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Rates of DSM-IV Psychiatric Disorders Among Adolescents in a Large Metropolitan Area

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Abstract

We present prevalence data for adolescents in a large metropolitan area in the U.S. and the association of DSM-IV diagnoses to functional impairment and selected demographic correlates. We sampled 4,175 youths aged 11–17 years from households enrolled in large health maintenance organizations. Data were collected using questionnaires and the Diagnostic Interview Schedule for Children, Version IV (DISC-IV). Impairment was measured using the Child Global Assessment Scale and diagnostic specific impairment in the DISC-IV. 17.1% of the sample met DSM-IV criteria for one or more disorders in the past year; 11% when only DISC impairment was considered and 5.3% only using the CGAS. The most prevalent disorders were anxiety (6.9%), disruptive (6.5%), and substance use (5.3%) disorders. The most prevalent specific disorders were agoraphobia, conduct and marijuana abuse/dependence, then alcohol use and oppositional defiant disorder. Younger youths and females had lower odds for any disorder, as did youths from two parent homes. There was increased odds associated with lower family income. Females had greater odds of mood and anxiety disorders, males of disruptive and substance use disorders. There were greater odds of mood and disruptive disorders for older youths. Prevalences were highly comparable to recent studies using similar methods in diverse non-metropolitan populations. We found associations with age, gender, and to a lesser extent, socioeconomic status reported in previous studies. The inclusion of both diagnosis-specific impairment and global impairment reduced prevalence rates significantly. Our results suggest commonality of prevalences and associated factors in diverse study settings, including urban and rural areas.

Keywords

adolescents; DSM-IV disorders; prevalence; impairment; risk factors; metropolitan population

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Introduction

Empirical data on the prevalence and incidence of child and adolescent disorders are fundamental to understanding the etiology and natural history of such disorders (Roberts et al., 1998; Costello et al., 2005). However, compared to adults, there have been fewer epidemiologic investigations aimed at estimating prevalence and incidence and associated risk factors for children and adolescents.

Roberts and colleagues (Roberts et al., 1998) reviewed 52 studies published through 1996 which estimated overall prevalence of psychopathology, and estimated the rates to be between 7 and 12%, adjusting for impairment. Without such adjustment, prevalences were in the 18–20% range. Studies which used structured interview schedules to obtain data from community samples of youths and used DSM diagnostic criteria provided the most concordant results (Costello et al., 1988; Costello et al., 1996; Velez et al., 1989; Garrison et al., 1992; Fergusson et al., 1993; Jensen et al., 1995; Shaffer et al., 1996).

Since that review, additional papers have appeared reexamining the question of the burden (prevalence) of psychiatric disorder among children and adolescents, using DSM-IV criteria. Costello et al. (2003) reported that the prevalence of any DSM-IV disorder in their sample of 9–16 year-olds was 13.3% for the past 3 months; prevalence of serious emotional disturbance was 6.8%. Canino et al. (2004) found a 12-month prevalence of DSM-IV disorder of 19.8% for youths 4–17 and a rate of 6.9% adjusting for impairment. Ford et al. (2003) found overall prevalence of DSM-IV disorders was 9.5% for youths who met criteria and had significant social impairment.

Of these studies, all of which used DSM-IV diagnostic criteria, two were conducted in rural areas of the American South (Costello et al., 2003; Costello et al., 1997) one on the island of Puerto Rico (Canino et al., 2004) and one in England (Ford et al., 2003). To date, there has been no study published estimating prevalence of DSM-IV disorders in the United States for large, metropolitan areas in which the overwhelming majority of children and adolescents reside.

Given the relatively few studies of adolescents to date, and the even greater paucity of data on prevalence of DSM-IV psychiatric disorders among adolescents in large urban areas, we reexamine this question using data from Teen Health 2000 (TH2K), a large, community-based study which used a structured interview schedule to generate DSM-IV diagnoses with adjustments for functional impairment. To our knowledge, this is the largest study of psychopathology among adolescents ever conducted in the United States which incorporates these procedures.

Methods

Subjects

The sample was selected from households in the Houston metropolitan area enrolled in local health maintenance organizations. One youth, age 11–17 years, was sampled from each eligible household, oversampling for African American and Latino households. Since ethnic status was not available from the HMOs, a sampling strategy was used to identify and oversample African and Latino American youths. We developed sample weights which were adjusted by poststratification to reflect the age, ethnicity, and gender distribution of the 5-county Houston metropolitan area in 2000. The total population was 4,669,571, of which 515,736 were 11–17 years of age. Of these, 94,498 were African Americans, 166,821 were Latinos and 220,410 were European Americans. The precision of estimates are thereby improved and sample selection bias reduced to the extent that it is related to demographic composition (Andrews et

al., 1973). Thus, the weighted estimates generalize to the population 11–17 years of age in a metropolitan area of 4.7 million people. Chi-square tests were used to compare ethnicity, gender and age distributions between census data for the 5-county area and sample data for both before and after the weighted procedure, showing that the distribution of age and ethnicity were statistically significant ($\chi^2=89.86$, $df=6$, $p<0.0001$; $\chi^2=800.26$, $df=2$, $p<0.0001$) in the raw data and census data, but not for gender ($\chi^2=0.78$, $df=1$, $p=0.78$), while no difference was identified between the two distributions with respect to the three demographic factors of age, gender and ethnic group ($\chi^2=0.02$, $df=6$, $p=0.99$; $\chi^2=0.01$, $df=1$, $p=0.93$; $\chi^2=0.005$, $df=2$, $p=0.99$). In other words, the weighted sample represents the 5-county area population composition (age, gender and ethnicity) after post-stratification adjustment.

Data were collected at baseline on sample youths and one adult caregiver using computer-assisted personal interviews and self-administered questionnaires. The computerized interview contained the structured psychiatric interview (see below), demographic data on the youths and the household as well as queries about stress exposure. The interviews were conducted by trained, lay interviewers and took on average 1–2 hours, depending on the number of psychiatric problems present. The questionnaires contained questions on a broad array of risk and protective factors. These took about 30 minutes to complete. Interviews and questionnaires were completed with 4,175 youths (66% of eligible households). All youths and parents gave written informed consent prior to participation in this study. All study forms and procedures were approved by the University of Texas Health Sciences Center Committee for Protection of Human Subjects.

The sample was diverse (see Table 1). In terms of ethnic status, the cohort was 35.4% EA, 35.4% AA, and 20.5% MA and 8.7% others. For education of caregivers, 32% had a high school diploma or less. In terms of income distribution, about 24% reported income less than \$35,000. About 3/4 of caregivers were currently married.

Measures

Psychiatric disorders among youths were based on youth self-report, assessed with the Diagnostic Interview Schedule for Children, Version 4 (DISC-IV), a highly structured instrument (Shaffer et al., 2000) designed to be administered by lay interviewers. In TH2K, we included anxiety disorders (agoraphobia, generalized anxiety, panic, social phobia, post-traumatic stress disorder), mood disorders (major depression, dysthymia, mania, hypomania), disruptive disorders (conduct, oppositional defiant), attention-deficit hyperactivity disorder, eating disorders (bulimia, anorexia nervosa), and substance use (alcohol, marijuana and other substance disorders). Our measure of presence of mental or behavioral problems is any DSM-IV disorder in the previous 12 months.

The DISC-IV inquires about the level of impairment associated with each diagnosis through probes that ascertain the degree to which symptoms of a disorder caused distress to the youth or affected school functioning or relations with caretakers, family, friends or teachers. Following Canino et al. (2004), we use the DISC-IV impairment algorithm which refers to moderate impairment in at least one area of functioning.

We also used the Child Global Assessment Scale (CGAS) administered by trained lay interviewers. Following Canino et al. (2004) and Shaffer et al. (1996), we scored as impaired any youth who scored 69 or lower. The CGAS has been shown to have good psychometric properties (Shaffer et al., 1983; Bird et al., 1990; Green et al., 1994).

Data Analyses

Two sets of analyses are presented. First, we estimate prevalences of past year disorders, unadjusted for impairment, then adjusting for DISC-IV impairment and for CGAS score. Second, we present odds ratios of selected demographic correlates for these same disorder categories. Reviews of the literature on risk and protective factors related to psychiatric disorders among children and adolescents have noted the putative role of a broad array of factors drawn from multiple domains (Roberts et al., 1998; Canino et al., 2004; Bird et al., 1989; Bergeron et al., 2000; Costello et al., 2001). From this array, there is considerable consensus concerning the role of age, gender, socioeconomic status, and marital status of parents. Given this, in our analyses, we examine the effects of age and gender of youths, total family income and caregiver education, and marital status of parents.

Age was categorized as 12 or younger, 13–15, and 16 or older. For income, we attempted to contrast youths from families whose family size and total family income placed them below the Office of Management and Budget definitions of poverty. There were too few families below poverty, particularly among majority households, to permit detailed analyses. Instead, are categorized income as \$65,000 or more, \$35,000–\$64,999 and less than \$35,000 per year. Caregiver education was categorized as high school degree or less (lower), education less than 2 years of post-high school education (middle), and those with more education (higher). Marital status of the primary caregiver was defined as “married” and “non-married”, which included divorced, separated, widowed, single, never married (see Table 1 for sample characteristics).

For generation of the confidence interval for the prevalence and odds ratio, survey mean (svymean) and survey logistic regression (svylogit) procedure in STATA V9.0 (2006) were employed. These procedures use Taylor series approximation to compute the standard error. Lepkowski and Bowles (1996) have indicated that the difference in computing standard error between this method and other repeated replication methods such as the jackknife is very small.

Results

Prevalence rates are presented in Table 2. The overall prevalence of at least one DISC-IV/DSM-IV disorder in the past year, without impairment, was 17.1%. Using the DISC impairment algorithm of moderate impairment in at least 1 area of functioning, prevalence was reduced to 10.1%. Using a definition of caseness having met DSM-IV criteria for at least 1 disorder in the past year and a CGAS score of 69 or less, prevalence was 5.3%.

The most prevalent disorders were the anxiety disorders and the disruptive disorders, with crude past year prevalences of 6.9% and 6.4%, respectively, followed by substance use disorders (SUDs) with 5.3%. Prevalence of any mood disorder was 3%. The prevalence of ADHD (any type) was 2.1%, not unexpected given the age of the sample. Eating disorders were rare.

The most prevalent mood disorder was major depression. For anxiety disorders, it was agoraphobia. Conduct and oppositional defiant disorder were the most prevalent disruptive disorders, while alcohol and marijuana abuse or dependence were the most prevalent SUDs. Again, these rates exclude tobacco use.

As was the case for overall prevalence, there is a linear, stepwise decrease in prevalence rates across specific disorders as one moves from prevalences unadjusted for impairment, those adjusted for DISC impairment, and those adjusted for CGAS score.

Table 3 presents data on correlates of disorder, for any disorder in the past year, any anxiety disorder, any eating disorder, any mood disorder, any disruptive disorder, ADHD, and any

substance use disorder. Odds ratios and 95% confidence intervals are presented as estimates of the association with each putative risk factor. Bonferroni adjustment was used for pairwise comparisons.

Regarding gender, males had lower odds of anxiety, and eating disorders, whereas females are at lower odds of disruptive and substance use disorders. With DISC impairment, males had lower odds of mood disorders as well and females had lower odds of ADHD and any disorder. Using CGAS score as impairment, differences were found for increased odds of disruptive, ADHD, substance use, and any disorder (higher for males).

Younger youths had greater odds for anxiety disorders, substance use disorders and any disorder. With DISC impairment, younger youths had lower odds for disruptive disorders, for substance disorders and any disorders, and this held across the DISC impairment conditions and after CGAS score was incorporated.

Youths from lower income families or less educated caregivers had greater odds of anxiety disorders. However, this held only for DISC-IV disorders without impairment.

Those youths residing in households with two parents had lower odds of mood disorders, any disruptive disorders, and any disorder. Adjusting for DISC impairment, youths from 2-parent households had lower odds of mood, disruptive, and any disorder. Adjusting for CGAS scores, youths whose primary caregiver was married had lower odds for anxiety disorders, any disruptive disorders and any disorder.

In a previous paper which focused on ethnic differences, we found African American youths had lower odds of any substance use disorder than Mexican American youths and lower odds of mood, disruptive, substance use and any DSM-IV disorder, after adjusting for gender, age, and family SES (Roberts et al., 2006). There were no differences between European and Mexican American youths.

Discussion

In their review of the literature, Roberts et al. (1998) concluded that prevalence rates from studies using earlier versions of the DISC and DSM criteria were in the 18–20% range. Our overall prevalence rate is clearly in this range. There actually appears to be even more congruence between recent studies and ours. Canino et al. (2004) note that when their sample was restricted to those 9–17, and similar diagnoses included for Puerto Rico and the Great Smoky Mountains Study, the overall prevalence in Puerto Rico was 17.3% and the rate in the latter study (Angold et al., 2002) was 17.7%. Again, our prevalence for 11–17 year-olds was 17.1%. Other studies have reported higher rates and also lower rates. McGee and colleagues (McGee et al., 1990; Feehan et al., 1994) have reported prevalences of DSM-III disorder of 22% for 15-year-olds in New Zealand and 36% for DSM-III-R disorders when the cohort was 18. On the other hand, Lewinsohn et al. (1993) reported a point prevalence of 11% for DSM-III-R disorders among 14–18 year-olds, while Ford et al. (2003) reported a prevalence of 9.5%. In the MECA study, Shaffer et al. (1996) reported a prevalence based on youth report of 32.2%, 15.3% with CGAS score of ≤ 70 and 12.3% with DISC and CGAS impairment.

Recently, Simpson et al. (2005) report that approximately 5% of youths 4–17 years of age in the U.S. had emotional or behavioral problems (by parent report) and about 80% of these were functionally impaired. Thus, about 4% had symptoms and impairment. Their research did not use structured diagnostic interviews nor DSM diagnostic criteria nor were youths interviewed.

We should note that our 1-year prevalence of agoraphobia makes this the most prevalent anxiety disorder. No other papers have reported rates of agoraphobia using the DSM-IV with

adolescents. In their review, Black et al. (2004) do not report data on agoraphobia, nor does the chapter specifically address issues of reliability or validity of this diagnosis. The chapter does cite rates of panic disorder and social phobia similar to what we report. DSM-IV-TR (American Psychiatric Association) notes that it is difficult to diagnose agoraphobia due to frequent overlap with specific phobias, and notes that agoraphobia without panic is more prevalent than panic disorder with agoraphobia. This is what we found as well. It appears that the DISC-IV may be overly sensitive with regards to agoraphobia, but absent data from other studies, we can only report what we found. Our overall rate of anxiety disorder (6.9%) was lower than the 9.5% reported by Canino et al. (2004), who excluded agoraphobia. Their highest rate of anxiety disorder was separation anxiety (5.7%), but their sample was age 4–17. This issue clearly awaits additional data from other studies.

Similar to the findings from other studies of children and adolescents, without adjusting for impairment, we found many of the expected associations of psychiatric disorders with gender and age (Costello et al., 1997; Ford et al., 2003; Feehan et al., 1994; Lewinsohn et al., 1993; Bird et al., 1989; Simpson et al., 2005) without adjusting for impairment. Similar to other studies, we did not find strong associations of disorders with indicators of socioeconomic status (see Costello et al., 1997; Canino et al., 2004).

Our results adjusting for impairment yielded similar effects to those noted by others (Costello et al., 1996; Shaffer et al., 1996; Bor et al., 1997; Simonoff et al., 1997; Narrow et al., 1998). In our study, adjusting for DISC-IV impairment reduced prevalence 54%. Adjusting for CGAS score reduced prevalence threefold (to 5.4). Based on their review, Roberts et al. (1998) concluded that prevalence of disorder was probably 7–12%, adjusting for impairment. Our rates were 5.3 to 11%, depending on the impairment criteria used. These are highly consistent with rates adjusted for impairment reported by Costello et al. (2003), Canino et al. (2004), and Ford et al. (2003). In a reanalysis of existing datasets, Costello et al. (1998) found that the median prevalence of disorder adjusted for global impairment was 5.4% (the same as our rate with $CGAS \leq 69$) with a range of 4.3% to 7.4%.

Adjusting for impairment eliminated initial effects of family income and caregiver education (already minimal). The effect of CGAS score ≤ 69 was greater than for the DISC algorithm for moderate impairment. However, adjusting for neither DISC impairment nor CGAS score appreciably altered the observed associations between disorders and age, gender, or marital status of caregiver. Overall, the most consistent effects were observed for gender, age, and marital status of the primary caregiver, with or without impairment. Our results, which need to be replicated, suggest that the epidemiology of disorders may vary, depending on the degree of impairment.

However, there remains no consensus on how to operationalize clinically important impairment in epidemiologic studies (Roberts et al., 1998; Costello et al., 1997; Simonoff et al., 1997; Narrow et al., 1998). No doubt lack of such consensus contributes to discordant results across studies. Although work is proceeding in this regard (Angold et al., 1999), much remains to be done, particularly in the case of children and adolescents. The CGAS is an example of an assessment strategy that has proven useful. Its utility to date is limited due to the fact that it has not been widely used in epidemiologic studies and there is variation in its application across studies.

Questions might arise from our sample design. We did not select an area probability sample. In an attempt to compensate for this design effect, we post-stratified the TH2K sample to approximate the age, gender and ethnic distribution of the 5-county metropolitan area in which all of our study households were located. We used the DISC-IV and DSM-IV diagnostic criteria, with and without adjustment for impairment. We would argue that the high

concordance between our prevalence rates and other studies discussed above provide strong evidence for the external validity of our results. We might add that numerous studies cited by Roberts et al. (1998) and studies by Shaffer et al. (1996) and Turner and Gil (2002) were not, in a study of 19–21 year olds, strictly speaking, area probability samples either.

Another issue related to our sampling strategy involves the socioeconomic composition of the sample. Our sample was underrepresented by families below poverty levels extant in the metropolitan area where subjects resided. This may explain, in part, the fact that we did not find much evidence for an association between youth psychiatric disorders and family income or education. However, the relation between SES and mental health has proven complex and not consistent across studies of adults (see Holzer et al., 1986; Dohrenwend, 1990; Dohrenwend et al., 1992). To illustrate this with data from adolescents, Johnson et al. (1999) found evidence for adverse effects of parental SES on a number of adolescent psychiatric disorders, prospectively. The sample was mostly European American. Wadsworth and Achenbach (2005) also found lower SES increased risk of a range of mental health problems (but not all). Their sample was mostly majority youths and no data were presented separately for minority youths. We also have found evidence for increased odds of youth disorders when only data from European Americans are examined (Roberts et al., 2006), but not for African or Mexican American youths. This result for minority youths has been reported from other studies. Costello et al. (1997) found poverty increased the odds of disorders among majority but not minority youths. Canino et al. (2004) found no association between family income and youth disorders in Puerto Rico. Thus, evidence for the role of family SES remains unclear in the risk of child and adolescent psychiatric disorders.

A second issue is that we did not interview parents about the DSM-IV disorders assessed by youth interview. As noted by Roberts et al. (1998), a substantial proportion of studies have relied on either parent or youth report, but not both. In the Oregon Adolescent Depression Study, Lewinsohn et al. (1993) relied only on adolescent self-reports as did Turner and Gil (2002) more recently for older adolescents. And while there is argument that data from multiple informants is desirable, many studies have demonstrated considerable discordance in parent-child reports of psychopathology, whether subjects are assessed with structured (Edelbrock et al., 1986; Jensen et al., 1999) or semi-structured interviews (Angold et al., 1987), using symptom dimensions or categorical diagnoses (Rubio-Stipec et al., 1994), or using checklists (Achenbach et al., 1987; Yeh et al., 2001). There is little consensus on how parent and youth reports should be combined in epidemiologic studies and, indeed, some authors report prevalences separately for parents and children.

In conclusion, the evidence we have presented suggests that the prevalence findings for children and adolescents are remarkably robust across diverse setting, using diverse methods to generate estimates of DSM-IV caseness. At this point, data from U.S. rural samples, the island of Puerto Rico, a sample from England, and our sample from a large, metropolitan area of the U.S. yield similar estimates of prevalences, both with and without adjustment for impairment. Our next step is to examine the natural history of DSM-IV disorders in the TH2K and risk factors for disorders over time using data from 2 waves of observation 12 months apart. This will provide much-needed prospective data on the epidemiology of psychiatric disorders among adolescents in the United States.

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Table 1
Unweighted Sample Characteristics, Teen Health 2000 (Wave 1)

Characteristics		Percent
Gender of Youth	Male	51.14
	Female	48.86
Age of Youth	16 +	24.91
	Between 13 and 15	48.05
	12 or less	27.04
Ethnicity of Youth	European American	35.43
	African American	35.35
	Mexican American	20.53
	Others	8.69
Parent Education	15+ years	38.59
	13 – 14 years	29.44
	≤ 12 years	31.98
Family Income	\$65,000 +	35.29
	\$ 35,000 – \$ 64,999	40.71
	< \$35,000	24.00
Parental	Married	75.71
Marital Status	Not Married	24.29

Table 2
Weighted Prevalence of DISC-IV/DSM-IV Disorders in Past Year With and Without Impairment, Teen Health 2000

Disorder	Prevalence of Disorder		Prevalence of Disorder with DISC Impairment		Prevalence of Disorder with CGAS ≤ 69	
	%	95% C.I.	%	95% C.I.	%	95% C.I.
Any Anxiety Disorder	6.89	(6.07 – 7.71)	3.42	(2.83 – 4.01)	1.36	(0.99 – 1.74)
Agoraphobia	4.50	(3.83 – 5.17)	1.56	(1.16 – 1.97)	0.75	(0.48 – 1.03)
Generalized Anxiety	0.41	(0.20 – 0.63)	0.38	(0.18 – 0.59)	0.20	(0.05 – 0.35)
Panic	0.65	(0.39 – 0.90)	0.38	(0.19 – 0.57)	0.19	(0.05 – 0.33)
PTSD	0.59	(0.35 – 0.82)	0.51	(0.28 – 0.73)	0.21	(0.08 – 0.35)
Social Phobia	1.64	(1.22 – 2.07)	1.02	(0.69 – 1.35)	0.28	(0.10 – 0.46)
Any Eating Disorder	0.28	(0.10 – 0.46)	0.12	(0 – 0.24)	0.10	(0 – 0.21)
Anorexia	0.28	(0.10 – 0.46)	0.12	(0 – 0.24)	0.10	(0 – 0.21)
Bulimia	0	/	0	/	0	/
Any Mood Disorder	2.99	(2.41 – 3.57)	1.99	(1.52 – 2.46)	1.09	(0.74 – 1.45)
Mania	0.39	(0.18 – 0.61)	0.31	(0.12 – 0.51)	0.22	(0.05 – 0.39)
Hypomania	0.81	(0.50 – 1.12)	/	/	0.09	(0 – 0.20)
Major Depression	1.70	(1.27 – 2.12)	1.54	(1.14 – 1.95)	0.67	(0.41 – 0.93)
Dysthymia	0.33	(0.13 – 0.52)	0.29	(0.11 – 0.48)	0.20	(0.04 – 0.36)
ADHD-Any Type	2.06	(1.59 – 2.54)	1.92	(1.46 – 2.38)	0.85	(0.53 – 1.16)
Any Disruptive Disorder	6.45	(5.64 – 7.26)	3.59	(2.99 – 4.20)	1.84	(1.40 – 2.29)
Conduct Disorder	3.32	(2.73 – 3.91)	2.48	(1.97 – 2.99)	1.64	(1.21 – 2.07)
Oppositional Defiant	2.77	(2.23 – 3.32)	2.63	(2.09 – 3.16)	1.30	(0.91 – 1.69)
Any Substance Use Disorder	5.27	(4.49 – 6.05)	2.72	(2.14 – 3.30)	2.37	(1.82 – 2.91)
Alcohol Abuse or Dependence	2.92	(2.32 – 3.53)	1.43	(1.00 – 1.86)	1.19	(0.79 – 1.59)
Marijuana Abuse or Dependence	3.38	(2.75 – 4.01)	1.89	(1.41 – 2.37)	1.78	(1.30 – 2.26)
Other Substances Abuse or Dependence	0.90	(0.57 – 1.24)	0.34	(0.12 – 0.55)	0.58	(0.30 – 0.85)

Disorder	Prevalence of Disorder		Prevalence of Disorder with DISC Impairment		Prevalence of Disorder with CGAS ≤ 69	
	%	95% C.I.	%	95% C.I.	%	95% C.I.
One or More DSM-IV Diagnoses	17.06	(15.81–18.31)	11.13	(10.09– 12.18)	5.32	(4.55 – 6.08)

Demographic Correlates of DSM-IV/DISC-IV Diagnoses in Teen Health 2000 Study - With and Without Impairment, Teen Health 2000*

Table 3

DSM-IV Disorder						
	Anxiety	Eating	Mood	Conduct/ Oppd	ADHD-Any Type	Substance Use
Gender						
M:F	0.53 (0.41–0.69)	0.11 (0.01–0.85)	0.70 (0.47–1.05)	2.82 (2.04–3.90)	1.58 (0.97–2.97)	1.98 (1.42–2.77)
Age						
L:H	1.53 (1.08–2.16)	N/A	0.65 (0.32–1.32)	0.41 (0.23–0.73)	0.83 (0.36–1.91)	0.004 (0–0.04)
M:H	1.04 (0.70–1.54)	1.18 (0.22–6.26)	0.92 (0.52–1.63)	0.84 (0.56–1.25)	1.03 (0.52–2.06)	0.28 (0.19–0.41)
L:M	1.48 (1.03–2.11)	N/A	0.71 (0.38–1.32)	0.49 (0.29–0.84)	0.80 (0.39–1.65)	0.01 (0.001–0.15)
Family Income						
L:H	1.57 (1.03–2.41)	0.27 (0.02–3.65)	1.08 (0.56–2.08)	1.27 (0.78–2.07)	0.68 (0.28–1.64)	0.88 (0.52–1.50)
M:H	1.48 (1.003–2.19)	0.34 (0.06–2.01)	1.12 (0.64–1.96)	1.04 (0.67–1.61)	1.27 (0.66–2.46)	0.89 (0.57–1.38)
L:M	1.06 (0.73–1.55)	0.80 (0.05–13.26)	0.96 (0.51–1.82)	1.22 (0.76–1.95)	0.54 (0.24–1.22)	0.99 (0.58–1.70)
Parental Education						
L:H	1.50 (1.03–2.19)	0.74 (0.12–4.63)	0.91 (0.49–1.66)	1.04 (0.67–1.61)	0.61 (0.29–1.26)	1.14 (0.73–1.78)
M:H	1.41 (0.95–2.09)	0.89 (0.13–6.04)	1.13 (0.64–1.99)	1.18 (0.75–1.84)	1.07 (0.55–2.08)	0.91 (0.56–1.48)
L:M	1.06 (0.73–1.55)	0.83 (0.11–6.36)	0.80 (0.43–1.48)	0.88 (0.56–1.38)	0.57 (0.27–1.20)	1.25 (0.76–2.05)
Marital Status						
Yes: Other	0.95 (0.71–1.28)	1.02 (0.21–4.86)	0.65 (0.42–0.99)	0.63 (0.46–0.88)	1.18 (0.66–2.12)	0.81 (0.57–1.17)
						0.80 (0.65–0.98)

DSM-IV Disorder with impairment												DSM-IV Disorder with CGAS ≤ 69			
Anxiety			Eating	Mood	Conduct/oppd	ADHD-Any Type	Substance Use	Any	Anxiety	Eating	Mood	Conduct/oppd	ADHD-Any Type	Substance Use	Any
Gender															
M:F	0.70 (0.49–0.90)	N/A	0.56 (0.34–0.92)	2.74 (1.93 – 3.91)	1.73 (1.04 – 2.88)	2.20 (1.37–3.52)	1.38 (1.11–1.73)	0.58 (0.33–1.01)	N/A	0.62 (0.31–1.23)	3.17 (1.91–5.27)	3.31 (1.33 – 8.25)	1.87 (1.13–3.09)	1.49 (1.09–2.04)	
Age															
L:H	1.10 (0.62–1.95)	N/A	0.53 (0.20–1.36)	0.51 (0.28 – 0.94)	0.81 (0.34 – 1.93)	N/A	0.46 (0.31–0.68)	0.65 (0.26–1.62)	N/A	0.49 (0.14–1.68)	0.30 (0.12–0.73)	0.52 (0.15 – 1.85)	0.01 (0 – 0.09)	0.26 (0.15–0.46)	
M:H	0.93 (0.55–1.57)	0.54 (0.05–5.91)	1.07 (0.54–2.11)	0.94 (0.60 – 1.47)	1.01 (0.49 – 2.05)	0.27 (0.16–0.47)	0.70 (0.51–0.94)	0.74 (0.35–1.59)	0.29 (0.02–5.45)	0.84 (0.34–2.07)	0.56 (0.31–1.00)	0.56 (0.20 – 1.57)	0.21 (0.11–0.39)	0.43 (0.29–0.63)	
L:M	1.19 (0.71–1.98)	N/A	0.49 (0.21–1.15)	0.54 (0.31–0.95)	0.84 (0.38 – 1.70)	N/A	0.66 (0.46–0.95)	0.87 (0.37–2.08)	N/A	0.59 (0.19–1.80)	0.53 (0.22–1.27)	0.93 (0.28–3.12)	0.04 (0.003–0.45)	0.61 (0.35–1.08)	
Family Income															
L:H	1.71 (0.95–3.06)	N/A	1.17 (0.55–2.50)	1.39 (0.82 – 2.36)	0.67 (0.27 – 1.68)	0.72 (0.33–1.56)	1.38 (0.96–1.99)	1.91 (0.77–4.77)	N/A	1.22 (0.42–3.52)	1.17 (0.56–2.46)	0.75 (0.19 – 2.93)	0.96 (0.44–2.10)	1.27 (0.76–2.10)	
M:H	1.53 (0.89–2.61)	0.28 (0.02–4.53)	0.81 (0.40–1.60)	1.11 (0.69 – 1.80)	1.31 (0.66 – 2.59)	0.95 (0.52–1.74)	1.19 (0.86–1.65)	1.42 (0.58–3.48)	0.39 (0.02–7.37)	1.08 (0.40–2.88)	1.00 (0.52–1.94)	1.09 (0.39 – 3.06)	0.89 (0.45–1.76)	1.14 (0.73–1.79)	
L:M	1.12 (0.66–1.89)	N/A	1.46 (0.68–3.14)	1.25 (0.75–2.07)	0.51 (0.22 – 1.21)	0.75 (0.35–1.64)	1.16 (0.82–1.64)	1.34 (0.60–3.00)	N/A	1.31 (0.41–3.13)	1.17 (0.57–2.39)	0.69 (0.18–2.55)	1.08 (0.49–2.39)	1.11 (0.68–1.80)	
Parental Education															
L:H	1.65 (0.97–2.79)	N/A	0.60 (0.28–1.28)	1.00 (0.63 – 1.61)	0.62 (0.29 – 1.32)	0.79 (0.42–1.47)	1.16 (0.84–1.60)	1.20 (0.55–2.62)	N/A	1.14 (0.44–2.96)	0.94 (0.49–1.79)	0.63 (0.21 – 1.90)	0.78 (0.40–1.52)	1.09 (0.71–1.68)	
M:H	1.67 (0.96–2.90)	1.64 (0.15–18.04)	0.99 (0.50–1.93)	1.07 (0.66 – 1.76)	1.06 (0.53 – 2.11)	0.71 (0.36–1.39)	1.18 (0.84–1.65)	0.99 (0.41–2.37)	0.71 (0.04–13.39)	1.07 (0.39–2.94)	0.88 (0.44–1.76)	0.70 (0.22 – 2.20)	0.66 (0.32–1.38)	0.94 (0.59–1.52)	
L:M	0.99 (0.59–1.64)	N/A	0.61 (0.28–1.34)	0.93 (0.57–1.54)	0.58 (0.27 – 1.26)	1.11 (0.54–2.30)	0.98 (0.70–1.37)	1.21 (0.52–2.79)	N/A	1.07 (0.39–2.90)	1.07 (0.52–2.19)	0.90 (0.26–3.17)	1.17 (0.53–2.61)	1.16 (0.72–1.86)	
Marital Status															
Yes: Other	0.99 (0.66–1.49)	0.86 (0.09–8.30)	0.46 (0.28 – 0.76)	0.66 (0.46 – 0.95)	1.08 (0.60 – 1.95)	0.88 (0.52–1.48)	0.71 (0.56–0.91)	0.56 (0.32–0.99)	0.62 (0.06–6.85)	0.63 (0.32–1.25)	0.57 (0.36–0.91)	1.08 (0.44 – 2.63)	0.68 (0.40–1.15)	0.61 (0.44–0.84)	

Odds ratios are presented in the first line of each column and 95% Confidence intervals in the second line.

Bold entries = p<0.05

L = lower age, income, and parent education

H = upper age, income, and parent education