TREATMENT OF ADOLESCENT DEPRESSION: FREQUENCY OF SERVICES AND IMPACT ON FUNCTIONING IN YOUNG ADULTHOOD

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In this report, we (a) present descriptive information about the extent and the kinds of treatments being provided to depressed adolescents; (b) identify the factors that are related to treatment utilization; and (c) examine whether the provision of treatment during adolescence reduced the risk for the occurrence of depression during young adulthood (19–24 years). The sample consisted of 1,507 randomly selected high school students who were diagnostically assessed on two occasions with an interval of approximately one year; 627 were assessed a third time when they reached the age of 24. The findings may be summarized as follows: 60.7% of those with major depressive disorder were provided with treatment. The modal treatment was outpatient, individual psychotherapy administered by a mental health provider. Inpatient treatment and medications were rare. Factors found to be related to treatment utilization were the severity of the depression, the existence of a comorbid nonaffective disorder, the number of previous episodes of depression, history of suicide attempt, academic problems, lack of intact family, and female gender. Unexpectedly, those who had received treatment were not less likely to relapse into another episode of depression during young adulthood. Depression and Anxiety 7:47–52, 1998. *© 1998 Wiley-Liss, Inc.*

Key words: *adolescent; depression; treatment; psychotherapy; outcome*

INTRODUCTION

Knowledge regarding the degree to which treatment is provided to children and adolescents for depression is important for many reasons. For example, depression is one of the most common psychiatric conditions of youth (Lewinsohn et al., 1993); it is associated with poor psychosocial functioning (Lewinsohn et al., 1994), and adolescent depression is often recurrent, negatively impacting functioning in young adulthood (Fleming et al., 1993; Garber et al., 1988; Harrington et al., 1990; Kovacs, 1996). The first goal of the present study was to extend previous findings regarding treatment utilization for childhood and adolescent psychopathology (Cuffe et al., 1995; Offord et al., 1987) by ascertaining the extent of treatment and the kinds of treatments being provided to this age group.

A second goal was to pinpoint factors related to treatment utilization. We hypothesized that adolescents with more severe depression, those with a comorbid nonaffective disorder, those with school problems, and those from disrupted families would be more likely to receive treatment. A third goal of the study was to examine whether there are any lasting positive effects of treatment during childhood and adolescence on functioning in young adulthood.

As per the literature, rates of treatment for adolescent depression in nonreferred community samples range from 15% to 65% (Beardslee et al., 1985; Cuffe et al., 1995; Goodman et al., 1997; Offord et al., 1987). The most frequently used form of treatment for child/adolescent depression is outpatient psychotherapy, with only a relatively small percentage of young patients receiving antidepressant medication (Kovacs et al., 1984; Keller et al., 1991).

The availability of data from a longitudinal study of community individuals who were assessed at two points during adolescence and again in young adulthood provided a unique opportunity to examine the impact of

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treatment utilization on the probability of relapse in those who had recovered from their episode. In a previous report of results from this sample (Lewinsohn et al., 1995), we focused on the clinical consequences of comorbidity and reported the rate of treatment to be higher for comorbid disorders than for pure disorders, for female adolescents than for males, and for adolescents who did not live with both biological parents.

METHODS

SAMPLE

Participants were adolescents who were randomly selected from nine senior high schools in western Oregon. A total of 1,709 adolescents completed the initial (T1) assessments (interview and questionnaires) between 1987 and 1989, with an overall participation rate of 61% (additional details are provided in Lewinsohn et al., 1993). At the second assessment (T2), 1,507 participants (88.2%) returned for a readministration of the interview and questionnaire (mean T1-T2 interval = 13.8 months, S.D. = 2.3). Differences between the sample and the larger population from which it was selected, and between participants and those who declined to participate or dropped out of the study, were small.

As participants reached their 24th birthday, subjects with a history of Major Depressive Disorder (MDD) and other psychopathology at T2 were invited to participate in a T3 telephone interview (Rohde et al., 1997) as were an approximately equal number of randomly selected control subjects with no history of mental disorder at T2. Of the T3 assessments currently in progress, 627 subjects had data available for the present study (T2 history of MDD, n = 220; T2 history of nonaffective disorder, n = 162; T2 history of no disorder, n = 245). The mean follow-up interval between T2 and T3 was 6.1 years (S.D. = 1.0; range = 3.0–8.7).

DIAGNOSTIC INTERVIEW

Participants were interviewed at T1 with a version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS), which combined features of the Epidemiologic version (K-SADS-E; Orvaschel et al., 1982) and the Present Episode version (K-SADS-P), and included additional items to derive diagnoses of psychiatric disorders as per DSM-III-R criteria (American Psychiatric Association, 1987). At T2 and T3, subjects were interviewed using the Longitudinal Interval Follow-up Evaluation (LIFE; Shapiro and Keller, unpublished), which elicits detailed information about the course of psychiatric symptoms and disorders since the previous K-SADS interview.

MEASURES

Hamilton Depression Rating Scale (HDRS; Hamilton, 1960). As a measure of depressive episode severity, a 14-item version of the HDRS was completed for current and worst past depressive symptoms.

History of suicide attempt. As part of the interview assessments of depression, adolescents were asked: "Have you ever tried to kill yourself or done anything that could have killed you?" A history of a suicide attempt (presence or absence) by T2 was used.

Center for Epidemiologic Studies Depression Scale. (CES-D; Radloff, 1977). The 20-item CES-D was completed by subjects at T1 and T2. The highest CES-D total score from the T1 and T2 assessments was used in the present study.

Academic problems. Nine items were combined into an aggregate measure of academic problems: lifetime occurrence of school expulsion or suspension, truancy, or repeating a grade; mean grade point average; low adolescent and parent satisfaction with grades; frequent school absenteeism, tardiness, and homework incompletion. Items were standardized and summed; the distribution was then dichotomized at one standard deviation above the mean.

Mental health treatment utilization. Information regarding lifetime outpatient, inpatient, and medication treatment was collected at each assessment. If the participant had received outpatient treatment, type of treatment (individual, family, alcohol or drug treatment support groups, other group treatment), provider (mental health professional, school counselor/staff, clergy), length of treatment (1–2 sessions, 3–7 sessions, 8–26 sessions, more than 26 sessions total), and age of first outpatient contact were ascertained. If the participant had received inpatient treatment, type (alcohol and drug treatment, psychiatric treatment), length (less than 1 month, 1 month or greater), age at first hospitalization, and number of hospitalizations were recorded. If psychoactive medication was prescribed, information was obtained regarding the type of medication (antidepressants, sedatives or minor tranquilizers, stimulants, and "other").

DIAGNOSTIC GROUPS

Three depression groups were formed based on a combination of their diagnostic status up to T2 and their CES-D scores at T1 and T2: (1) MDD (n = 356) consisted of adolescents who met DSM-III-R criteria for major depressive disorder at or prior to T2; (2) Subsyndromal (n = 218) consisted of adolescents who scored at least one standard deviation above the sample mean on the CES-D (i.e., 27) at either T1 or T2 but did not meet diagnostic criteria for MDD; and (3) Never Depressed (n = 900) consisted of adolescents who scored less than 27 on both CES-D administrations and did not meet criteria for MDD at or before T2.

Depression group membership was associated with several demographic factors and with nonaffective disorder (for each contrast, rates are given for the MDD, Subsyndromal, and Never Depressed groups, respectively). Depression group was associated with gender (70.5%, 48.2%, and 48.2% female); $\chi^2(2, n = 1,474) = 53.96$, $P < .001$; age (60.1%, 42.7%, and 46.1% were

in the older half of the sample); $\chi^2(2, n = 1,474) = 24.10$, $P < .001$; living situation (43.0%, 56.0%, 58.7% were living with both biological parents); $\chi^2(2, n = 1,474) = 25.56$, $P < .001$; maximum parental education (40.4%, 45.0%, 50.3% had higher parental education); $\chi^2(2, n = 1,474) = 10.01$, $P < .01$; and the presence of a nonaffective disorder (47.8%, 34.4%, 19.7%); $\chi^2(2, n = 1,474) = 102.66$, $P < .001$. Depression group was not associated with race.

RESULTS

PROVISION OF MENTAL HEALTH SERVICES TO DEPRESSED ADOLESCENTS

Table 1 shows the lifetime treatment utilization information for the total sample. A substantial proportion of adolescents received some form of mental health service, which virtually always consisted of outpatient treatment. Less than one in twelve of those receiving outpatient treatment also received inpatient treatment, and approximately one-eighth of the adolescents receiving outpatient services also received medication.

The rates of various mental health services for the Never Depressed, the Subsyndromal, and the MDD groups are also shown in Table 1. Overall group differences in treatment utilization were statistically significant for each of the three forms of mental health treatment (outpatient, medication, and inpatient).

FACTORS RELATED TO TREATMENT UTILIZATION

Mental health treatment utilization was associated with gender (46.1% of females vs. 32.2% of males received treatment) but not with age or parental education. The significant association between gender and treatment utilization was not due to the fact that females had a higher rate of MDD; controlling for de-

TABLE 1. Treatment utilization rates for total T1-T2 sample and by depression group

Variable	Total (n=1,507)	Depression group[a] Never depressed (n=900)	Subsyndromal (n=218)	MDD (n=356)	Test statistic
Any treatment %	40.0	29.8_a	45.9_b	60.7_c	$\chi^2 = 105.97$***
Outpatient treatment %	39.9	29.8_a	45.9_b	60.1_c	$\chi^2 = 102.61$***
Type					
Individual %	29.8	19.7_a	33.9_b	51.4_c	$\chi^2 = 126.18$***
Family %	11.1	9.4_a	11.5_{ab}	14.3_b	$\chi^2 = 6.33$*
A&D[b] %	2.7	1.2_a	3.2_{ab}	5.9_b	$\chi^2 = 21.98$***
Other %	2.1	1.4	1.8	3.4	$\chi^2 = 4.93$
Provider					
Mental health %	28.9	21.2_a	29.8_b	47.2_c	$\chi^2 = 84.09$***
School %	11.7	7.9_a	15.1_{bc}	17.7_b	$\chi^2 = 28.12$***
Clergy %	1.5	1.3	1.4_b	2.2	$\chi^2 = 1.44$
Approximate number of sessions					
1–2%	29.1	30.7_a	39.4_b	21.8_c	$\chi^2 = 26.29$***
3–7%	26.9	28.8	25.5	26.5	
8–26%	26.2	29.2	11.7	28.4	
26 or more%	17.7	11.4	22.3	22.3	
Mean age of first outpatient treatment	13.40	13.19_a	12.90_a	13.90_b	$F(2, 561) = 4.58$**
Inpatient treatment %	2.9	1.2_a	3.2_{ab}	6.2_b	$\chi^2 = 23.98$***
Type					
A&D %	2.1	1.1_a	0.9_a	4.5_b	$\chi^2 = 16.99$***
Psychiatric %	0.6	0.0_a	1.4_{bc}	1.7_c	$\chi^2 = 14.41$***
Length of inpatient treatment					
≥ month %	52.6	60.0	42.9	52.4	$\chi^2 = 0.49$
Mean age of first hospitalization	15.42	15.90	15.29	15.22	$F(2, 36) = 0.49$
Medication %	5.0	2.8_a	6.4_b	9.0_b	$\chi^2 = 22.90$***
Type					
Antidepressant %	1.8	0.4_a	2.3_b	4.2_b	$\chi^2 = 23.33$***
Antianxiety %	1.7	0.8_a	1.4_{ab}	3.7_b	$\chi^2 = 13.77$**
Stimulants %	1.5	1.1	3.2	1.1	$\chi^2 = 5.81$
Other %	0.6	0.4	0.9	0.8	$\chi^2 = 1.06$

[a] *Percentages and means with different subscripts differ signfiicantly at* P < *.05.*
[b] *A&D = alcohol and drug.*
*P < *.05.*
**P < *.01.*
***P < *.001.*

pression group membership, gender remained significantly associated with treatment utilization; likelihood ratio χ^2 (1, n=1474) = 16.28, $P < .001$.

The association between treatment and family structure was examined by classifying adolescents into four groups: adolescents living with a single mother, a single father, a biological parent and stepparent, and two biological parents. Treatment utilization rates significantly differed across the four groups; χ^2 (3, n= 1474) = 68.59, $P < .001$. Treatment rates were significantly greater for adolescents living with single mothers, single fathers, and stepfamilies (53.8%, 52.2%, and 47.8%, respectively) compared to adolescents living in intact families (30.1%). Interactions with gender were nonsignificant. Differences in treatment utilization rates for the three depressiion groups remained significant after controlling for relevant demographic factors and the co-occurrence of a non-affective disorder; utilization ratio χ^2 (2, n= 1474) = 45.50, $P < .001$.

The association of several factors with mental health treatment for adolescents with a history of MDD at T2 is shown in Table 2. Each of the variables was significantly associated with treatment utilization, as indicated by the unadjusted odds ratios (ORs). After adjusting for the impact of all the other variables using multiple logistic regression (MLR), treatment rates for depressed adolescents were significantly greater given psychiatric comorbidity, a history of suicide attempt, poor academic performance, female gender, and a nonintact family. The MLR correctly classified 68.5% of the MDD adolescents (a comparable multiple regression resulted in an $R = .40$, accounting for 16.0% of the variance in treatment utilization).

IMPACT OF ADOLESCENT TREATMENT ON OCCURRENCE OF DEPRESSION IN YOUNG ADULTHOOD

Of the 627 subjects who have completed the T3 interview to date, 228 (36.4%) reported experiencing an episode of MDD between T2 and T3 (this rate is not representative of the general community because participants with a previous disorder were oversampled). As expected, T2 depression group membership was highly associated with future MDD episodes; χ^2(1, n = 627) = 35.52, $P < .001$. The incidence rates of MDD were 25.5%, 42.4%, and 50.0% in the Never Depressed, Subsyndromal, and MDD groups, respectively.

Contrary to expectation, MDD incidence rate was higher for subjects who had received treatment (47.1% vs. 27.1%); χ^2(1, n = 627) = 26.94, $P < .001$. Even when controlling for differences in T2 depression group status, gender, and the presence of nonaffective disorder during adolescent, the difference between treated and untreated groups remained significant. In an effort to clarify this counterintuitive finding, subsequent analyses were computed separately for the MDD and the subsyndromal depression groups. For subjects with a history of MDD at T2, a trend was present for those who had received treatment to have a higher rate of future MDD (54.6% vs. 41.8%); χ^2(1, n = 220) = 3.34, $P = .068$. Because formerly depressed females were more likely to relapse ([55.2% vs. 34.5%]; χ^2[1,n = 220] = 7.01, $P < .01$), treatment utilization and future MDD were examined separately for females and males. Among MDD female participants, previous treatment

TABLE 2. Factors associated with treatment utilization among adolescents with MDD

Variable	Level	Treatment utilization rate (%)	OR[b]	Unadjusted 95% CI[c]	Adjusted[a] OR	95% CI
MDD severity	Low	51.9	2.2***	1.4–3.4	1.5	0.9–2.4
	High	70.2				
Nonaffective disorder	No	49.5	2.8***	1.8–4.3	2.4***	1.5–3.8
	Yes	72.9				
No. of MDD episodes	One	57.3	1.9*	1.1–3.3	1.4	0.8–2.5
	Two or more	72.0				
History of suicide attempt	No	55.8	2.7**	1.5–4.9	1.9*	1.1–3.7
	Yes	77.5				
Academic problems	Low	56.9	2.8**	1.5–5.4	2.4*	1.1–4.9
	High	78.7				
Gender	Female	65.7	2.0**	1.3–3.2	2.5***	1.5–4.2
	Male	48.6				
Both biological parents in household	No	68.0	2.0**	1.3–3.1	2.2**	1.4–3.6
	Yes	51.0				

[a] *Adjusted for all of the other variables in the table.*
[b] *OR, odds ratio.*
[c] *CI, confidence interval. Significance levels are based on the likelihood. ratio test.*
*P < *.05.*
**P < *.01.*
***P < *.001.*

was unrelated to future depression relapse (56.8% relapse among treated females vs. 51.9% among nontreated); $\chi^2(1, n = 165) = 0.35$, $P > .05$. Among MDD male participants, previous treatment was associated with greater relapse (46.7% relapse among treated males vs. 20.0% among nontreated); $\chi^2(1, n = 55) = 4.29$, $P < .05$. For subjects with subsyndromal depression at T2, the provision of mental health treatment was unrelated to future occurrence of MDD, although the pattern was in a similar direction. Almost half of the T2 Subsyndromal adolescents who received treatment (48.8%) experienced their first episode of MDD by T3, compared with 36.6% of nontreated subsyndromal adolescents; $\chi^2(1, n = 84) = 1.29$, $P > .05$.

In a final attempt to explain the counterintuitive findings, a series of analyses restricted to subjects who had received treatment during adolescence was performed. The rates of future depression were unrelated to: (a) treatment provider (45.1% of adolescents treated by a mental health professional had a future MDD vs. 44.5% of those treated by others); $\chi^2(1, n = 271) = 0.01$, $P > .05$; (b) treatment type (46.5% of adolescents receiving individual treatment had a future MDD vs. 37.9% receiving another modality); $\chi^2(1, n = 271) = 1.35$, $P > .05$; or (c) age of first outpatient treatment; likelihood ratio $\chi^2 (1, n = 271) = 0.18$, $P > .05$.. The rates of future depression were higher given a greater duration of previous treatment (52.4% of adolescents receiving 8 or more sessions had a future MDD vs. 38.0% of those receiving 1–7 sessions); $\chi^2(1, n = 271) = 5.55$, $P < .05$.

DISCUSSION

We found treatment utilization for depressed adolescents to be higher than has been reported in some previous studies (Goodman et al., 1997; Keller et al., 1991; Offord et al., 1987) but comparable in magnitude to the rates reported in a recent study by Cuffe et al. (1995). As expected, treatment utilization increased as a function of depression level. It is important to note that the treatment rate for the Subsyndromal group was significantly higher than that of the Never Depressed group. Subclinical or subthreshold depression is being increasingly recognized as a significant clinical condition with associated psychosocial impairments. In interpreting the relatively high rate of treatment utilization for the Never Depressed group, it needs to be kept in mind that this group included adolescents with a history of nonaffective disorders. The modal treatment was individual outpatient psychotherapy provided by mental health providers and slightly under half received 8 or more sessions of treatment. Inpatient treatment was relatively rare and typically was provided to those whose depression was comorbid with alcohol and drug abuse/dependence.

In addition to depression severity, the presence of a comorbid nonaffective disorder, the number of MDD episodes, the history of a suicide attempt, the presence of academic problems, disruptive family structure, and being female were all positively related to treatment utilization. The odds ratios for all of these factors indicated that the variable generally doubled the likelihood of treatment. However, the variables, taken in combination, had limited predictive ability. Future studies need to identify other variables that were not included in our study which lead to mental health treatment utilization for depressed adolescents.

Those who had received treatment were not less likely to experience a new episode of depression during young adulthood. Actually, the trend was in the opposite direction, and formerly depressed boys who had received treatment were more likely to have relapsed. Our attempts to account for this finding in terms of initial severity differences between those who received and those who did not receive treatment were not borne out. Existing treatment outcome studies have generally focused on the short-term effects of treatment (Kazdin, 1993). To our knowledge this is the only study that has examined the long-term effects of outpatient treatment in a community sample. Clearly, the finding of negative relationship between treatment and prognosis is provocative and needs to be cross-validated. While relapse is only one criterion of long-term treatment efficacy, it is clearly a very important one.

Two possible explanations can be offered for this counterintuitive finding. First, other factors (which were not measured in the present study) which have negative prognostic implications may be correlated with being referred for treatment. For example, boys who were living in especially stressful environments may have been selected for treatment but living in the same bad environment might have undone the initial benefits derived from treatment. Another possibility is that the effects of treatment do not extend into the future far enough to prevent relapse. The question that is being raised by our findings is: Are there any lasting beneficial effects from treatments? This needs to be addressed by future research.

Limitations of our study include the fact that we did not have a measure of treatment "adequacy." Some (Keller et al., 1991) have suggested that depressed children often receive inadequate services. Admittedly, "adequacy" of treatment, either as per clinical judgement or as per empirical studies, is a difficult construct to measure, but clearly psychotherapy covers a multitude of interventions and some of these are probably better than others. Another limitation of our study is that our measure of treatment utilization is entirely based on self-report by the adolescent. While there is no a priori reason to question the veridicality of these self-reports, independent corroboration would have been desirable.

A number of the findings which are being reported for the first time in this paper will be addressed in future publications, such as the very high rate of relapse among those who had an episode of MDD during adolescence, and the fact that the MDD incidence rate

was also high among those with subthreshold depression in adolescence.

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