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ORIGINAL PAPER

Correlates of Behavioral Problems among Youth with Anxiety

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Abstract

More information is needed to elucidate factors related to anxiety and behavioral problems among adolescents to inform those developing interventions. Reduced levels of parental stress and a supportive parent-adolescent relationship may be positively associated with anxiety and behavioral problems while experiencing adverse childhood events typically is negatively associated with anxiety and behavioral problems. This study investigated correlates of behavioral problems among youth with anxiety. Secondary data analyses were performed using a sample of 2,285 youth (10–17 years) whose parents reported that they currently had anxiety and behavioral problems from the 2019 National Survey of Children's Health. Two multivariable logistic regressions examined the associations between four predictors: anxiety severity (mild or moderate/severe), adverse childhood experiences (0 ACEs, 1 ACE, ≥ 2 ACEs), parental stress (always or seldom stressed from parenting role), and emotional support for parents (Yes or No) and outcome variables (parent report of current or past behavioral problems for youth with anxiety). Results were similar for the two regression models. Specifically, participants who had severe/moderate anxiety, were exposed to more traumatic events (≥2 ACEs), lived with parents who were always stressed from parenting roles, and resided with parents who did not receive emotional support with parenting were more likely to have behavioral problems. Interventions are needed to reduce parental stress and provide emotional support for parents whose children experience anxiety and behavioral problems.

Keywords Children · Anxiety · Parent · Behaviors

Highlights

- Exposure to two or more traumatic events increased the likelihood of behavioral problems among youth with anxiety.
- Parental stress is related to behavioral problems among youth with anxiety.
- The association of risk factors for anxiety and behavioral problems were significant for males, youth who were black, and younger youth (10–13 years).
- Emotional support for parents is a protective factor for behavioral problems among youth with anxiety.

Anxiety is one of the most common mental health problems among children in the United States (U.S.), and it can impair a child's social and academic development (Bitsko et al., 2022; Vassey et al., 2014). Anxiety is defined as emotional responses related to anticipating a threat to the self (Fonseca & Perrin, 2011; Grupe and Nitschke, 2013). The American Psychological Association (2022) also defined anxiety as "an emotion characterized by feelings of tension, worried thoughts, and physical changes." Children with anxiety may avoid certain situations out of fear or worry, have trouble sleeping, become easily irritable, or experience physical symptoms such as fatigue, headache, or stomachaches (Centers for Disease Control and Prevention (CDC), 2022). Typically, anxiety is more common in females than males during late childhood/early adolescence and adulthood (Asher et al., 2017; Bahrami and Yousefi, 2011; McLean et al., 2011, Smith et al., 2022). Estimates for anxiety in children vary, with some studies indicating

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prevalence rates between 6–12% of children under 18 years in the U.S. (Merikangas et al., 2009; Ramsawh et al., 2010). For example, Ghandour et al. (2019) found that approximately 4.5 million (7%) children between 3–17 years in the U.S. had anxiety problems in 2016. Others have found even higher rates of anxiety. Wehry et al. (2015) proposed that about 15–20% of children in the U.S. experience anxiety problems. The differences in prevalence rates may be related to the samples used in these studies. Irrespective of the variance in occurrence of anxiety, it remains a significant childhood problem (Bitsko et al., 2022; Ghandour et al., 2019).

Some children with anxiety also tend to experience comorbid conditions, such as behavioral problems, which can further exacerbate the symptoms and negatively affect their quality of life (Creswell et al., 2014; Kendall et al., 2010). Ford et al. (2003) asserted that 7% of children ages 5–15 years with anxiety (e.g., generalized anxiety disorder) also had disruptive behavioral problems. Ghandour et al. (2019) indicated that over one-third (about 38%) of children ages 3–17 years with anxiety also had behavioral problems, yet only 53.5% of them received treatment for their conditions. It may be that anxiety confers risk for behavioral problems (Bubier & Drabick, 2009), or the latter increases the risk of the former (Foley et al., 2004). Numerous studies have examined this association and reported varying results about the relationships between comorbid anxiety and behavioral problems (Isdahl-Troye et al., 2022; Marmorstein, 2007). Arbel et al. (2020) reported that worry and behavioral problems co-occurred for male and female adolescents, and their findings indicated that males might be at even greater risk than females for worries influencing risk behaviors. However, the mean age of youth in their study was 18 years. Therefore, this study extends knowledge to young adolescents as well, focusing on adolescents ages 10–17 years whose parents completed the 2019 National Survey of Children's Health (NSCH). Understanding the relationships between parental stress, parental support, and adverse childhood experiences for adolescents with anxiety and behavioral problems, will provide knowledge about resilience and risk factors for youth with these comorbid problems. While parental support and decreased stress related to parenting roles may be inversely related to behavioral problems and anxiety, adverse child experiences may be positively associated with anxiety and behavioral problems (Garrido et al., 2018; Kovács-Tóth et al., 2021).

Adverse Childhood Experiences

Adverse childhood experiences (ACEs) are traumatic events that may influence the development of behavioral problems among youth (CDC, 2021). Examples of these traumatic experiences include emotional, physical, or sexual abuse, neglect, family discord and divorce, parental substance abuse, exposure to violence, parental death or incarceration, and social discrimination (Bethell et al., 2014). Estimates show that one-in-three children under 18 years in the U.S. has experienced at least one ACEs (HRSA, 2019). Children who experience traumatic events are more likely to exhibit internalizing and externalizing behavioral problems (Herzog & Schmahl, 2018; Hunt et al., 2017; Schickedanz et al., 2018). The likelihood is higher for those with exposure to multiple ACEs (Bevilacqua et al., 2021). Garrido et al. (2018) and Kovács-Tóth et al. (2021) contended that children and adolescents exposed to two or more ACEs are more likely to develop social, emotional, and behavioral problems than those exposed to no ACEs. Other researchers (Bevilacqua et al., 2021; Blodgett and Lanigan, 2018; El-Din et al., 2019) also reported that exposure to at least two ACEs increases the risk of developing problem behaviors, such as aggression towards others as well as delinquent and/or impulsive behaviors. Hunt et al. (2017), however, noted that only a higher level of ACEs exposure (i.e., 3 or more) was significantly associated with behavioral problems. Thus, they proposed further investigation into the relationship between fewer ACEs exposure (i.e., 1 or 2 ACEs) and the presence of behavioral problems. Having anxiety and being exposed to multiple ACEs may result in alteration of brain structures related to emotional regulation (CDC, 2019; Monnat & Chandler, 2015) and long-term psychiatric issues in adulthood (Herzog and Schmahl, 2018). Given the prevalence and potential long-term negative impacts of ACEs exposure, it is important to examine exposure to multiple ACEs on the emotional functioning of youth (CDC, 2021), as well as understand how other family-level risk and resilience factors are related to adolescent functioning.

Parental Stress

One family-level risk factor is the experience of parental stress related to caring for a child (Yu & Singh, 2012). Parents who are stressed from their parenting roles may not have a positive relationship with their children and foster optimal development (Goldberg & Carlson, 2014; Suh and Luthar, 2020). Parents who are stressed from parenting roles have a higher likelihood of exhibiting dysfunctional parenting behaviors, including harshness, aggression, and anger toward adolescents, which can affect their emotional functioning (Goodman & Garber, 2017; Herwig et al., 2004; Suh & Luthar, 2020). These negative parental behaviors often lead to dysfunctional parent-child interactions which, in turn, elevate the risk for maladjustment, anxiety, and behavioral problems for children (Neece et al., 2012; Reid et al., 2002; Suh & Luthar, 2020). The relationship

may be bidirectional, however, as the child's negative behaviors can increase stress related to parenting the child (Datta et al., 2021; Mak et al., 2020; Miranda et al., 2019; Pinquart, 2018). A meta-analysis by Cousino and Hazen (2013) found that parents who have a child with chronic mental health conditions were significantly more likely to report parental stress than those whose child did not have mental health conditions. Other research confirmed the link between child mental health problems and parental stress (Cherry et al., 2019; Cohn et al., 2020; Flannery et al., 2021). Parental stress may decrease care for and quality of the parent-child relationship, resulting in further emotional and behavioral problems for the child (Cohn et al., 2020; Datta et al., 2021).

Emotional Support for Parents

Parents who feel strongly supported may be more positive in their parenting approach and experience less stress, and, as such, this is a resilience factor that may positively affect emotional functioning of children in the family. (Cheng & Furnham, 2021; Herwig et al., 2004; McCarty et al., 2005). Emotional support for parents may strengthen them, and improve their interactions with their children, such that they can assist their children in overcoming anxiety and reducing anger (Lippold et al., 2018). Parents who feel supported may engage in positive interactions, which then reduces the likelihood of their child developing mental health problems (Bjørseth & Wichstrøm, 2016; Thomas and Zimmer-Gembeck, 2007; Wilsie et al., 2017). The alternate relationship may also be true, with parents who lack emotional support tending to feel overwhelmed, which may negatively impact the child's emotional functioning (Cheng & Furnham, 2021).

Present Study

The purpose of our study was to assess the associations between four predictors (child anxiety severity, ACEs, parental stress, and emotional support for parents) and two dependent variables (current or past behavioral problems among youth with anxiety) while accounting for important sociodemographic covariates (i.e., child sex, age, racial/ethnic group, and family income). While the current study uses secondary data, current anxiety and behavioral problems are defined as youth who currently have anxiety and behavioral problems at the time of survey completion.

The current study adds to the literature by examining the relationships between our predictors and outcome variables. Several researchers have examined the relationship between comorbid anxiety and behavioral problems (Isdahl-Troye et al., 2022; Marmorstein, 2007). However, limited studies exist on whether the severity of anxiety symptoms elevates the risk of behavioral problems, especially during early (10–13 years) and late (14–17 years) adolescence (Cassiello-Robbins et al., 2015). Furthermore, the relationship between ACEs exposure and behavioral problems is mixed as some researchers (Hunt et al., 2017) suggested that only a higher level of ACEs exposure (i.e., 3 or more) was significantly associated with behavioral problems. Some studies do not clearly support a positive correlation between stress related to parenting roles and mental health problems for youth, especially adolescents (Buckner, 2021). Jiang et al. (2022) asserted that parental stress was related to behavioral problems during early childhood (3–5 years), but not in older youth (5–15 years). Chung et al. (2013) and de Maat et al. (2021) also found no relationship between parental stress and adolescent behavioral problems. This seems counterintuitive, and thus we explored this relationship in the current study.

Our model draws, in part, on Urie Bronfenbrenner's Ecological Systems Theory (2005) which posits that a child's emotional and behavioral functioning is influenced by events in other interrelated environmental ecosystems including the microsystem and mesosystem. Bronfenbrenner's first level of influence was the microsystem, where family and environmental events such as parental stress and adverse childhood events could significantly impact child functioning. The next level is the mesosystem, which includes variables that connect to the microsystem such as emotional support for parents which may come from different individuals. In addition, child-level factors, such as anxiety severity, could influence child functioning as the child is at the center of Bronfenbrenner's spheres of influence. Our covariates, incorporated into this model at the child level, were sex and age. Other covariates were race/ethnicity and family poverty -- a systemic influence, which may be connected to several spheres of influence in Bronfenbrenner's model. Arguably, scientific exploration is strengthened when it relates to several theories. Thus, this research is also supported by Bowen's (1961) notion that parents' emotions and behaviors can directly influence child functioning. Bandura (1978) proposed that an individual's emotional and behavioral functioning is jointly influenced by individual factors (e.g., age, race, anxiety severity) and environmental variables (e.g., parental stress, emotional support for parents, and family poverty); hence, his ideas support examining child and family variables related to child mental health. Figure 1 depicts the theoretical model for this study. The circle at the center of the model represents our dependent variables: current or past behavioral problems for our sample of youth with anxiety. The squares surrounding the circle represent the influence of factors in the child's environment, parental functioning, and child-level demographic factors that should be associated with current or past behavioral problems for youth with anxiety.

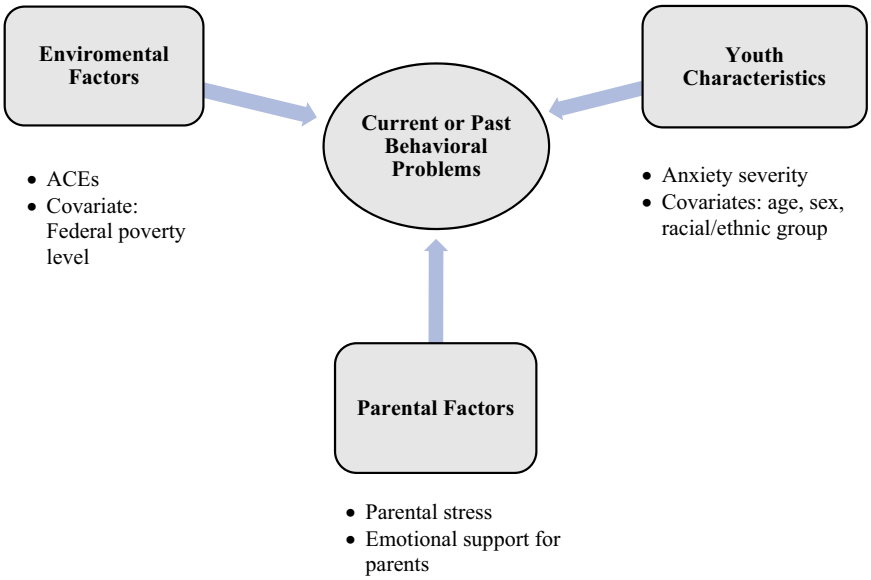

Fig. 1 Theoretical Model for Factors Associated with Behavioral Problems among Youth with Anxiety

We examined several hypotheses. First, we hypothesized that youth with mild anxiety would be less likely to have current or past behavioral problems compared to youth with moderate/severe anxiety (Chung et al., 2019; Neumann et al., 2010). Examining whether behavioral problems are more likely to occur with moderate/severe anxiety versus mild anxiety may shed light on equivocal results for studies examining co-occurrence of anxiety and behavioral problems (Isdahl-Troye et al., 2022; Marmorstein, 2007). Second, we anticipated that youth who experienced no ACEs or one ACE would be less likely to have current or past behavioral problems compared to those with two or more ACEs (Bevilacqua et al., 2021). If this were the case, then assessing ACEs and trauma history is important when treating youth with anxiety and behavioral problems. Stress from parenting roles and adolescent behavioral problems are not always related (Arbel et al., 2020; Jiang et al., 2022; de Maat et al., 2021). As mentioned, this bears investigation. We expected that youth with anxiety whose parents usually felt stressed from parenting would be more likely to have current or past behavioral problems than those whose parents seldom felt stressed from parenting (Suh & Luthar, 2020). Examining resilience factors for adolescents with comorbid behavioral problems is important, and if parents feel supported this may have a positive impact on adolescent functioning (Cheng & Furnham, 2021; Lippold et al., 2018). Thus, we also hypothesized that parents who perceived they had emotional support related to parenting would be less likely to report current or past behavioral problems for their child than parents who did not perceive they had emotional support with parenting.

We examined whether child anxiety severity, ACEs, parental stress, and parental support predicted behavioral problems beyond the impact of child demographic factors (e.g., sex, age, racial/ethnic group) and family poverty, as research has indicated the aforementioned socio-demographic factors, considered as covariates in our study, are related to anxiety and behavioral functioning for youth (Halfon et al., 2017; Hunt et al., 2017; Newacheck et al., 2003; Russell et al., 2016). We expected that males, younger youth (10–13 years), youth who were Black, and youth residing in very low-income families (<200% FPL) would be more likely to have current or past behavioral problems than females, older youth (14–17 years), youth who were Caucasian, and those who resided in higher income families (≥200% FPL; Kaiser et al., 2017; McLaughlin et al., 2007; Peisch et al., 2017; Owens, 2016).

Methods

Participants and Procedures

The sample for this study was comprised of 2,285 youth between ages 10–17 years whose parents reported that they currently had anxiety. We used data from the 2019 National Survey of Children's Health (NSCH; CAHMI, 2021). There were 29,433 surveys completed by parents for one child in their care; 79.2% were completed online and about 20.8% were completed using mail surveys. The NSCH is an annual household survey conducted by the U.S. Census Bureau that provides national- and state-level information regarding the health and well-being of children under 18 years old and their families. Retrospective data were collected at one point in time using self-administered online- and paper-based questionnaires. Parents responded to questions about one child in the household. Further information about the survey is available from the Child and Adolescent Health Measurement

Initiative (CAMHI) (https://www.childhealthdata.org/docs/default-source/nsch-docs/2019-nsch-sampling-administration_cahmi_10-2-20.pdf?sfvrsn=7b7b5f17_2). A university-based institutional review board approved this study.

We used the following parent-reported variables from the 2019 NSCH Codebook and dataset (CAHMI, 2021) that are detailed below: whether the child had anxiety currently, anxiety severity, current or past behavioral problems for the child, ACEs, parental stress, and emotional support for parents.

Measures

Current Anxiety

Parents were asked whether a doctor or other health care professionals ever told them that their child had an anxiety condition ("Yes", No"). For parents who answered "Yes", a follow-up question asked whether the child currently had the condition ("Yes", "No"). We selected youth ages 10–17 years whose parents answered "Yes" to both items as study participants, and therefore defined youth as currently having anxiety.

Anxiety Severity

Among youth whose parents responded "Yes" to the current anxiety question, a follow-up question assessed the severity of the condition. Response options were: (1) "Current condition rated mild" and (2) "Current condition rated moderate/severe."

Behavioral Problems

Behavioral problems were measured using parents' reports of whether a doctor or other health care professional ever told them that their child had behavioral problems ("Yes", "No"). A follow-up question asked whether the child currently had the condition ("Yes", "No"). Responses were categorized into (1) "Does not have the condition," (2) "Ever told, but does not currently have the condition" and (3) "Currently has the condition."

ACEs

ACEs were measured using nine survey items. The first item was hard to cover basics on family's income (4-point scale, anchors were "Never," "Rarely," "Somewhat often," and "Very often"). The other eight items were answered "Yes" or "No" and were: (1) parent or guardian divorced or separated, (2) parent or guardian died, (3) parent or guardian served time in jail, (4) saw or heard parents or adults slap, hit, kick punch one another in the home, (5) was a victim of violence or witnessed violence in neighborhood, (6) lived with anyone who was mentally ill, suicidal or severely depressed, (7) lived with anyone who had a problem with alcohol or drugs, and (8) treated or judged unfairly due to race/ethnicity. We used the NSCH-provided aggregate variable with responses: (1) "No adverse childhood experiences," (2) "Experienced 1 adverse childhood experience," and (3) "Experienced 2 or more adverse childhood experiences."

Parental Stress

We used the NSCH-provided parental aggravation variable as our proxy variable for assessing stress related to parenting role. This aggregate variable, which measured how often parents felt stressed from parenting during the past month, was developed from three items: How often parents felt that (1) "This child was much harder to care for than most children of his or her age," (2) "This child does things that really bother you a lot," and (3) "Angry with this child." Responses for each of these questions were on a 5-point scale ("Never," "Rarely," "Sometimes," "Usually," and "Always"). Responses for the aggregate parental aggravation variable were dichotomized and coded as "Parent usually/always feels aggravation from parenting" if the response to the three survey items were "Usually" or "Always" and "Parent seldom feels aggravation from parenting" if the response to the three survey items were "Never," "Rarely," or "Sometimes."

Emotional Support for Parents

Parents were asked whether they had someone they could turn to for day-to-day emotional support with parenting or raising children. This was answered using a "Yes" or "No" scale.

Sociodemographic/Covariates

Other variables selected included sex (male or female), age, race/ethnicity ("White alone", "Black or African American alone", and "Other"), and federal poverty level (FPL), which was imputed based on the U.S. Department of Health and Human Services' guidelines ("0–99%", "100–199%", "200–399%", or "≥ 400%"). The FPL level was based on an application of the U.S. Census Bureau's information about the "federal poverty threshold." This threshold was determined using questions related to household income: total family income, sources of income, number of people in the household, and how many persons in the home were family members. Further information on the FPL measure can be accessed at the U.S. Census Bureau's website (https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html).

Statistical Analyses

Descriptive statistics were used to determine frequencies for demographic information and variables used in study analyses. Two multivariable logistic regression analyses were performed to analyze the relations among our predictors: anxiety severity, ACEs, parental stress, emotional support for parents, and the outcome variables (current or past behavioral problems among youth with anxiety). The first model examined our predictors in relation to current behavioral problems. The second model examined the predictors in relation to whether the child was ever told, but did not currently have behavioral problems (i.e., past behavioral problems). The reference category in both models was child did not have the condition (i.e., never had behavioral problems). There were four covariates in each model: sex, age, race/ethnicity, and FPL. Age in years was dichotomized into two categories to represent younger (10–13 years) and older (14–17 years) youth. The NSCH-provided weighting variable (i.e., "FWC") was used in the analyses (CAHMI, 2021). The weighting variable adjusted for nonresponse from households and other variables related to the household, such as special healthcare needs of the child, number of people in the home, and education of the respondent (CAHMI, 2021). Analyses were performed using SPSS (Version 26). Linear regression analyses were conducted to examine collinearity, using variance inflation factor (VIF) values, among predictors and covariates for both models. Little's Missing Completely at Random (MCAR) test was conducted, and results indicated that missing data were minimal (0.7–1.3%) and missing completely at random. Cases with missing data were removed from the analyses.

Results

Participants' sociodemographic information is presented in Table 1. There were 2,285 youth whose parents reported that they currently have anxiety. More than half (53.1%) of them had moderate/severe anxiety. The majority of participants were females (55.4%), between 14–17 years (63.7%), White alone (84.6%), and had FPLs of either 200–399% (31.2%) or ≥ 400% (39.3%). About 74.3% of participants did not currently have behavioral problems while 25.7% currently had behavioral problems. Additionally, 64.2% of youth experienced at least one or more ACEs; specifically, 24.9% of youth experienced one ACE and 39.3% experienced ≥2 ACEs. Regarding parental stress and emotional help with parenting, 80.7% of youth had parents who seldom felt stressed from parenting, and 80.8% had parents who received emotional help with parenting.

The results of the multivariable logistic regression analysis for youth with anxiety who currently have behavioral problems are presented in Table 2. The Hosmer and Lemeshow goodness-of-fit test showed that the model was not significant ($p = 0.431$) and was a good fit. Variance inflation factors (VIFs) in the model indicated no multicollinearity among the predictors and covariates with values < 1.1 (Johnston et al., 2018; Lomax & Hahs-Vaughn 2012). Results indicated that youth with mild anxiety were less likely to have current behavioral problems compared to those with moderate/severe anxiety (OR = 0.402, $p < 0.001$, see Table 2). Youth with 0 or one ACE were less likely to have current behavioral problems than youth with ≥2 ACEs (OR = 0.371, $p < 0.001$ and OR = 0.525, $p < 0.001$

Table 1 Sociodemographic Information of Youth with Current Anxiety, 2019 NSCH

Variable	*n*	%
Parent-Rated Severity of Child's Current Anxiety		
Current condition rated mild	1072	46.9
Current condition rated moderate/severe	1213	53.1
Sex		
Male	1020	44.6
Female	1265	55.4
Age Level		
10–13	830	36.3
14–17	1455	63.7
Race/Ethnicity		
White alone	1932	84.6
Black or African American alone	111	4.9
Other	242	10.6
FPL		
0–99%	268	11.7
100–199%	408	17.9
200–399%	712	31.2
≥400%	897	39.3
Behavioral or Conduct Problems		
Does not have condition	1601	70.1
Past condition	95	4.2
Current condition	589	25.7
ACESs		
0 ACEs	818	35.8
1 ACE	568	24.9
≥2 ACEs	899	39.3
Parental Stress		
Parent usually/always feels aggravation from parenting	441	19.3
Parent seldom feels aggravation from parenting	1844	80.7
Parent Receives Emotional Help with Parenting		
Yes	1846	80.8
No	439	19.2

NSCH National Survey of Children's Health, *FPL* federal poverty level, *ACEs* adverse childhood experiences

Table 2 Logistic regression results for youth with current anxiety who have current behavioral problems, 2019 NSCH

Variables	*n*(%)[a]	aOR	95% CI lower	95% CI upper	*p*[b]
Parent-Rated Severity of Child's Current Anxiety					
Current condition rated mild	1072 (46.9)	0.402	0.400	0.404	<0.001
Current condition rated moderate/ severe	1213 (53.1)	(Ref)	(Ref)	(Ref)	(Ref)
ACEs					
0 ACEs	818 (35.8)	0.371	0.369	0.374	<0.001
1 ACE	568 (24.9)	0.525	0.521	0.529	<0.001
≥2 ACEs	899 (39.3)	(Ref)	(Ref)	(Ref)	(Ref)
Parental stress					
Parent usually/ always feels aggravation from parenting	441 (19.3)	8.501	8.445	8.558	<0.001
Parent seldom feels aggravation from parenting	1844 (80.7)	(Ref)	(Ref)	(Ref)	(Ref)
Parent Receives Emotional Help with Parenting					
Yes	1846 (80.8)	0.452	0.449	0.455	<0.001
No	439 (19.2)	(Ref)	(Ref)	(Ref)	(Ref)
Sex					
Male	1020 (44.6)	3.547	3.527	3.568	<0.001
Female	1265 (55.4)	(Ref)	(Ref)	(Ref)	(Ref)
Age level					
10–13	830 (36.3)	3.125	3.107	3.143	<0.001
14–17	1455 (63.7)	(Ref)	(Ref)	(Ref)	(Ref)
Race/Ethnicity					
White alone	1932 (84.6)	2.226	2.208	2.245	<0.001
Black or African American alone	111 (4.9)	7.362	7.283	7.442	<0.001
Other	242 (10.6)	(Ref)	(Ref)	(Ref)	(Ref)
FPL					
0–99%	268 (11.7)	1.306	1.295	1.317	<0.001
100–199%	408 (17.9)	1.801	1.786	1.816	<0.001
200–399%	712 (31.2)	0.843	0.837	0.850	<0.001
≥400%	897 (39.3)	(Ref)	(Ref)	(Ref)	(Ref)

$n = 2285$. *NSCH* National Survey of Children's Health, *aOR* adjusted odds ratio, *CI* confidence interval, *Ref* reference, *ACEs* adverse childhood experiences, *FPL*, federal poverty level

[a]Raw counts and weighted row percentages are presented in the *n* (%) column. Missing values were excluded

[b]Multivariable logistic regression analysis controlling for child sex, age, race/ethnicity, and FPL

respectively). Youth whose parents usually/always felt stressed from parenting were more likely to have current behavioral problems than those whose parents rarely felt stressed from parenting (OR = 8.501, $p < 0.001$). Parents who reported having emotional support with parenting were less likely to have youth with current behavioral problems than those with no emotional support (OR = 0.452, $p < 0.001$).

When regarding covariates, male youth were more likely to have current behavioral problems compared to female youth (OR = 3.547, $p < 0.001$, see Table 2). Similarly, younger youth (10–13 years) were more likely to have current behavioral problems compared to older youth (OR = 3.125, $p < 0.001$). Also, both White and Black youth had a higher likelihood of having current behavioral problems compared to youth in the Other racial/ethnic group (OR = 2.226, $p < 0.001$ and OR = 7.362, $p < 0.001$ respectively). Finally, those residing at lower FPLs (i.e., 0–99% FPL and 100–199% FPL) had higher odds of having current behavioral problems (OR = 1.306, $p < 0.001$ and OR = 1.801, $p < 0.001$ respectively) than those in the highest FPL at ≥400%. The odds of having current behavioral problems were lower for youth residing in families that fall within 200–399% FPL compared to those in the highest FPL at ≥400% (OR = 0.843, $p < 0.001$).

The results of the multivariable logistic regression analysis for youth with anxiety who have past behavioral problems are presented in Table 3. The Hosmer and Lemeshow goodness-of-fit test showed that this model was not significant ($p = 0.325$) and was also a good fit. Variance inflation factors (VIFs) in this model also indicated no multicollinearity among the predictors and covariates with values < 1.1 (Johnston et al., 2018; Lomax & Hahs-Vaughn 2012). The predictors were significant, showing the same pattern as results for youth with current behavioral problems. Specifically, youth with mild anxiety were less likely to have past behavioral problems compared to those with moderate/severe anxiety (OR = 0.667, $p < 0.001$). Likewise, youth who experienced 0 or one ACE were less likely to have had past behavioral problems compared to youth who experienced ≥2 ACEs (OR = 0.359, $p < 0.001$ and OR = 0.847, $p < 0.001$ respectively). Also, youth whose parents usually/always felt stressed from parenting had higher odds of having past behavioral problems than youth whose parents seldom felt stressed from parenting (OR = 2.518, $p < 0.001$). Emotional support for parents was a protective factor as youth whose parents received emotional support with parenting had a lower likelihood of having past behavioral problems compared to those whose parents did not receive emotional support with parenting (OR = 0.664, $p < 0.001$).

Considering the covariates in the second model, male youth had higher odds of having past behavioral problems than female youth (OR = 1.981, $p < 0.001$). Younger youth (10–13 years) were more likely to have past behavioral problems compared to older youth (14–17 years) (OR = 1.055, $p < 0.001$). Compared to youth from Other

Table 3 Logistic regression results for youth with current anxiety who have past behavioral problems, 2019 NSCH

Variables	*n*(%)[a]	aOR	95% CI lower	95% CI upper	*p*[b]
Parent-Rated Severity of Child's Current Anxiety					
Current condition rated mild	1072 (46.9)	0.667	0.660	0.674	<0.001
Current condition rated moderate/severe	1213 (53.1)	(Ref)	(Ref)	(Ref)	(Ref)
ACEs					
0 ACEs	818 (35.8)	0.359	0.354	0.364	<0.001
1 ACE	568 (24.9)	0.847	0.836	857	<0.001
≥2 ACEs	899 (39.3)	(Ref)	(Ref)	(Ref)	(Ref)
Parental Stress					
Parent usually/always feels aggravation from parenting	441 (19.3)	2.518	2.485	2.551	<0.001
Parent seldom feels aggravation from parenting	1844 (80.7)	(Ref)	(Ref)	(Ref)	(Ref)
Parent Receives Emotional Help with Parenting					
Yes	1846 (80.8)	0.664	0.656	0.672	<0.001
No	439 (19.2)	(Ref)	(Ref)	(Ref)	(Ref)
Sex					
Male	1020 (44.6)	1.981	1.961	2.002	<0.001
Female	1265 (55.4)	(Ref)	(Ref)	(Ref)	(Ref)
Age Level					
10–13	830 (36.3)	1.055	1.044	1.066	<0.001
14–17	1455 (63.7)	(Ref)	(Ref)	(Ref)	(Ref)
Race/Ethnicity					
White alone	1932 (84.6)	0.943	0.930	0.955	<0.001
Black or African American alone	111 (4.9)	2.788	2.739	2.839	<0.001
Other	242 (10.6)	(Ref)	(Ref)	(Ref)	(Ref)
FPL					
0–99%	268 (11.7)	0.906	0.891	0.921	<0.001
100–199%	408 (17.9)	0.980	0.965	0.995	<0.05
200–399%	712 (31.2)	0.822	0.811	0.833	<0.001
≥400%	897 (39.3)	(Ref)	(Ref)	(Ref)	(Ref)

$n = 2285$. *NSCH* National Survey of Children's Health, *aOR* adjusted odds ratio, *CI* confidence interval, *Ref* reference, *ACEs* adverse childhood experiences, *FPL* federal poverty level

[a]Raw counts and weighted row percentages are presented in the *n* (%) column. Missing values were excluded

[b]Multivariable logistic regression analysis controlling for child sex, age level, race/ethnicity, and FPL

race/ethnicity, Black youth had higher odds (OR = 2.788, $p < 0.001$) whereas White youth had lower odds (OR = 0.943, $p < 0.001$) of having past behavioral problems. Youth with FPLs of 0–99% (OR = 0.906, $p < 0.001$), 100–199% (OR = 0.980, $p < 0.05$) and 200–399% (OR = 0.822, $p < 0.001$) were less likely to report past behavioral problems compared to youth with a ≥ 400% FPL.

Discussion

Findings from both models indicated that anxiety severity is a risk factor for behavioral problems among youth in the U.S. Specifically, youth with mild anxiety were less likely to have current or past behavioral problems compared to those with moderate/severe anxiety. This is consistent with previous studies (Neumann et al., 2010; Chung et al., 2019) reporting that children with more severe anxiety exhibit higher levels of behavioral problems than those with less severe symptoms (e.g., mild anxiety). It may be that more anxious children feel a need to overcome the discomfort they feel in anxiety-provoking situations; hence, they develop disruptive behaviors such as anger and aggression as coping strategies (Neumann et al., 2010). This idea is speculative, however, and it is important that parents and health professionals monitor the functioning of youth with severe anxiety and provide relevant interventions to lessen the risk of exhibiting behavioral problems.

Adverse Childhood Experiences

In addition, both models indicated that youth with anxiety who experienced 0 or one ACE were significantly less likely to have current or past behavioral problems compared to youth who experienced ≥2 ACEs, which supports previous research (Bevilacqua et al., 2021; Blodgett & Lanigan, 2018; Kovács-Tóth et al., 2021; El-Din et al., 2019). Given the high prevalence rates of ACEs with one-in-three children <18 years old experiencing at least one ACE (HRSA, 2019) and the potential long-term negative effects of ACEs exposure on quality of life and health (CDC, 2019; Herzog & Schmahl, 2018; Monnat & Chandler, 2015), interventions are needed to mitigate the impact of ACEs exposure among youth. For example, it is critical to support parents with healthy coping behaviors when they are stressed, so that they can model appropriate behaviors for their children and minimize the impact of traumatic experiences (Monnat & Chandler, 2015; Suh & Luthar, 2020).

Parental Stress

As expected, both models showed that parents who usually/always felt stressed from parenting were more likely to have youth who currently or previously had behavioral problems than youth whose parents seldom felt stressed from parenting. Neece et al. (2012) and Suh and Luthar (2020) reported similar findings for youth with mental health problems, but our findings extend this relationship to older youth with current anxiety. In-depth interviews with parents feeling significant stress may reveal ideas for behaviors and attitudes that assist them in mitigating their stress, such as how they are attuned to their child's feelings and reasons for negative behaviors (Arbel et al., 2020). Encouragingly, about 81% of the parents seldom felt stressed from parenting in this study. Parents may be learning ways to manage stress and promote child development from counseling, media, and literature, which strengthens their abilities to foster resilience in their children. How parents foster child functioning and reduce their stress remains an area for research.

Emotional Support for Parents

We anticipated that emotional support for parents would be a protective factor for youth with current anxiety, who had current or past behavioral problems. This notion was supported in this study with the two models revealing that parents who received emotional support with parenting were less likely to have children with current or past behavioral problems compared to children living with parents who did not receive emotional support with parenting. This is similar to previous research (Cheng and Furnham, 2021; Herwig et al., 2004; Lippold et al., 2018). In this study, the majority (81%) of parents reported that they were receiving emotional support for their parenting efforts, which is encouraging. Conducting studies to assess parental views of support needed especially when parenting a child with comorbid anxiety and behavioral problems will provide information for clinicians to aim to increase support. In addition, determining who could be a support person and how they should support parents will advance knowledge. For instance, understanding how friends, family members, or neighbors can provide support to parents would provide useful information for prevention messaging and intervention efforts.

The three demographic covariates of sex, age, and race/ethnicity similarly predicted current or past behavioral problems in both models. For example, male youth were more likely to have current or past behavioral problems than female youth. This is analogous to results of other studies (e.g., Arbel et al., 2020; Owens, 2016). Age level and race/ethnicity were also significant, such that younger youth (10–13 years) and Black youth had a higher likelihood of current or past behavioral problems. These findings were consistent with previous research (Ghandour et al., 2019; McLaughlin et al., 2007). Results for FPL were less clear between the two models. Overall, results were consistent with literature demonstrating that youth residing in low-income families were more at risk for exhibiting behavioral problems (Kaiser et al., 2017; Peisch et al., 2017). However, there were fine-grained differences in the relations among FPLs and current or past behavioral problems. For the model assessing youth with current behavioral problems, youth from low-income families (defined as being at 0–99% FPL and 100–199% FPL) were more likely to exhibit current behavioral problems compared to youth residing in the highest income families (≥400% FPL). In the second model predicting youth with past behavioral problems, youth who resided in the first three FPLs of 0–99%, 100–199%, and 200–399% were less likely to have past behavioral problems compared to youth who resided in the highest FPL of ≥400%. The FPL categories were broad, and several factors that were not publicly available for analysis (e.g., income level) contributed to determining the FPL. Further examination of relations among various factors related to FPL, such as neighborhood conditions, bears further investigation.

Study Limitations

Several factors limited the generalizability of our findings. First, parents provided data about their child's anxiety and behavioral problems, and their recall may not be accurate. Having health care professionals provide diagnoses or

examining medical records may provide more accurate information about anxiety and behavioral problems of the child. Research, however, shows that parents' recall of their youth's emotional and behavioral concerns is fairly accurate (Hoagwood et al., 2000). For example, Crone et al. (2016) found that parents and pediatricians often provide information that is similar regarding the diagnoses of children. Data on sociodemographic variables was limited. For example, dichotomizing age into two categories for younger (10 to 13 years) and older youth (14 to 17 years) may not accurately reflect developmental changes across these two age groups. However, results suggested age level differences, indicating that this split showed that age is associated with past and current behavioral problems in children with anxiety. Additionally, the Other category for racial/ethnic groups was broad, and more information is needed to understand relations among study variables and children in a variety of racial/ethnic groups. Similarly, the majority of our sample were Caucasian, and it will be important that future studies recruit a broader representation of youth of color in future studies. Questions used in the NSCH were typically single items that were developed for use in the survey. Using measures with multiple questions assessing a construct or using measures that have good psychometric properties to assess constructs may provide a more comprehensive assessment of key constructs. For example, parental stress was assessed using three questions, which may have provided a limited perspective on this broad topic. Emotional support for parents, another comprehensive topic, was assessed using only one question. In the future, asking parents about the kind of emotional support they receive and what types of support help them may provide more information about this construct. We examined number of ACEs, and more information is needed about what types of ACEs lead to comorbid mental health problems. Additionally, the cross-sectional nature of this study and the wording of questions about behavioral problems did not allow for examination of a temporal relationship between variables of interest. More stable assessment may occur over time, using longitudinal assessments, and longitudinal designs may provide information to answer whether parental stress and emotional support of parents play causal roles in the maintenance of behavioral problems in children who are also experiencing current anxiety.

In summary, results supported the notion that anxiety severity, high parental stress, and lack of emotional support for parents were related to current and past behavioral problems among youth with current anxiety. Reducing parental stress and improving emotional support for parents may improve child and family functioning and quality of life. Screening for ACEs will provide information about whether trauma-informed treatment could be added to interventions to address co-occurring anxiety and behavioral problems. Future research needs to assess changes in anxiety and behavioral problems over time to understand what factors are important at different developmental stages and differentiate youth who are experiencing behavioral problems from those who are not. Increasing the understanding of how specific types of ACEs and parental support are related to the functioning of youth with anxiety and behavioral problems will also assist clinicians in determining key areas for interventions to promote resilience among youth with co-occurring anxiety and behavioral problems.

Conclusion and Implications of Study Findings

Implications for research, policy, and practice are four-fold. First, more research is needed to determine parental and microsystem factors, such as family members' influence on child functioning, to determine critical factors for intervention for children with comorbid anxiety and behavioral concerns. Second, results of this study point to the importance of tailoring interventions based on child gender, age level, and race/ethnicity, rather than offering "one size fits all" approaches to addressing mental health problems among youth. Third, when developing interventions for youth, it is important to consider effective strategies for assisting parents in reducing stress, harnessing their emotional functioning, and encouraging them to seek support when needed. Ensuring parents are included in interventions, even when their youth are older, may be critical for supporting them. Examining the types and level of parent engagement and support that is needed will be an important contribution to future research. Finally, schools and policymakers need to consider the needs of families who have youth with anxiety and behavioral problems, recognizing that youth with anxiety also face other mental health concerns that may affect their lives. The impact of policies to ensure that mental health concerns are addressed need to be determined, as policy level changes may provide support to youth that attenuates the long-term risks of anxiety and behavioral problems for child development.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

Informed Consent Statement This study used publicly available de-identified data and did not constitute human subject research. Thus, participants' informed consent and consent to publish were not required.

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