

The Relationship Between Parents' Poor Emotional Health Status and Childhood Mood and Anxiety Disorder in Florida Children, National Survey of Children's Health, 2011–2012

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Abstract The purpose of this study was to examine how parents' emotional health relates to childhood mood and anxiety disorder among Florida children in the 2011–2012 National Survey of Children's Health. Analyses were restricted to 1,241 Florida children 6–17 years of age. Childhood mood and anxiety disorder was defined as a parent-reported diagnosis of current depression or anxiety. Parents' emotional health status was a composite measure of the lowest reported emotional health of any parent in the household. To assess the association between parents' emotional health and childhood mood and anxiety disorder, bivariate and multivariate logistic regression analyses were performed. Nearly 5 % of Florida children had a mood or anxiety disorder in 2011–2012. Children living with a parent in poor emotional health were significantly more likely to have a mood or anxiety disorder compared to children living with a parent in good emotional health (OR 5.01; 95 % CI 1.89, 13.29). After adjusting for covariates, this association remained substantial and significant (aOR 4.33; 95 % CI 1.49, 12.57). Findings presented here are consistent with national findings and emphasize the strong link between parents' emotional health status and childhood mood and anxiety disorders. To address the mental health of children in the state of Florida, Florida public health initiatives should consider family processes and child level characteristics.

Keywords Children · Mental health · Parent health · National Survey of Children's Health (NSCH)

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Introduction

Mental illness in childhood is a particularly important public health issue. National studies estimate that up to one in five children in the US experience a mental health disorder in a given year [1], suggesting that rates of childhood mental illness are comparable to rates of major physical conditions that commonly occur in children, such as diabetes and asthma [2]. Mood and anxiety disorders are among the most pervasive of childhood mental illnesses. These disorders are generally characterized by feelings of sadness, depression, fear, or low self-esteem [1], and are frequently comorbid in children [3, 4]. Children who suffer from mood and anxiety disorders are more likely to have difficulties at home, in school, or in social settings compared to their mentally healthy peers [1]. These disorders commonly occur with other health conditions, and have been linked to injury, suicide, criminal behaviors, and risk-taking (e.g., substance use and sexual risk behaviors) [1, 5]. Mood and anxiety disorders interfere with healthy development and often persist or repeat over a period of months or years, continuing to impact individuals well into adulthood [1, 5, 6].

The cause of mood and anxiety disorders in children is multifactorial [5]; however, family related factors have emerged as important determinants of childhood mental illness. The American Academy of Pediatrics states that “The health and well-being of children are inextricably linked to their parents' physical, emotional, and social health... [7].” The link between parents' emotional health and the health of children as it relates to mental illness has been well established in US samples of children [8]. Poor emotional health in parents is associated with a greater risk for childhood mental illness, including childhood mood and anxiety disorders [9–13]. This association can begin as

early as infancy and is seen throughout all stages of child development [12]. The prevalence of emotional health problems in parents makes this association particularly worrisome. For example, a 2009 report by the National Research Council estimated that approximately 15.6 million children in the US lived with a parent or guardian who had major depression in the past year [14].

While previous findings describe the extent of the relationship between parental emotional health and childhood mental illness on a national level, this association has not been examined in great detail at state or local levels. Large differences in the health and well-being of children and families persist within and across states, suggesting that national analyses may obscure significant differences in the relationship between parental emotional health and childhood mental illness at the state level. State-specific examinations allow for a comparison to the national average and provide an opportunity to better understand childhood mental illness and the role of parents' emotional health within a given population. Observed differences can be used to tailor necessary interventions and ultimately strengthen the capacity to meet the needs of sub-groups of children and families and improve overall health. The state of Florida is the fourth largest state in the nation, and is often recognized for its diverse racial and cultural population. As population characteristics contribute to health outcomes, and a primary focus of Florida public health initiatives is improving the health and well-being of children and families, the purpose of this study was to examine the relationship between parents' emotional health status and childhood mental illness in Florida. Due to the prevalent nature of childhood mood and anxiety disorders, these mental illnesses were the focus of this study.

Methods

Data Source

Data from the 2011–2012 National Survey of Children's Health (NSCH) were used for analyses. The NSCH [15] is a cross-sectional survey designed to provide national and state level data on a variety of childhood health indicators and factors related to child well-being. The NSCH is conducted as part of the State and Local Area Integrated Telephone Survey (SLAITS) program by the Centers for Disease Control and Prevention in collaboration with the Maternal and Child Health Bureau of the US Department of Health and Human Services. SLAITS uses a list-assisted random-digit-dial (RDD) sample of landline telephone numbers to identify US households with at least one resident child under the age of 18. In 2011–2012, an independent sample of RDD cell phone numbers was included

as a supplement to the landline telephone numbers [16]. One child from each eligible household in the sample was randomly selected to be the subject of the survey, and a parent or guardian (from this point forward referred to as parent) with knowledge of that child's health completed the survey. A full description of the NSCH survey methodology has been published elsewhere [16] and is available from <http://www.cdc.gov/nchs/slaits/nsch.htm>. The de-identified NSCH data are publicly available; therefore, approval from the institutional review board was not required.

Sample

Of the 95,677 respondents who completed the NSCH in 2011–2012, a total of 1,855 were Florida residents [15]. Data on children between the ages of 6 and 17 ($n = 1,258$) were used for analyses because criteria for identifying and assessing mental health symptoms and disorders in very young children (ages 2 to 5) are low in reliability and validity [17, 18]. Children with missing data on the outcome of interest ($n = 2$) and children who did not have information on the emotional health status of at least one parent living in the household ($n = 15$) were excluded, resulting in a final analytical sample of 1,241 Florida children.

Dependent Variable

The outcome of interest in this study was childhood mood and anxiety disorder. Parents were asked to report whether the focal child had ever been diagnosed with any of 17 specific health conditions, several of which were related to mental health. Because symptoms of depression and anxiety are the most common characteristics of mood and anxiety disorder [1, 19], these indicators were selected to represent the dependent variable. A binary measure was created to identify children whose parents indicated they had been told by a doctor or healthcare provider that their child had depression or anxiety and the respective condition was current at the time of the survey.

Independent Variable

The primary independent variable in this study was parents' emotional health status. Each parent responding to the survey was asked to rate his or her own mental and emotional health, and that of any other parent living in the household, on a 5-point scale (excellent, very good, good, fair, or poor). Few differences were noted between parents reporting excellent, very good, or good emotional health; and fair or poor emotional health was reported infrequently. For this reason, responses were collapsed into two

Table 1 Descriptive characteristics of Florida children aged 6–17, National Survey of Children’s Health, 2011–2012 (n = 1,241)

	Unweighted n ^a	Weighted %	CI
<i>Mood or anxiety disorder</i>			
No	1,189	95.48	0.93, 0.97
Yes	52	4.52	0.03, 0.07
<i>Parent emotional health</i>			
Good	1,144	92.00	0.89, 0.94
Poor	97	8.00	0.06, 0.11
<i>Age group</i>			
6–12 years	746	56.42	0.52, 0.60
13–17 years	495	43.58	0.40, 0.48
<i>Gender</i>			
Male	676	51.16	0.47, 0.55
Female	563	48.37	0.44, 0.52
<i>Race/ethnicity</i>			
White, Non-Hispanic	646	44.56	0.41, 0.49
Black, Non-Hispanic	154	20.49	0.17, 0.24
Hispanic	319	25.46	0.22, 0.29
Other	95	7.95	0.06, 0.10
<i>Family structure</i>			
Two parent ^b	889	66.63	0.63, 0.71
Single mother	244	24.20	0.21, 0.28
Other	104	8.73	0.07, 0.11
<i>Parent education</i>			
HS or less	295	34.45	0.30, 0.39
More than HS	946	65.55	0.61, 0.70
<i>Household employment</i>			
Employed	1,044	81.81	0.78, 0.85
Unemployed	178	16.47	0.01, 0.20
<i>Household income</i>			
<200 % FPL	457	49.64	0.46, 0.54
200–399 % FPL	343	25.50	0.22, 0.29
≥400 % FPL or greater	441	24.86	0.22, 0.28
<i>No. of children in household</i>			
1 child	543	25.51	0.22, 0.29
2+ children	698	74.49	0.71, 0.78
<i>Adverse childhood experiences (ACEs)</i>			
Unexposed	592	41.56	0.38, 0.45
Exposed	616	55.70	0.52, 0.60
<i>Access to health care</i>			
No	253	23.2	0.20, 0.27
Yes	988	76.8	0.73, 0.80
<i>Attention/behavioral disorder</i>			
No	1,091	88.15	0.85, 0.91
Yes	150	11.85	0.09, 0.18

^a Total n may differ for each characteristic due to missing values
^b Two parent household = two biological parents, two adopted parents, or one parent/one step parent

categories: (1) good (excellent, very good, or good), and (2) poor (fair or poor). In an effort to be mindful of the relatively small sample of children living with a parent in poor emotional health, and to allow children from diverse family types to contribute to analyses, a composite measure was created to indicate the lowest reported emotional health status of any parent in the household. Reports of poor emotional health captured by this measure were due in large part to mothers’ poor emotional health status.

Covariates

Numerous covariates were selected for inclusion in this study based on previous literature and data availability (see Table 1). Child and family characteristics included child’s age, gender, race/ethnicity, family structure, highest parent education, household employment status, household income as a percentage of the federal poverty level (FPL), and number of children in the household. Additional variables included exposure to adverse childhood experiences (ACEs), access to healthcare, and diagnosed attention or behavioral disorder.

A measure of exposure to ACEs was created based on parent responses to nine survey items included in the 2011–2012 NSCH [20]. The ACE items capture various psychosocial risk factors that affect children, including whether or not a child has ever experienced: (1) parental separation or divorce, (2) death of a parent or guardian, (3) socioeconomic hardship, (4) domestic violence, (5) neighborhood violence, (6) substance abuse in the household, (7) parental incarceration, (8) familial mental illness, or (9) racial discrimination. An index of exposure to adverse childhood experiences was created by summing the total number of ACEs a child was exposed to. This measure was then categorized into exposed (one or more ACEs) and unexposed (no ACEs).

Following previous research [21], a measure of access to health care was created using two survey items: (1) receipt of preventive medical care in the last 12 months, and (2) delay or denial of needed medical care in the last 12 months. Children who had one or more preventive medical care visits and did not experience a delay or denial of needed medical care in the last 12 months were categorized as having access to health care. This variable was included in analyses because limited access to health care may represent a bias in the parent-reported mental health diagnoses examined here.

Mood and anxiety disorders may cause restless, impulsive, or disruptive behaviors in some children and subsequently be mistaken for attention or behavioral disorders

[22]. For this reason, a binary indicator of diagnosed attention or behavioral disorder was included in analyses as a statistical control. Diagnosed attention or behavioral disorder was defined as a parent-reported diagnosis of current: (1) attention deficit disorder or attention deficit hyperactivity disorder, or (2) behavioral or conduct problems.

Missing values for the selected variables ranged from a low of 0.1 % for gender to a high of 2.7 % for exposure to adverse childhood experiences. For household income, missing values were replaced using single imputation values provided by the NSCH [15, 16]. All variables were considered confounding factors when examining the relationship between parents' emotional health status and childhood mood and anxiety disorder.

Statistical Analyses

Statistical analyses were performed using STATA software, version 12.1 (StataCorp, College Station, TX). All estimates were weighted to adjust for the complex sampling design of the NSCH unless otherwise specified. Weighted estimates are representative of all non-institutionalized Florida children aged 6–17. Descriptive statistics were calculated for all variables listed above. Bivariate analyses, including Chi square tests, were conducted to assess relationships between variables and evaluate significant differences in those relationships. Bivariate and multivariate logistic regression analyses were performed to generate odds ratios (OR) and 95 % confidence intervals (CI) for the association between parents' emotional health status and childhood mood and anxiety disorder. Odds ratios from the multivariate logistic regression model were adjusted for all covariates simultaneously. Diagnostic tests to identify problematic variables were incorporated into preliminary analyses (e.g., correlation coefficients, variance inflation factors), and no issues were detected. Findings were considered statistically significant at $p < 0.05$.

Results

Among Florida children 6–17 years of age, 4.5 % had a mood or anxiety disorder at the time of the survey (Table 1). The emotional health status of children's parents was generally high, with most children (92.0 %) living with a parent who reported good emotional health. Only a small percentage of children (8.0 %) were living with a parent who reported poor emotional health; however, the prevalence of mood or anxiety disorder was significantly higher among these children compared to children living with a parent who reported good emotional health (15.6 and 3.6 %, respectively) (Table 2). Variations in the

percentage of children with a mood or anxiety disorder were also evident across sample characteristics. The prevalence of mood or anxiety disorder was significantly higher among children living with a single mother, children living in an unemployed household, and children who had been exposed to adverse childhood experiences. A significantly higher percentage of children with a diagnosed attention or behavioral disorder also had a mood or anxiety disorder.

The prevalence of living with a parent in poor emotional health also varied across sample characteristics (results not shown). A significantly higher percentage of children in low income households (<200 % of the FPL) and children exposed to adverse childhood experiences were living with a parent who reported poor emotional health. Interestingly, the percentage of children living with a parent who reported poor emotional health did not significantly differ across the remaining sample characteristics.

For logistic regression analyses (Table 3), unadjusted odds ratios reveal that children living with a parent who reported poor emotional health had approximately five times the odds of having a mood or anxiety disorder (OR 5.01; 95 % CI 1.89, 13.29) compared to children living with a parent who reported good emotional health. After adjusting for all covariates in the final logistic regression model, parents' emotional health status remained a significant, substantial predictor of childhood mood and anxiety disorder among children living with a parent in poor emotional health (aOR 4.33; 95 % CI 1.49, 12.57). In addition to parents' emotional health status, factors significantly associated with childhood mood or anxiety disorder in the final logistic regression model included household employment status and diagnosed attention or behavioral disorder.

Discussion

The purpose of this study was to examine the relationship between parents' emotional health status and childhood mental illness in a representative sample of Florida children 6–17 years of age. Findings from this study reveal that 4.5 % of Florida children had a mood or anxiety disorder in 2011–2012, and 8.0 % were living with a parent in poor emotional health. Using the same definition and data source, the national prevalence of childhood mood and anxiety disorder was 5.4 and 10.1 % of children were living with a parent in poor emotional health. Overall, the prevalence estimates of childhood mood and anxiety disorder and poor parental emotional health were slightly lower in Florida, although these differences were not statistically significant. This finding suggests that prevalence rates in Florida are generally consistent with national

Table 2 Prevalence of mood or anxiety disorder among Florida children aged 6–17 across select characteristics, National Survey of Children’s Health, 2011–12 (n = 1,241)

	Mood or anxiety disorder		<i>p</i> ^a
	Yes Weighted % (CI)	No Weighted % (CI)	
<i>Parent emotional health</i>			0.0004
Good	3.56 (0.02, 0.05)	96.44 (0.95, 0.98)	
Poor	15.61 (0.07, 0.31)	84.39 (0.69, 0.93)	
<i>Age group</i>			0.1751
6–12 years	3.49 (0.02, 0.06)	96.51 (0.94, 0.98)	
13–17 years	5.86 (0.04, 0.09)	94.14 (0.91, 0.96)	
<i>Gender</i>			0.9208
Male	4.76 (0.03, 0.07)	95.24 (0.93, 0.97)	
Female	4.32 (0.02, 0.08)	95.68 (0.92, 0.98)	
<i>Race/ethnicity</i>			0.3801
White, Non-Hispanic	5.71 (0.03, 0.10)	94.29 (0.90, 0.97)	
Black, Non-Hispanic	2.65 (0.01, 0.07)	97.35 (0.93, 0.99)	
Hispanic	3.08 (0.02, 0.06)	96.92 (0.94, 0.98)	
Other	6.54 (0.02, 0.19)	93.46 (0.81, 0.98)	
<i>Family structure</i>			0.0288
Two parent	2.86 (0.02, 0.05)	97.14 (0.95, 0.98)	
Single mother	8.86 (0.05, 0.15)	91.14 (0.85, 0.95)	
Other	5.46 (0.02, 0.16)	94.54 (0.84, 0.98)	
<i>Parent education</i>			0.1026
HS or less	2.89 (0.02, 0.05)	97.11 (0.95, 0.98)	
More than HS	5.38 (0.03, 0.08)	94.62 (0.92, 0.97)	
<i>Household employment</i>			0.0000
Employed	2.84 (0.02, 0.05)	97.16 (0.95, 0.98)	
Unemployed	12.83 (0.07, 0.22)	87.17 (0.78, 0.93)	
<i>Household income</i>			0.8215
<200 % FPL	4.30 (0.02, 0.07)	95.70 (0.93, 0.98)	
200–399 % FPL	4.08 (0.02, 0.08)	95.92 (0.92, 0.98)	
≥400 % FPL or greater	5.42 (0.03, 0.11)	94.58 (0.89, 0.97)	
<i>No. of children in household</i>			0.0722
1 child	7.09 (0.04, 0.12)	92.91 (0.88, 0.96)	
2+ children	3.65 (0.02, 0.06)	96.35 (0.94, 0.98)	
<i>Adverse childhood experiences (ACEs)</i>			0.0035
Unexposed	1.90 (0.01, 0.04)	98.10 (0.96, 0.99)	
Exposed	6.55 (0.04, 0.10)	93.45 (0.90, 0.96)	
<i>Access to health care</i>			0.5736
No	3.63 (0.01, 0.09)	96.37 (0.91, 0.99)	
Yes	4.79 (0.03, 0.07)	95.21 (0.93, 0.97)	
<i>Attention/behavioral disorder</i>			0.0000
No	2.25 (0.01, 0.04)	97.75 (0.96, 0.99)	
Yes	21.47 (0.13, 0.33)	78.53 (0.67, 0.97)	

^a Chi square *p* value

averages. Also consistent with national findings [8–13], the odds of having a mood or anxiety disorder among Florida children were approximately five times greater for children living with a parent in poor emotional health compared to children living with a parent whose emotional health status was good. Controls for confounding somewhat dampened

the magnitude of this association; however, it remained both substantial and significant.

This study makes an important contribution to the literature on the mental and emotional health and well-being of children and families at the state level. The findings from this study of Florida children closely resemble

Table 3 Odds ratios for the association between parent emotional health and mood or anxiety disorder among Florida children aged 6–17, National Survey of Children’s Health, 2011–2012 (n = 1,241)

	Unadjusted OR (CI) (n = 1, 241)	Adjusted OR (CI) ^a (n = 1,181)
<i>Parent emotional health</i>		
Good	–	–
Poor	5.01 (1.89, 13.29)***	4.33 (1.49, 12.57)**
<i>Age group</i>		
6–12 years	–	–
13–17 years	–	1.52 (0.63, 3.65)
<i>Gender</i>		
Male	–	–
Female	–	1.11 (0.47, 2.63)
<i>Race/ethnicity</i>		
White, Non-Hispanic	–	–
Black, Non-Hispanic	–	0.49 (0.12, 2.00)
Hispanic	–	0.67 (0.26, 1.69)
Other	–	0.65 (0.18, 2.35)
<i>Family structure</i>		
Two parent	–	–
Single mother	–	1.69 (0.53, 5.37)
Other	–	1.20 (0.35, 4.14)
<i>Parent education</i>		
HS or less	–	–
More than HS	–	2.81 (0.88, 9.07)
<i>Household employment</i>		
Employed	–	–
Unemployed	–	5.43 (2.19, 13.52)***
<i>Household income</i>		
<200 % FPL	–	0.73 (0.21, 2.57)
200–399 % FPL	–	–
≥400 % FPL or greater	–	1.87 (0.62, 5.68)
<i>No. of children in household</i>		
1 child	–	–
2+ children	–	0.73 (0.33, 1.62)
<i>Adverse childhood experiences (ACEs)</i>		
Unexposed	–	–
Exposed	–	2.28 (0.82, 6.38)
<i>Access to health care</i>		
No	–	–
Yes	–	0.73 (0.26, 2.04)
<i>Attention/behavioral disorder</i>		
No	–	–
Yes	–	10.05 (4.04, 25.00)***

– Referent group

* $p < .05$; ** $p < .01$; *** $p < .001$ ^a Adjusted for all variables simultaneously

findings from national studies, emphasizing the strong link between parents’ emotional health status and childhood mood and anxiety disorders. These findings also have important implications for public health programs and policies in the state of Florida. To address childhood mood and anxiety disorders and reduce adverse outcomes among Florida families, Florida public health initiatives should consider family processes in addition to child level characteristics. Proper treatment and prevention efforts at both the child and family level can improve the overall health and well-being of children with mental illness and their families. The findings presented here also suggest the need to direct attention to the mental and emotional health needs of Florida’s families.

This study is subject to several limitations. The NSCH is a cross-sectional data set; therefore, the ability to determine whether parents’ emotional health leads to childhood mood and anxiety disorder is limited. It may be that the relationship between the two is reversed (i.e., parents’ reports of poor emotional health are a result of having a child with mental illness). In addition, the outcome of interest in this study was based on parent-reported diagnoses of depression or anxiety. Although statistical controls for access to health care were included in analyses, the stigma often surrounding diagnosed mental illnesses suggest that reporting of this measure by survey respondents may still underestimate the prevalence of mood and anxiety disorder among children in this sample. Parents’ reports of their own emotional health status (or that of any other parent living in the household) may also be subject to bias. Finally, residual confounding by factors not considered in this study may be present.

Continued research should seek to confirm the findings presented here using a longitudinal data set that will allow temporal order of parent and child health indicators to be established. Future research should also consider the severity of parent emotional health status and childhood mood and anxiety disorders, as severity may influence the strength of the association found here. Other states may wish to replicate this study to better understand state-specific differences in the mental and emotional health of children and families and ultimately reduce rates of childhood mental illness across the nation.

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