

# A Longitudinal Study of Adolescent Mental Health Service Use

**Steven P. Cuffe, MD**

**Jennifer L. Waller, PhD**

**Cheryl L. Addy, PhD**

**Robert E. McKeown, PhD**

**Kirby L. Jackson, AB**

**Jamaluddin Moloo, MD, MPH**

**Carol Z. Garrison, PhD**

## Abstract

*This study examines longitudinal mental health service use patterns of a school-based sample of adolescents. Based on the Center for Epidemiologic Studies Depression Scale scores, a stratified sample of middle-school students was interviewed using the Schedule for Affective Disorders and Schizophrenia for School-Aged Children: cycle one (n = 579; mean age 12.83) and cycle two (n = 490; mean age 18.65). Service use also was assessed by mailed questionnaire: cycle three (n = 330; mean age 20.60). Service use decreased over time. Whites and males received significantly more treatment in the first cycle. In the second cycle, service use by race and gender was equal; in the third cycle, females received more treatment. Those with a psychiatric diagnosis (first cycle, 54%; second cycle, 33%) received treatment in the prior year. Under-treatment of youth with psychiatric diagnoses is a significant problem, with differences in service use by race and gender over time.*

---

Address correspondence to Steven P. Cuffe, MD, Associate professor, Department of Neuropsychiatry and Behavioral Science, University of South Carolina, Director, Division of Child and Adolescent Psychiatry, William S. Hall Psychiatric Institute, South Carolina Department of Mental Health, P.O. Box 202, Columbia, SC 29202. Telephone (803) 898-1593, fax (803) 898-1617, e-mail SPC45@WSHPI.DMH.STATE.SC.US.

Jennifer L. Waller, PhD, is Assistant Professor in the Office of Biostatistics at the Medical College of Georgia.

Cheryl L. Addy, PhD, is Associate Professor in the Department of Epidemiology and Biostatistics at the University of South Carolina, Columbia.

Robert E. McKeown, PhD, is Associate Professor in the Department of Epidemiology and Biostatistics at the University of South Carolina, Columbia.

Kirby L. Jackson, AB, is Instructor in the Department of Epidemiology and Biostatistics at the University of South Carolina, Columbia.

Jamaluddin Moloo, MD, MPH, is Assistant Professor in the Department of Internal Medicine at the University of South Carolina Medical School.

Carol Z. Garrison, PhD, is Professor in the Department of Family and Community Medicine, University of Louisville School of Medicine and Provost at the University of Louisville.

*Journal of Behavioral Health Services & Research*, 2001, 28(1), 1–11. © 2001 National Council for Community Behavioral Healthcare.

There is a paucity of research on mental health service use in community samples of adolescents, and even fewer studies examining service use longitudinally. The majority of studies to date have shown that less than half of children with psychiatric disorders have contact with any professional for their emotional or behavioral problems.<sup>1-5</sup> The percentage of children with disorders reporting treatment contact with any professional ranges from 18% to 45% in these studies. They included teachers, family physicians, guidance counselors, clergy, and other professionals as long as the focus was on emotional problems. Three other studies<sup>6-8</sup> found slightly over half of the children (range, 51% to 58%) with emotional problems saw any professional for these problems. With the exception of the study by Leaf et al<sup>5</sup> in 1996, which found only 36% of the children with problems received any help, the more recent studies have shown a higher percentage of children with disorders receiving some contact with a professional. This may be seen as a promising sign that more children are receiving some treatment. However, it appears only a small minority of these children are receiving specialty mental health care. In the two studies<sup>6,7</sup> providing a breakdown by professional groups, only 33% and 11%, respectively, of the disordered children received treatment from a trained mental health professional.

Few studies have examined the reasons why some children are treated while others are not. The existing evidence is contradictory. Cohen and Hesselbart<sup>9</sup> found that the only diagnoses correlated with service use were conduct disorder and oppositional defiant disorder. Cuffe et al<sup>8</sup> found all diagnoses significantly associated. Some studies<sup>10,11</sup> have shown a predominance of boys in treatment in childhood and girls in adolescence. Others have found no differences by sex<sup>2,4</sup> or males treated more than females in early adolescence.<sup>8</sup> Similarly, Offord et al<sup>4</sup> found no differences by age, socioeconomic status (SES), or urbanicity, while Cohen and Hesselbart<sup>9</sup> found lower treatment levels in 18- to 21-year-olds, rural residents, and middle-income families. Finally, Cuffe et al<sup>8</sup> and Hoberman<sup>12</sup> found evidence of under-treatment for African Americans, while other studies report the possibility of higher service use in this group.<sup>9,13,14</sup> Some variation may be due to regional differences in help-seeking behaviors since these studies were conducted in different regions of the United States.

Most studies have used cross-sectional data. Research using longitudinal, community-based designs could begin to clarify some of the inconsistencies in the literature. Accordingly, we report on mental health service use data from a longitudinal, school-based, epidemiologic study of adolescents. The relationship between race, sex, psychiatric diagnosis, socioeconomic status, and service use is explored.

## **Method**

### **Measures**

The Center for Epidemiologic Studies Depression Scale (CES-D)<sup>15</sup> is a 20-item, self-report, symptom rating scale developed to measure depressive symptomatology. When completing the instrument, the individual is asked to report on his or her feelings during the preceding week. The total CES-D score (range, 0 to 60) is obtained by summing the 20 depression items. The single score is used to index the degree of depressive symptomatology present. Three suicide items ("I felt life was not worth living," "I felt like hurting myself," and "I felt like killing myself") were added to the end of the CES-D. Responses to these additional items were made on the same scale as the original 20 CES-D items.

The Present Episode Version of the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (K-SADS)<sup>16</sup> is a semi-structured diagnostic interview. The K-SADS focuses on psychiatric disorders during the past year in children and adolescents aged 6 to 17 years. Items covered in the K-SADS permit the measurement of affective, schizophrenic, anxiety, phobic, conduct, substance use/abuse, and eating disorder symptoms and diagnoses. Information regarding

specific types (thoughts versus plans versus actions), onset, frequency, severity (intent), and medical lethality of suicidal behaviors as well as non-suicidal physically self-damaging acts is also collected. K-SADS data were entered into a computer program, and cut-off points were set for the severity of response needed to meet *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*<sup>17</sup> (DSM-IV) symptom criteria. A computer algorithm was created corresponding to DSM-IV diagnostic criteria to determine final diagnoses.

Inpatient and outpatient treatments were assessed using the K-SADS by way of two overall screening items. For inpatient hospitalizations, participants were asked about psychiatric hospitalization during the present episode or last year, not including direct transfer from another hospital. The item for inpatient treatment was measured on a 0 to 2 scale (0 = No information; 1 = No; 2 = Yes). For outpatient treatment they were asked, "Did you see any professional person where the focus was on your emotional or behavioral problems?" The item for outpatient treatment was measured on a 0 to 3 scale (0 = No information; 1 = No contact; 2 = Consultation for no more than 2 weeks of treatment; 3 = More than 2 weeks of treatment). After examining the data, it was seen that too few subjects received inpatient treatment ( $n = 16$  at baseline and 7 at follow-up) to analyze this group separately. All hospitalized subjects also reported outpatient treatment. Thus, psychiatric treatment was defined as indicating any treatment on the outpatient treatment item (answering with value 2 or 3).

The Children's Global Assessment Scale (CGAS)<sup>18</sup> was used to assess impairment in family, social, peer, and school functioning on a scale of 0 to 100. Those subjects with a CGAS score of 60 or less were judged to have met the criterion for impairment in functioning.

## Procedure

This study is part of a longitudinal study of depression and suicidal behaviors in adolescents. Data were collected in three cycles: 1987 through 1989 for the first cycle, 1991 through 1994 for the second cycle, and 1994 through 1995 for the third cycle. Data for the first cycle (1987 through 1989) were collected on 7th, 8th, 9th, and 10th grade students in six public suburban schools (four middle schools and two high schools) in a single school district in the Southeast. The general methods of the first cycle of the study are described elsewhere.<sup>19</sup> Data collection in the first cycle occurred in two phases: school screening and diagnostic evaluation. Each year during the school screening, students enrolled in the participating schools were contacted in classroom settings. Ninety-eight percent ( $n = 3,456$ ) of the students completed a self-administered questionnaire that included the CES-D (to which three suicide items were added) and demographic variables.

The diagnostic evaluation in the first cycle consisted of separate semi-structured interviews of the adolescent and one parent (most often the mother). The interview protocol utilized the K-SADS, the CGAS, and the Hollingshead two-factor index of social position.<sup>20</sup> The following types of students were asked to participate in the interview phase of the study: (1) students with the highest CES-D scores (ie, scores  $\geq 30$ , top 10 percent;  $n = 220$ ); (2) students with high suicide screening scores (scores  $\geq 6$ ;  $n = 40$ ); (3) students with probable depression derived by applying an algorithm based on research diagnostic criteria<sup>21</sup> to the CES-D responses ( $n = 40$ ); (4) students with a missing CES-D score ( $n = 20$ ); (5) low-risk black students also were oversampled ( $n = 79$ ) to ensure the ability to analyze the data by race; and (6) a random sample of the remaining low-risk white students ( $n = 180$ ). For reporting purposes the four high-risk categories are combined into one high-risk group and the number of low-risk black and white students are reported. Psychiatric nurse clinicians who had participated in a rigorous 3-month training and standardization period conducted all interviews during the first cycle.

Those students interviewed at any time during the first cycle were recruited for follow-up interviews in consecutive years during the first cycle. The total number of individuals completing a diagnostic evaluation in the first cycle was 589. Eight adolescents reporting their race as other than black or white were excluded from analyses due to small numbers. Two participants were excluded

due to missing information on the outcome variable, leaving a total of 579 students in these analyses. This sample includes 320 high-risk students, 79 low-risk black students, and 180 low-risk white students. This number represents an increase of 101 youth from an earlier study<sup>8</sup> that reported on the cross-sectional service use patterns of adolescents during the first cycle of this project and included only those subjects completing diagnostic interviews in the year following their first school screening. The 21% increase in subjects allows a larger sample of adolescents to be followed longitudinally for service use patterns.

Data collection during the second cycle consisted of a semi-structured interview of the adolescent and a parent (usually the mother) during the 12th grade. If the adolescent was married, the spouse was interviewed rather than a parent. The interview protocol utilized the K-SADS, the CGAS, and an adolescent written questionnaire. The adolescent written questionnaire included the CES-D scale and demographic information including race and sex. A total of 490 individuals completed the second cycle diagnostic evaluation and written questionnaire, but only 488 provided treatment information. This sample includes 266 high-risk students, 63 low-risk black students, and 159 low-risk white students.

Psychiatry residents and fellows and master's-prepared psychologists in a doctorate program conducted the interviews during the second cycle. All interviewers participated in rigorous training and standardization procedures.

For the third cycle of data collection a mental health treatment questionnaire was mailed to all individuals who participated in the second cycle of diagnostic interviews. This questionnaire was mailed in 1994 through 1995 and was used to determine whether the individual had any lifetime or past-year mental health treatment. Three-hundred and thirty individuals completed and returned the mailed questionnaire. This represents 172 high-risk students, 38 low-risk black students, and 120 low-risk white students.

## **Statistical analyses**

All statistical analyses incorporated a stratified two-stage sampling design. Weights were calculated by dividing the number of individuals in each stratum in the baseline screening sample by the number of individuals in the corresponding stratum in the baseline clinical sample for individuals in the first cycle. For individuals in the second cycle, the baseline screening sample was divided by the number of individuals in the corresponding stratum in the follow-up clinical sample. Appropriate weights were applied to each observation. SUDAAN<sup>22</sup> was used to incorporate the stratified two-stage sampling design into all statistical analyses.

Weighted percentages and prevalence estimates were calculated on the demographic characteristics, treatment utilization, and psychiatric disorders. Demographic variables included race (black and white; white is the referent group), gender (male is the referent group), and SES (categorized as low versus medium to high; medium to high is the referent group). Psychiatric disorders include major depressive disorder (MDD), any disorder, and a four-category psychiatric disorder variable (affective comorbid with nonaffective disorder, affective disorder only, nonaffective disorder only, and no disorder; no disorder is the referent group). Weighted percentages of treatment were calculated by race and gender groups within the four psychiatric disorder categories and among those with any psychiatric disorder for those in the first and second cycles of diagnostic evaluation.

Weighted logistic regression was utilized to determine the correlates of outpatient treatment among those in the first and second cycles of diagnostic evaluation. Possible correlates included race-gender groups, SES, total CES-D score, and the four psychiatric disorder categories. All variables were first entered into univariable weighted logistic regression models. Those variables statistically significant at an alpha level of 0.05 were then entered into a comprehensive multivariable weighted logistic regression model. Using a backward stepwise elimination procedure, the final multivariable weighted logistic regression model contained all variables retaining significance at an alpha level of 0.05.

Weighted chi-square tests were performed to determine differences in treatment utilization by race and by gender using data from the mailed questionnaire. Differences in treatment in the past year and before the past year were assessed.

## Results

Overall frequencies and weighted percentages are given in Table 1 for demographic, treatment, and psychiatric variables in each of the three samples, first cycle of diagnostic evaluation, second cycle of diagnostic evaluation, and the mailed service utilization questionnaire (third cycle). Distributions of race and gender are consistent across the three samples with approximately 83% to 86% white and 53% to 56% female. The percentage of individuals in the low SES group decreased over the course of the study (32% in the first cycle, 30% in the second cycle, 25% in the third cycle). The percentage of individuals receiving mental health treatment in the past year also showed a decrease over time (24% of the first cycle, 9% of the second cycle, and 3% of the third cycle). Weighted prevalence of disorder during the first cycle was higher than at the second cycle for MDD, any disorder, and all diagnosis categories.

Table 2 shows weighted prevalence of mental health treatment by race-gender groups within disorder categories for the first cycle diagnostic evaluation and the second cycle diagnostic evaluation. Rates of treatment were lower at the second cycle diagnostic evaluation for all race-gender groups within all diagnosis categories with the exception of black males with nonaffective disorder only and any disorder and white males with affective disorder comorbid with a nonaffective disorder. However, these rates are based on a very small sample of black males in both the first and

**Table 1**

Frequencies and weighted percentages for variables among adolescents in the first ( $n = 579$ ), second ( $n = 490$ ), and third ( $n = 330$ ) cycles of evaluation

Variable	First cycle		Second cycle		Third cycle	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Race/gender</b>						
White male	188	40	164	40	113	39
White female	254	43	218	44	158	47
Black male	60	7	46	7	18	4
Black female	77	9	62	9	41	9
<b>Socioeconomic status</b>						
Low	202	32	158	30	88	25
Medium to high	377	68	332	70	242	75
<b>Mental health treatment in the past year</b>	165	24	59	9	21	3
<b>Major depressive disorder</b>	116	12	32	3		
<b>Any disorder</b>	212	26	49	6		
<b>Diagnosis category</b>						
No diagnosis	367	74	441	94		
Nonaffective only	77	12	12	2		
Affective only	30	4	19	2		
Affective comorbid with nonaffective	105	10	18	2		

**Table 2**

Weighted prevalence of mental health treatment contact among adolescents in the first ( $n = 579$ ) and second ( $n = 490$ ) cycles of diagnostic evaluation

Variable	First cycle		Second cycle	
	<i>n</i>	% treated	<i>n</i>	% treated
<b>No diagnosis</b>	367	13	441	8
White male	130	18	146	6
White female	154	10	195	9
Black male	35	13	42	7
Black female	48	6	58	7
<b>Nonaffective disorder only</b>	77	44	12	15
White male	21	50	4	6
White female	30	57	4	9
Black male	17	11	4	40
Black female	9	19	0	0
<b>Affective disorder only</b>	30	60	19	42
White male	10	71	7	29
White female	15	58	10	50
Black male	4	15	0	0
Black female	1	0	2	0
<b>Affective comorbid with nonaffective disorder</b>	105	64	18	44
White male	27	67	7	71
White female	55	70	9	25
Black male	4	31	0	0
Black female	19	48	2	0
<b>Any disorder</b>	212	54	49	33
White male	58	60	18	33
White female	100	63	23	33
Black male	25	16	4	40
Black female	29	34	4	0

second cycle diagnostic evaluations and should be interpreted with caution. In addition, rates of treatment are highest for individuals with an affective disorder comorbid with a nonaffective disorder, followed by an affective disorder only, then a nonaffective disorder only, and finally no disorder. For those with any disorder, 54% received treatment in first cycle, while 33% were treated in cycle two. Further, a history of diagnosis and treatment during the first cycle was not associated with having a diagnosis in the second cycle. For example, of those students with an affective disorder only in the first cycle, 2 of 13 who received treatment retained a diagnosis at the second cycle, while 1 of 13 who did not receive treatment retained a diagnosis. This pattern is similar for all diagnostic categories.

As would be expected, the high-risk students had higher levels of both diagnoses (153 of 320; 47.8%) and treatment (102 of 320; 31.9%) than did the low-risk white (40 of 180 or 22.2% with diagnosis; 38 of 180 or 21.1% treated) or black (19 of 79 or 24.1% with diagnosis; 9 of 79 or 11.4% treated) students at baseline. The follow-up data are similar, with 15% of high-risk students (40 of 267), 4.6% of low-risk white students (7 of 153) and 3.2% of low-risk black students (2 of 63)

receiving a diagnosis, while 13.5% (36) high-risk students, 7.5% (12) low-risk white, and 6.3% (4) low-risk black students received treatment.

Weighted univariable and multivariable models for outpatient treatment in the first and second cycles of diagnostic evaluation are given in Table 3. The final multivariable model consisted of race-gender groups, CES-D total score, and the disorder categories. At the first cycle black females (odds ratio [OR]=0.35) and black males (OR=0.39) were significantly less likely to receive treatment than white males. White females (OR = 0.68) also were less likely to have outpatient treatment at the first cycle, although the difference was not significant. Those with higher CES-D scores were more likely (OR = 1.05) to have had outpatient treatment at the first cycle. An increasing trend was seen in the disorder categories at first cycle with those having an affective disorder comorbid with a nonaffective disorder being more likely to have had outpatient treatment (OR = 12.34), followed by affective disorder only (OR = 10.55), and finally nonaffective disorder only (OR = 5.35). Associations were similar, with the exception of race-gender groups, at the second cycle diagnostic evaluation, although the magnitudes of the odds ratios were less. Black females (OR = 0.87) were less likely and black males (OR = 1.31) and white females (OR = 1.54) were more likely to have had outpatient treatment at the second cycle, but these associations were not statistically significant.

**Table 3**  
Weighted univariable and multivariable logistic regression analyses on outpatient treatment—  
first cycle (*n* = 579) and second cycle (*n* = 490)

Variable	First cycle		Second cycle	
	OR	95% CI	OR	95% CI
<b>Univariable logistic regression</b>				
Black females*	0.35	0.17, 0.71	0.87	0.26, 2.90
Black males*	0.39	0.17, 0.91	1.31	0.41, 4.19
White females*	0.68	0.40, 1.15	1.54	0.65, 3.64
Low SES	0.94	0.57, 1.56	1.12	0.52, 2.40
CES-D total score <sup>†</sup>	1.05	1.03, 1.07	1.03	0.99, 1.07
Nonaffective disorder only	5.35	2.67, 10.72	2.24	0.47, 10.66
Affective disorder only	10.55	3.52, 31.59	8.96	2.13, 37.75
Affective comorbid with nonaffective disorder	12.34	6.31, 24.14	9.46	2.19, 40.89
<b>Multivariable logistic regression</b>				
Black females*	0.24	0.10, 0.59	1.08	0.31, 3.85
Black males*	0.25	0.09, 0.71	1.68	0.52, 5.41
White females*	0.56	0.30, 1.05	1.55	0.62, 3.86
CES-D total score <sup>†</sup>	1.03	1.01, 1.06	1.01	0.96, 1.05
Nonaffective disorder only	5.11	2.40, 10.85	2.50	0.58, 10.84
Affective disorder only	8.11	2.30, 28.63	8.73	1.93, 39.42
Affective comorbid with nonaffective disorder	9.90	4.52, 21.69	10.37	1.80, 59.75

\*Referent group is white males.

<sup>†</sup>Continuous variable. Odds ratio is for a one-unit change.

OR, odds ratio; CI, confidence interval; SES, socioeconomic status; CES-D, Center for Epidemiologic Studies Depression Scale

Using data from the third cycle survey of service utilization, significant chi-square statistics (Table 4) were seen for race with treatment before the past year ( $p = .0006$ ) and for gender with treatment in the past year ( $p = .0061$ ). Whites (21%) were more likely to have received treatment before the past year than blacks (6%). Likewise, females (5%) were more likely to have received treatment in the past year than males (1%). These results should be viewed with caution due to small numbers. Since no diagnostic evaluation was performed at the time of the third cycle mailed survey, logistic regression analysis for diagnostic variables could not be performed. However, using diagnosis at cycle two as a proxy for diagnostic status, 24% of those with major depression and 20% of those with any disorder received treatment in the past year.

## Discussion

The results of this study add to our knowledge of the patterns of adolescent mental health service use. In early adolescence, boys predominated and a majority (54%) of subjects diagnosed with psychiatric disorders had some contact with a professional where the focus was on emotional problems. As these youth progressed through adolescence, however, there was a dramatic decrease in such treatment. In the second cycle, only 33% of those receiving a diagnosis reported any treatment. In the third cycle in late adolescence, only 20% of those receiving a diagnosis in the second cycle received treatment. These data mirror the service use of the overall sample for the three time periods of 24% for the first cycle, 9% for the second, and 3% for the third.

Selective attrition could account for part of the decrease in treatment contact for the sample over time. The three samples differed by race (statistically significant) and SES (not statistically significant). Adolescents diagnosed with a disorder in the first cycle were lost to follow-up more than adolescents without a disorder, but the difference was not statistically significant. For example, 16% of students with major depressive disorder and 13% of those with no diagnosis were lost to follow-up ( $p = .38$ ). Thus, having a diagnosis during the first cycle did not correlate with an increased attrition. Approximately 57% of the total sample, and 66% of the students from cycle two, responded to the mailed questionnaire. This sample had a lower number in the low socioeconomic group and a much lower number of black males. This could introduce bias and result in an underestimate of

**Table 4**  
Weighted chi-square tests for differences in treatment utilization among adolescents  
in the third cycle ( $n = 330$ )

Variable	<i>n</i>	%	$\chi^2$	<i>p</i> value
<b>Treatment in past year</b>				
White	18	3	0.52	.4715
Black	3	5		
Male	3	1	7.59	.0061
Female	18	5		
<b>Treatment before the past year</b>				
White	74	21	12.07	.0006
Black	4	6		
Male	26	20	.04	.8509
Female	52	19		



service use for the sample as a whole. However, the treatment patterns of the subgroup of 330 subjects completing the mailed survey were computed separately. The percentage of this sample receiving treatment during the three time periods is virtually identical to the results for the entire sample. This reduces the likelihood that selective attrition played a major role in these results.

The dramatic decrease in the frequency of contact with professionals as the adolescents grow older may reflect multiple factors related to help-seeking behaviors. First, the older adolescent tends to be less under parental influence and therefore more able to resist seeking help. Second, the majority of mental health-related services are obtained in the school setting.<sup>5,7</sup> As adolescents age, more tend to drop out of school. It is probable that children with psychiatric disorders have higher drop-out rates, thus reducing their access to care in this setting. Finally, the transition from high school to college or work may disrupt treatment for the adolescent and young adult, or reduce the likelihood of pursuing treatment. Economic barriers in particular may become prominent. These data support Cohen and Hesselbart's<sup>9</sup> findings of very low service use in this age group. Further study of the relevant causes is important. This is a time when psychiatric disorders such as bipolar disorder, major depression, and schizophrenia may be expressed. The stress of transition to adulthood also may increase vulnerability to psychiatric morbidity. There are serious implications for secondary and tertiary prevention of psychiatric illness. If the underlying reasons for the decrease in service use were understood, interventions could be devised to increase treatment in this age group.

The relationship of service use to gender is interesting in this sample. In the early adolescent period males received treatment at a slightly, but not significantly, higher rate. In later adolescence (second cycle), the frequency of treatment contact is approximately equal between the sexes. Females were significantly more likely to obtain treatment in the early adult period (third cycle mailed survey) for this sample, where service use resembles the reported service use frequency of adult samples. Self-selection bias (who returned the survey) could account for some of the difference in service use.

Unlike the Cohen and Hesselbart<sup>9</sup> study, the current study shows affective disorders significantly correlated with service use in both early and late adolescence. Nonaffective disorder diagnoses were significantly correlated with service use in early, but not late, adolescence, and the magnitude of the odds ratios was the smallest of any diagnostic category. As might be expected, the comorbid occurrence of affective and nonaffective disorders was associated with the highest odds ratios.

Race was significantly correlated with service use in both simple and multivariable models in the youngest age group. These data cannot shed light on the cause of this finding. Cultural factors appear to be impacting the use of mental health services by young teens. The differences in treatment contact by race lessened over time, until they were virtually identical in early adulthood. Further study of differences in help-seeking behaviors and service use patterns by race is warranted.

The number of adolescents diagnosed with psychiatric disorders decreased over time in this sample. This is counter-intuitive since research has pointed to increased risk for developing psychiatric disorders such as schizophrenia, depression, and bipolar disorder in late adolescence and early adulthood. The reduced numbers of diagnosed subjects in the older age groups limit the ability to analyze by race, gender, and SES. A possible explanation of this decrease is that the first cycle diagnoses relied heavily on the parent's report of symptoms in reaching a diagnosis. In 7th, 8th, and 9th grade the parent (usually the mother) felt very comfortable reporting symptoms for their children. In the second cycle, however, the interviewers noticed that many parents had very little knowledge of their adolescent's symptoms, particularly internalizing symptoms. This may have decreased the ability to reach a threshold for diagnoses in the second cycle. In addition, older adolescents may be more likely to deny or disavow emotional or behavioral problems.

This phenomenon of decreasing diagnoses in older adolescents has been previously reported in a cross-sectional study of a large general population of children and adolescents.<sup>23</sup> In Cohen et al's study, many diagnoses showed a sharp decline in prevalence in the older groups of children. The current study supports the Cohen et al study findings with a longitudinal sample and suggests that their results are not due solely to a cohort effect.

These data are limited in their ability to shed light on the motivations for or barriers to mental health care in this sample of adolescents and their families. There are no data concerning the type of professional consulted, the type of treatment, or the perceived outcome of the treatment. There is a need for increased research focused on service use patterns, accessibility of care, and perceived barriers to mental health care. Factors related to help-seeking behaviors by parents, adolescents, and young adults are particularly important to understand. Epidemiologic and services research have shown both the prevalence of disorders and the amount of unmet service need. Further work should detail the barriers to treatment that underlie the failure to seek treatment by parents and teenagers.

## Implications for Behavioral Health Services

Many questions also are posed for clinicians and mental health care managers by these data. Under-use of services by adolescents with disorders may reduce the immediate costs to managed health care companies. However, the long-term functioning of these individuals may be poor, resulting in far greater human costs and costs to employers over time. There is growing evidence that while people with mental disorders often have a higher use of other medical services, once some mental health treatment is obtained there may be a reduction in overall health service costs.<sup>24</sup> This cost offset is especially important in view of the current national debate over nondiscriminatory mental health coverage (parity) by the insurance and managed care industries. Further data are needed to evaluate the efficacy of treatment and overall service use costs.

Information from epidemiologic and service use studies should be used to design intervention strategies across the continuum of the mental health prevention/treatment spectrum.<sup>25,26</sup> This includes research on risk factors and causality used for universal, selective, and indicated prevention studies and research to prevent comorbidity, disability, and relapse in a clinical population. Interventions seeking to reduce the rate of treatment drop-out rates would be particularly important in the late adolescent and young adult periods.

## References

1. Anderson JC, Williams S, McGee R, et al. DSM-III disorders in preadolescent children: prevalence in a large sample from the general population. *Archives of General Psychiatry*. 1987;44:69–76.
2. Beitchman J. Social class, symptom type, and the utilization of children's psychiatric services. *Canadian Psychiatric Association Journal*. 1978;23:297–302.
3. Langner TS, Gersten JC, Greene EL, et al. Treatment of psychological disorders among urban children. *Journal of Consulting and Clinical Psychology*. 1974;42:170–179.
4. Offord DR, Boyle MH, Szatmari P, et al. Ontario child health study: II. Six month prevalence of disorder and rates of service utilization. *Archives of General Psychiatry*. 1987;44:832–836.
5. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: results from the four-community MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1996;35(7):889–897.
6. Cohen P, Kasen S, Brook JS, et al. Diagnostic predictors of treatment patterns in a cohort of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1992;31:951–960.
7. Zahner GEP, Pawelkiewicz W, DeFrancesco JJ, et al. Children's mental health service needs and service utilization patterns in an urban community. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1992;31:951–960.
8. Cuffe SP, Waller JL, Cuccaro MLZ, et al. Race and gender differences in the treatment of psychiatric disorders in young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1995;34(11):1536–1543.
9. Cohen P, Hesselbart CS. Demographic factors in the use of mental health services. *American Journal of Public Health*. 1992;82:49–52.
10. Andreasen NC, Rice J, Endicott J, et al. Familial rates of affective disorder: a report from the National Institute of Mental Health collaborative study. *Archives of General Psychiatry*. 1987;44:461–469.
11. Orvaschel H, Thompson WD, Belanger A, et al. Comparison of the family history method to direct interview: factors affecting the diagnosis of depression. *Journal of Affective Disorders*. 1982;4:49–59.
12. Hoberman HM. Ethnic minority status and adolescent mental health services utilization. *Journal of Mental Health Administration*. 1992;19:246–267.
13. Costello EJ, Janiszewski S. Who gets treated? Factors associated with referrals in children with psychiatric disorders. *Acta Psychiatrica Scandinavica*. 1990;81:523–529.
14. Sue S, Fujino DC, Hu L, et al. Community mental health services for ethnic minorities: a test of the cultural responsiveness hypothesis. *Journal of Consulting and Clinical Psychology*. 1991;59:533–540.

15. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977;1:385–401.
16. Chambers WJ, Puig-Antich J, Hirsch M, et al. The assessment of affective disorders in children and adolescents by semistructured interview: test-retest reliability of the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present Episode Version. *Archives of General Psychiatry*. 1985;42:696–702.
17. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1995.
18. Shaffer D, Gould MS, Brasic J, et al. A children's global assessment scale (CGAS). *Archives of General Psychiatry*. 1983;40:1228–1231.
19. Garrison CZ, Jackson KL, Addy CL, et al. Suicidal behaviors in young adolescents. *American Journal of Epidemiology*. 1991;133(10):1005–1014.
20. Hollingshead AB, Redlich FC, eds. *Social Class and Mental Illness*. New York: John Wiley; 1958.
21. Schoenbach VJ, Kaplan BH, Grimson RC, et al. Use of a symptom scale to study the prevalence of a depressive syndrome in young adolescents. *American Journal of Epidemiology*. 1982;116:791–800.
22. Shah BV, Barnwell BG, Bieler GS, eds. *SUDAAN User's Manual, Release 7.0*. Research Triangle, NC: Research Triangle Institute; 1996.
23. Cohen P, Cohen J, Kasen S, et al. An epidemiological study of disorders in late childhood and adolescence: I. Age and gender-specific prevalence. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 1993;34:851–867.
24. Burke JD. Mental health services research. In: Tsuang MT, Tohen M, Zahner GEP, eds. *Textbook in Psychiatric Epidemiology*. New York: Wiley-Liss, Inc; 1995:199–209.
25. Mrayek PJ, Haggerty RJ, eds. *Reducing Risks for Mental Disorders*. Washington, DC: National Academy Press; 1994:19–29.
26. National Institute of Mental Health. *Priorities for Prevention Research at NIMH*. A Report by the National Advisory Mental Health Council Workgroup on Mental Disorders Prevention Research. Bethesda, MD: National Institutes of Health (NIH Publication No. 98-4321); 1998.

Full Text  
ONLINE  
www.jbhsr.com