

Depressive and Disruptive Disorders and Mental Health Service Utilization in Children and Adolescents

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ABSTRACT

Objective: To examine the relationship of depressive and disruptive disorders with patterns of mental health services utilization in a community sample of children and adolescents. **Method:** Data were from the NIMH Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. The sample consisted of 1,285 child (ages 9–17 years) and parent/guardian pairs. Data included child psychopathology (assessed by the Diagnostic Interview Schedule for Children), impairment, child need and use of mental health services, and family socioeconomic status. **Results:** After adjusting for potential confounding factors, disruptive disorder was significantly associated with children's use of mental health services, but depressive disorder was not. For school-based services, no difference was found between the 2 types of disorders. Parents perceived greater need for mental health services for children with disruptive disorders than for those with depression. Conversely, depression was more related to children's perception of mental health service need than was disruptive disorder. **Conclusions:** The findings highlight the need for more effective ways to identify and refer depressed children to mental health professionals, the importance of improving school-based services to meet children's needs, and the necessity to better educate parents and teachers regarding the identification of psychiatric disorders, especially depression. *J. Am. Acad. Child Adolesc. Psychiatry*, 1999, 38(9):1081–1090. **Key Words:** depression, disruptive disorder, mental health service utilization, perceived need, school-based services.

Depression is one of the leading risk factors for suicide in children and adolescents (Brent et al., 1993; Shaffer et al., 1996b), as well as a source of serious distress and impairment (Weissman et al., 1991). Improving the early identification and treatment of youths with depression, therefore, has both clinical and policy implications.

Identifying the patterns of service use or nonuse in this vulnerable population is the first step to improving mental health services. There has been limited research in this specific area, and consequently little is known about the service use patterns of children and adolescents with depressive disorders in the community.

Many children with a need for mental health services do not receive professional help (Burns, 1991; Burns et al., 1995; Costello, 1989; Gould et al., 1980; Staghezza-Jaramillo et al., 1995; Whitaker et al., 1990) or appropriate services (Saxe et al., 1988). However, few studies have examined the relationship between types of psychiatric disorders and patterns of service utilization (Anderson et al., 1987; Cohen et al., 1991; Cuffe et al., 1995; Koot and Verhulst, 1992; Verhulst and Ende, 1997). The findings are also inconsistent. For example, some studies found that children with "externalizing" disorders, such as attention-deficit hyperactivity disorder, conduct disorder, and oppositional defiant disorder are more likely

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to be referred to and to use mental health services than children without these disorders. On the other hand, "internalizing" disorders, such as depression and anxiety, are not generally associated with service use (Anderson et al., 1987; Cohen et al., 1991; Koot and Verhulst, 1992). In Verhulst and Ende's recent study in the Netherlands (1997), both externalizing and internalizing problems made unique contributions to service use. However, the effect of externalizing disorders was stronger than that of the internalizing disorders. Studies also found that impairment had an impact on child use of mental health services, which is independent of the psychiatric disorders (Bird et al., 1996; Leaf et al., 1996; Staghezza-Jaramillo et al., 1995).

Besides the type of disorder and impairment, some characteristics of family, parent, and youth have been found to affect child service utilization patterns, including the child's age (Barber et al., 1992; Cohen and Hesselbart, 1993; Zahner and Daskalakis, 1997), gender (Barber et al., 1992; Cuffe et al., 1995; Garralda and Bailey, 1988; Zahner and Daskalakis, 1997), ethnicity (Cohen and Hesselbart, 1993; Cuffe et al., 1995; Neighbors et al., 1992; Zahner and Daskalakis, 1997), family socioeconomic status (Cohen and Hesselbart, 1993; Garralda and Bailey, 1988; John et al., 1995; Koot and Verhulst, 1992), child physical illness (John et al., 1995), parental use of mental health services for psychiatric problems (Garralda and Bailey, 1988), and parental perceived burden (Angold et al., 1998). Inasmuch as most of these factors are related to disorders as well as to service utilization, it is important to control for them when assessing the relationship between type of disorder and patterns of service utilization.

In Andersen's model of health services utilization among adults (Andersen, 1995; Andersen and Newman, 1973), an important determinant is the "need" for services, which includes perceived need and evaluated need (diagnosis). Children's pathways to mental health services, however, are more complicated than those of adults in that children do not usually decide to seek mental health services. Others, usually parents and teachers, and in some instances, other agents, such as the police (Horwitz, 1982), play the most important role in both identifying a child's mental health problems and obtaining professional help. Their attitudes toward and perceptions of children's needs for services have a major impact on child service use decisions (Angold et al., 1998; Costello and Janiszewski, 1990; Hoberman, 1992; Tarico et al., 1989; Zahner and Daskalakis, 1997).

Recent studies have shown that more than three fourths of children using mental health services were seen in school, and for many of them the school-based service is the only source of care received (Burns et al., 1995; Leaf et al., 1996; Staghezza-Jaramillo et al., 1995). Perhaps for this reason, school-based health and mental health centers continue to grow (Lear, 1996). Schools provide a single point of access to services in a non-threatening atmosphere and thus reduce the barriers to children receiving help for emotional, behavioral, and drug-related problems (Flaherty et al., 1996). However, few studies have examined and compared the impact of specific psychiatric disorder and risk factors on the utilization of mental health services within or outside the school setting (Angold et al., 1998; Koot and Verhulst, 1992; Zahner et al., 1992; Zahner and Daskalakis, 1997).

To examine the unmet needs of children with depressive disorders, the service use patterns of depressed children were compared with those of children with disruptive disorders. These comparisons were conducted on children's use of specialty mental health services, school-based services, as well as any service use for emotional, behavioral, and drug-related problems. The analysis addresses 4 questions: (1) How do children with depressive disorders receive mental health services? (2) Are the patterns of service utilization the same for children with depressive disorders as for those with disruptive disorders? (3) If there are differences, do these differences exist for specialty mental health services, as well as school-based services? (4) Finally, if there are differences, can they be explained by demographic, familial, parental, and individual characteristics or by perceived service needs? The answers to these questions will provide a more thorough understanding of the unmet needs of children with depressive disorders, identify various factors affecting children's use of mental health services, and provide clinicians and policymakers with useful information to help improve services for children in need, especially those with depression.

METHOD

Sample and Data

Data were obtained in the National Institute of Mental Health (NIMH)-funded Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study (Dulcan, 1996; Lahey et al., 1996), a multisite community survey conducted in 1992. Probability samples of children aged 9 to 17 years were obtained in 4 geographic areas: (1) Hamden, East Haven, and West Haven, Connecticut ($N = 314$); (2) DeKalb, Rockdale, and Henry counties, Georgia ($N =$

299); (3) Westchester County, New York ($N = 360$); and (4) San Juan, Puerto Rico ($N = 312$). The 1,285 parent-child pairs interviewed represented 84% of those eligible (Lahey et al., 1996). Fifty-three percent of the sample were boys, and the mean age of the children in the sample was 12.9 years ($SD = 2.6$).

Structured, in-person interviews were conducted in families' homes separately for parents and children. The protocol included the NIMH Diagnostic Interview Schedule for Children (DISC) Version 2.3 (Shaffer et al., 1996a) and a Service Utilization and Risk Factors interview (Goodman et al., 1998; Leaf et al., 1996).

Measures of Service Utilization for Child Emotional, Behavioral, or Drug Use Problems

All parents and children were asked about mental health and substance use services used by children, both in the previous year as well as in their lifetime. However, only parents were asked about children's use of specific types of services (Leaf et al., 1996). On the basis of information from both parents and children, the following 3 types of service utilization in lifetime and past year were used in this study:

Mental Health Services. A child was seen by a psychiatrist, psychologist, or counselor in his/her private office, or received treatment in a psychiatric or drug and alcohol outpatient clinic, or stayed overnight in a hospital or residential treatment center for psychiatric or substance use problems.

School-Based Mental Health Services. A child used school-based services for emotional, behavioral, and/or drug use problems. The services include both individual counseling and special classes or programs.

Any Service. A child used any of the following services for emotional or behavioral problems or alcohol or drug use: (1) mental health services, (2) medical professionals, (3) school-based services, (4) social services, (5) clergy, or (6) other (e.g., spiritualists, herbalists).

Service Need Recognition

Parent and child perceptions of the child's need for services for emotional, behavioral, and/or drug problems were based on their own reports. Teacher's perceptions of the child's service need and police contact (for anything but minor traffic violations) were based on reports from either parent or child.

Measures of Child Characteristics

Psychiatric Disorders and Impairment. Children's psychopathology in the previous 6 months was assessed by the DISC (version 2.3). Aggregated data from both parent and child interviews were used, that is, a diagnosis was considered to be positive if symptoms reported by the parent and/or the child, when combined, met diagnostic criteria. Impairment was included in the definition of each psychiatric disorder. In this study, a child was considered to have positive results for any disorder when (1) *DSM-III-R* criteria for that disorder were met, (2) there was an indication of diagnosis-specific impairment, and (3) either parent or child interviewer ratings on the nonclinician Global Assessment Scale for Children were below 71 (Shaffer et al., 1996a). **Depressive disorders** included major depression and dysthymia. **Disruptive behavior disorders** included attention-deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder. **Any other disorders** included any of 24 other disorders assessed by the DISC (Shaffer et al., 1996a).

The Columbia Impairment Scale is a 13-item scale covering interpersonal relations and functioning at work, in school, and at home. Items are scored from 0 ("no problem") to 4 ("a very bad problem") (Bird et al., 1993, 1996). The internal reliability of the scale is 0.83.

The scale was based on both parent and child reports and was dichotomized at the optimal threshold ≥ 16 recommended by Bird et al. (1996) to distinguish between those with definite impairment and all others.

Physical Illness. Thirteen childhood illnesses such as diabetes, heart disease, asthma, allergy, and others were included in the parent report. A dichotomized variable was created with two or more types of illnesses coded as 1 and none or one as 0.

Child Demographics. Child demographics include gender, age, and ethnicity. Children were divided into 4 ethnic groups: non-Hispanic white, African-American, Hispanic, and other. Three dummy-coded variables—African-American, Hispanic, and other—were created for logistic regression analyses with non-Hispanic white as the reference group.

Measures of Familial and Parental Characteristics

Low family income was defined as receiving public assistance or having an annual household income of less than \$18,000 (1 SD below the mean) for the 3 U.S. sites. Because income in Puerto Rico was considerably lower than at the other 3 sites, low income in Puerto Rico was defined as receiving public assistance or having an annual household income of less than \$4,000 (1 SD below the mean of Puerto Rico). Mother's education was dichotomized with 13 or more years of schooling coded as 1 in the analysis. Information about family insurance coverage (either private or public, such as Medicaid or Medicare) was obtained from parents. Mothers' or fathers' use of mental health services was determined by having "ever seen a psychiatrist, psychologist, social worker, doctor, or other health professional, for a psychological or emotional problem."

Analysis

Univariate analyses compared the service use patterns, identified need for services, and child and family characteristics of depressed children and children with disruptive behavior disorders. Because comorbidity existed between the 2 types of disorders, children who had either type of disorder were divided into 3 groups: (1) depressive only ($n = 44$), (2) disruptive only ($n = 96$), and (3) both depressive and disruptive disorders ($n = 36$). Children without any disorder ($n = 1,016$) served as a reference group.

Logistic regression analyses predicting child mental health service use were conducted for the total sample in 5 steps. In each model, study site, mother's education, family income, health insurance status, and child's age, sex, and ethnicity were controlled. In model 1, depressive disorder was entered into the equation. In model 2, disruptive disorder was entered into the equation. In model 3, both depressive and disruptive disorders were simultaneously entered to take comorbidity into account. The odds ratio for each disorder shows the effect of one disorder while controlling for the effect of the other. In model 4, all variables in model 3, plus child's other psychiatric disorders, impairment, and lifetime chronic physical illnesses, were simultaneously entered so we could examine the unique contribution of depressive or disruptive disorders while controlling for other mental and physical illnesses as well as impairment. Finally, model 5 added perceived need, police contact, and parental use of mental health services into the equation. These latter variables were entered into the model so we could examine whether recognition of child psychopathology by parent and others is related to service use and whether the difference between depressive and disruptive disorders was due to the fact that children with disruptive disorders were more easily identified and labeled as being in need of help than those with depressive disorders.

The differences among the 4 sites in the MECA study have been previously discussed (Lahey et al., 1996). In all the logistic regression

analyses, the effect of site was controlled. Also, the interactions of site with depressive disorders, disruptive disorders, and important demographic variables were added to the final model to examine whether the main findings still held.

RESULTS

Univariate Analyses

Individual and family characteristics were first compared among children with depressive but not disruptive disorders ($n = 44$), children with disruptive but not depressive disorders ($n = 96$), children with both disorders ($n = 36$), and those without any disorder ($n = 1,016$) (Table 1).

The ethnic distribution of the Disruptive Only group was significantly different from that of the No Disorder group. There were more African-Americans and fewer Hispanics in the Disruptive Only group than in the No Disorder group. Children with depressive disorders

tended to be older (mean age = 14.3) than those without depression (12.9 in the No Disorder group and 12.6 in the Disruptive Only group). As expected, more girls met criteria for depression and more boys met criteria for disruptive disorders. Fifty-nine percent of children with depression only and 31% of children in the Disruptive Only group were girls. Among children with either depressive or disruptive disorders or both disorders, a high proportion of children (more than 60%) also met criteria for other disorders. Children with either depressive or disruptive disorders were also more likely to be impaired than those with no disorder. Finally, children with both depressive and disruptive disorders were most likely to be impaired (67%). No significant difference was found on physical illnesses across groups.

The comparison of family and parental characteristics across groups showed that the mothers of children with both depressive and disruptive disorders had less education

TABLE 1
Family, Parental, and Individual Characteristics by Depressive and Disruptive Disorders

Characteristics	(1) No Disorder ($n = 1,016$)	(2) Depressive Only ($n = 44$)	(3) Disruptive Only ($n = 96$)	(4) Both Depressive & Disruptive ($n = 36$)
Child				
Race/ethnicity				
White	51.2	50.0	54.2	63.9
African-American ^a	13.3	22.7	25.0	13.9
Hispanic ^b	30.4	25.0	12.5	13.9
Others	5.1	2.3	8.3	8.3
Age (mean) ^c	12.9	14.3	12.6	14.2
Female ^d	47.2	59.1	31.3	44.4
Any other disorder	N/A	61.4	61.5	72.2
Chronic illness (2+)	20.0	29.5	16.7	22.2
Impairment (CIS 16+)* ^{e,f}	2.6	22.7	39.6	66.7
Family & parental				
Low income	16.6	22.7	20.8	25.0
Mother's education (>12) ^g	58.7	63.6	57.4	32.4
No health insurance	8.7	15.9	12.5	13.9
Mother's use of MH services ^h	19.6	38.6	36.5	27.8
Father's use of MH services	14.5	18.2	14.6	16.7

Note: Except where indicated otherwise, values represent percentages. CIS = Columbia Impairment Scale; MH = mental health.

^a Compared with whites, a significantly higher proportion of African-American children is found in group 3 than in group 1 ($p < .05$).

^b Compared with the other 3 ethnic groups, a significantly lower proportion of Hispanic children is found in group 3 than in group 1 ($p < .01$).

^c Groups 1 and 3 are significantly lower than groups 2 ($p < .001$) and 4 ($p < .01$).

^d Groups 1 and 2 are significantly higher than group 3 ($p < .01$).

^e Group 1 is significantly lower than all the other groups ($p < .001$).

^f Groups 2 and 3 are significantly lower than group 4 ($p < .01$).

^g Group 4 is significantly lower than groups 1, 2 ($p < .01$), and 3 ($p < .001$).

^h Group 1 is significantly lower than groups 3 ($p < .001$) and 2 ($p < .01$).

TABLE 2
Service Use Patterns in Lifetime and Past Year by Depressive and Disruptive Disorders

	(1) No Disorder (n = 1,016) (%)	(2) Depressive Only (n = 44) (%)	(3) Disruptive Only (n = 96) (%)	(4) Both Depressive & Disruptive (n = 36) (%)	(2) + (4) Depressive With or Without Disruptive (n = 80) ^a (%)	(3) + (4) Disruptive With or Without Depressive (n = 132) ^b (%)
Lifetime						
Mental health service	13.6 ^c	38.6	56.3 ^d	55.6	46.3	56.1 ^e
School-based service	17.2 ^c	50.0	50.0	61.1	55.0	53.0
Any service	34.6 ^c	72.7	80.2	86.1	78.8	81.8
Past year						
Mental health service	4.4 ^c	31.8	29.2	38.9	35.0	31.8
School-based service	10.2 ^c	31.8	40.6	38.9	35.0	40.2
Any service	16.7 ^c	52.3	59.4	63.9	57.5	60.6

Note: Values represent percentages.

^a This combined group (Depressive With or Without Disruptive disorders) is compared only with the Disruptive Only group.

^b This combined group (Disruptive With or Without Depressive disorders) is compared only with the Depressive Only group.

^c Significantly lower than groups 2, 3, and 4 ($p < .001$).

^d Significantly higher than the Depressive Only group ($p < .10$).

^e Significantly higher than the Depressive Only group ($p < .05$).

than mothers in other groups. Mothers' rates of mental health service use were higher in the Depressive Only group and Disruptive Only group than in the No Disorder group. No significant differences were found in income, health insurance, or fathers' use of mental health services.

Table 2 shows children's service use patterns by type of disorder. For both lifetime and past year service use, children with either one or both disorders used more services than those with no disorder. For lifetime service use, children with disruptive disorder, whether they had a depressive disorder or not (Disruptive Only and Both groups), were more likely to report receiving mental health services (56.1%) than those in the Depressive Only group (38.6%). However, this pattern was not found in school-based service use. For service use in the past year, no significant difference was found among children with different types of disorders.

One explanation of the findings in Table 2 may be that children with disruptive disorders are more likely to use mental health services because they (or their parents) perceive greater need for services than those with depressive disorders. To test this hypothesis, the perceived needs for services were compared among children with different disorders (Table 3). As we expected, significantly higher rates of service need recognition by parents, teachers, and children themselves were found in children with either or both disorders than those with no disorder. Also, children with either or both disorders

were more likely to report police contact than those with no disorder. Parents of children with disruptive disorders (with or without depressive disorder) were more likely to perceive child service need (51.5%) than those with depressive disorder only (36.4%). The highest rate of parent-perceived need was found in children with both depressive and disruptive disorders (61.1%), and a similar pattern was found for police contact. However, a different pattern was found for child-perceived mental health service need. Children with depressive disorders (with or without disruptive disorders) were more likely to perceive a need for services (35.0%) than those with disruptive disorders only (22.9%). No significant difference was found between the 2 disorders for teachers' perceived need (reported by parents and children).

Multivariate Analysis

To explore further the relationship between types of disorders and service use, we conducted logistic regression analyses to assess the effect of each specific category of disorder, adjusting for the effects of other factors. The results are summarized in Table 4.

Mental Health Services. The results for mental health service use show striking differences between depressive and disruptive disorders. When the 2 types of disorders were entered into the equation (model 3), the adjusted odds ratio (AOR) for disruptive disorders (6.05, $p < .001$) was about 3 times that for depressive disorders (2.00, $p < .05$).

Results in model 4 showed that impairment, other psychiatric disorders, and chronic illness were also significantly associated with child mental health service use. Controlling for them, the AOR for disruptive disorder reduced to 4.01 ($p < .001$), while depressive disorders were no longer significantly related to mental health service use (AOR = 1.35). Model 5 assumes that children with disruptive disorders are more easily identified and labeled as being in need of help. If this assumption is true, the effect of disruptive disorders on service use will disappear or diminish after control for perception of child service need. The effect of disruptive disorders still held in this final model (AOR = 3.44, $p < .001$). Also significantly associated with child mental health service use were child physical illness; mother's lifetime mental health service use; perceived child mental health service need by children, parents, and teachers; and police contact. In addition, African-American children were less likely than whites to use mental health services (AOR = 0.57, $p < .05$). Older children (15 or older) were more likely to use services than younger ones (9–11 years old) (AOR = 1.78, $p < .05$).

School-Based Services. No difference between the effects of depressive and disruptive disorders was found on school-based mental health service use. For example, in model 3, the AOR was 3.14 ($p < .001$) for disruptive disorders and 2.88 ($p < .001$) for depressive disorders. When all the other factors were controlled (model 5), neither of the 2 disorders remained significant. Teacher-perceived need is the strongest predictor of school-based service use (AOR = 3.90, $p < .001$), followed by child-perceived

(AOR = 2.65, $p < .001$) and parent-perceived need (AOR = 2.18) for mental health services.

Any Service Use. The findings for use of any services were quite similar to those for mental health service use, although the difference between depressive and disruptive disorders was not as striking. In the final model (5), the effects of depressive disorder became nonsignificant (AOR = 1.69), while the effects of disruptive disorders still held (AOR = 2.55, $p < .01$).

The stronger effect of disruptive disorders on mental health service utilization than depressive disorders was found for lifetime service use only, and thus it is possible that this difference was due to the greater chronicity of disruptive disorders. Using age of onset of each disorder reported by both parent and child, we created a proxy of the "duration" for each disorder and conducted additional analyses to control for the duration of disorders. The results indicate that the difference between the 2 types of disorders still held.

In addition to controlling for site effect in each model, we also conducted analyses with interactions of site with depressive, disruptive, and some important sociodemographic variables controlled. The results showed no significant interaction, and the main findings remained the same.

DISCUSSION

This study examines the effects of disorders, primarily depression and disruptive disorders, on the use of services for emotional, behavioral, and/or drug-related problems by children and adolescents in a community sample.

TABLE 3
Service Need Recognition by Depressive and Disruptive Disorders

	(1) No Disorder (n = 1,016) (%)	(2) Depressive Only (n = 44) (%)	(3) Disruptive Only (n = 96) (%)	(4) Both Depressive & Disruptive (n = 36) (%)	(2) + (4) Depressive With or Without Disruptive (n = 80) (%)	(3) + (4) Disruptive With or Without Depressive (n = 132) (%)
Parent perceived need	8.4 ^c	36.4	47.9	61.1 ^d	47.5	51.5 ^e
Child perceived need	9.4 ^c	34.1	22.9	36.1	35.0 ^f	26.5
Teacher perceived need	6.8 ^c	29.5	30.2	38.9	33.8	32.6
Police contact	8.6 ^g	20.5	30.2	44.4 ^d	31.3	34.1 ^e

^a This combined group (Depressive With or Without Disruptive disorders) is compared only with the Disruptive Only group.

^b This combined group (Disruptive With or Without Depressive disorders) is compared only with the Depressive Only group.

^c Significantly lower than groups 2, 3, and 4 ($p < .001$).

^d Significantly higher than the Depressive Only group ($p < .05$).

^e Significantly higher than the Depressive Only group ($p < .10$).

^f Significantly higher than the Disruptive Only group ($p < .10$).

^g Significantly lower than groups 2 ($p < .01$), 3, and 4 ($p < .001$).

TABLE 4
Adjusted Odds Ratios From Logistic Regressions Predicting Lifetime Service Use Variables ($N = 1,285$)

Model	Predictors ^a	Ever Used MH Service		Ever Used School-Based Services		Ever Used Any Services	
		AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
1	Any depression	3.56***	(2.17, 5.81)	4.10***	(2.53, 6.68)	4.95***	(2.89, 8.93)
2	Any disruptive	6.99***	(4.65, 10.58)	3.88***	(2.62, 5.74)	6.57***	(4.17, 10.74)
3	Any depression	2.00*	(1.15, 3.44)	2.88***	(1.73, 4.82)	3.35***	(1.89, 6.20)
	Any disruptive	6.05***	(3.96, 9.30)	3.14***	(2.08, 4.72)	5.49***	(3.45, 9.06)
4	Any depression	1.35	(0.75, 2.40)	2.02*	(1.17, 3.48)	2.18*	(1.18, 4.15)
	Any disruptive	4.01***	(2.45, 6.57)	1.89**	(1.17, 3.04)	3.42***	(2.04, 5.89)
	Any other disorder	1.74**	(1.14, 2.64)	1.47	(0.99, 2.18)	1.65*	(1.12, 2.44)
	Impairment (CIS 16+)	1.96**	(1.17, 3.25)	2.71***	(1.67, 4.39)	2.81***	(1.64, 4.96)
	Chronic illness (2+)	1.94***	(1.37, 2.73)	1.29	(0.91, 1.79)	1.64**	(1.22, 2.20)
5	Any depression	0.91	(0.46, 1.76)	1.54	(0.85, 2.76)	1.69	(0.87, 3.41)
	Any disruptive	3.44***	(1.97, 6.02)	1.51	(0.90, 2.52)	2.55**	(1.43, 4.64)
Child characteristics							
Race/ethnicity (Ref. = white)							
	African-American	0.57*	(0.32, 0.98)	1.12	(0.73, 1.72)	0.70	(0.46, 1.05)
	Hispanic	0.78	(0.30, 1.87)	1.54	(0.73, 3.14)	1.43	(0.70, 2.92)
	Other	0.79	(0.33, 1.71)	0.65	(0.29, 1.33)	0.58	(0.30, 1.08)
Age (Ref. = 9–11)							
	12–14	1.50	(0.97, 2.31)	1.29	(0.89, 1.88)	1.24	(0.89, 1.72)
	15+	1.78**	(1.16, 2.75)	1.26	(0.87, 1.84)	1.24	(0.89, 1.73)
	Female	0.77	(0.54, 1.08)	0.84	(0.62, 1.14)	0.86	(0.66, 1.12)
	Any other disorders	1.06	(0.65, 1.73)	0.96	(0.61, 1.49)	1.10	(0.70, 1.70)
	Impairment (CIS 16+)	0.87	(0.47, 1.55)	1.61	(0.94, 2.72)	1.31	(0.71, 2.47)
	Chronic illness (2+)	2.01***	(1.37, 2.94)	1.23	(0.85, 1.75)	1.62**	(1.17, 2.23)
Family & parental characteristics							
Low income							
	Mother's education (>12)	1.30	(0.90, 1.89)	1.01	(0.73, 1.40)	0.98	(0.74, 1.31)
	No health insurance	1.14	(0.63, 2.01)	1.55	(0.95, 2.50)	1.55	(0.99, 2.45)
Parent MH service use							
	Mother	2.51***	(1.67, 3.78)	1.05	(0.70, 1.55)	1.86***	(1.30, 2.66)
	Father	1.33	(0.83, 2.11)	1.10	(0.69, 1.72)	1.47	(0.97, 2.22)
Service need recognition							
Perceived need							
	Child	1.79*	(1.07, 2.96)	2.65***	(1.73, 4.06)	2.64***	(1.71, 4.10)
	Parent	4.01***	(2.60, 6.17)	2.18***	(1.44, 3.28)	4.43***	(2.80, 7.15)
	Teacher	4.06***	(2.53, 6.52)	3.90***	(2.52, 6.06)	6.39***	(3.73, 11.41)
	Police contact	1.68*	(1.05, 2.68)	1.45	(0.94, 2.25)	1.73*	(1.18, 2.69)

Note: AOR = adjusted odds ratio; CI = confidence interval; CIS = Columbia Impairment Scale; MH = mental health.

^a Site was controlled in all the models; coefficients not shown. In models 1 through 4, mother's education, low income, health insurance, and child's age, sex, and ethnicity are also in the equation. Coefficients not shown.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

The results of the study highlight the unmet service needs of children with depressive disorders and indicate possible ways to meet their needs.

Unmet Needs of Children With Depressive Disorders

In contrast to children with disruptive disorders, children with depressive disorders are less likely to receive spe-

cialty mental health services. This is especially true for those with depressive disorders alone. This pattern suggests that children with internalizing problems are underidentified or underreferred. The pattern we observed is consistent with findings from other studies (Anderson et al., 1987; Cohen et al., 1991; Koot and Verhulst, 1992). However, this study went beyond the previous studies in

several aspects. Unlike the studies of Anderson et al. (1987) and Cohen et al. (1991), this study took comorbidity between depressive and disruptive disorders into account. Also, different from Koot and Verhulst's study (1992), this study used *DSM-III-R* criteria, measured by the DISC, to assess child psychopathology. Finally, additional potential confounding variables, such as impairment, perceived needs, physical illness, and parental mental health service use, were controlled for in our multivariate analyses. Logistic regression analyses were conducted hierarchically to determine whether the difference between the 2 types of disorders could be explained by the effects of other disorders; by level of impairment; by familial, parental, and individual characteristics; or by perceived child service needs. The results indicate that after controlling all the confounding factors, children with disruptive disorders still appeared to be more likely to use mental health services than children without disruptive disorders, while the presence of depressive disorders was not associated with receiving mental health services. The findings from testing the multiple-step model indicate that the effects of child psychiatric disorders on child mental health service use are partially indirect, being mediated through impairment and perceived needs. When impairment was entered into the equation, it contributed significantly to mental health service use and reduced the effect of disorders. When perceived mental health service needs were entered into the equation, the effect of impairment became insignificant.

Another unique aspect of our analysis is that, in addition to service use, we compared perceived need for services among children with different disorders. The results showed that, while depressed children used mental health services less, they actually reported more need for services than those with disruptive disorders. These findings further highlight the unmet need of depressed children.

School-Based Mental Health Service

A comparison between children's use of non-school-based mental health services and their use of school-based services shows that, after control for familial, parental, and individual factors, the difference between the effect of disruptive disorders and depressive disorders on service use is significant regarding the use of specialty mental services, but not for the use of school-based services. Moreover, the findings suggest that children's use of school-based services is less likely than use of mental

health services outside of school to be influenced by demographic and parental factors. Ethnicity, child's age, and maternal use of mental health services are significantly associated with child mental health service use but have no effect on use of school services. These findings are consistent with those reported in other studies which showed that school-based services are most widely used by children and adolescents and are easier to access (Burns et al., 1995; Flaherty et al., 1996; Lear, 1996; Staghezza-Jaramillo et al., 1995). These results suggest that unlike children's use of specialty mental health services, children with depressive disorders did not appear to have more difficulties in accessing school services for their emotional and behavioral problems. Therefore, expanding and improving school-based mental health services can be potentially helpful in meeting the specific needs of depressed children and adolescents.

Role of Parents and Teachers

Consistent with previous studies (Angold et al., 1998; Costello and Janiszewski, 1990; Zahner and Daskalakis, 1997), our findings indicate the importance of parents and teachers in initiating children's use of mental health services. Teacher's perception of child service needs was strongly associated with the use of both school and non-school mental health services. Parents' perceived needs had a stronger impact on children receiving mental health services outside of school than on receipt of school services. In our final model, when the perceived needs were entered into the equation, with the exception of disruptive disorder, the effects of psychopathology and impairment on service use disappeared. These findings are similar to those reported by Angold and colleagues (1998).

Limitations and Strengths of the Study

It should be noted that the conclusions drawn from this study are limited in several ways. First, because of the cross-sectional design of the MECA study, we cannot address pathways to mental health services and no causal relationships can be determined regarding service use and perceived service need. A longitudinal study is necessary to confirm these findings. Also, while the analyses were conducted on service utilization, no conclusion can be made about the effectiveness of the services offered or received. However, the large size of the MECA sample, the detail of the psychiatric disorders measured by the NIMH DISC, and the rich information on service utilization for mental health problems gave us a

wonderful opportunity to explore the pattern of service utilization and the need for mental health services for children with different types of psychiatric disorders. The results provide useful information for clinicians as well as policymakers.

Clinical and Policy Implications

Our findings indicate that patterns of service use are influenced not only by sociodemographic factors but also by types of disorders. Among children and adolescents, depressive disorders are less likely to be identified than disruptive disorders. Consequently, children with depressive disorders are less likely to be referred to mental health professionals. In future service planning, policymakers and clinicians need to find more effective ways to identify and appropriately refer depressed children. The findings of this study indicate the important role of school-based services in meeting children's needs for mental health services. School-based services provide an efficient locus for the cost-effective delivery of mental health services to children. Existing services should be improved and new services developed to meet children's unmet needs. For example, there is a need for school-based screening instruments to identify children's psychiatric disorders at an early stage. Finally, parent's or teacher's perceived need for child mental health services plays a critical role in children's obtaining mental health services. Further mental health education should be offered to parents and teachers, which in turn will improve early identification and treatment of children with psychiatric disorders.

The MECA Program is an epidemiological methodology study performed by 4 independent research teams in collaboration with staff of the Division of Clinical Research, which was reorganized in 1992 with components now in the Division of Epidemiology and Services Research and the Division of Clinical and Treatment Research, of the NIMH, Rockville, MD. The NIMH Principal Collaborators are Darrel A. Regier, M.D., M.P.H., Ben Z. Locke, M.S.P.H., Peter S. Jensen, M.D., William E. Narrow, M.D., M.P.H., Donald S. Rae, M.A., John E. Richters, Ph.D., Karen H. Bourdon, M.A., and Margaret T. Roper, M.S. The NIMH Project Officer was William J. Huber. The Principal Investigators and Coinvestigators from the 4 sites are as follows: Emory University, Atlanta, UO1 MH46725; Mina K. Dulcan, M.D., Benjamin B. Lahey, Ph.D., Donna J. Brogan, Ph.D., Sherryl Goodman, Ph.D., and Elaine W. Flagg, Ph.D.; Research Foundation for Mental Hygiene at New York State Psychiatric Institute (Columbia University), New York, UO1 MH46718; Hector R. Bird, M.D., David Shaffer, M.D., Myrna Weissman, Ph.D., Patricia Cohen, Ph.D., Denise Kandel, Ph.D., Christina W. Hoven, Dr.PH., Mark Davies, M.P.H., Madelyn S. Gould, Ph.D., and Agnes Whitaker, M.D.; Yale University, New Haven, CT, UO1 MH46717; Mary Schwab-Stone, M.D., Philip J. Leaf, Ph.D., Sarah McCue Horwitz, Ph.D., and Judith H. Lichtman, Ph.D.; University of Puerto Rico, San Juan, UO1 MH46732;

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Commentary

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Wu and colleagues (1999) illuminate the difficulty children with depression too often experience in "getting noticed," let alone in receiving treatment. Specifically, this latest MECA report confirms the paucity of attention and services for children with depression when compared with those with attention deficit, oppositional defiant, or conduct disorders. Perhaps more troubling, while juveniles with depression recognized their need for mental health services, their parents and teachers frequently were unaware of the child's depression.

Disruptive disorders, by definition, impact the lives of others, who often react by demanding intervention. Fortunately, for attention-deficit hyperactivity disorder particularly, we can respond with effective treatments that benefit the child as well as parents and teachers. Historically, treatments of juvenile depression have been less predictable, rapid, or efficacious. Parents, teachers, and even child and adolescent psychiatrists may be less aggressive or able to identify something, such as depres-

sion, which usually distresses the individual afflicted more than others in the environment. Given the powerful impact of a depression on a juvenile, Wu and colleagues' study reiterates the importance of detecting depression even though it may not immediately distress others.

Consistent with other epidemiological samples, girls were almost twice as likely to be depressed as boys. Sensitivity to adolescent girls' distress manifested in depression or dysthymia continues to lag behind efforts observed for boys manifesting behavioral problems during this same age span. Similarly, ethnic differences were described in this report, as disruptive disorders were identified more often in African-Americans than in other ethnic groups. These discrepancies punctuate the need for better identification and for equitable treatment of diverse juveniles with various psychiatric disorders.

Ultimately, Wu et al. suggest that expanding services on-site at the school would be one appropriate strategy for improving treatment of juvenile depression. As schools absorb increasing responsibility for the care of our children (somewhat as a consequence of managed care, fragmented or overworked families, etc.), school-based services represent an effort to include caregivers such as psychiatrists to participate in the creation of a school "community" where multiple adults interact to care for "its" children. Contemporary mental health models have similarly recognized the need for integration

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