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Prevalence of mental health disorders among low-income African American adolescents

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Abstract

Purpose—Data on the prevalence of mental health disorders for low-income, urban African American adolescents are scarce. This study presents data about the burden of mental disorders for this understudied population.

Methods—Mental disorders were assessed using the Diagnostic Interview Schedule for Children (C-DISC), Youth Self-Report (YSR), and Child Behavior Checklist (CBCL) among a sample of adolescents and their caregivers from very impoverished neighborhoods in a Southern city.

Results—Based on the C-DISC, 3.8, 5.1 and 7.7 % of adolescents met diagnostic criteria for major depression, post-traumatic stress disorder, and conduct disorder, respectively. There were significant differences among some of the mental health disorders based on adolescent and caregiver characteristics such as sex, school status, caregiver work status, and income level. We found a low prevalence of alcohol, marijuana, and substance abuse and dependence disorders.

Conclusions—Information about the prevalence of mental health disorders in specific communities and populations can assist in addressing unmet needs, planning for services and treatment, and reducing health disparities.

Keywords

Adolescent mental health; Depression; Conduct disorder; Post-traumatic stress; Disorder; African American

Introduction

National data on the prevalence of mental health and substance use disorders among adolescents, particularly subgroups of adolescents, are scarce [1–3]. Data from the National Comorbidity Survey-Adolescent (NCS-A), which included 10,000 adolescents ages 13 through 17, are beginning to fill this gap for the general adolescent population. Recently published data presented the 12-month prevalence estimates for major depressive disorder (8.2 %), post-traumatic stress disorder (PTSD, 3.9 %), conduct disorder (5.4 %), alcohol abuse with or without dependence (4.7 %), and of having any DSM-IV disorder (40.3 %) for all adolescents [1].

It is even more challenging to obtain reliable, generalizable data for specific population subgroups, such as low-income, urban, African American adolescents. NCS-A data show that, compared to non-Hispanic Whites, non-Hispanic African Americans had similar prevalence rates of major depressive disorder, post-traumatic stress disorder, conduct disorder, or any diagnosis, but a higher prevalence of any anxiety disorder (30.9 % vs. 22.7 %) and a lower prevalence of alcohol abuse or dependence (1.4 % vs. 5.5 %) [4]. Among an insured adolescent sample, Whites were 3.8 and 1.3 times more likely than African Americans to have a substance use disorder or have any DSM-IV disorder [3]. However, previous literature is ambiguous regarding racial differences in anxiety and depression [5] and studies show racial and ethnic disparities in utilization of mental health services [6–11] as well as in the consequences of mental health disorders. For example, regarding disparities in utilization, a study using data from the National Longitudinal Study of Adolescent Health found that, regardless of income and parent education, only 8 % of distressed African American adolescents received counseling services, compared to 19 % of non-Hispanic Whites [9]. Mental disorders, including substance use, begin in childhood and tend to correspond with worse educational and employment outcomes in adulthood [12–14] as well as greater risk for other problems in adolescence such as physical victimization, incarceration and negative health outcomes [15–17].

There is strong evidence from the literature that poverty negatively impacts children's mental health [18]. For example, a study using three waves of longitudinal data found that persistent poverty was associated with depression and antisocial behavior [18]. A study that examined trajectories of depressive symptoms across adolescence and young adulthood found that most of the racial/ethnic differences in depression were explained by socioeconomic status and stressful events [19]. Another study found that 22 % of low-income adolescents were depressed compared to 11, 9, and 6 % of adolescents living in low-middle, middle-high, and high SES conditions [20].

Substance use and abuse is associated with increased risk for mental health disorders [21–23]. Nationally, rates of teenage substance use are high with 30-day use rates for 9th through 12th graders at 20 % for cigarettes, 42 % for alcohol, and 21 % for marijuana [17]. A convincing body of research documents that cigarette [24], drug, and alcohol use are consistently less prevalent among African American youth compared to White and Hispanic youth, [2, 4, 25–28] even when only including youth living in high-poverty areas [29]. Urban, low-income African American youth are more likely than Whites to have unmet

mental health needs [9, 30, 31] as well as greater risk factors for mental disorders due to poverty, exposure to violence, and experiences with racial discrimination [32–36].

Due to the paucity of subgroup data, further research is needed on the mental health status and needs of many minority groups. Our study of urban, low-income, African American youth included three measures of mental health on a wide range of disorders and the overarching purpose of this article is to present data on the frequency of mental disorders for the understudied and underserved population of low-income, African American youth. One strength of this study is the use of a structured psychiatric interview to estimate the prevalence of mental disorders, rather than relying exclusively on symptom or distress scales. Such scales may measure general psychological distress rather than depression, and often have low positive predictive values in non-clinical samples [37, 38]. Scale measures were also collected in this study, and we compare their association with results of the psychiatric interview, as well as by different types of caregivers that provided reports. Another strength of the current study is that participants were drawn from a larger community sample, rather than from a school-based sample. School-based samples have the advantage of being ascertained from a known sampling frame, but the disadvantage of excluding youths who are not in school. We explicitly test for differences in the frequencies of mental disorders among those in and out of school to help characterize this effect for future research in school and community samples.

Methods

This study, known as the Gene, Environment, Neighborhood Initiative (GENI), included a community sample of 592 adolescents aged 13 through 18 and their primary caregiver. The adolescents and caregivers were from predominantly African American, very low-income neighborhoods in the Mobile, Alabama metropolitan statistical area (MSA), basically the cities of Mobile (2010 population approximately 200,000) and Pritchard (2010 population approximately 20,000) [39]. As in many other cities in the United States, large concentrations of African Americans live in Mobile's low-income neighborhoods, and these neighborhoods are geographically clustered and physically isolated by natural and engineered barriers (e.g., highways).

GENI participants were recruited from a community-based, multiple cohort longitudinal study with annual data collection, the Mobile Youth Study (MYS); the MYS has been described in detail elsewhere [40, 41]. Participation in GENI involved approximately two and a half hour interview for both the adolescent and his/her caregiver. Interviews were conducted between March 2009 and October 2011. Written parental consent and youth assent were obtained. Caregivers and adolescents were compensated for their participation. Procedures for this study were approved by the Institutional Review Boards at Northwestern University, Virginia Commonwealth University, and the University of Alabama.

Measures

Mental health assessments

The Diagnostic Interview Schedule for Children (C-DISC) version 4.0 was used to assess *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* diagnoses. The C-DISC is a widely used assessment of psychiatric diagnoses among adolescents and is administered to adolescents as a computerized, structured interview by trained lay interviewers. Interviewers were educators, social workers, counselors with experience working with inner city youth, and college interns working on the MYS study. African American interviewers administered the C-DISC to 79 % of our sample and White interviewers administered it to 21 % of our sample; there were no significant differences in

the proportion of participants meeting diagnostic criteria based on the interviewer's race. All interviewers went through extensive training according to accepted procedures [42] and received ongoing supervision by licensed Clinical Psychologists trained in C-DISC administration and in psychological assessment of urban, minority youth. We administered modules for post-traumatic stress disorder (PTSD), major depression, conduct disorder, alcohol, nicotine, marijuana, and substance use; for the substance use modules, if the diagnosis of dependence was made, then the diagnosis of abuse was not assigned. All diagnoses were made based on an established and validated computer algorithm and were for the previous 12-month period. The acceptable reliability and validity of the computerized DISC 4.0 and earlier versions have been well-described [42, 43].

The Child Behavior Checklist (CBCL) and the Youth Self-Report (YSR) are used to assess symptoms of psychopathology. The CBCL is completed by a parent or caregiver and consists of 20 competence items and 120 items on behavior or emotional problems during the past 6 months. The YSR, completed by the adolescent, consists of 20 competence items and 112 behavioral items. Our analyses use the Internalizing and Externalizing broad band scales. The internalizing scale is the sum of scores from the anxious/depressed, withdrawn/depressed, and somatic/complaints syndrome scales, while the externalizing scale is the sum of the rule-breaking behavior and aggressive behavior syndromes. The clinically significant cutoffs for the YSR and CBCL scales have previously been normed by taking a sample of referred (clinical) participants and non-referred participants and computing the odds of a referred participant achieving a deviant score on each scale; 21 % of these samples were African Americans [44]. Studies have shown the CBCL and YSR to be reliable and valid [44] and these measures have been used in many diverse samples.

Sociodemographic characteristics

Self-reported race/ethnicity was categorized as African American, White, Asian, Mixed Race, Hispanic/Latino, or other. As this study was linked to the MYS, and between 89 and 94 % of MYS participants each year identified themselves as African American [29], almost all study participants were African American. Caregivers reported the age, sex and school attendance status of their participating adolescents as well as their own employment status, education level, marital status, the amount of money that the family lived on during the prior year, and relationship to the adolescent in the study.

Statistical analyses

We estimated unadjusted frequencies and standard errors (SE) for the entire sample and for demographic subsamples based on adolescent sex and age, as well as caregiver work status, educational level, marital status, and amount of money the family lived on the past year. Analyses of frequencies of the disorders were conducted using SPSS version 20.0 [45]; the data were not weighted. As the study design allowed for multiple children in the same household to participate, the analyses of effects of family and care-giver characteristics on adolescent mental health must account for the clustering of children within families. To accommodate this clustering, analyses were conducted using Hierarchical linear modeling (HLM) [46]. In HLM, we performed logistic regression to estimate the odds ratios and 95 % confidence intervals for differences in the frequencies of the disorders by child and caregiver demographics. To examine differences in outcomes using Chi-square testing, we categorized adolescents as either (1) attending a regular school program or completed/graduated school, or (2) not attending school. We also used cross-tabulations to estimate the sensitivity, specificity, and predictive values for the YSR/CBCL internalizing scale with the CDISC PTSD and major depression diagnoses, and the YSR/CBCL externalizing scale with the conduct disorder diagnosis from the CDISC.

To understand the representativeness of the GENI sample compared to the larger MYS sample ($N = 10,692$ through 2009), we compared the two groups on selected demographic and risk behaviors. MYS participants who had baseline MYS participation at age 12, 13 or 14 in the years 2003–2009 were included in this comparison. After controlling for sex, year of survey, age, and length of time living in their neighborhood, youths from the MYS who did and did not participate in GENI were not significantly different on risk behaviors and most family factors. Differences that were significant were trivial in magnitude.

Results

The demographic characteristics of the sample are provided in Table 1. The mean age of adolescent participants was 15.9 years, 51.2 % were female, almost all (98.8 %) were African American, and 84.2 % were attending a regular school program or had completed school. In terms of the characteristics of their caregivers, 40.4 % of adolescents had a currently working caregiver, 47.9 % of their caregivers had less than a high school education, 53.9 % were never married and had no live-in partner, and 50.7 % lived on less than \$10,000 in the previous year (84.3 % lived on less than \$20,000).

We present the percentage of participants meeting diagnostic criteria on the C-DISC in the prior 12 months (Table 2) by sociodemographic characteristics. The most common disorder for which diagnostic criteria was met was conduct disorder (7.7 %), followed by PTSD (5.1 %) and major depression (3.7 %). While the number of participants meeting criteria for the alcohol, nicotine, marijuana and substance abuse and dependence disorders was small (ranging from 0.3 % for alcohol dependence and substance abuse to 3.2 % for marijuana abuse), 41.7 % of alcohol abusers, 26.3 % of marijuana abusers, and 61.5 % of those dependent on marijuana also met criteria for conduct disorder (data not shown). Of the above disorders, 17.9 % of adolescents met diagnostic criteria for any disorder. A large majority (82.1 %) of adolescents did not have any disorders, while 12.1 % had one, and the remaining 5.8 % had between two and four disorders.

The percentage of adolescents with clinically significant scores on the YSR and CBCL broad band scales is shown in Table 3. Based on the YSR self-reports, 14.4 % of adolescents had clinically significant scores for internalizing problems, as did 23.2 % for externalizing problems. CBCL caregiver reports resulted in 21.0 and 33.7 % of adolescents having clinically significant scores for internalizing and externalizing problems, respectively.

The results of the logistic regression models testing demographic differences in C-DISC mental disorders are shown in Table 4. Females were nearly three times more likely than males to meet C-DISC diagnostic criteria for PTSD [odds ratio (OR) = 2.87], but were less likely than males to meet C-DISC diagnosis criteria for conduct disorder (OR = 0.57). There was an increase in alcohol abuse (OR = 1.53) with age. Adolescents who had a non-working caregiver were more likely (OR = 2.55) to have major depression and less likely (OR = 0.28) to be dependent on marijuana than adolescents with a working caregiver. Similar to the effect of parental employment, lower parental education was associated with higher rates of major depression (OR = 2.13). Compared to having a caregiver who was married, adolescents with a caregiver who was never married and had no live-in partner were less likely to report major depression (OR = 0.24). Participants not in a regular school program were more likely than adolescents in school or who had completed school to meet C-DISC diagnostic criteria for conduct disorder (OR = 2.00), marijuana abuse (OR = 4.60), marijuana dependence (OR = 3.66), and having any diagnosis (OR = 1.96), but were less likely to meet criteria for major depression (OR = 0.19). Adolescents living in a family that lived on less than \$20,000 last year were less likely than those who lived on more than \$20,000 to have any diagnosis (OR = 0.56).

There were a number of significant demographic differences using the YSR and CBCL broad band scales (Table 5). Results from both the YSR and CBCL show that females were about twice as likely as males to have a clinically significant score for externalizing problems (YSR OR = 1.86, CBCL OR = 1.95); our analyses of the scales and items that make up the externalizing problems scale indicate that this gender difference is driven by the higher proportion of girls than boys who had clinically significant scores on the YSR aggressive behaviors scale, including a significantly higher proportion of girls reporting yes to 10 of the 17 aggressive behavior items, such as “I argue a lot” and “I have a hot temper.” For the YSR internalizing problems scale, younger teens were less likely to have clinically significant scores (OR = 0.86), teens who had caregivers not currently working were more likely than teens with working caregivers to have clinically significant scores (OR = 2.49) and those with never married or separated/divorced/widowed caregivers were less likely than those with married caregivers to have clinically significant scores (OR = 0.38 and 0.51, respectively). CBCL results indicated a decreasing likelihood (OR = 0.77) of having a clinically significant score on the externalizing scale as age increased. Being in a family that lived on less than \$20,000 last year decreased the odds of a clinically significant score (OR = 0.41) on the YSR externalizing scale. Participants not in a regular school program were more likely than adolescents in school or who had completed school to have clinically significant scores on the YSR internalizing (OR = 1.87) and externalizing (OR = 3.28) scales and on the CBCL externalizing scale (OR = 2.11).

In addition to testing for sociodemographic differences described above, we also examined if the type of caregiver providing the report on the CBCL was associated with the response. The majority of the caregiver respondents was biological mothers (74.5 %), and responses were also provided by other female caregivers (16.9 %; e.g., grandmothers, aunts) and male caregivers (8.6 %; e.g., grandfathers, uncles). Compared to mothers, there were no apparent differences when reports were provided by other women. There were non-significant trends for other males to be less likely to endorse both internalizing and externalizing problems.

Table 6 reports cross-tabulations of the YSR and CBCL internalizing broad band scales by C-DISC PTSD and major depression diagnoses, and the externalizing broad band scales by C-DISC conduct disorder diagnosis. The lowest sensitivity was 30.0 % for PTSD, which indicated that only three of ten participants who met C-DISC PTSD criteria were correctly identified by the CBCL internalizing scale; the highest sensitivity was 71.1 % for participants who met C-DISC conduct disorder criteria also having clinically significant scores on the YSR externalizing problems scale. The specificity indicates the percentage of cases that the YSR or CBCL internalizing or externalizing scales correctly identified as non-cases on the C-DISC PTSD, major depression, or conduct disorder categories. For example, for the conduct disorder-YSR externalizing scale cross-tabulation, the specificity of 80.8 % represents the proportion of cases that the YSR correctly identified as non-conduct disorder. A clinically significant case on the YSR externalizing scale had a 23.5 % chance of meeting conduct disorder criteria, and a negative case had a 97.1 % probability of not meeting conduct disorder criteria (positive and negative predictive values, respectively).

Discussion

This study reports on the prevalence of mental health disorders for a sample of very low-income, African American adolescents in an urban, Southern city. Strengths of the study include: (1) data from different measures of mental health, the C-DISC, and the YSR and CBCL, based on interviewer administered structured psychiatric interviews, self-reports, and caregiver reports; (2) the representativeness of the GENI sample of the larger, longitudinal MYS sample; and (3) that our sample is community-based rather than school-based, so higher-risk youths are included (15.8 % of our sample reported that they were not in school,

dropped out of school, in a GED program, completed or graduated from school, home schooled, or some other situation). Since our sample is community-based rather than school-based, our findings likely avoid some of the weaknesses of school-based studies, which may underestimate risk behaviors, particularly for low-income youth, due to high absenteeism and dropout rates [47, 48]. Given the scarcity of data on the prevalence of mental health disorders for adolescents, and low-income minorities in particular, these estimates should prove useful to other researchers, program planners, and health care providers.

A goal of Healthy People 2020 is to eliminate health disparities and achieve health equity among Americans [49]. Therefore, one reason for examining the mental health of specific population groups is to determine whether there are health disparities. Limited data on the prevalence of mental health disorders in adolescents make it difficult to assess whether health disparities exist. A review of studies regarding racial differences in anxiety and depression among children and adolescents concluded that the literature was ambiguous [5]. The NCS-A reported overall prevalence rates of 8.2 % for major depression, 3.9 % for PTSD, 5.4 % for conduct disorder, and 4.7 % for alcohol abuse with or without dependence [1]; rates are also publicly available by race/ethnicity and by income category yet not for combinations of those categories [4]. Direct comparisons of prevalence across studies must be made with caution due to differences in study methodology; however, it is notable that the frequencies of PTSD (5.1 %) and conduct disorder (7.7 %) are slightly higher in our study than the prevalence rates in the NCS-A, while the frequency of depression (3.8 %) was less than half the prevalence in the NCS-A and the frequency of alcohol abuse was considerably lower (2.0 % for alcohol abuse, 0.3 % for alcohol dependence). Our population is one that is likely to be facing discrimination due to race and poverty, which may help explain the higher rate of conduct disorder, although not the lower rate of depression [50–53]. Our participants also lived in neighborhoods with a high level of violence, which could help to explain the higher rate of PTSD; we have data on exposure to violence and other stressors which we plan to explore in future analyses. Our finding of lower prevalence of depression among our sample than in the NCS-A adds to the inconsistencies in the literature regarding racial differences in the prevalence of depression [see 5]. The lower prevalence of alcohol abuse is consistent with national data on racial differences in substance use, such as the Youth Risk Behavior Surveillance Survey [17]. While some studies have found that lower socioeconomic status is associated with a higher prevalence of mental health disorders [18, 54], our results show lower prevalence of depression and alcohol abuse than in the NCS-A. This may be due to the intersection of race and SES [see 55] with other variables not measured here. Future research should further examine whether the differences we found hold up in other samples and possible reasons why they exist.

In the current study, there were a number of significant differences in prevalence of disorders based on sex. Girls were more likely than boys to have PTSD (C-DISC), and have externalizing problems (YSR and CBCL), while they were less likely to have conduct disorder (C-DISC); the discrepancy between externalizing problems and conduct disorder may be partially explained by measurement differences between the C-DISC and YSR/CBCL. An analysis of the YSR aggressive and rule-breaking behavior items, which form the externalizing problems scale, indicates that the difference between boys and girls is driven by the aggressive behavior scale; in fact, significantly more girls than boys reported ten of the seventeen aggressive behaviors (e.g., “I am mean to others,” “I argue a lot,” “My moods and feelings change suddenly”), while girls did not report more of any of the 15 rule-breaking behaviors and boys reported more of two of the 15 rule-breaking behaviors (“I cut classes or skip school” and “I think about sex too much”). Our finding regarding the YSR aggression scale is consistent with a study of African American high school students in Chicago, which also found girls had a significantly higher score on the YSR aggression scale than boys [56]. Girls in our study were not significantly more likely than boys to report

any of the C-DISC conduct disorder symptoms, which is consistent with previous research [57, 58]. Similarly, data from the NCS-A show higher rates of PTSD, anxiety, depression, and any diagnosis for girls than boys; the NCS-A findings of boys having higher prevalence of behavior and substance use disorders were not replicated here [4]. Sex differences could be related to how disorders were measured (e.g., use of aggressive versus non-aggressive behaviors) or relationship to age of onset for when disorders are prone to occur [59, 60]. There have been studies which look at sex differences in regard to factors which impact mental health disorders, such as exposure to violence [61, 62]; future analyses from GENI will allow us to examine how neighborhood, family and individual factors affect mental health for boys and girls in our study.

Our findings also demonstrate the importance of including school status when examining adolescent mental health disorders. Adolescents who were not in or had already completed a regular school program had a significantly higher likelihood of meeting diagnostic criteria for conduct disorder, marijuana abuse, marijuana dependence, and having any C-DISC diagnosis, as well as obtaining clinically significant scores on the YSR internalizing and externalizing scales and the CBCL externalizing scale; they also had a lower likelihood of meeting C-DISC criteria for major depression. It is not surprising that these youth would have more disruptive behaviors as that may be a reason why they are not currently in a regular school program. A multinational study of the association between mental health disorders and early school termination found significant associations among failure to complete secondary education and any anxiety disorder, any mood disorder, any impulse disorder, any substance use disorder and any mental disorder in high-income countries [63]. A study of youth in Mexico City also found a greater likelihood of conduct, mood, and substance use disorders among adolescents not in school compared to those who were attending school [64]. An explanation for why adolescents not currently in or graduated from a regular school program in our study were less likely to be depressed is more unclear and deserves further investigation. Certainly, not completing high school is a risk factor for further negative social outcomes [see 65].

The low prevalence of alcohol, marijuana, and substance abuse and dependence disorders does complement results from national surveys, including the NCS-A, regarding use of these substances among African American adolescents. Research has demonstrated the co-existence of marijuana [66–68], alcohol [69], and substance use [70] with conduct disorder. Despite the very small number of participants meeting diagnostic criteria for alcohol, marijuana, and substance abuse and dependence, we did find a significant association between substance abuse and conduct disorder.

The proportion of participants meeting C-DISC diagnostic criteria for PTSD, major depression, and conduct disorder is considerably lower than the proportion of adolescents with clinically significant scores on the YSR/CBCL internalizing and externalizing scales. The C-DISC is an interviewer administered structured psychiatric interview and the YSR/CBCL is a paper and pencil measure completed by the adolescent/caregiver. Using the C-DISC PTSD, major depression, and conduct disorder diagnoses as the gold standard resulted in low positive predictive value in all cases for the YSR/CBCL internalizing and externalizing scales; the strongest positive predictive value was 23.5 % of clinically significant YSR externalizing scale cases met conduct disorder criterion. Therefore, using YSR/CBCL broad band scales may overestimate DSM-IV PTSD, major depression, and conduct disorder in this population. Negative predictive values ranged from 94.5 to 98.2 % indicate that almost all youths with non-clinical scores on the YSR/CBCL scales will also fail to meet criteria in a structured clinical interview. This pattern suggests that as a screening instrument in this population, the YSR/CBCL has some utilities for screening out clinical disorders, but less utility in firmly establishing likely diagnoses.

Upon comparison of the CBCL and YSR, caregiver reports produced more clinically significant results for both externalizing and internalizing problems. Researchers have yet to settle on the best interpretation for inconsistencies in reports of child psychopathology from different informants, but the differences likely reflect different experiences with and perspectives on the child behavior [71]. Including the estimates from all three measures provides more information on this understudied subgroup as well as more opportunities for comparisons with other studies.

Our study does have several limitations. There are limitations with using self-report data, and we do see differences between the interviewer-administered C-DISC and the youth reports from the YSR. Also, we performed many tests, albeit on different dependent variables, so Type I errors may have occurred. Another limitation is that our results may not be generalizable to other samples, as they are based on a very specific sample of low-income African American adolescents in an urban area in the South. However, our study does provide detailed data on the prevalence of mental health disorders for an understudied, underserved population. Studies of specific populations can also complement national studies through their depth of measurement and specificity of population. It also may encourage further examination of the different psychological measures used to assess mental health and how to interpret results based on a single measure.

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Table 1Participant demographics ($N = 592$ adolescents)

Variable	% (No.)
Adolescent characteristics	
Sex	
Male	48.8 (289)
Female	51.2 (303)
African American	98.8 (584)
Age ^a	
13	1.7 (10)
14	19.1 (113)
15	20.5 (121)
16	20.5 (121)
17	20.6 (122)
18	17.6 (104)
School attendance status	
Yes, regular school program	80.5 (475)
Yes, vocational/technical	0.7 (4)
Yes, special education for limited abilities	0.2 (1)
Home schooling	0.3 (2)
Not in school	4.2 (25)
Dropout	3.7 (22)
GED program	4.9 (29)
Graduated/completed school	3.7 (22)
Other	1.7 (10)
Caregiver characteristics	
Currently working	
Yes	40.4 (239)
No	59.6 (352)
Educational level	
Less than high school	47.9 (283)
High school graduate	27.9 (165)
Some college/specialized training	18.8 (111)
College graduate or higher	5.4 (32)
Marital status	
Married	17.6 (104)
Never married/no live-in partner	53.9 (318)
Separated/divorced/widowed	25.6 (151)
Live-in partner	2.9 (17)
Amount lived on past year	
<\$10,000	50.7 (299)
\$10,000–\$19,999	33.6 (198)

Variable	% (No.)
\$20,000–\$29,999	8.8 (52)
\$30,000 or more	6.9 (41)
Relationship to child	
Biological mother	74.5 (441)
Other female	16.9 (100)
Any male	8.6 (51)

^aMean age=15.9 (SD=1.42)

Table 2
 Percentage of respondents meeting diagnosis criteria for mental disorders, C-DISC^a (N = 588)

	Posttraumatic stress disorder % (SE)	Major depression % (SE)	Conduct disorder % (SE)	Alcohol abuse % (SE)	Alcohol dependence % (SE)	Nicotine dependence % (SE)	Marijuana abuse % (SE)	Marijuana dependence % (SE)	Substance abuse % (SE)	Any diagnosis % (SE)
Number meeting criteria	30	22	45	12	2	4	19	13	2	105
Adolescent characteristics										
All	5.1 (0.9)	3.7 (0.8)	7.7 (1.1)	2.0 (0.6)	0.3 (0.2)	0.7 (0.3)	3.2 (0.7)	2.2 (0.6)	0.3 (0.2)	17.9 (1.6)
Sex										
Male	2.8 (1.0)	3.8 (1.1)	9.4 (1.7)	2.1 (0.8)	0.7 (0.5)	0.7 (0.5)	3.1 (1.0)	2.8 (1.0)	0.4 (0.3)	17.4 (2.2)
Female	7.3 (1.5)	3.7 (1.1)	6.0 (1.4)	2.0 (0.8)	0	0.7 (0.5)	3.3 (1.0)	1.7 (0.7)	0.3 (0.3)	18.3 (2.2)
Age										
13	0	0	0	0	0	0	0	0	0	0
14	6.3 (2.3)	3.6 (1.8)	4.5 (2.0)	0	0	0	0	1.8 (1.3)	0	14.3 (3.3)
15	6.7 (2.3)	6.7 (2.3)	12.5 (3.0)	0.8 (0.8)	0	0	2.5 (1.4)	0.8 (0.8)	0	25.0 (4.0)
16	3.3 (1.6)	2.5 (1.4)	10.0 (2.8)	3.3 (1.6)	0	1.7 (1.2)	7.5 (2.4)	5.0 (2.0)	0.8 (0.8)	22.5 (3.8)
17	4.1 (1.8)	2.5 (1.4)	6.6 (2.3)	1.6 (1.2)	0	0.8 (0.8)	2.5 (1.4)	1.6 (1.1)	0	12.2 (3.0)
18	5.8 (2.3)	3.9 (1.9)	4.9 (2.1)	4.9 (2.1)	1.9 (1.4)	1.0 (1.0)	3.9 (1.9)	1.9 (1.4)	1.0 (1.0)	16.5 (3.7)
School status										
In regular school program or completed/graduated	5.1 (1.0)	4.3 (0.9)	6.9 (1.1)	1.4 (0.5)	0.2 (0.2)	0.4 (0.3)	2.2 (0.7)	1.6 (0.6)	0.4 (0.3)	16.4 (1.7)
Other	5.4 (2.4)	1.1 (1.1)	11.8 (3.4)	5.4 (2.4)	1.1 (1.1)	2.2 (1.5)	8.6 (2.9)	5.4 (2.4)	0	25.8 (4.6)
Caregiver characteristics										
Currently working										
No	5.4 (1.2)	4.9 (1.2)	7.4 (1.4)	2.3 (0.8)	0.6 (0.4)	0.6 (0.4)	3.4 (1.0)	1.1 (0.6)	0	17.7 (2.0)
Yes	4.6 (1.4)	2.1 (0.9)	8.0 (1.8)	1.7 (0.8)	0	0.8 (0.6)	3.0 (1.1)	3.8 (1.2)	0.8 (0.6)	18.1 (2.5)
Educational level										
Less than high school	5.0 (1.3)	5.0 (1.3)	8.5 (1.7)	2.8 (1.0)	0.4 (0.4)	0.4 (0.4)	3.2 (1.1)	2.5 (0.9)	0.4 (0.4)	19.6 (2.4)
High school or higher	5.2 (1.3)	2.6 (0.9)	6.9 (1.4)	1.3 (0.7)	0.3 (0.3)	1.0 (0.6)	3.3 (0.1)	2.0 (0.8)	0.3 (0.3)	16.3 (2.1)
Marital status										
Married	7.8 (2.7)	5.8 (2.3)	6.8 (2.5)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	4.9 (2.1)	1.9 (1.4)	0	22.3 (4.1)
Never married/no live-in	4.1 (1.1)	1.9 (0.8)	7.6 (1.5)	1.9 (0.8)	0.3 (0.3)	0.6 (0.4)	3.2 (1.0)	2.5 (0.9)	0.3 (0.3)	14.5 (2.0)
Separated/divorced/widowed	5.4 (1.9)	6.0 (2.0)	9.4 (2.4)	3.4 (1.5)	0	0.7 (0.7)	2.0 (1.2)	2.0 (1.2)	0.7 (0.7)	22.2 (3.4)

	Posttraumatic stress disorder % (SE)	Major depression % (SE)	Conduct disorder % (SE)	Alcohol abuse % (SE)	Alcohol dependence % (SE)	Nicotine dependence % (SE)	Marijuana abuse % (SE)	Marijuana dependence % (SE)	Substance abuse % (SE)	Any diagnosis % (SE)
Live-in partner	5.9 (5.9)	5.9 (5.9)	0	0	0	0	0	0	0	11.8 (8.1)
Amount lived on past year										
<\$20,000	4.8 (0.1)	3.6 (0.8)	7.3 (1.2)	2.0 (0.6)	0.4 (0.3)	0.8 (0.4)	2.8 (0.7)	1.8 (0.6)	0.2 (0.2)	16.4 (1.7)
\$20,000 or more	6.5 (2.6)	4.3 (2.1)	9.8 (3.1)	2.2 (1.5)	0	0	5.4 (2.4)	4.3 (2.1)	1.1 (0.1)	26.1 (4.6)

^a *C-DISC* Computerized Diagnostic Interview Schedule for Children

Table 3

Percentage of respondents meeting diagnostic criteria for the Youth Self Report ($N = 590$) and Child Behavior Checklist ($N = 582$)

	Youth Self Report (YSR)		Child Behavior Checklist (CBCL)	
	Internalizing problems % (SE)	Externalizing problems % (SE)	Internalizing problems % (SE)	Externalizing problems % (SE)
Adolescent characteristics (<i>n</i>)	85	137	122	196
All	14.4 (1.4)	23.2 (1.7)	21.0 (1.7)	33.7 (2.0)
Sex				
Male	14.3 (2.1)	18.1 (2.3)	20.0 (2.4)	25.9 (2.6)
Female	14.6 (2.0)	28.2 (2.6)	21.6 (2.4)	41.2 (2.9)
Age				
13	20.0 (13.3)	10.0 (10.0)	20.0 (13.3)	40.0 (16.3)
14	16.1 (3.5)	23.2 (4.0)	19.6 (3.8)	40.2 (4.7)
15	15.7 (3.3)	25.6 (4.0)	16.7 (3.4)	39.2 (4.5)
16	14.1 (3.2)	24.0 (3.9)	24.8 (4.0)	33.3 (4.4)
17	14.8 (3.2)	25.4 (4.0)	25.4 (4.0)	30.6 (4.2)
18	10.7 (3.1)	18.5 (3.8)	18.3 (3.8)	24.0 (4.2)
School Status				
In regular school program or completed/graduated	13.7 (1.5)	19.8 (1.8)	19.6 (1.8)	31.9 (2.1)
Other	18.5 (4.1)	42.4 (5.2)	28.6 (4.8)	44.0 (5.2)
Caregiver characteristics				
Currently working				
No	18.7 (2.1)	25.1 (2.3)	22.4 (2.2)	35.5 (2.6)
Yes	8.4 (1.8)	20.1 (2.6)	19.0 (2.6)	31.0 (3.0)
Educational level				
Less than high school	16.4 (2.2)	26.0 (2.6)	19.7 (2.4)	36.5 (2.9)
High school or higher	12.7 (1.9)	20.5 (2.3)	22.2 (2.4)	30.9 (2.6)
Marital status				
Married	22.3 (4.1)	29.1 (4.5)	19.8 (4.0)	28.7 (4.5)
Never married/no live-in	12.3 (1.8)	22.0 (2.3)	19.4 (2.2)	30.8 (2.6)
Sep./divorced/widowed	13.9 (2.8)	22.5 (3.4)	24.5 (3.6)	42.9 (4.1)
Live-in partner	12.5 (8.5)	18.8 (10.1)	23.5 (10.6)	35.3 (11.9)
Amount lived on past year				
<\$20,000	14.8 (1.6)	21.0 (1.8)	19.6 (1.8)	32.6 (2.1)
\$20,000 or more	12.9 (3.5)	34.4 (5.0)	29.2 (4.8)	38.2 (5.2)
Relationship to adolescent				
Biological mother	–	–	21.1 (2.0)	34.6 (2.3)
Other female			23.2 (4.3)	34.3 (4.8)
Any male			14.9 (5.2)	23.4 (6.2)

Table 4

Odds ratios for demographic correlates of mental disorders, C-DISC

	PTSD	Major depression	Conduct disorder	Alcohol abuse	Marijuana abuse	Marijuana dependence	Any diagnosis
Adolescent characteristics							
Sex							
Male (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Female	2.87 ^{**} (1.50, 5.49)	1.09 (0.59, 2.02)	0.57 [*] (0.34, 0.96)	0.86 (0.37, 2.04)	0.88 (0.39, 1.97)	0.48 (0.21, 1.11)	1.02 (0.66, 1.58)
Age ^a	0.97 (0.80, 1.17)	1.03 (0.84, 1.26)	0.88 (0.74, 1.04)	1.53 ^{***} (1.21, 1.95)	1.11 (0.90, 1.36)	0.92 (0.71, 1.21)	0.90 (0.78, 1.03)
School status							
In regular school program or completed/graduated (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Other	0.92 (0.41, 2.07)	0.19 ^{**} (0.07, 0.51)	2.00 [*] (1.04, 3.82)	1.16 (0.88, 5.31)	4.60 ^{***} (2.07, 10.22)	3.66 [*] (1.37, 9.73)	1.96 [*] (1.11, 3.45)
Caregiver characteristics							
Currently working							
Yes (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	1.38 (0.66, 2.91)	2.55 ^{***} (1.52, 4.34)	0.86 (0.49, 1.52)	1.16 (0.47, 2.84)	1.45 (0.61, 3.47)	0.28 ^{**} (0.11, 0.70)	1.08 (0.69, 1.71)
Educational level							
High school graduate or higher (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Less than high school education	0.99 (0.53, 1.85)	2.13 [*] (1.17, 3.87)	1.36 (0.78, 2.37)	2.06 (0.78, 5.43)	1.08 (0.48, 2.44)	1.69 (0.72, 3.97)	1.44 (0.92, 2.23)
Marital Status							
Married (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Never married/no live-in	0.50 (0.22, 1.15)	0.24 ^{**} (0.10, 0.58)	1.59 (0.81, 3.11)	1.93 (0.56, 6.69)	0.82 (0.34, 1.99)	2.30 (0.59, 8.95)	0.66 (0.37, 1.16)
Sep./divorced/widowed	0.66 (0.28, 1.55)	0.92 (0.39, 2.21)	1.98 (0.93, 4.24)	3.42 (0.99, 11.90)	0.53 (0.15, 1.84)	1.86 (0.48, 7.26)	1.09 (0.59, 2.02)
Live-in partner	0.81 (0.12, 5.39)	0.75 (0.16, 3.53)	-	-	-	-	0.47 (0.13, 1.74)
Amount lived on past year							
\$20,000 or more (referent)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<\$20,000	0.83 (0.35, 2.01)	0.88 (0.40, 1.97)	0.56 (0.28, 1.11)	0.71 (0.27, 1.92)	0.56 (0.21, 1.53)	0.38 (0.11, 1.24)	0.56 [*] (0.32, 0.97)

^a Age represents the increase in likelihood of the outcome for each year of age from 13 years* $p < 0.05$.

1000
 $p < 0.001$

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Table 5

Odds ratios for demographic correlates of mental disorders for the YSR and CBCL

	Youth Self Report (YSR)		Child Behavior Checklist (CBCL)	
	Internalizing problems	Externalizing problems	Internalizing problems	Externalizing problems
Adolescent characteristics				
Sex				
Male (referent)	1.00	1.00	1.00	1.00
Female	1.09 (0.70,1.71)	1.86 ** (1.24,2.80)	1.03 (0.70,1.51)	1.95 *** (1.37,2.79)
Age ^a	0.87 (0.75, 1.01)	0.86 * (0.75, 0.99)	1.00 (0.83, 1.14)	0.77 *** (0.68, 0.88)
School Status				
In regular school program or completed/graduated (referent)	1.00	1.00	1.00	1.00
Other	1.87 * (1.04,3.34)	3.28 *** (1.97,5.45)	1.53 (0.92,2.54)	2.11 ** (1.29,3.45)
Caregiver currently working				
Yes (referent)	1.00	1.00	1.00	1.00
No	2.49 *** (1.53,4.05)	1.46 (0.94,2.26)	1.35 (0.88,2.08)	1.22 (0.81,1.82)
Educational level				
High school graduate or higher (referent)	1.00	1.00	1.00	1.00
Less than high school education	1.35 (0.85,2.16)	1.49 (0.98,2.27)	0.93 (0.61,1.41)	1.38 (0.92,2.05)
Marital Status				
Married (referent)	1.00	1.00	1.00	1.00
Never married/no live-in	0.38 *** (0.22,0.67)	0.72 (0.42,1.25)	1.03 (0.53,2.03)	1.01 (0.55,1.89)
Sep./divorced/widowed	0.51 * (0.27,0.95)	0.73 (0.39,1.38)	1.40 (0.70,2.79)	1.68 (0.89,3.17)
Live-in partner	0.42 (0.10,1.82)	0.61 (0.13,3.01)	1.33 (0.32,5.62)	1.40 (0.35,5.61)
Amount lived on past year				
\$20,000 or more (referent)	1.00	1.00	1.00	1.00
<\$20,000	1.13 (0.60,2.08)	0.41 ** (0.23,0.72)	0.55 (0.30,1.00)	0.58 (0.33,1.04)
Relationship to child				
Biological mother (referent)	–	–	1.00	1.00
Other female			1.01 (0.60,1.72)	0.94 (0.58,1.5)
Male			0.57 (0.27,1.24)	0.55 (0.27,1.13)

^a Age represents the increase in likelihood of the outcome for each year of age from 13 years

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 6

Sensitivity, specificity and predictive values of the YSR/CBCL Internalizing and Externalizing Scales with PTSD, major depression, and conduct disorder as the criterion

C-DISC diagnosis			
	Negative, no. (specificity)	Positive, no. (sensitivity)	Row total (predictive value)
<i>Post-traumatic stress disorder</i>			
YSR Internalizing Scale			
Negative	484	17	501 (484/501 = 96.6 %)
Positive	73	12	85 (12/85 = 14.1 %)
Column total	557 (484/557 = 86.9 %)	29 (12/29 = 41.4 %)	
CBCL Internalizing Scale			
Negative	435	21	456 (95.4 %)
Positive	113	9	122 (7.4 %)
Column total	548 (79.4 %)	30 (30.0 %)	
<i>Major depression</i>			
YSR Internalizing Scale			
Negative	492	9	501 (98.2 %)
Positive	72	13	85 (15.3 %)
Column total	564 (87.2 %)	22 (59.1 %)	
CBCL Internalizing Scale			
Negative	442	14	456 (96.9 %)
Positive	114	8	122 (6.6 %)
Column total	556 (79.5 %)	22 (36.4 %)	
<i>Conduct disorder</i>			
YSR Externalizing Scale			
Negative	437	13	450 (97.1 %)
Positive	104	32	136 (23.5 %)
Column total	541 (80.8 %)	45 (71.1 %)	
CBCL Externalizing Scale			
Negative	363	21	384 (94.5 %)
Positive	171	23	194 (11.9 %)
Column total	534 (68.0 %)	44 (52.3 %)	