.89</b>
13 to 17 years old	<b>4.07</b>	<b>3.12–5.31</b>	<b>4.00</b>	<b>2.93–5.46</b>
Race/Ethnicity of Child				
Non-Hispanic White	Referent		Referent	
Non-Hispanic African-American	0.71	0.51–0.99	0.58	0.40–0.99
Hispanic	1.13	0.84–1.52	1.12	0.80–1.59
„Other“ Non-Hispanic	1.20	0.89–1.33	1.13	0.78–1.65
Special health care needs				
Yes	<b>1.79</b>	<b>1.46–2.20</b>	<b>1.86</b>	<b>1.47–2.35</b>
Characteristics of Parent/Household				
Respondent's relation to child				
Mother	Referent		Referent	
Father	0.76	0.57–1.02	0.93	0.64–1.35
Other	<b>1.50</b>	<b>1.15–1.96</b>	<b>1.85</b>	<b>1.39–2.47</b>
Primary Language				
English	Referent		Referent	
Not English	<b>0.32</b>	<b>0.18–0.53</b>	<b>0.23</b>	<b>0.11–0.48</b>
Guardian Education				

Variable	Four or more ACEs		Four or more ACEs (without economic hardship)	
	Point estimate	95% CI <sup>a</sup>	Point estimate	95% CI <sup>a</sup>
Less than high school or high school	<b>1.26</b>	<b>1.01–1.57</b>	1.05	0.80–1.36
Some college or more	Referent		Referent	
Family Structure				
Two parents, currently married	Referent		Referent	
Two parents, not currently married	<b>4.52</b>	<b>3.11–6.56</b>	<b>3.75</b>	<b>2.41–5.84</b>
Single mother/other	<b>8.75</b>	<b>6.76–11.33</b>	<b>7.33</b>	<b>5.35–10.02</b>
Poverty/ Income Level				
0–99% Federal Poverty Level			<b>2.45</b>	<b>1.74–3.45</b>
100%–199% Federal Poverty Level			<b>1.90</b>	<b>1.38–2.61</b>
200%–399% Federal Poverty Level			<b>1.59</b>	<b>1.13–2.24</b>
400% Federal Poverty Level or above			Referent	

<sup>a</sup>95% CI = 95% Wald confidence intervals; bold indicates significance.