



The association between early family social stressors and emotional well-being among infants and toddlers

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Abstract

Objective: Early childhood behavioral and emotional disorders are linked to diagnosable mental health problems both later in childhood and into adulthood. However, little work has examined the association between family social stressors and emotional well-being among children under two years of age, including whether differences exist between infancy and toddlerhood.

Methods: Data come from the nationally representative 2019-2022 National Health Interview Survey, an annual, cross-sectional survey conducted by the National Center for Health Statistics. Separate multivariate logistic regression models estimated associations between family social stressors (stressful life events, family food insecurity, family difficulty paying medical bills) and having a Baby Pediatric Symptom Checklist (BPSC) subscale score of 3 or more (“above the BPSC cutoff”) for poorer emotional well-being among children 2-23 months. Models were additionally stratified by age group (infants, 2-11 months; toddlers, 12-23 months), and adjusted for child and family sociodemographic and geographical characteristics.

Results: Children who had experienced a stressful life event (AOR=3.83, 95% CI: 2.48-5.92), family food insecurity (AOR=1.69, 95% CI: 1.13-2.51), or family difficulty paying medical bills (AOR=2.10, 95% CI: 1.54-2.87) had higher odds of being above the BPSC cutoff, adjusted for all relevant covariates. Toddlers who experienced a stressful life event (66.5% vs. 41.0%) or family difficulty paying medical bills (53.1% vs. 29.8%) had higher odds of being above the BPSC cutoff compared with infants.

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Conclusions: Family social stressors were linked to poorer emotional well-being among young children. Future research may benefit from the exploration of additional predictors of emotional well-being among this age group.

Keywords

national survey; children; social and emotional difficulties

Introduction

Behavioral and emotional problems are common in early childhood, with signs presenting as early as infancy and toddlerhood that can persist through childhood,¹ and manifest as emotional and behavioral disorders, such as depression and ADHD.^{2,3} Children with early behavioral and emotional problems have been found to be at increased risk for school absenteeism and vocational difficulties.³⁻⁶

Early life social stressors, including family adversity, material or financial hardships, and food insecurity have been associated with behavioral and emotional problems in childhood. Findings from the longitudinal Future of Families and Child Well-Being Study (FFCWS) found children who experienced early adversity were significantly more likely to present with both internalizing and externalizing problems later in their childhood.⁸ Similarly, findings from the National Survey of Children's Health (NSCH) found associations between childhood adversity and symptoms of anxiety and depression among school-aged children.⁹

Additional research from these surveys revealed an association between material hardship and mental and behavioral problems.¹⁰⁻¹¹ Findings are consistent with other research documenting a relationship between family income and internalizing and externalizing problems, with a sudden loss of income increasing this risk.¹² Medical financial hardship, regardless of insurance status, has been associated with poor child emotional well-being.¹³

Material hardships, including food insecurity, have also been associated with mental and behavioral problems. Findings from the Environmental Risk Longitudinal Study indicated that food-insecure children were twice as likely to have clinically significant behavioral problems compared with food-secure children at age 10.¹⁴ Findings from the National Health Interview Survey (NHIS) showed a linear relationship between food insecurity and mental disorders among children, such that odds of mental disorders increased with the severity of household food insecurity.¹⁵

The need to understand contextual factors that can impact a child's emotional well-being in later childhood is well-established.¹⁶ Furthermore, the American Academy of Pediatrics (AAP) recommends assessing for social and behavioral risk factors during visits.⁷ Nonetheless, the associations between early family stressors and emotional well-being in children under 2 are understudied. While a recent single-site study has examined this relationship among infants¹⁷, to our knowledge, no studies have examined these relationships among infants and toddlers using nationally-representative data.

When the NHIS was redesigned in 2019^A, the Baby Pediatric Symptom Checklist¹⁸ (BPSC) was added in the hopes of addressing this gap. The objective of the current study is to examine associations between early family social stressors and emotional well-being among infants and toddlers utilizing nationally representative survey data. Given distinct social-emotional and cognitive developmental milestones for infant and toddler age groups, this study examined infant and toddler outcomes separately.

Methods

Data Source

Data from the 2019-2022 NHIS were used. NHIS is a nationally representative survey of the civilian non-institutionalized population, and interviews are conducted continuously throughout the year both in-person or over the telephone by trained U.S. Census Bureau interviewers. Among sampled households, one adult aged 18 years or older and one child, if any are present, are randomly selected to be the subject of a detailed health questionnaire. While an adult answers on their own behalf, an adult who is knowledgeable and responsible for the health of the child answers on the child's behalf. Between 2019-2022, the NHIS child interview response rates ranged from 45.8%-59.1%.¹⁹ The four-year pooled unweighted sample size for children was 30,708 (with a weighted sample size of 27,124,310).

Sample

The analysis was limited to children between the ages of 2-23 months (n=3,036), excluding children with missing birthdates or whose age in months could not be calculated. The analytic sample was subdivided into infants (2-11 months) (n=1,421) and toddlers (12-23 months) (n=1,615).

Measures

Baby Pediatric Symptom Checklist (BPSC)—The BPSC is a 12-item, clinically validated questionnaire designed to help pediatricians screen for social and emotional disorders among young children.¹⁸ The BPSC has previously been evaluated using the 2019 NHIS,²⁰ replicating the original validation study.¹⁸

The BPSC contains three subscales dedicated to “irritability,” “inflexibility,” and “difficulty with routines.” Each of the three subscales contain four questions. Parents are instructed to select how much each statement applies to their child’s behavior compared to what they would expect of other children the same age. Response options are “not at all”, “somewhat”, and “very much”. Items are scored with 0, 1, or 2 points, respectively. In a clinical setting, a score of 3 or more on any of the three subscales indicates that the child is above the BPSC cutoff score and needs further clinical evaluation for behavioral or emotional dysfunction and indicated interventions.²¹ A score of less than 3 on all BPSC subscales indicates the child is not in need of further clinical evaluation. In these analyses of non-clinical survey data, children with a score of 3 or more on any subscale will simply be identified as children “above the BPSC cutoff”.

^AFor more information about the 2019 NHIS redesign, visit: http://cdc.gov/nchs/nhis/2019_quest_redesign.htm

Early Family Social Stressors—Stressful Life Events: Parents were asked about four stressful life events (SLEs), whether the child had experienced: 1) household substance abuse (“lived with anyone who had a problem with alcohol or drugs”), 2) household mental illness (“lived with anyone who was mentally ill or severely depressed”), 3) parental incarceration (“separated because parent or guardian went to jail, prison, or a detention center”), or 4) neighborhood violence (“been a victim of violence or witnessed violence in the neighborhood”). A composite was created for the current study of having experienced one or more SLEs.

Questions on SLEs were added to the NHIS in 2019 as part of the survey’s redesign and were adapted from the larger battery of questions from the Adverse Childhood Experiences (ACEs) study (see <https://www.cdc.gov/violenceprevention/aces/about.html> for more information). A larger battery of SLEs appeared in subsequent years of the NHIS, but pooling across multiple years limits the current study to the four SLEs detailed above.

Food Insecurity: Parents were asked up to 10 questions about their family’s food security with responses being used to create a raw food security score and food security categories as defined by the United States Department of Agriculture.²² Children living in families with “low” or “very low” food security were considered “food insecure”.

Difficulty Paying Medical Bills: Parents were asked if anyone in the family had problems paying or were unable to pay any medical bills in the past 12 months. If the parent answered “yes”, they were subsequently asked if anyone in the family currently has medical bills that they are unable to pay at all. Parents that said “yes” to either survey question were categorized as difficulty paying medical bills.

Child-level demographic characteristics examined include age groups (infants: 2-11 months, toddlers: 12-23 months), sex, race, and Hispanic origin (Black, non-Hispanic, White, non-Hispanic, Other non-Hispanic, Hispanic). Family-level sociodemographic characteristics examined include income as a percentage of federal poverty level (<100%, 100-199%, 200-399%, >400%) (multiply imputed when missing) and highest parental education level (less than high school, high school or some college, Bachelor’s degree or more). Geographic level characteristics include urbanization level (large metropolitan, medium or small metropolitan, nonmetropolitan),²³ and region (Northeast, Midwest, South, West). Covariates selected have been associated with early family stressors.

Statistical Analysis

First, child, family, and geographic characteristics were described for children above the cutoff, compared to those at or below the cutoff. A design-based Rao-Scott corrected χ^2 test was used to test whether an overall difference existed between the two groups for each characteristic.

Next, the percentage of children above the cutoff was estimated separately among children who had experienced each of the early family social stressors both for all children and then by age group (infants and toddlers).

Finally, bivariate logistic regressions were used to determine if children above the cutoff differed by whether they had experienced an early family social stressor separately for each stressor, and both overall and stratified for infants and toddlers. Multivariate logistic regressions were also used to determine whether this relationship remained after adjusting for child's sex, race and Hispanic origin, family income, highest parent education level, urbanization level, region, and survey year --- covariates selected have been associated with family social stressors.

Missing data were low for the BPSC (<0.1%) and each of the early family social stressors (stressful life event (1.1%), food insecurity (1.1%), difficulty paying medical bills (0.6%)). Estimates were calculated using Stata 17.0²⁴ to account for the complex survey design of the NHIS, incorporating both survey design and sampling weight variables. Doing such allows for nationally representative estimates of children all ages, but also those under 2 years of age.²⁵

Analyses were completed using restricted-use NHIS data in order to calculate child's age in months from either the child's date of birth or age in months as reported in the household roster.^B NHIS public files only contain the child's age in years.

Results

Table 1 explores differences in selected characteristics between children 2-23 months above the BPSC cutoff compared to those below. In total, 27.4% of all children were above the BPSC cutoff, with toddlers being more likely to be above the BPSC cutoff than infants. All other observed differences were not significant.

Figure 1 displays the percent of children who experienced each family social stressor among those scoring above the BPSC cutoff, including 56.8% for any stressful life event, 38.5% for food insecurity, and 41.3% for family difficulty paying medical bills. Toddlers had higher odds of being above the BPSC cutoff compared to infants for any stressful life event (66.5% vs. 41.0%) and difficulty paying medical bills (53.1% vs. 29.8%), but the difference for food insecurity (45.5% vs. 31.6%) was not significant. Additional information about the percent of children above the BPSC cutoff among those without early family social stressors, both overall, and for each age group, can be found in an online supplemental table.

Table 2 contains both unadjusted and adjusted odds ratios for being above the BPSC cutoff for each of the family social stressors, overall and stratified by age group. Before adjustment, children 2-23 months who had experienced each social stressor had higher odds of being above the BPSC cutoff, with the highest odds being for any stressful life event (OR=3.61, 95% CI:2.31-5.65), followed by difficulty paying medical bills (OR=2.02, 95% CI:1.47-2.77), and food insecurity (OR=1.77, 95% CI:1.21-2.58). These associations remained significant after adjusting for child, family, and geographic characteristics:

^BFor this study, analyses were based on restricted use NHIS data to calculate child's age in months from either the child's date of birth or age in months as reported in the household roster. For more information, please visit the Research Data Center (<https://www.cdc.gov/rdc/index.htm>)

any stressful life event (AOR=3.83, 95% CI:2.48-5.92), difficulty paying medical bills (AOR=2.10, 95% CI: 1.54-2.87) and food insecurity (AOR=1.69, 95% CI:1.13-2.51).

Toddlers consistently had higher odds of being above the BPSC cutoff for each of the family social stressors. Associations remained significant for all 3 assessed social stressors among toddlers after adjustment. For infants, associations remained significant for any stressful life event and food insecurity; associations for difficulty paying medical bills for infants were not significant.

Discussion

This analysis of a nationally representative sample of infants and toddlers between 2-23 months of age highlights the association between early family social stressors in the form of stressful life events, food insecurity, and difficulty paying medical bills with an indicator of emotional well-being. Children who experienced each family social stressor had higher odds of being above the BPSC cutoff. Among infants, there was only statistically significant associations between 2 of the family social stressors and the indicator of emotional well-being. However, all 3 family social stressors were statistically significant among the toddlers. This suggests that while the impact of family stressors on early childhood emotional well-being begins during infancy, it may become more observable in older ages.

The current study in younger children is line with previous research linking family social stressors and poorer emotional well-being among older children. These same family social stressors have been associated with significant mental health issues later in childhood among children with behavioral and emotional problems.^{26,27} Stressful life events, food insecurity and difficulty paying medical bills may be signs of social distress within the family. These experiences of social distress might affect the quality of parenting and household functioning²⁸⁻³⁰ needed to meet the needs of very young children in developing emotional and behavioral skills.

Strengths and Limitations

The current study benefits from a nationally representative sample that provides valuable information on population level surveillance and includes groups of children who may not seek out preventative services in healthcare settings.

Despite these strengths, several limitations should be acknowledged. First, the BPSC was administered by a trained interviewer outside the confines of a medical office, whereas the BPSC is typically completed by a parent as part of the clinical process for a health appointment. As such, it is possible responses may differ based on survey mode and setting. Parents may respond differently to a survey based on whether they were interviewed in person or by telephone, as well as whether they are in their home compared to a medical setting. However, given that the BPSC was previously validated within the NHIS, the impact of these concerns is likely minimal.²⁰ Second, as these data are based on parent report, social desirability and recall bias is possible, particularly for early life stressors and the sensitive nature of these questions. Third, as the NHIS is a cross-sectional survey, it is not possible to establish causality or directionality between poorer emotional well-being and

the presence of family social stressors. Finally, there isn't the ability to compare parental responses to a "gold standard" criterion clinical assessment.

Implications

Stressful life events, food insecurity, and difficulty paying medical bills differentially impact emotional well-being during two key developmental stages in early childhood. This finding highlights the importance of continuing to monitor emotional well-being in infants and toddlers using a surveillance mechanism that can lead to nationally representative estimates among these youngest age groups.

Clinically, the American Academy of Pediatrics (AAP) recommends behavioral and emotional screening at every well-child visit from the newborn period through adolescence done in tandem with developmental screening focusing on language, motor and cognitive skills, as emotional and behavioral challenges which can impact other aspects of development and vice versa.^{31,32} While there is no standardized process for the identification and treatment of behavioral and emotional problems in very young children in the United States, identifying children in need of further evaluation has been shown to have interventional value at the clinical level and aid collaboration between clinician and parent.³³

The AAP also recommends that clinicians ask about family stressors, including poverty and other social determinants of health that impact both the parent and child.³¹ The differential impact of family stressors on the well-being of toddlers compared to infants seen in the current study underscores the importance of early screenings. It also highlights the role doctors in pediatric settings play in assessing and treating early childhood mental health problems and ensuring families are supported.^{34,35}

Additional research may explore the role protective factors could play in moderating the relationship between family stressors and child emotional well-being, including the type and quality of the relationship the child has with family members and others in the community.

Conclusions

Early family social stressors may be associated with indicators of poorer emotional well-being as assessed with the BPSC. The NHIS provides an opportunity for the national surveillance of behavioral and emotional problems in very young children and their association with early family social stressors.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Disclaimer:

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What's New?

The present study found significant associations between family social stressors and emotional well-being in children as young as under one year of age, with significant differences seen between toddlers and infants. Previous work has largely focused on older children.

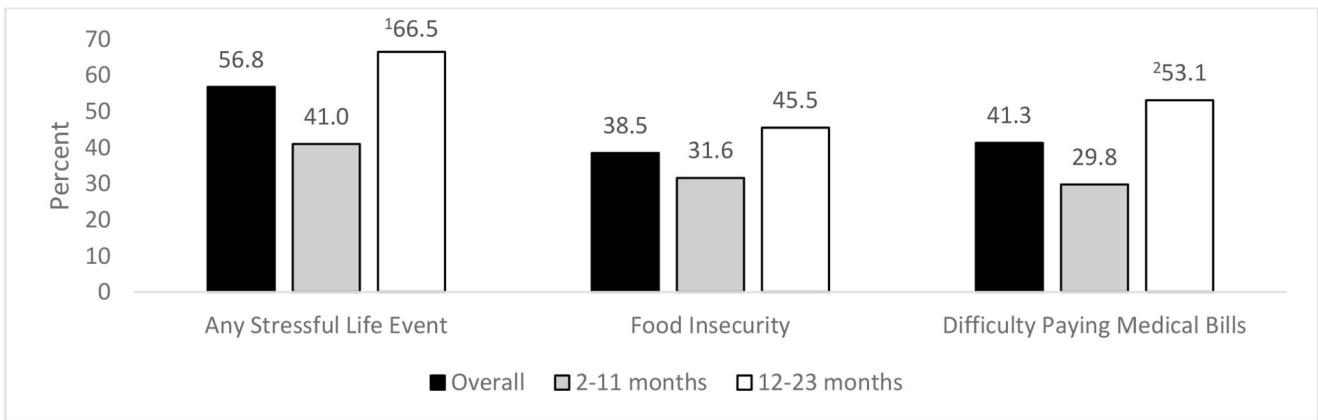


Figure 1. Percent of children aged 2-23 months above Baby Pediatric Symptom Checklist cutoff, by select family social stressor and age group: United States, 2019-2022.

NOTE: To be above the BPSC cutoff a child must score 3 or higher on any of the three BPSC subscales.

¹ Significantly different from infants (2-11 months) of age for any stressful life event using logistic regression ($p<.05$).

² Significantly different from infants (2-11 months) of age for difficulty paying medical bills using logistic regression ($p<.05$).

Table 1.

Demographic characteristics of children aged 2-23 months, by Baby Pediatric Symptom Checklist cutoff: United States: 2019-2022

	Above BPSC cutoff (n=833) (%) SE	Below BPSC cutoff (n=2,201) (%) SE	F-value	p-value
Child characteristics				
Age group			12.29	<0.001
Infants (2-11 months)	40.3 (2.2)	49.6 (1.4)		
Toddlers (12-23 months)	59.7 (2.2)	50.4 (1.4)		
Sex			0.88	0.35
Male	49.2 (2.1)	51.5 (1.3)		
Female	50.8 (2.1)	48.5 (1.3)		
Race and Hispanic origin			1.78	0.15
Black, non-Hispanic	12.7 (1.8)	51.6 (1.7)		
White, non-Hispanic	49.8 (2.2)	11.2 (1.2)		
Other, non-Hispanic	14.1 (1.5)	10.6 (1.0)		
Hispanic	23.4 (1.9)	26.6 (1.5)		
Family characteristics				
Family poverty level			2.20	0.09
<100%	22.6 (2.0)	17.5 (1.2)		
100-199%	20.6 (1.7)	21.2 (1.2)		
200-399%	28.5 (1.8)	31.1 (1.3)		
>400%	28.3 (1.8)	30.1 (1.2)		
Highest educated parent			0.50	0.60
Less than high school	7.9 (1.4)	6.5 (0.7)		
High school or some college	21.5 (1.9)	22.3 (1.3)		
Bachelor's degree or more	70.6 (2.2)	71.3 (1.4)		
Geographic characteristics				
Urbanization level			0.61	0.54
Large metropolitan	52.0 (2.4)	54.7 (1.6)		
Medium or small metropolitan	32.6 (2.5)	31.3 (1.9)		
Nonmetropolitan	1.5 (2.1)	14.0 (1.5)		
Region ^I			1.49	0.22
Northeast	18.0 (1.7)	15.8 (1.1)		
Midwest	22.6 (1.9)	21.1 (1.3)		
South	36.7 (2.3)	41.9 (1.5)		
West	22.7 (1.8)	21.2 (1.2)		
Interview characteristics				
Survey year			1.31	0.27

	Above BPSC cutoff (n=833) (%) SE	Below BPSC cutoff (n=2,201) (%) SE	F-value	p-value
2019	24.6 (1.7)	24.8 (1.1)		
2020	23.5 (2.0)	27.0 (1.3)		
2021	24.4 (1.8)	24.4 (1.1)		
2022	27.5 (1.9)	23.8 (1.2)		

NOTE: Sample sizes are unweighted, but percentages are weighted. To be above the BPSC cutoff a child must score 3 or higher on any of the three BPSC subscales.

¹Geographic region was defined using the United States Census Bureau classification: https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

Table 2:

Bivariate and multivariate logistic regression models for children aged 2-23 months above Baby Pediatric Symptom Checklist cutoff, by select family social stressor: United States: 2019-2022

Family social stressor	Age group	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Any stressful life event	Overall (2-23 months)	3.61 *** (2.31-5.65)	3.83 *** (2.48-5.92)
	Infants (2-11 months)	2.34 * (1.15-4.75)	2.48 * (1.18-5.20)
	Toddlers (12-23 months)	4.60 *** (2.61-8.08)	5.41 *** (3.09-9.47)
Food insecurity	Overall (2-23 months)	1.77 ** (1.21-2.58)	1.69 * (1.13-2.51)
	Infants (2-11 months)	1.59 (0.96-2.63)	1.78 * (1.02-3.10)
	Toddlers (12-23 months)	2.02 ** (1.21-3.35)	1.70 * (1.01-2.87)
Difficulty paying medical bills	Overall (2-23 months)	2.02 *** (1.47-2.77)	2.10 *** (1.54-2.87)
	Infants (2-11 months)	1.43 (0.91-2.25)	1.53 (0.96-2.44)
	Toddlers (12-23 months)	2.82 *** (1.82-4.39)	2.73 *** (1.78-4.18)

 $p < .001$

**
 $p < .01$

*
 $p < .05$

NOTE: To be above the BPSC cutoff a child must score 3 or higher on any of the three BPSC subscales. Adjusted for child's sex, race and Hispanic origin, family income, highest parent education level, urbanization level, geographic region, and survey year.