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The Relationship of Reported Neighborhood Conditions with Child Mental Health

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Abstract

Objective—While multiple studies have documented the relationship between neighborhood socioeconomic status and child mental health, few have examined the association between neighborhood conditions and mental health disorders. The objective of this study was to determine whether parent-reported neighborhood conditions are associated with common child mental health disorders.

Methods—We analyzed data on children ages 6–17 (N = 64,076) collected through the 2007 National Survey of Children’s Health. Primary outcome variables were a child being reported to have a diagnosis of (a) anxiety and/or depression and (b) attention-deficit hyperactivity disorder (ADHD) and/or disruptive behavior. Main independent variables were parent-reported neighborhood amenities (e.g., recreation center), poor physical characteristics (e.g., dilapidated housing), social support/trust, neighborhood safety, and school safety. Multivariate logistic regression analyses were conducted to examine associations between neighborhood conditions and (a) anxiety/depression and (b) ADHD/disruptive behavior.

Results—Children living in a neighborhood with three poor physical characteristics had higher odds of anxiety/depression (AOR 1.58, 95% CI [1.01–2.46]) and ADHD/disruptive behavior (AOR 1.44, 95% CI [1.04–1.99]) compared to children living in a neighborhood with no poor physical characteristics. Children of parents who reported living in a neighborhood with low social support/trust had higher odds of depression/anxiety (AOR 1.71, 95% CI [1.28–2.30]) and ADHD/disruptive behavior (AOR 1.47, 95% CI [1.19–1.81]) than children living in a neighborhood with greater social support/trust.

Conclusions—Parent perception of neighborhood social support/trust and physical characteristics may be important to assess in clinical settings and should be examined in future study of child mental health burden.

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Keywords

child; mental health; neighborhood; social determinants

Introduction

A large body of literature demonstrates a link between low family socioeconomic status (SES) and increased child mental health problems.¹⁻⁴ Recent examination of a nationally representative sample demonstrated that children from low SES families are more likely to have any common mental health disorder, including attention deficit-hyperactivity disorder (ADHD), conduct disorder, anxiety disorder, and mood disorder, compared to children from higher SES families.⁵ Similarly, study of a nationally representative sample of adolescents demonstrated that lower parental SES is associated with a higher prevalence of adolescent mood, anxiety, and behavior disorders.⁶

Given the widespread influence of SES on health, the *social determinants of health* is increasingly advocated as a framework to examine and address inequalities in child health.⁷⁻⁸ The World Health Organization defines the social determinants of health as the conditions in which people are born, grow, live, work, and age.⁹ Neighborhood context, in particular, has been postulated as an important factor in understanding child health outcomes,^{10,11} such as mental health disorders.

Studies examining the relationship between neighborhood factors and child mental health have largely shown an association between neighborhood-level SES (e.g., unemployment rate) or structure (e.g., percent of minorities) and mental health.¹²⁻¹³ Limited studies have identified neighborhood conditions that are associated with mental health disorders.¹⁴⁻¹⁶ Neighborhood conditions can be defined as the physical and social aspects of neighborhoods that may impact mental health.¹⁷ In contrast to neighborhood SES, which involves indicators of neighborhood-level education, occupation, and income, neighborhood physical conditions include the physical quality of neighborhoods (e.g., housing quality) and available amenities (e.g. recreational resources).¹⁷ Neighborhood social conditions include the level of safety and support/trust.¹⁷ The few studies examining neighborhood conditions and child mental health used local data and indicate more mental disorder symptoms are associated with lower neighborhood social cohesion and safety,¹⁴⁻¹⁵ including violence exposure.¹⁶ However, additional study examining several neighborhood conditions using nationally-representative data is needed to elucidate neighborhood circumstances that may be important targets of intervention to decrease child mental health burden.

The purpose of this study was to examine whether negative neighborhood physical and social conditions are associated with common mental health disorders among a nationally-representative sample of children and adolescents. Specific aims included examining the relationships between parent-reported neighborhood physical and social conditions and: (a) depression and/or anxiety, and (b) ADHD and/or disruptive behavior disorders. We hypothesized significant associations between negative neighborhood conditions and greater child mental health disorders while controlling for individual sociodemographic characteristics and parental mental health.

Methods

Study Design and Participants

This study includes data from parents and guardians of children ages 6–17 (N = 64,076) who participated in the 2007 National Survey of Children’s Health (NSCH).¹⁸ The NSCH is a

telephone-based survey conducted in the United States in Spanish and English. The survey is directed by the Centers for Disease Control and Prevention's National Center for Health Statistics and sponsored by the Maternal Child Health Bureau. A random digit dial procedure identified households across the 50 states and the District of Columbia with at least one child below age 18 years. If more than one household child was under age 18, one was randomly selected as the interview focus. Survey respondents included adult guardians who answered questions about demographics, child health, health insurance, health care utilization, access to health care, medical home, family functioning, parental health, and neighborhood characteristics. The survey was approximately 20 minutes in duration, and conducted using a computer-assisted telephone interview. Households without a landline telephone were not included. The overall response rate was 46.7%. Efforts to maximize response rate included sending advance letters, toll-free telephone numbers allowing participants to call at their convenience, cash incentives, refusal conversion efforts, translated questionnaires, and obtaining feedback to improve procedures. Data estimates were adjusted for nonresponse. The Baylor College of Medicine Institutional Review Board approved the current study.

Dependent Variables

Current Mental Health—Mental health diagnosis measurement was informed by previous research demonstrating common child mental health disorders constitute two dimensions, labeled internalizing and externalizing disorders, and symptoms of disorders within each dimension are correlated.¹⁹ Thus, we simultaneously examined (a) anxiety and depression, and (b) ADHD and other disruptive behavior to reflect internalizing and externalizing disorders, respectively. Overall, dichotomous outcome (yes or no) variables included two measures of child mental health: (a) anxiety and/or depression and (b) ADHD and/or disruptive behavior problems. Each condition was measured by a two-question series. Parents were first asked “Has a doctor or other health care provider ever told you that (child’s name) has (condition)?” The conditions included “attention deficit disorder or attention deficit hyperactive disorder,” “depression,” “anxiety problems,” and “behavior or conduct problems such as oppositional defiant disorder or conduct disorder.” When a parent responded “yes” to the first question, they were then asked “Does your child currently have (condition).” The presence of anxiety and/or depression was identified if the parent responded “yes” to both questions in the series related to depression or anxiety. The presence of ADHD and/or disruptive behavior was identified if the parent responded “yes” to both questions in the series related to ADHD or disruptive behavior (See Table 1).

Independent Variables

Neighborhood Conditions—Primary independent variables were five measures of neighborhood conditions: neighborhood amenities, poor physical characteristics, neighborhood support/trust, neighborhood safety, and school safety. Scoring of the neighborhood variables was accomplished using algorithms provided within the NSCH¹⁸ (descriptions below). This was done to maintain consistency with some published studies using neighborhood data from the NSCH.^{20–21} Table 1 indicates survey questions.

Neighborhood Amenities was measured by parent response (yes or no) to 4 questions with the stem “Please tell me if the following places and things are available to children in your neighborhood, even if (child) does not actually use them”: (1) sidewalks or walking paths?, (2) a park or playground area?, (3) a recreation center, community center, or boys’ or girls’ club?, and (4) a library or book mobile?. The number of affirmative responses were summed; scores ranged from 0 (no affirmative responses) to 4 (all affirmative responses).

Poor Physical Characteristics was measured by parent response (yes or no) to the following 3 questions: (1) “In your neighborhood, is there litter or garbage on the street or sidewalk?; (2) How about poorly kept or dilapidated housing?; (3) How about vandalism such as broken windows or graffiti?”. The number of affirmative responses were summed; scores ranged from 0 (no poor features) to 3 (3 poor features).

Neighborhood Support/Trust was measured by parent level of agreement with the following statements: “People in the neighborhood help each other out”; “We watch out for each other’s children in this neighborhood”; “There are people I can count on in this neighborhood”; “If my child were outside playing and got hurt or scared, there are adults nearby I can trust to help my child”. Parents responded to each item on a 4- point likert scale ranging from definitely disagree to definitely agree. In the NSCH scoring algorithm, parent responses were transformed into a dichotomous variable (“living in a supportive neighborhood” vs. “not living in a supportive neighborhood”). Specifically, item responses were assigned values (i.e., definitely agree = 1 to definitely disagree = 4) and an average was calculated. Thus, parent responses were reported at the ordinal level, but responses were transformed to interval-data. The threshold for living in a supportive neighborhood is a mean score of 2.25 or higher, indicating that no more than one response was a “disagree” option.

Neighborhood Safety was measured by parent response to the question “How often do you feel (child) is safe in your community or neighborhood.” Parents responded on a 4-point likert scale: never, sometimes, usually, or always. In the NSCH algorithm responses of “usually” and “always” were combined. The variable was scored as never, sometimes, or usually/always.

School Safety was measured by parent response to the question “How often do you feel (child) is safe at school?” Parents responded on a 4-point likert scale ranging from never to always. In the NSCH algorithm, responses of “usually” and “always” were combined. The variable was scored as never, sometimes, or usually/always.

Covariates

Covariate variables included child gender, child age, insurance status, race, parent education, household poverty status, and parental mental health. Insurance status was first assessed by the question, “Does (child) have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicaid?” If parents responded “yes”, they were asked: “During the past 12-months, was there any time when (he/she) was not covered by any health insurance?” A dichotomous variable was created. Parents who indicated their child was currently insured and there was not any time during the past 12-months that their child was not covered by insurance were categorized as insured; all others were categorized as not insured. Race/ethnicity was determined using survey categories. Parents were first asked if their child was of Hispanic or Latino origin. They were also asked if their child was of one or more of the following: White, Black or African American, American Indian, Alaska Native, Asian, Native Hawaiian, or other Pacific Islander. Mutually-exclusive categories were created for this study: non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanic other (hereafter referred to as white, black, Hispanic, and other). Income data relative to the Federal Poverty Level (FPL) was assessed. Responses for parental education were categorized as less than high school, 12 years/high school graduate, and more than high school. Parental mental health was assessed by the questions “Would you say that, in general (Child’s Mother’s) mental and emotional health is excellent, very good, good, fair, or poor?” and “Would you say that, in general (Child’s Father’s) mental and emotional health is excellent, very good, fair, or poor?” The respondent’s least favorable response to these two questions was used for this study to

account for the effect of either parent's poor mental health on child disorders. A dichotomous variable was created for this study (excellent/very good/ good vs. fair/poor).

Data Analysis

Descriptive statistics were performed to summarize sample characteristics and child disorders. Rao-Scott chi-square tests were performed to determine differences in the distribution of sample characteristics between children with and without disorders. We first conducted unadjusted logistic regression analyses to examine bivariate relationships between neighborhood conditions and disorders. Logistic regression analyses were conducted due to binary dependent variables (disorders). Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated for the bivariate models. To account for the complex sample design, standard errors were estimated using the Taylor series linearization method.²² First, each neighborhood condition was evaluated in a separate regression model examining child anxiety/depression and ADHD/disruptive behavior. We then examined the multivariate relationship between neighborhood conditions and (a) child anxiety/depression and (b) child ADHD/disruptive behavior while controlling for other neighborhood conditions, child gender, child age, insurance status, race/ethnicity, parent education, household poverty, and parental mental health. To examine the multivariate relationship, all neighborhood characteristics were entered in the model with covariates to evaluate the unique contribution of each neighborhood condition to child anxiety/depression and ADHD/disruptive behavior separately.

Finally, we conducted two exploratory multivariate analyses using each neighborhood amenity separately as a dichotomous independent variable (present vs. not present) to systematically evaluate whether the availability of specific types of amenities are associated with child mental health while controlling for sociodemographic and other neighborhood variables.

Results

Descriptive Statistics

Table 2 contains demographic information and weighted percentages for the entire study sample and by diagnoses. Approximately 5% (n = 3,267) of children were reported to have anxiety/depression, and 10% (n = 6,239) were reported to have ADHD/disruptive behavior. Among children with a disorder, the majority were reported to only have anxiety/depression or ADHD/disruptive behavior (77%), and 23% were reported to have both. The youngest age category (6–8 years) had the lowest percentage of anxiety/depression (3%) and ADHD/disruptive behavior (7%). Males had the highest proportion of anxiety/depression (5%) and ADHD/disruptive behavior (14%). Hispanic children had the lowest proportion of ADHD/disruptive behavior (7%). Children living in households with an income of 0–99% FPL had the highest proportion of anxiety/depression and ADHD/disruptive behavior (7% and 14%). Children of parents with more than a high school education had the lowest proportion of ADHD/disruptive behavior (8%). Children of parents with poor mental health had the highest proportion of anxiety/depression and ADHD/disruptive behavior (26% and 33%, respectively).

Bivariate and Multivariate Associations between Neighborhood Characteristics and Child Mental Health Disorders

Table 3 indicates results from the bivariate logistic regression analyses examining the association between neighborhood characteristics and disorders. In the bivariate analyses, parent-report of fewer neighborhood amenities, more poor physical qualities, lower neighborhood support, less frequent neighborhood safety, and less frequent school safety

were associated with higher odds of anxiety/depression and ADHD/disruptive behavior. Table 3 also shows results from multivariate logistic regression analyses to determine the unique contribution of each neighborhood characteristic to disorders while controlling for other neighborhood characteristics, sociodemographic factors, and parental mental health. In the multivariate analyses, having only one or three compared to having four neighborhood amenities were associated with higher odds of anxiety/depression. Notably, report of none or two amenities were not associated with increased odds of anxiety/depression. Number of amenities was not uniquely associated with ADHD/disruptive behavior. Additionally, exploratory analyses indicated no significant association between type of amenity and anxiety/depression or ADHD/disruptive behavior. Children living in a neighborhood with three poor physical qualities had higher odds of anxiety/depression and ADHD/disruptive behavior compared to children living in a neighborhood with no poor qualities. Children of parents who reported not living in a supportive neighborhood had higher odds of anxiety/depression, and ADHD/disruptive behavior than children whose parents reported living in a supportive neighborhood. Parent-reported neighborhood safety and school safety were not significantly related to mental health in the multivariate analyses.

In the multivariate model, higher odds of anxiety/depression were found for: older children ages 12–14 years and 15–17 years compared to younger children ages 6–8 years; males; children with insurance; and lower income households of 0%–99% FPL and 100–199%FPL compared to children from families with an income of 400% FPL or greater. Hispanic and black children had lower odds of anxiety/depression compared to white children. Children of parents with fair/poor mental health had higher odds of anxiety/depression compared to children of parents with good/excellent mental health.

Higher odds of ADHD/disruptive behavior were also associated with several sociodemographic factors in the multivariate model: older child ages of 9–11 years, 12–14 years, and 15–17 years compared to 6–8 years; male gender; insured status; and lower family incomes of 0–99% FPL and 100–199% FPL compared to 400%FPL or greater. Hispanic children had lower odds of ADHD/disruptive behavior compared to white children. Fair/poor parent mental health was associated with higher odds of ADHD/behavior problems compared to good/excellent parent mental health. See Table 3.

Discussion

Building on the body of research demonstrating the association between neighborhood and individual SES and child mental health,^{1–6, 13–14} findings from this nationally-representative study show that several neighborhood conditions are associated with higher odds of child mental health disorders. Specifically, living in a neighborhood with more poor physical qualities and low parent-perceived neighborhood social support/trust were uniquely associated with higher odds of anxiety and/or depression and ADHD and/or behavior problems, after controlling for other neighborhood conditions, individual sociodemographic factors and parental mental health. These findings are consistent with and extend previous study findings among children ages 5–11 years using local data from Chicago neighborhoods. Specifically, examination of parent survey (aggregated neighborhood social cohesion and child mental health symptoms) and U.S. census data (neighborhood disadvantage) showed that low parent-reported neighborhood social cohesion mediated the relationship between neighborhood disadvantage and child depressive and anxiety symptoms after controlling for sociodemographic characteristics.¹⁵

It was unexpected that while having one and three amenities were associated with higher odds of anxiety and/or depression, having none or two of the amenities were not. Although neighborhood resources, such as amenities, have been specified as important to child

outcomes¹³ and are hypothesized to promote mental health functioning by increasing child social support/cohesion²³, we could not identify any previous study that has examined their association with child disorders. The current study examined diverse types of neighborhood amenities but failed to find consistent associations of the number of available amenities with child mental health. The inconsistent findings and failure to find significant associations between the type of available amenities and disorders in exploratory analyses suggest that neighborhood amenities do not have a robust association with disorders when controlling for other neighborhood and sociodemographic factors.

We did not find evidence for a relationship between neighborhood or school safety and the examined disorders. Lack of significant associations is inconsistent with previous studies linking neighborhood safety with depression, anxiety, oppositional defiant disorder, and conduct disorder symptoms. This inconsistency is likely due to the different way in which safety was measured in the current study, which used parent-report. Previous studies have measured safety using adolescent-report of perceived safety.^{14, 23} Objective measures in previous studies have included frequency of neighborhood violent events encountered²⁴, and police district crime rates.²⁵ It is possible that objective and adolescent-report measures have a different association with child mental health compared to parent-report measures. Furthermore, neighborhood and school safety were not associated with the disorders after controlling for multiple factors, including neighborhood social support/trust. It is possible that neighborhood resources, such as social support/trust, may serve as a protective factor for children living in unsafe neighborhood conditions.²⁶

The current study findings indicate an important consideration for future study of neighborhood conditions as possible social determinants of child mental health. All of the neighborhood conditions were associated with increased odds of the examined disorders without controlling for other factors. However, when individual sociodemographic factors, parental mental health, and other neighborhood conditions were controlled, only neighborhood poor physical qualities and low social support/trust were associated with higher odds of disorders. Consistent with previous studies, older child age and lower household income were associated with higher odds of mental health problems.⁵⁻⁶ In line with a large body of literature, poor parental mental health emerged as a significant predictor of child mental health.²⁷ The results suggest the importance of examining sociodemographic factors and parental mental health, as well as multiple negative neighborhood conditions to identify the most robust circumstances that impact child mental health, as well as critical targets for neighborhood-level intervention.

Study Limitations

The study design is cross-sectional, thus causal relationships could not be determined. Child disorders were based on parent report of whether they had been told by a doctor that their child had the condition. Few children with mental health disorders actually receive mental health services.²⁸ In this study, having insurance was associated with higher odds of disorders. It is possible that children without insurance were less likely to receive health services in which a diagnosis could be made. Therefore; the current study may under represent the number of children with mental health problems and not fully reflect the association between disorders and neighborhood conditions. Neighborhood variables were scored using algorithms provided within the NSCH.¹⁸ Some scoring was accomplished by combining response categories or by transforming ordinal level data to interval data. This scoring may lead to different associations between neighborhood variables and disorders than other scoring options.

This study involves secondary data analysis, which limits the study to examination of previously collected data. Limitations of this approach include findings may not be generalizable to individuals without a landline telephone. Objective neighborhood measures would have expanded our options for examining neighborhood condition and child mental health. Perceptions of neighborhood conditions and objective conditions have associations with child mental health.^{14, 23–25} Inclusion of both measures is important for future studies. The NSCH may not represent the range of neighborhood types or contain adequate representation of individuals living in various types of neighborhoods. It is possible that the number of individuals in different types of neighborhoods may vary within geographic areas sampled in the NSCH. Length of time living in negative neighborhood conditions is likely associated with mental health, but was not available in the dataset. Studies have shown individual factors, such as parenting practices²⁹, family conflict³⁰, and child-peer relationships³¹ mediate the association between neighborhood SES and child mental health. Control for such factors in the current study would have allowed more precise estimates of associations. Differential effects of neighborhood disadvantage by gender and race have been found in previous research,³² but were not examined. Lastly, exposure to violence is associated with mental health, but was not in the dataset.^{24–25}

Conclusions

There is growing emphasis on using the social determinants of health as a framework for examining and addressing child mental health.^{7–8} The current study suggests that several neighborhood conditions are important for understanding and addressing child mental health burden, and may be social determinants of child mental health problems. In particular, examination of poor neighborhood physical characteristics and low neighborhood social cohesion/trust are warranted in future study. Future studies should include objective and perceptual measures of neighborhood conditions as well as individual factors that are possible pathways through which negative neighborhood conditions affect mental health. Such study can lead to development of neighborhood-level interventions that decrease child mental health burden.

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What's New?

Findings demonstrate that low neighborhood social support and poor physical qualities may be important for understanding and addressing child mental health burden given associations persisted after controlling for sociodemographic factors, other neighborhood conditions, and parental mental health.

Table 1

Survey Questions for Measurement of Neighborhood Conditions

Condition	Survey Questions
Amenities	<p>Please tell me if the following places and things are available to children in your neighborhood, even if (child) does not actually use them (i.e., yes or no):</p> <ol style="list-style-type: none"> 1 Sidewalks or walking paths? 2 A park or playground area? 3 A recreation center, community center, or boys' or girls' club? 4 A library or bookmobile?
Poor Physical Characteristics	<ol style="list-style-type: none"> 1 In your neighborhood, is there litter or garbage on the street or sidewalk? 2 How about poorly kept or dilapidated housing? 3 How about vandalism such as broken windows or graffiti?
Social Support/Trust	<p>Would you say that you definitely agree, somewhat agree, somewhat disagree, or definitely disagree with the following statements:</p> <ol style="list-style-type: none"> 1 People in this neighborhood help each other out 2 We watch out for each other's children in this neighborhood 3 There are people I can count on in this neighborhood 4 If my child were outside playing and got hurt or scared, there are adults nearby who I trust to help my child
Neighborhood Safety	<ol style="list-style-type: none"> 1 How often do you feel (child) is safe in your community or neighborhood? Would you say never, sometimes, usually, or always?
School Safety	<ol style="list-style-type: none"> 1 How often do you feel (he/she) is safe at school? Would you say never, sometimes, usually, or always?
Child Mental Health	<ol style="list-style-type: none"> 1 Has a doctor or other health care provider ever told you that (child) had (condition)? 2 Does (child) currently have (condition)? <p>Conditions were indicated as:</p> <p>Depression</p> <p>Anxiety problems</p> <p>Attention deficit disorder or attention deficit hyperactive disorder</p> <p>Behavior or conduct problems such as oppositional defiant disorder or conduct disorder</p>

Data Source: National Center for Health Statistics and Maternal and Child Health Bureau, National Survey of Children's Health, 2007

Table 2
Demographic Characteristics and Mental Health Diagnoses of the Study Sample

Variable	Overall (N=64076, Weighted=49278249)	Anxiety / Depression (n=3267, Weighted=2353663)	ADHD / Disruptive Behavior (n=6239, Weighted=4855961)	p-value ^c
Child's Age	N (Weighted %)	N ^a (Weighted %) ^b	N ^a (Weighted %) ^b	p-value ^c
6–8 years old	13592 (24.4)	404 (3.3)	926 (7.1)	<0.01
9–11 years old	14200 (24.1)	632 (4.0)	1442 (10.7)	
12–14 years old	16524 (26.1)	904 (5.4)	1799 (10.0)	
15–17 years old	19760 (25.4)	1327 (6.3)	2072 (11.4)	
Child's Gender				
Male	33292 (51.1)	1789 (5.3)	4326 (13.5)	<0.01
Female	30693 (48.9)	1474 (4.2)	1908 (6.0)	
Child's Race/Ethnicity				
Hispanic	7357 (19.4)	367 (4.0)	568 (6.9)	<0.01
White, non-Hispanic	43789 (57.2)	2330 (5.2)	4351 (10.4)	
Black, non-Hispanic	6450 (15.1)	247 (4.3)	724 (12.1)	
Other	5389 (8.3)	278 (4.9)	505 (9.0)	
Insurance Status Over Past 12 Months				
Uninsured	7731 (15.2)	407 (4.3)	676 (8.7)	0.14
Insured	56153 (84.8)	2856 (4.9)	5552 (10.1)	
Annual Household Income				
0–99% FPL	7038 (17.3)	634 (7.3)	1072 (14.1)	<0.01
100–199% FPL	10643 (20.5)	657 (5.8)	1177 (11.4)	
200–399% FPL	21866 (32.1)	1020 (3.6)	2002 (8.5)	
400% FPL or greater	24529 (30.1)	956 (3.9)	1988 (7.8)	
Parent's Highest Education Received				
Less than high school	4606 (12.0)	266 (5.2)	500 (10.2)	0.01
12 years/high school graduate	12382 (26.1)	660 (5.1)	1320 (11.0)	
More than high school	41755 (61.9)	1947 (4.2)	3654 (8.8)	
Parent's Mental Health				
				<0.01

Variable	Overall (N=64076, Weighted=49278249)		Anxiety / Depression (n=3267, Weighted=2353663)		ADHD / Disruptive Behavior (n=6239, Weighted=4855961)	
	N (Weighted %)	p-value ^c	N ^a (Weighted %) ^b	p-value ^c	N ^a (Weighted %) ^b	p-value ^c
Excellent	20069 (33.2)		437 (2.1)		1175 (5.9)	
Very good	23996 (37.8)		977 (3.7)		2099 (8.4)	
Good	11351 (21.1)		869 (6.4)		1406 (11.4)	
Fair	3129 (6.8)		457 (12.1)		654 (23.3)	
Poor	573 (1.1)		143 (25.5)		156 (33.1)	
Anxiety/Depression						
Yes	3267 (4.8)		-		-	
Behavior problems/ADHD						
Yes	6239 (9.9)		-		-	

FPL=Federal Poverty Level

^aUnweighted frequency of children in stratum with Anxiety / Depression or ADHD / Disruptive Behavior

^bWeighted % of children in stratum with Anxiety / Depression or ADHD / Disruptive Behavior

^cRao-Scott chi-square test

Data Source: National Center for Health Statistics and Maternal and Child Health Bureau, National Survey of Children's Health, 2007

Table 3

Bivariate and Multivariate Associations between Neighborhood Characteristics and Sociodemographic Factors and Child Mental Health

Variable	Frequency N (weighted %)	Anxiety / Depression		ADHD / Disruptive Behavior	
		^a Unadjusted OR Estimate (95% CI) ^c	^b Adjusted OR Estimate (95% CI) ^c	^a Unadjusted OR Estimate (95% CI) ^c	^b Adjusted OR Estimate (95% CI) ^c
Neighborhood amenities					
(vs. All 4 amenities present)	28493 (47.1)				
None present	3121 (4.7)	1.09 (0.83–1.43)	0.99 (0.72–1.36)	1.11 (0.89–1.38)	0.88 (0.66–1.16)
1 present	5036 (7.9)	1.50 (1.11–2.04)	1.49 (1.05–2.12)	1.46 (1.16–1.83)	1.22 (0.95–1.56)
2 present	9627 (14.6)	1.08 (0.84–1.41)	1.07 (0.79–1.44)	1.15 (0.95–1.40)	1.03 (0.84–1.25)
3 present	16253 (25.7)	1.20 (0.95–1.51)	1.30 (1.01–1.69)	1.06 (0.91–1.22)	1.03 (0.86–1.22)
Neighborhood Poor Physical Features					
(vs. None present)	46529 (72.0)				
1 present	11063 (18.0)	1.22 (0.97–1.52)	1.12 (0.86–1.47)	1.10 (0.94–1.28)	0.99 (0.83–1.17)
2 present	3751 (6.4)	1.49 (1.12–1.98)	1.04 (0.74–1.45)	1.25 (1.00–1.56)	0.88 (0.69–1.12)
3 present	1914 (3.6)	2.49 (1.77–3.52)	1.58 (1.01–2.46)	1.96 (1.51–2.56)	1.44 (1.04–1.99)
Supportive neighborhood					
(vs. Live in supportive)	55236 (84.9)				
Do not live in supportive	7715 (15.1)	1.76 (1.42–2.19)	1.71 (1.28–2.30)	1.53 (1.30–1.80)	1.47 (1.19–1.81)
Neighborhood safety					
(vs. Usually/Always safe)	56930 (86.4)				
Never safe	1034 (2.3)	1.99 (1.34–2.97)	0.80 (0.43–1.47)	1.28 (0.96–1.70)	0.82(0.52–1.30)
Sometimes safe	5420 (11.3)	1.46 (1.10–1.94)	1.00 (0.66–1.51)	1.36 (1.11–1.65)	0.96 (0.75–1.23)
School safety					
(vs. Usually/Always safe)	56933 (89.5)				
Never safe	406 (1.1)	3.45 (1.74–6.82)	2.01 (0.78–5.23)	1.54 (0.84–2.84)	0.71 (0.26–1.97)
Sometimes safe	4425 (9.4)	1.51 (1.20–1.90)	1.04 (0.75–1.45)	1.55 (1.27–1.88)	1.11 (0.88–1.41)
Child's Age					
(vs. 6–8 years old)	13592 (24.4)				
9–11 years old	14200 (24.1)	1.20 (0.87–1.66)	1.19 (0.81–1.74)	1.56 (1.29–1.90)	1.69 (1.38–2.08)
12–14 years old	16524 (26.1)	1.67 (1.22–2.28)	1.56(1.11–2.27)	1.45 (1.21–1.90)	1.51 (1.25–1.83)

Variable	Frequency N (weighted %)	Anxiety / Depression		ADHD / Disruptive Behavior	
		<i>a</i> Unadjusted OR Estimate (95% CI) ^c	<i>b</i> Adjusted OR Estimate (95% CI) ^c	<i>a</i> Unadjusted OR Estimate (95% CI) ^c	<i>b</i> Adjusted OR Estimate (95% CI) ^c
15–17 years old	19760 (25.4)	1.96 (1.45–2.65)	1.84 (1.32–2.58)	1.68 (1.38–2.04)	1.72 (1.39–2.13)
Child's Gender					
(vs. Female)	30693 (48.9)				
Male	33292 (51.1)	1.28 (1.07–1.52)	1.33 (1.09–1.62)	2.43 (2.11–2.80)	2.51 (2.15–2.92)
Child's Race/Ethnicity					
(vs. White, non-Hispanic)	43789 (57.2)				
Hispanic	7357 (19.4)	0.75 (0.55–1.03)	0.54 (0.38–0.76)	0.64 (0.50–0.81)	0.51 (0.37–0.70)
Black, non-Hispanic	6450 (15.1)	0.83 (0.62–1.11)	0.48 (0.33–0.70)	1.19 (1.00–1.41)	0.82 (0.67–1.00)
Other	5389 (8.3)	0.94 (0.71–1.24)	0.84 (0.63–1.13)	0.85 (0.68–1.06)	0.78 (0.61–1.01)
Insurance Status Over Past 12 Months					
(vs. Uninsured)	7731 (15.2)				
Insured	56153 (84.8)	1.13 (0.84–1.51)	1.45 (1.03–2.05)	1.17 (0.95–1.44)	1.42 (1.11–1.81)
Annual Household Income					
(vs. 400% FPL or greater)	24529 (30.1)				
0–99% FPL	7038 (17.3)	1.96 (1.54–2.50)	1.88 (1.35–2.64)	1.94 (1.62–2.33)	2.04 (1.61–2.58)
100–199% FPL	10643 (20.5)	1.51 (1.15–1.99)	1.75 (1.34–2.28)	1.52 (1.24–1.85)	1.55 (1.24–1.93)
200–399% FPL	21866 (32.1)	0.92 (0.74–1.16)	1.01 (0.80–1.28)	1.11 (0.93–1.31)	1.09 (0.91–1.30)
Parent's Highest Education Received					
(vs. More than high school)	41755 (61.9)				
Less than high school	4606 (12.0)	1.26 (0.87–1.84)	0.89 (0.56–1.39)	1.18 (0.92–1.51)	0.90 (0.67–1.20)
12 years/high school graduate	12382 (26.1)	1.25 (1.02–1.53)	0.92 (0.74–1.15)	1.29 (1.10–1.50)	0.99 (0.85–1.16)
Parent's Mental Health					
(vs. Excellent/Very good/Good)	55416 (92.1)				
Fair/Poor	3702 (7.9)	4.22 (3.38–5.28)	3.38 (2.51–4.56)	3.68 (3.00–4.51)	3.06 (2.47–3.78)

FPL=Federal Poverty Level

^aBivariate logistic regression analyses examining each neighborhood condition and each sociodemographic variable in a separate model^bMultivariate logistic regression adjusted for all neighborhood conditions, age, race, gender, insurance status, parent's education, annual household income, and parent mental health^cSignificant estimates are bolded.

Data Source: National Center for Health Statistics and Maternal and Child Health Bureau, National Survey of Children's Health, 2007