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Service Utilization for Lifetime Mental Disorders in U.S. Adolescents: Results of the National Comorbidity Survey Adolescent Supplement (NCS-A)

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Abstract

Objective—Mental health policy for youth has been constrained by a paucity of nationally representative data concerning patterns and correlates of mental health service utilization in this segment of the population. The objectives of this investigation are to examine the rates and sociodemographic correlates of lifetime mental health service use by severity, type, and number of DSM-IV disorders in the National Comorbidity Survey-Adolescent Supplement (NCS-A).

Method—Face-to-face survey of mental disorders from 2002-2004 using a modified version of the fully-structured World Health Organization Composite International Diagnostic Interview in a nationally representative sample of 6,483 adolescents aged 13-18 years for whom information on service use was available from both an adolescent and a parent report. Both total and sector-specific mental health service use was also assessed.

Results—Approximately one-third of adolescents with mental disorders received services for their illness (36.2%). Although disorder severity was significantly associated with an increased likelihood of receiving treatment, half of adolescents with severely impairing mental disorders had never received mental health treatment for their symptoms. Service rates were highest among those with attention-deficit/hyperactivity disorder (59.8%) and behavior disorders (45.4%), but less than one in five affected adolescents received services for anxiety, eating, or substance use

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disorders. Comorbidity and severe impairment were strongly associated with service utilization, particularly among youth with behavior disorders. Hispanic and non-Hispanic black adolescents were less likely than their white counterparts to receive services for mood and anxiety disorders, even when such disorders were associated with severe impairment.

Conclusions—Despite advances in public awareness of mental disorders in youth, a substantial proportion of young people with severe mental disorders have never received specialty mental health care. Marked racial disparities in lifetime rates of mental health treatment highlight the urgent need to identify and combat barriers to the recognition and treatment of these conditions.

Keywords

Epidemiology; adolescents; mental disorders; treatment; services

Introduction

Despite the availability of effective mental health treatments¹, current evidence suggests that only a minority of youth with mental disorders receive mental health care²⁻⁵. This broad and disconcerting inference is supported by several community epidemiological surveys of U.S. youth that have found that only one-fourth to one-half of youth with mental disorders receives professional services. In particular, prior work has indicated that youth are most likely to receive treatment for attention deficit-hyperactivity disorder (ADHD)⁶ and other disruptive behavior disorders⁷, and least likely to be treated for anxiety^{5, 8}. Sociodemographic correlates of service utilization include gender^{5, 9-14}, age¹⁵, parental educational level^{16, 17}, family size¹⁰, family structure^{9, 10}, availability of health insurance⁹, and ethnic minority status^{7, 9, 10, 12, 18}. These surveys which have helped to inform federal and state mental health policy have sampled young people who reside in specific local geographic regions^{4, 9-11, 15, 18, 19} and are therefore not nationally representative. The lack of a national data base on the prevalence, correlates, and service patterns for childhood mental disorders in the U.S. remains a major impediment to the refinement of federal and state mental health policies to reduce the burden of childhood mental disorders.²⁰

Several limitations characterize the existing data on mental health treatment patterns of adolescents in general and among U.S. adolescents in particular. First, although a large number of community studies have examined rates and correlates of service use among youth meeting criteria for specific disorders^{7, 21-24} or for any type of psychiatric problem^{4, 10, 18, 19, 25, 26}, only a few studies^{5, 8, 14} have investigated variation of service use across a broad range of psychiatric disorders. Second, while research has demonstrated that many youth receive mental health services outside of the specialty mental health treatment sector^{4, 7, 14, 18, 19}, very few studies have examined rates of service use across these sectors. Finally, few prior studies have included sufficient numbers to investigate sex and ethnic differences in mental health service patterns. The present study examines data from the National Comorbidity Survey-Adolescent Supplement (NCS-A)²⁷⁻³⁰, a nationally-representative sample of U.S. adolescents using direct interviews to assess a broad range of emotional and behavioral disorders.

The goals of the present paper are to: (1) estimate lifetime service use across service sectors for specific DSM-IV mental disorders; (2) examine associations of severity, comorbidity, and number of classes of lifetime mental disorders with service use; and (3) identify sociodemographic correlates of lifetime service use among youth with mental disorders.

Method

Sample and Procedure

The NCS-A is a nationally-representative face-to-face survey of 10,148 adolescents aged 13-18 years in the continental U.S.^{5, 27} The survey was administered by the professional interview staff of the Institute for Social Research at the University of Michigan. The background, measures, design, and clinical validity of the NCS-A are described by Merikangas et al²⁷ and Kessler et al^{28, 29}. Briefly, the NCS-A sample was based on a nationally representative household sample (n=904 adolescents) and a school sample (n=9,244 adolescents), with a combined response rate of 82.9%. Parents (or parent surrogates) of adolescents were mailed a self-administered questionnaire (SAQ) that was developed for the survey. The SAQ collected additional information on adolescent sociodemographic characteristics, developmental background, mental and physical health, service use, and other family- and community-level factors²⁷. The SAQ conditional response rate was 82.5-83.7% in the household and school samples. This study focuses on the subsample of 6,483 adolescent-parent pairs for whom data were available from both the adolescent interview and the parent SAQ. This subsample was used because several key elements of service utilization were only collected from one informant (e.g., lifetime number of mental health outpatient visits was present only in the SAQ, whereas disorder-specific service was only collected in the adolescent diagnostic interview). A sample weight was specifically calculated for this subsample to ensure that it was nationally representative with respect to weighting variables such as sex, age, race/ethnicity, family income, urbanicity, and CIDI/DSM-IV disorder estimates from the NCS-A full sample²⁷⁻²⁹. Written informed consent was obtained from parent and adolescent participants. Each respondent was given \$50 for participation. These recruitment and consent procedures were approved by the Human Subjects Committees of Harvard Medical School and University of Michigan.

Measures

Sociodemographic factors—Socio-demographic variables assessed in the NCS-A include age, sex, race/ethnicity, parental marital status, parent education, urbanicity, and geographic region. The 2000 census definitions were used to code urbanicity by distinguishing large metropolitan areas from smaller metropolitan and rural areas. About half of the sample was male (51.3%) and the mean age was 15.9 years. The sample was comprised of 65.6% non-Hispanic White, 15.1% non-Hispanic Black, and 14.4% Hispanic adolescents. A great majority (85.5%) had parents who had completed at least high school, more than two-thirds (69.5%) of the sample lived with currently married or cohabiting parents, 15.5% had parents who were separated, divorced or widowed, and 3.4% of the sample lived with single parents.

Diagnostic assessment—Details of the diagnostic and risk factor measures are described by Merikangas et al.²⁷, and lifetime prevalence rates are reported by Merikangas et al.³⁰. Briefly, adolescents were administered a modified version of the World Health Organization (WHO) Composite International Diagnostic Interview Version 3.0 (CIDI), a fully structured interview administered by trained lay interviewers to generate DSM-IV diagnoses²⁹. The major classes of lifetime disorders assessed in the CIDI included mood disorders, anxiety disorders, attention-deficit/hyperactivity disorder [ADHD], behavior disorders (oppositional defiant disorder [ODD] and conduct disorder [CD]), substance use disorders, and eating disorders. Parents reported information on selected disorders.

Impairment criteria embedded in DSM-IV required endorsement of some/a lot/extreme levels of impairment or moderate/severe/very severe levels of symptom severity. Our definition of severe lifetime disorders used higher thresholds of impairment that required endorsement of “a lot” or “extreme” impairment in daily activities, or “severe or very severe” distress. Severe emotional disorders required both distress *and* impairment to be present. Because distress was not assessed for behavior disorders, severe behavior disorders (ODD or CD) and ADHD required severe or very severe levels of impairment as well as endorsement of symptom criteria (i.e., the appropriate number of symptoms for each respective disorder) by both the parent and the adolescent. Parallel severe lifetime eating and substance use disorders were not created because variations in levels of impairment and distress for these disorders were not available⁵.

Although service use was included as an index of impairment in deriving DSM-IV diagnoses, this criterion was removed from the diagnostic algorithms for the purposes of these analyses. Additionally, indices of disability assessed solely for 12-month disorders were not considered in defining lifetime disorder severity. For the present analyses, we created a summary variable of the number of classes of DSM-IV non-severe and severe disorders (0, 1, 2, 3+ classes of disorders).

Service Use

Immediately following questions related to diagnostic criteria in each disorder interview module, respondents were asked whether they ever received disorder-specific treatment. In a separate interview module focusing on services, all respondents were asked whether they had ever received service for emotional or behavioral problems and the settings in which they had received these services. Reports of service use were classified into the following categories: 1) *Mental health specialty*: a psychiatrist in settings such as a mental health clinic, drug or alcohol clinic, and admissions to hospitals and other facilities; 2) *General medical*: service provided by a general practitioner, family physician, pediatrician, any other physician, and emergency room service; 3) *Human services*: a counselor, a religious/spiritual advisor, or mental health crisis hotlines; 4) *CAM*: support groups, self-help groups, or any other healer; 5) *Juvenile justice*: probation officer or juvenile correction officer; 6) *School services*: special school/class for emotional or behavioral problems, school nurse, school counseling, and school medication. We also examined the number of sectors in which youth had received treatment for specific mental disorders. In addition to these qualitative categories, services were examined according to the number of visits made to mental health

outpatient facilities (e.g., community mental health center or drug/alcohol clinic), and to mental health professionals (e.g., psychiatrist, psychologist, social worker, or family counselor) in their lifetime. The number of lifetime visits was categorized as frequent (>20 visits), intermediate (6-20 visits) and limited (<6 visits).

Parents also reported about their child's treatment for emotional or behavior problems using similar questions to those administered in the adolescent diagnostic interview. The analysis of service use in this paper was based on endorsement by the parent or adolescent. Levels of agreement between parent and adolescent report for any mental health treatment ($\kappa=.58$, s.e. = .0001) and for any service use ($\kappa=.54$, s.e. = .0001) were both acceptable. The service questions for adolescents and parents were primarily derived from the Service Assessment for Children and Adolescents (SACA). Validity of parent and child reports on the SACA are reported by Stiffman et al³¹.

Analysis Procedures

The data were weighted to adjust for the differential probability of selection of respondents within the school and household samples, for differential non-response, and for residual differences between the subsample and the full NCS-A sample as well as the U.S. population on the cross-classification of socio-demographic variables²⁹. Cross tabulations were used to calculate treatment estimates. Logistic regression analyses were used to examine demographic correlates of disorder-specific treatment. In order to examine the predictors of lifetime treatment contact, each model was estimated separately among respondents with a disorder in each of five major diagnostic classes. Logistic regression models included all sociodemographic correlates simultaneously, and adjusted odds ratios are presented. Correlates included: age, sex, race/ethnicity, region, urbanicity, parental marital status, parental education, poverty index ratio, and number of classes of disorders (0, 1, 2, or 3 or more of the 5 classes). Multivariate significance tests were calculated using Wald Chi-Square tests based on coefficient variance-covariance matrices that were adjusted for design effects using the Taylor series method. Statistical significance was based on two-sided design-based tests evaluated at a 0.05 level of significance.

Results

Lifetime Disorder-Specific Service Utilization by DSM-IV Disorder

Table 1 displays the rates of disorder-specific service use among adolescents with DSM-IV mental disorders by sex and age group. Approximately one third (36.2%) of adolescents with any mental disorder received treatment for a particular lifetime disorder. Adolescents with behavior disorders had the highest rates of disorder-specific treatment, with 59.8% of adolescents with ADHD and 45.4% with ODD or CD receiving treatment for their respective disorders in their lifetime. Of adolescents with mood disorders, 37.7% received disorder-specific treatment, while a more modest portion of adolescents with anxiety (17.8%), substance use (15.4%), and eating disorders (12.8%) received treatment. There was a direct association between the number of classes of disorder affecting youth and their rate of service use. Whereas approximately only 20% of adolescents with one class of disorder

received treatment, 51.0% of those with two classes of disorder, and 72.2% of those with 3 or more classes of disorder received services.

Among adolescents diagnosed with any disorder, sex and age had minimal impact overall on the rates of service use across all disorders. However, some specific disorders had greater discrepancies. For panic disorder, females were nearly three times more likely to receive treatment than were males (50.1% vs. 14.3%, $\chi^2=13.5$, $p=0.0002$), and the female-to-male service use ratio for eating disorders was greater than nine-to-one (17.0% vs. 1.8%, $\chi^2=9.8$, $p=0.008$). Conversely, males were more likely than were females to receive treatment for ADHD (64.8% vs. 44.6%, $\chi^2=14.1$, $p=0.0002$). Overall, treatment for anxiety disorders tended to increase with age, with 13.2% of the 13-14 year olds and 25.0% of the 17-18 year olds receiving disorder-specific treatment for an anxiety disorder ($\chi^2=8.5$, $p=0.014$). Although variations in treatment prevalence across age were evident for specific subtypes of anxiety disorders, none of these differences across age groups reached statistical significance.

Table 2 displays the comparison of service use by the severity status of the psychiatric disorder. Overall rates of service use among adolescents with severe DSM-IV disorders were significantly higher than those seen among adolescents with non-severe DSM-IV disorders (26.1% vs. 47.4, $p<.0001$). There were significant increases in the proportion of youth with mental health service use among those with anxiety disorders, ADHD, and ODD or CD, but the differences in service use for youth with severe versus non-severe mood disorders were negligible. Patterns of service use by sex and age varied little across severe disorders, with one exception: the higher rate of services received by males relative to females with ADHD was not observed among adolescents with severe ADHD (80.8% males; 85.0% females, $\chi^2=0.74$, $p=0.226$) (results not shown but available upon request).

Sociodemographic Correlates of Service Utilization

Table 3 displays the multivariate associations between socio-demographic characteristics and seeking treatment within each disorder class. Females were more likely than males to receive treatment for anxiety disorders, while the reverse was true for ADHD. Increasing age was also associated with treatment of anxiety disorders. Ethnic/racial minorities had lower treatment rates than did non-Hispanic whites for several classes of disorder: (1) Hispanics were less likely to receive treatment for mood and anxiety disorders; (2) non-Hispanic Blacks were less likely to receive treatment for mood disorders; and (3) and other/multiracial ethnic youth were less likely to receive treatment for anxiety and ADHD.

In terms of family characteristics, parental marital status significantly predicted treatment among adolescents with mood or substance use disorders, with higher rates of treatment among adolescents whose parents were previously married relative to adolescents of married or cohabitating parents. Adolescents whose parents did not complete high school or college were more likely to receive services for substance use disorders, and adolescents were less likely to receive treatment for these conditions if they lived in the South as compared to the West. No association was observed between urbanicity or poverty level and disorder-specific services in these multivariate analyses. However, the number of comorbid classes

was strongly associated with service use for mood, anxiety, ODD or CD, and substance use disorders.

Correlates of mental health service use for severe disorders were generally similar to those for DSM-IV disorders with respect to age, sex, parental marital status, and number of classes of disorders. However, Hispanic youth were less likely than non-Hispanic White youth to receive services for severe ADHD, whereas there were no significant differences in mental health services for non-severe ADHD by ethnicity. Two-way interaction terms were derived from demographic and clinical correlates that exhibited significant associations with disorder-specific service use within each DSM-IV disorder class. After controlling for multiple testing with a Bonferroni correction, four interactions were significantly associated with service use: 1) race/ethnicity and urban/rural residence for mood disorders: rural Blacks were less likely than were rural Whites to receive treatment for mood disorders, whereas there were no differences in services by ethnicity among youth who resided in urban areas; 2) ethnicity and number of classes of disorder for mood disorders: there was a greater increase in service use by the number of classes of disorders among Hispanic youth compared to those of other races/ethnicities; 3) sex by ethnicity for anxiety disorders: White males had significantly more treatment for anxiety disorders than did males of other ethnic backgrounds; 4) parental marital status and number of classes of disorders for substance use disorders: there was a greater increase in treatment rates by the number of classes of disorders in youth with divorced parents relative to youth with married parents. There was no significant interaction of sex and race/ethnicity when examining the probability of getting treatment for mood disorders, behavior disorders, ADHD, or substance use disorders. When the reported severity of disorder was included in the models predicting service use, we found that severity predicted service use for the class of anxiety disorders (OR=2.56, 95% CI: 1.60-4.11), ADHD (OR=3.47, 95% CI: 1.29-9.30), and behavior disorders (OR= 5.33, 95% CI: 3.74-7.58), but not for mood disorders. Further, the effect of race/ethnicity and its interaction with sex on service use for anxiety disorders persisted after controlling for the severity of anxiety disorders. There was no three-way interaction between severity and sex and race/ethnicity for service use for any disorder class (results not shown but available upon request).

Service Utilization by Service Sector and Number of Visits

Table 4 displays the rate of any lifetime services (rather than disorder-specific services) by the type of service sectors across each class of DSM-IV psychiatric disorder. Among adolescents with any class of disorder, most were seen in the mental health specialty service sector (46.5%) or in the school setting (35.4%). The pattern of services by sector was largely consistent across disorder classes. Services within each sector increased as a function of number of classes of disorder. Among all adolescents receiving services, 37.9% received services from only one sector, followed by 28.6% from two sectors, 20.3% from three sectors, and 13.2% from four or more service sectors (results not shown but available upon request). Analyses of demographic and clinical predictors of specialty mental health service use revealed that youth with ADHD were 2.69 times as likely to receive mental health vs. other services (95% C.I., 1.94 – 3.72), after controlling for demographic characteristics, specific classes of disorders, and the number of classes of disorders. Not shown, non-

Hispanic Blacks and other ethnic groups were significantly less likely to receive mental health services than their White counterparts.

Table 4 presents the prevalence rates and 95% confidence intervals for the number of lifetime service visits with a health professional by the specific classes of mental disorders and the number of classes. The majority (68.4%) of those with mental disorders had limited service contacts (i.e., less than 6 visits), whereas 16.2% reported intermediate visits (i.e., 6-20 visits), and 15.5% reported frequent visits (i.e., greater than 20 visits). With some variation, this pattern was consistent both across the type and the number of classes of disorder. The proportion of frequent service use increased as the number of classes of disorder increased, 7.3% for those with one class, 21.6% for those with 2 classes, and 35.6% for those with 3 or more classes.

The right side of Table 4 presents the adjusted odds ratios and 95% confidence intervals for the associations between the number of service visits and disorder classes. The most robust effects were observed for behavior disorders. As is shown, ADHD was the only disorder that was significantly associated with more frequent service contacts (OR = 2.38, 95% C.I., 1.33 - 4.27), and similarly but conversely, ADHD was also significantly associated with limited or minimal service contacts (OR = 0.52, 95% C.I., 0.31 - 0.87). Youth with conduct disorder were also significantly less likely to have limited service contacts (OR = 0.58, 95% C.I., 0.36 - 0.95), after controlling for sociodemographic characteristics (i.e., sex, age, race/ethnicity, parent marital status, parent education, region, urbanicity, and poverty index ratio), specific classes of disorders, and the number of classes of disorders.

With regard to sociodemographic correlates of the number of service visits, significant associations were observed for several individual- and family-level characteristics. Concerning individual characteristics, females were less likely than were males to receive frequent services (OR = 0.68, 95% C.I., 0.47 - 0.98), and similarly, Hispanics and non-Hispanic Blacks were significantly less likely than were Whites to receive frequent services (OR = 0.68, 95% C.I., 0.47 - 0.98). In terms of family-level characteristics, youth of parents who were previously married had a higher likelihood of more frequent service visits (OR = 1.95, 95% C.I., 1.38-2.75), whereas youth residing in the Northeast (OR = 0.56, 95% C.I., 0.34-0.92) or Midwest (OR = 0.79, 95% C.I., 0.64-0.97) had a lower likelihood of intermediate service visits relative to youth residing in the West (results not shown but available upon request).

Discussion

Results of the current study show that most youth with mental disorders *do not* receive mental health treatment for their symptoms. The treatment gap is especially pronounced for anxiety^{5, 8, 21} and substance use disorders. Among adolescents with mood disorders, Hispanics and non-Hispanic Blacks were much less likely than were Whites to report having received mental health treatment, and a similar pattern was observed for Hispanic youth with anxiety disorders. Although psychiatric comorbidity and disorder severity increased the probability of receiving treatment, roughly one in two adolescents with comorbid and severely impairing mental disorders had never received mental health treatment for their

symptoms. Over the past several years, a number of public health efforts have sought to increase access to mental health treatment for young people with psychiatric disorders. The State Children's Health Insurance Program (S-CHIP)³², which subsidizes mental health services³³, has expanded access to care for low income and previously uninsured youth. Likewise, over the past two decades, the federal Children's Mental Health Initiative has developed dedicated systems of care for young people with serious emotional disturbances in nearly 150 communities nationwide³⁴. Voluntary national screening programs have also been initiated to enhance detection and mental health referral of adolescents with psychiatric disorders³⁵. Despite these and other policy reforms, it is striking that the rates of mental health treatment are not markedly higher than those of studies including youth of comparable age groups conducted several years ago, though methodologic differences cannot be ruled out^{4, 12, 15}. A more recent nationally representative survey of 12-month disorders in a broader age group with stricter diagnostic thresholds yielded somewhat higher service rates than those of this more comprehensive study⁵, half of the children with severely impairing disorders still did not receive professional service. These patterns raise serious concern over the slow pace of progress in extending mental health service provision for American youth with mental disorders. The fact that these rates are similar to those of adults with mental disorders also suggests widespread deficiencies in the provision of early mental health care³⁶.

Among adolescents with mood and anxiety disorders, racial/ethnic minority groups tended to receive lower rates of treatment than their White counterparts. This pattern confirms and extends results from prior studies of adults³⁷⁻⁴¹ and youth^{3-5, 9, 10, 12, 15, 18, 42, 43} in the U.S. Although eliminating racial/ethnic disparities in mental health care is a well established and widely pursued national public health goal⁴⁴, substantial racial/ethnic disparities persist in the treatment of the internalizing disorders. In contrast with externalizing conditions, which are often recognized and addressed due to behaviors observed in school or other public settings, services for mood and anxiety disorders may require self-recognition or close observation by family members. Given these differences in service initiation across broad types of disorder, the lower rates of treatment for internalizing disorders among ethnic minorities may be especially pronounced due to concerns over stigma, perceived lack of culturally-competent or effective services, or financial barriers to service access^{10, 11, 18, 42}. Vigorous and sustained efforts are required to increase awareness of mood and anxiety disorders in minority communities, combat stigma, broaden the assessment skills and cultural competence of front line clinicians, and expand the access and capacity of mental health services.

Treatment rates of ADHD were proportionately greater than those of other disorder groups^{6, 14, 45}. Among youth with ADHD, however, adolescent boys were significantly more likely than girls to receive treatment. Similar service patterns have been described in elementary school children^{46, 47}. The reasons for gender differences in treatment seeking for ADHD are not yet known, though several hypotheses have been proposed. A gender gap in treatment has been attributed to greater impairment⁴⁸ and more disruptive behaviors^{49, 50} in boys relative to girls with ADHD. It has also been suggested that disproportionately higher rates of the inattentive subtype⁵¹ or other less easily recognized clinical presentations⁵² of ADHD among girls compared to boys may account for this treatment pattern. Alternatively,

parents and teachers may perceive that pharmacological⁵³ or psychosocial⁵⁴ ADHD treatments are less effective in girls versus boys. The current findings underscore the importance of identifying and seeking to eradicate gender-related barriers in the community treatment of ADHD. The prominent role of school-based services in the treatment of ADHD suggests that such efforts should include a focus on improving school-based identification and referral of girls with ADHD.

Consistent with previous research, disorder severity was strongly correlated with mental health treatment.^{4, 10, 12} The highest lifetime rates of treatment were reported among youth with severe ADHD and other behavior disorders. This suggests that aggressive, impulsive, and disruptive behaviors tend to drive or attract mental health care treatment seeking of adolescents. Also consistent with earlier research⁷, psychiatric comorbidity, which is a crude measure of illness complexity, was strongly related to treatment.

Among adolescents who receive mental health treatment, a substantial proportion reported receiving relatively few visits. Although the data do not permit an assessment of treatment effectiveness, the fact that roughly one half of youth with ADHD, behavior disorders, and substance use disorders received six or fewer lifetime outpatient mental health visits suggests that many youth with high service needs may not receive adequate care. A general tendency for youth with ADHD to receive more intensive outpatient care than youth with other disorders may relate to the early onset of ADHD and the effectiveness of stimulants and other pharmacological treatment in ameliorating inattention, impulsivity, and hyperactivity⁵⁵.

The specialty mental health sector was the dominant locus of mental health care. This portrait contrasts with an earlier epidemiological study of a rural population in which schools were the primary mental health treatment setting². In that study, school-based mental health care was more than four times more common than specialty mental health sector care². In the current study, school-based mental health care was an important treatment setting, especially in the care of ADHD and other behavior disorders¹⁹, though the specialty mental health care was more common for each disorder group. In contrast with UK studies of adolescents¹⁴ and U.S. studies of adults³⁶, care from general medical professionals does not equal or exceed care from mental health specialists among U.S. adolescents. The traditional pathway from primary mental health care to specialty mental health care, which is central to the delivery of adult mental health services⁵⁶, may be comparatively less well-traveled by youth. In order to better understand common service paths of children and adolescents, it will be important to clarify the sequence of health care settings and the role of referral patterns, service availability, child and family preferences, professional competencies, financial considerations, and other factors that shape mental health care treatment pathways for adolescents.

The NCS-A offers several strengths for evaluating mental health service patterns. The large sample size yields sufficient power to examine correlates of service use among several ethnic minority subgroups. The interview collected extensive information on services including the full range of service sectors from the perspectives of both the parent and the youth. It also provides the first data on lifetime service use in a representative sample of

U.S. youth that supplements our recent study of 12-month disorders in a broader age range of youth⁵. However, the current analysis also has several limitations. First, the NCS-A under-represents several segments of the adolescent population including those who are not enrolled in school, are homeless, or do not speak English. The absence of these subgroups likely reduces disorder prevalence rates, particularly among older adolescents²⁹. Second, the cross-sectional methodology precludes analysis of time trends as well as longitudinal predictors of service use. Third, discrepancies in reported service use between parents and adolescents may have led to unreliable estimates of service contacts and correlates. Unlike claims data or other more objective measures of service use, respondent recall of services is susceptible to error and social desirability bias. Fourth, no information was available concerning health care insurance which is likely an important determinant of service use. Fifth, data collection occurred in 2002-2004; however, important changes in community mental health treatment patterns may have occurred in the interim following increases in pharmacological treatments and ensuing safety concerns in youth⁵⁷.

Widespread gaps in mental health care of youth with severe mental disorders pose serious challenges to public health planners and policy makers. Many youth with mental disorders, even severe and impairing disorders, have never received treatment for their conditions. Among those who have received care, treatment is often quite limited. Racial disparities in mental health care of mood and anxiety disorders pose especially urgent mandates for action. Despite calls over the past decade for comprehensive and accessible community-based mental health services for youth and families, particularly minority youth¹⁴, substantial unmet needs for care persist. National shortages of mental health specialists for children remain widely prevalent. Recruitment, training, and promotion of child and adolescent mental health professionals remain leading priorities. Strains on available treatment resources are likely to grow as coverage is extended to large groups of currently uninsured American young people⁵⁸ meeting their mental health care needs will pose critical challenges to health and mental health care professionals.

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Table 1

Rates of lifetime disorder-specific mental health service use among adolescents with a DSM-IV disorder by sex and age group

DSM-IV Disorder	No. of cases	Total % (SE)	Sex		Age		
			Female % (SE)	Male % (SE)	13-14 yr % (SE)	15-16 yr % (SE)	17-18 yr % (SE)
Any mood disorders	921	37.7 (2.3)	41.5 (4.2)	31.5 (4.0)	44.2 (7.1)	30.8 (3.6)	42.4 (5.1)
Major depressive disorder or dysthymia	741	39.4 (3.1)	40.9 (4.8)	36.5 (4.4)	44.3 (8.6)	34.1 (4.6)	43.1 (5.7)
Bipolar I or II	192	22.2 (4.8)	26.5 (5.4)	17.9 (6.2)	24.4 (8.6)	17.2 (7.5)	28.2 (8.4)
Any anxiety disorders	1506	17.8 (1.4)	20.3 (1.7)	14.5 (2.0)	13.2 (2.2)	18.1 (1.9)	25.0 (3.2)
Agoraphobia	142	7.0 (3.7)	8.0 (5.2)	4.8 (2.8)	1.4 (1.1)	11.4 (7.5)	5.7 (4.5)
Generalized anxiety disorder	61	43.8 (10.1)	39.9 (11.1)	52.5 (22.8)	22.2 (16.3)	50.1 (15.6)	47.4 (14.4)
Social phobia	355	12.1 (1.8)	11.4 (2.3)	13.2 (4.1)	12.9 (4.4)	5.9 (1.9)	21.1 (4.6)
Specific phobia	954	6.5 (1.1)	7.2 (1.5)	5.6 (1.3)	8.8 (2.5)	5.0 (1.4)	5.0 (1.7)
Panic disorder	149	33.8 (6.4)	50.1 (9.0)	14.3 (5.3)	20.7 (10.2)	32.9 (8.7)	47.9 (10.8)
Separation anxiety disorder	397	6.9 (1.4)	8.8 (2.2)	4.1 (2.3)	5.6 (2.0)	6.9 (2.2)	9.1 (3.7)
Attention-deficit/hyperactivity disorder	617	59.8 (3.1)	44.6 (4.6)	64.8 (3.4)	57.9 (4.5)	59.6 (4.7)	63.4 (5.6)
Behavior Disorders	974	45.4 (2.0)	46.5 (4.7)	44.6 (2.8)	48.1 (5.7)	48.0 (3.8)	38.4 (5.3)
Oppositional defiant disorders	488	53.8 (4.6)	49.4 (6.8)	57.5 (4.9)	55.6 (7.7)	54.5 (6.3)	48.8 (5.8)
Conduct disorder	695	32.3 (3.0)	30.6 (4.9)	33.5 (3.0)	25.4 (5.1)	39.3 (4.0)	28.9 (5.1)
Any substance use disorders	666	15.4 (3.2)	15.2 (6.5)	15.5 (3.7)	37.4 (15.4)	12.3 (3.1)	11.4 (2.9)
Alcohol abuse/dependence	385	11.9 (2.9)	8.7 (2.4)	13.9 (4.4)	0.3 (0.3)	17.8 (5.3)	8.7 (2.5)
Drug abuse/dependence	500	18.3 (4.0)	18.1 (7.7)	18.5 (4.1)	40.1 (15.9)	13.4 (3.5)	14.7 (3.5)
Eating disorders	176	12.8 (3.7)	17.0 (5.4)	1.8 (1.3)	4.7 (2.9)	11.7 (4.0)	30.4 (9.5)
Any class^a	2899	36.2 (1.6)	34.9 (2.2)	37.4 (1.9)	35.0 (3.0)	36.5 (2.1)	37.2 (2.4)
1 class	1692	19.9 (1.5)	18.1 (2.1)	21.7 (2.2)	22.2 (3.1)	20.6 (2.2)	15.0 (2.0)
2 classes	768	51.0 (2.2)	49.7 (3.8)	52.2 (3.7)	50.5 (4.0)	49.2 (3.7)	53.9 (4.3)
3+ classes	439	72.2 (4.0)	76.6 (5.1)	68.1 (5.4)	70.5 (8.8)	74.0 (4.5)	71.3 (5.7)

Note:

^aExcluding eating disorders

Table 2
Rate comparisons of lifetime disorder-specific mental health service use by severity status of the disorder

Mental Disorders	Non-Severe Cases		Severe Cases		Wald-F (df=1) [p-value]
	No. of cases	% (SE)	No. of cases	% (SE)	
Mental Disorders	646	37.8 (3.4)	275	37.7 (5.5)	0.0 [.946]
Any mood disorders					
Major depressive disorder or dysthymia	561	38.8 (4.0)	180	41.1 (6.0)	0.1 [.769]
Bipolar I or II	97	20.9 (5.4)	95	23.3 (6.4)	0.1 [.742]
Any anxiety disorders	1108	13.6 (1.5)	398	29.1 (3.7)	18.1 [.0001]
Agoraphobia	142	7.0 (3.7)	142 ^b	7.0 (3.7)	-
Generalized anxiety disorder	32	29.7 (12.8)	29	59.3 (14.0)	2.0 [.163]
Social phobia	267	9.3 (1.7)	88	21.3 (5.3)	6.1 [.018]
Specific phobia	914	5.5 (0.9)	40	28.7 (12.1)	10.3 [.003]
Panic disorder	149	33.8 (6.4)	149 ^b	33.8 (6.4)	-
Separation anxiety disorder	371	7.0 (1.4)	26	5.8 (4.1)	0.1 [.775]
Attention-deficit/hyperactivity disorder	505	55.0 (3.6)	112	81.6 (5.9)	9.4 [.004]
Behavior Disorders	667	32.0 (2.1)	307	72.0 (4.4)	66.5 [<.0001]
Oppositional defiant disorders	296	35.2 (4.9)	196	78.3 (4.8)	28.3 [<.0001]
Conduct disorder	534	26.2 (2.8)	161	54.1 (6.6)	19.7 [.0001]
Any substance use disorders	666	15.4 (3.2)	666^b	15.4 (3.2)	-
Alcohol abuse/dependence	385	11.9 (2.9)	385 ^b	11.9 (2.9)	-
Drug abuse/dependence	500	18.3 (4.0)	500 ^b	18.3 (4.0)	-
Eating disorders	176	12.8 (3.7)	176 ^b	12.8 (3.7)	-
Any class^a	1611	26.1 (1.7)	1288	47.4 (2.2)	61.2 [<.0001]

Note:

^a Excluding eating disorders

^b No severe definition

Disorder-Specific Mental Health Service Use μ by Sociodemographic Factors and Classes of Disorder

Table 3

Correlates	Disorder Class, Adjusted Odds Ratio (95% CI) ^b				
	Mood	Anxiety	Attention Deficit Hyperactivity	Behavior	Substance Use
Sex					
Male	0.59 (0.33 - 1.05)	0.67 (0.45 - 1.00)	1.81 (1.06 - 3.08)	1.05 (0.72 - 1.53)	2.01 (0.89 - 4.57)
Female	1.00	1.00	1.00	1.00	1.00
χ^2 ¹ [p-value]	3.4 [0.066]	4.1 [0.044]	5.1 [0.024]	0.1 [0.786]	3.0 [0.085]
Age					
	1.01 (0.84 - 1.22)	1.16 (1.02 - 1.31)	1.06 (0.91 - 1.23)	0.92 (0.81 - 1.05)	0.83 (0.62 - 1.10)
χ^2 ¹ [p-value]	0.0 [0.901]	5.6 [0.018]	0.6 [0.457]	1.5 [0.221]	1.8 [0.181]
Race/Ethnicity					
Hispanic	0.47 (0.29 - 0.78)	0.24 (0.09 - 0.65)	0.80 (0.36 - 1.80)	0.75 (0.40 - 1.41)	2.09 (0.72 - 6.11)
Non-Hispanic Black	0.23 (0.14 - 0.40)	0.60 (0.34 - 1.08)	0.58 (0.22 - 1.52)	0.77 (0.40 - 1.45)	1.56 (0.23 - 10.56)
Other	0.61 (0.22 - 1.68)	0.47 (0.26 - 0.83)	0.32 (0.14 - 0.73)	0.68 (0.39 - 1.20)	1.57 (0.40 - 6.10)
Non-Hispanic White	1.00	1.00	1.00	1.00	1.00
χ^2 ³ [p-value]	36.1 [0.000]	14.8 [0.002]	8.3 [0.040]	3.2 [0.361]	2.2 [0.525]
Parent's marital status^c					
Previously married	3.07 (1.61 - 5.84)	1.41 (0.85 - 2.33)	1.19 (0.61 - 2.31)	1.95 (1.14 - 3.31)	2.69 (1.22 - 5.91)
Never married	2.05 (0.65 - 6.46)	0.81 (0.33 - 1.95)	0.50 (0.13 - 2.00)	0.97 (0.31 - 3.04)	0.46 (0.10 - 2.01)
Married/Cohabiting	1.00	1.00	1.00	1.00	1.00
χ^2 ³ [p-value]	13.6 [0.004]	2.3 [0.516]	3.0 [0.389]	6.6 [0.085]	11.4 [0.010]
Region					
Northeast	1.40 (0.83 - 2.36)	1.29 (0.70 - 2.36)	0.67 (0.27 - 1.65)	1.67 (0.71 - 3.91)	1.37 (0.48 - 3.92)
Midwest	1.27 (0.85 - 1.88)	1.04 (0.61 - 1.79)	0.69 (0.34 - 1.42)	1.01 (0.56 - 1.84)	0.80 (0.23 - 2.79)
South	1.26 (0.73 - 2.18)	0.85 (0.49 - 1.46)	1.32 (0.50 - 3.48)	1.23 (0.66 - 2.29)	0.26 (0.07 - 0.91)
West	1.00	1.00	1.00	1.00	1.00
χ^2 ³ [p-value]	2.3 [0.514]	2.9 [0.408]	7.0 [0.070]	2.2 [0.532]	9.8 [0.020]
Urbanicity					
Metro	0.99 (0.55 - 1.78)	1.18 (0.52 - 2.67)	0.59 (0.26 - 1.33)	1.04 (0.55 - 1.97)	0.27 (0.08 - 0.91)

Correlates	Disorder Class, Adjusted Odds Ratio (95% CI) ^b				
	Mood	Anxiety	Attention Deficit Hyperactivity	Behavior	Substance Use
Other	1.68 (0.96 - 2.93)	0.94 (0.43 - 2.06)	0.52 (0.26 - 1.07)	0.77 (0.46 - 1.28)	0.34 (0.12 - 0.97)
Rural	1.00	1.00	1.00	1.00	1.00
χ^2_{22} [p-value]	7.0 [0.031]	1.8 [0.409]	3.4 [0.179]	1.6 [0.441]	5.3 [0.070]
Parent's education					
< High school	0.67 (0.25 - 1.82)	0.65 (0.29 - 1.46)	0.52 (0.24 - 1.13)	0.70 (0.36 - 1.36)	3.02 (1.13 - 8.06)
High school grad	0.76 (0.43 - 1.35)	0.83 (0.49 - 1.41)	0.50 (0.25 - 1.02)	0.69 (0.35 - 1.35)	1.53 (0.49 - 4.78)
Some college	0.99 (0.65 - 1.50)	1.00 (0.56 - 1.78)	0.75 (0.36 - 1.57)	0.81 (0.46 - 1.42)	3.83 (1.67 - 8.77)
College grad	1.00	1.00	1.00	1.00	1.00
χ^2_{23} [p-value]	1.5 [0.686]	1.9 [0.591]	5.1 [0.164]	2.0 [0.567]	15.0 [0.002]
Poverty index ratio (PIR)					
PIR <=1.5	1.02 (0.43 - 2.44)	1.41 (0.67 - 2.98)	0.96 (0.49 - 1.87)	1.04 (0.55 - 1.95)	0.62 (0.16 - 2.38)
PIR <=3	1.02 (0.50 - 2.09)	1.10 (0.60 - 2.03)	0.78 (0.39 - 1.56)	1.28 (0.64 - 2.55)	0.75 (0.30 - 1.87)
PIR <=6	0.75 (0.37 - 1.53)	1.16 (0.72 - 1.89)	0.79 (0.34 - 1.82)	1.56 (0.95 - 2.55)	0.59 (0.21 - 1.61)
PIR >6	1.00	1.00	1.00	1.00	1.00
χ^2_{23} [p-value]	1.6 [0.660]	0.9 [0.819]	0.6 [0.897]	4.1 [0.251]	1.2 [0.754]
Class of disorder^d					
0 class	1.00	1.00	1.00	1.00	1.00
1 class	1.90 (1.03 - 3.50)	1.73 (1.06 - 2.82)	1.56 (0.79 - 3.05)	2.17 (1.19 - 3.95)	3.54 (0.92 - 13.53)
2 classes	3.61 (1.84 - 7.09)	2.51 (1.51 - 4.19)	1.83 (0.80 - 4.23)	1.93 (1.07 - 3.51)	4.38 (1.86 - 10.36)
3+ classes	3.97 (1.86 - 8.47)	2.48 (1.18 - 5.20)	1.17 (0.46 - 2.98)	5.16 (2.58 - 10.32)	7.75 (2.35 - 25.58)
χ^2_{23} [p-value]	20.5 [0.000]	15.0 [0.002]	3.0 [0.392]	23.4 [0.000]	16.0 [0.001]

Note:

^a Among those with specific disorder^b Adjusted odd ratios and 95% confidence intervals from models containing all variables in the table^c Unknown marital status not shown^d Minus the class of disorder of interest

Lifetime service rates by sector and association between mental health specialty service use and DSM-IV disorder classes

Table 4

Disorder Classes	No. of Cases	Mental Health Specialty	General Medical	Human Service	Other Sector CAM	Juvenile Justice	School Service	Service Rates by Sectors, % (95% CI) ^a		Mental Health Specialty vs. Other sector
								Adjusted Odds Ratio (95% CI) ^c	Adjusted Odds Ratio (95% CI) ^d	
Mood disorders	921	58.8 (53.9 - 63.6)	26.3 (21.8 - 31.3)	24.8 (20.3 - 29.8)	16.9 (13.2 - 21.4)	8.7 (5.0 - 14.7)	39.8 (35.4 - 44.5)	1.64 (1.19 - 2.27)	1.17 (0.81 - 1.70)	
Anxiety disorders	1506	40.0 (36.0 - 44.2)	18.2 (15.7 - 21.1)	16.8 (14.2 - 19.7)	11.7 (9.1 - 14.9)	5.4 (3.8 - 7.7)	28.9 (26.1 - 31.9)	1.15 (0.87 - 1.53)	0.95 (0.68 - 1.34)	
Attention-deficit/hyperactivity disorder	617	68.1 (61.3 - 74.2)	32.8 (27.9 - 38.1)	22.7 (17.8 - 28.4)	16.0 (12.5 - 20.3)	14.3 (9.5 - 20.8)	63.2 (55.5 - 70.3)	2.69 (1.94 - 3.72)	2.18 (1.51 - 3.15)	
Behavior disorders	974	64.6 (59.4 - 69.5)	28.3 (23.6 - 33.5)	28.4 (24.6 - 32.5)	16.9 (13.3 - 21.3)	21.3 (15.6 - 28.4)	53.5 (48.9 - 58.1)	2.15 (1.56 - 2.94)	1.46 (1.04 - 2.05)	
Substance disorders	666	58.8 (50.3 - 66.8)	25.1 (20.0 - 31.0)	21.6 (17.1 - 27.0)	19.2 (14.6 - 24.8)	21.3 (14.5 - 30.2)	43.7 (37.9 - 49.8)	1.91 (1.33 - 2.74)	1.19 (0.71 - 2.00)	
Any class^b	2899	46.5 (43.0 - 49.9)	20.7 (18.3 - 23.3)	18.2 (16.4 - 20.1)	12.6 (10.7 - 14.7)	9.5 (7.0 - 12.9)	35.4 (32.8 - 38.1)	1.74 (1.33 - 2.28)	--	
1 class	1692	33.3 (29.6 - 37.2)	15.3 (13.0 - 17.8)	13.2 (10.4 - 16.5)	8.3 (6.8 - 10.2)	3.9 (2.8 - 5.3)	23.2 (20.1 - 26.7)	1.19 (0.90 - 1.58)	1.00	
2 classes	768	59.8 (54.5 - 64.8)	23.9 (19.6 - 28.8)	20.7 (17.0 - 25.0)	15.9 (12.6 - 19.9)	16.8 (11.2 - 24.5)	50.7 (44.3 - 57.1)	2.10 (1.44 - 3.04)	1.46 (0.87 - 2.47)	
3+ classes	439	73.3 (65.0 - 80.2)	35.5 (29.1 - 42.6)	32.4 (25.3 - 40.3)	23.0 (17.0 - 30.4)	18.7 (12.2 - 27.6)	55.6 (49.0 - 62.1)	3.82 (2.28 - 6.38)	1.69 (0.73 - 3.87)	

Note:

^a Proportions of service in each service sector among those with any DSM-IV disorder^b Excluding eating disorder^c Crude odds ratios among adolescents who received any treatment

Adjusted odds ratios controlling for demographic characteristics (sex, age, race/ethnicity, parent marital status and education, region, urbanicity, and poverty index ratio), specific classes of disorders, and number of classes of disorders among adolescents who received any treatment

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Lifetime rates of mental health specialty service visit^d by frequency and associations between frequency of visits and DSM-IV disorder classes

Table 5

Disorder Classes	No. of cases	Frequency of Visits, % (95% CI) ^b			Frequency of Visits, Adjusted Odds Ratio (95% CI) ^c		
		Frequent	Intermediate	Limited	Frequent	Intermediate	Limited
Mood disorders	921	23.1 (17.8 - 29.4)	17.8 (14.1 - 22.3)	59.1 (53.3 - 64.6)	1.43 (0.88 - 2.31)	0.74 (0.51 - 1.07)	1.03 (0.70 - 1.53)
Anxiety disorders	1506	15.2 (11.4 - 20.0)	12.8 (10.7 - 15.2)	72.0 (68.1 - 75.5)	1.63 (0.92 - 2.87)	0.73 (0.46 - 1.17)	0.96 (0.65 - 1.43)
Attention deficit hyperactivity disorder	617	26.3 (20.9 - 32.4)	23.9 (19.2 - 29.3)	49.8 (42.7 - 56.9)	2.38 (1.33 - 4.27)	1.13 (0.73 - 1.74)	0.52 (0.31 - 0.87)
Conduct or oppositional defiant disorders	974	24.9 (19.5 - 31.2)	24.1 (19.8 - 29.0)	51.1 (45.4 - 56.6)	1.66 (0.83 - 3.31)	1.36 (0.91 - 2.01)	0.58 (0.36 - 0.95)
Substance disorders	666	24.3 (18.1 - 32.0)	18.8 (14.4 - 24.2)	56.9 (49.1 - 64.3)	1.62 (0.76 - 3.46)	0.77 (0.49 - 1.21)	0.90 (0.51 - 1.58)
Any Class^d	2899	15.5 (12.8 - 18.5)	16.2 (14.2 - 18.4)	68.4 (65.4 - 71.2)	--	--	--
1 class	1692	7.3 (5.3 - 9.8)	11.9 (10.1 - 14.1)	80.8 (78.3 - 83.1)	1.00	1.00	1.00
2 classes	768	21.6 (16.4 - 27.9)	21.9 (16.6 - 28.4)	56.5 (50.1 - 62.6)	1.68 (0.74 - 3.81)	1.44 (0.76 - 2.69)	0.55 (0.29 - 1.06)
3+ classes	439	35.6 (27.7 - 44.3)	22.5 (16.3 - 30.3)	41.9 (35.4 - 48.8)	1.37 (0.33 - 5.61)	1.45 (0.61 - 3.43)	0.51 (0.18 - 1.43)

Note:

^aVisits made to mental health outpatient facilities (e.g., community mental health center or drug/alcohol clinic), and to mental health professionals (e.g., psychiatrist, psychologist, social worker, or family counselor) in their lifetime; categorized as frequent (>20 visits), intermediate (6-20 visits) and limited (<6 visits)

^bProportions of visit frequency groups in each category among those with any DSM-IV disorder

^cAdjusted odds ratios of visit frequency groups by DSM-IV disorder class controlling for demographic characteristics (sex, age, race/ethnicity, parent marital status and education, region, urbanicity, and poverty index ratio), specific classes of disorders, and number of classes of disorders among adolescents who received any treatment

^dExcluding eating disorder