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Follow-up Treatment Utilization by Hospitalized Suicidal Adolescents

Shirley Yen, PhD,

Alpert Brown Medical School, Providence, RI

Anne Fuller, BS,

Loyola University, Chicago, IL

Solomon Joel, M.D., and

Butler Hospital, Providence RI

Anthony Spirito, PhD

Alpert Brown Medical School, Providence, RI

Abstract

This study examines treatment utilization in a sample of 99 adolescents who were psychiatrically hospitalized due to a risk of suicide and followed for 6 months. Descriptive information regarding participants' use of various forms of outpatient and intensive treatment, including emergency, inpatient, and residential care is presented. In addition, the relationships between utilization of mental health services and various characteristics of the adolescents and their families were assessed. Overall treatment engagement was high, with 78 participants (79%) receiving some care for the duration of the follow-up period and 91 (92%) participating in at least one session of outpatient treatment, although the extent of utilization was highly variable. In addition, 28 participants (28%) were rehospitalized during follow-up. Both family and individual characteristics were associated with differences in adolescents' participation in follow-up treatment. Specifically, adolescents with a family history of mood disorders were more likely to participate in outpatient treatment and less likely to require intensive treatments. Conversely, more impaired baseline functioning and suicide attempts during the follow-up period were associated with greater utilization of intensive treatments and less utilization of outpatient therapy. Given that 19 participants (19%) in our sample attempted suicide during the follow-up interval, the findings of this study suggest that, in spite of high rates of outpatient treatment engagement, rates of suicide attempts and use of intensive treatment services remain high. These results suggest the need for improved outpatient care, as well as possibly longer inpatient stays and more elaborate discharge and transition planning.

Corresponding Author: Shirley Yen, Ph.D., 700 Butler Drive, Providence, RI 02906, Ph: 401-444-1915, Shirley_Yen_PhD@Brown.edu.

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Keywords

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Suicide among adolescents is a major concern, representing the third leading cause of death among 10–19-year-olds between 1999 and 2007.¹ Notably, the 2009 Youth Risk Behavior Surveillance survey found that 14% of high school students had seriously considered committing suicide and 6% of high school students had actually made a suicide attempt during the previous year.² These adolescents are at increased risk for death by suicide; previous studies report that about one-third of adolescents who die by suicide have made previous attempts.^{3,4} The risk of a subsequent suicide attempt is especially high during the first year after a previous attempt.⁵

The high rates of suicidal behavior among adolescents, particularly among those who have made prior attempts, indicate the need to examine treatment utilization during high-risk periods. Previous research offers evidence of poor compliance and low rates of follow-up service use subsequent to a suicide attempt. One study of 10–18-year-old outpatients reported a premature termination rate of 77%.⁶ Another study suggests that many adolescents seen in the emergency department following a suicide attempt attend fewer than four therapy sessions, although the average number of sessions was greater for those who were psychiatrically hospitalized immediately after the attempt.⁷

More recent studies indicate more extensive treatment utilization by adolescent suicide attempters, with 84% attending at least one individual psychotherapy session during the first 6 months of follow-up, 72% attending family therapy, 59% taking medication, 26% being rehospitalized, and 21% attending day hospital programs.⁸ The high rates of service use in these samples may be due to the fact that, unlike in the studies reviewed above, the participants were psychiatrically hospitalized, which suggests that they represented higher risk samples. Nonetheless, Spirito et al. reported that, during a 3-month period after discharge, 18% terminated outpatient therapy against therapist advice,⁹ and James et al. found that, over a 30-month follow-up period, 28% of their sample of children and adolescents failed to receive any treatment following their first psychiatric hospitalization,¹⁰ thus offering a less optimistic view of patterns of service use. In a review of data concerning children and adolescents who received inpatient psychiatric care, Daniel et al. reported that, in general, two thirds or more of psychiatrically hospitalized youth received treatment of some kind following discharge from the hospital.¹¹ It was not uncommon, however, for delays in treatment initiation to occur. Daniel et al. also reported that many of the participants in the studies they reviewed did not remain in treatment for the recommended length of time. Thus, it is clear that the pursuit and/or availability of psychiatric treatment for this vulnerable population is inadequate.

Many factors can interfere with adolescents' access to and use of various types of treatment. Given that adolescents typically live with their parents and are unable to make independent decisions about their treatment, family factors have a significant impact on adolescent treatment utilization and compliance.¹² Parental psychopathology, for instance, seems to

affect adolescents' involvement in treatment. Thus, one study found that hospitalized suicidal adolescents with mothers with depressive or paranoid symptoms were less likely to follow through with individual and family therapy after discharge than those whose mother did not have such symptoms.¹³

Few studies have examined the effects of individual characteristics on use of treatment services, particularly with adolescents. Those studies that have been done in this area have mostly focused on the effect of psychiatric disorders. For example, Essau found that, in adolescents with anxiety disorders, older age, a history of attempted suicide, and parental depression and anxiety were associated with an increased likelihood of receiving mental health treatment.¹⁴ In adolescents with depressive disorders, a prior suicide attempt was the only significant predictor of service use.¹⁴

In this article, we present data from a study of hospitalized suicidal adolescents and examine their treatment utilization over the course of 6 months following discharge. Clinical outcomes in this sample during follow-up, including a 19% re-attempt rate (operationalized as suicidal behavior with non-zero intent to die), have been reported and described elsewhere.¹⁵ This sample of adolescents is distinct in that it represents a more clinically serious sample than those assessed in many previous studies. This descriptive account details participants' rates of involvement in various forms of outpatient and intensive treatment, including emergency, inpatient, and residential care. The relationships between utilization of mental health services and various attributes of adolescents and their families, such as gender, psychiatric illness, impairment at baseline, and family history of psychopathology and suicidality are also described.

METHODS

Participants

This study included adolescent psychiatric inpatients who were hospitalized due to a risk of suicide (i.e., suicidal behavior or severe suicidal ideation). Patients who had only nonsuicidal self-injurious behaviors were excluded. Adolescents and their parents/guardians were recruited from a university-affiliated psychiatric hospital in the Northeast and were identified via chart review of consecutive admissions. For the recruitment years of this study, the average duration of inpatient admissions in this hospital was 10.4 days; information on the mean length of stay for this specific sample is not available. Parental consent and adolescent assent were obtained for all participants. The Institutional Review Boards of the hospital and affiliated university approved all study procedures.

Procedure

Intake assessments with adolescent and parent participants, interviewed separately, were conducted during or shortly after the adolescents' index hospitalizations. Assessments were re-administered at the 6-month follow-up. Abbreviated follow-up phone calls to the adolescents, assessing for significant life events, suicidal behaviors, and inpatient or residential treatment were made at 2- and 4- month follow-ups to assist with recall for the 6-

month follow-up. In the event of disagreement between child and parent, consensus ratings were assigned after discussion in team meetings based on all available information.

Assessment Instruments

Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime Version (K-SADS-PL)—The K-SADS-PL is a semi-structured parent-child interview.¹⁶ Children's symptoms are assessed through separate interviews with the child and his or her parent; consensus ratings based on data from all informants were used in the analyses. Family history of psychopathology is also assessed. Psychiatric disorders assessed using the K-SADS-PL include mood disorders, anxiety disorders, attention-deficit/hyperactivity disorder, conduct disorder, oppositional defiant disorder, substance use disorders, and eating disorders. The K-SADS-PL has good to excellent test-retest reliability ($\kappa = 0.63$ – 1.00) and inter-rater reliability (range 93%–100%).¹⁶ The K-SADS-PL was administered only at baseline to determine the specific psychiatric disorders for which the participant met criteria.

Childhood Interview for Borderline Personality Disorder (CI-BPD)—The CI-BPD¹⁷ is an adaptation of the Diagnostic Interview for DSM-IV Personality Disorders¹⁸ for adolescents. The CI-BPD was administered at baseline and at the 6-month follow-up. In the present sample, the k coefficient based on 20 interviews was 0.82.

Children's Global Assessment Scale (CGAS)—The CGAS is a clinician-rated scale of children and adolescents' overall functional impairment.¹⁹ Scores range from 1 to 100, with higher scores indicating a higher level of functioning. The scale has excellent inter-rater reliability (0.84) and test-retest reliability (0.85).¹⁹ The CGAS was administered only at baseline as part of the effort to determine whether certain baseline attributes could prospectively predict outpatient treatment engagement.

Adolescent Longitudinal Interval Follow-up Evaluation (A-LIFE)—The A-LIFE is a semi-structured interview consisting of three sections designed to assess individuals' psychiatric diagnoses, psychosocial functioning, and treatment utilization during a specified follow-up interval.²⁰ The A-LIFE was used during follow-up to assess the status of the psychiatric diagnoses that were identified at baseline using the K-SADS-PL.

In the treatment utilization section, participants and parent(s) were questioned regarding the adolescent's use of various mental health services, including emergency department visits, psychiatric hospitalization, residential treatment, partial/day programs, and outpatient treatment. With regard to outpatient treatment, participants/parents were asked about their participation in different types of services, including individual, group, and family therapy; medication only; intensive outpatient psychotherapy (IOP); and self-help. For each outpatient service received, the type of treatment and service provider (e.g., psychiatrist) were noted, along with the frequency and duration of treatment, the approximate number of sessions, and whether or not the participant had previously been involved with that provider. A score was assigned to indicate the highest level of treatment received by each participant during each week of the 6-month follow-up period. Dichotomous variables were also created

to indicate whether or not participants received each form of treatment at any point throughout the follow-up period.

Data Analysis

Our descriptive analyses report frequency and proportion of participants engaged in each type of treatment modality. Treatment modality was operationalized as a dichotomous variable. For analyses that examined predictors of treatment utilization, chi-square analyses were conducted for categorical predictor variables whereas Mann-Whitney *U* tests were used to examine predictors operationalized by non-parametric variables.

RESULTS

Characteristics of the Sample

Partial or complete follow-up data was available for 99 (82%) of the 119 adolescent participants. Those with and without follow-up data were compared on a number of demographic and clinical variables.¹⁵ For the most part, there were no significant differences between those who remained in the study and those who were lost to attrition. Those who dropped out were more likely to be diagnosed with bipolar disorder ($p = 0.037$) and to identify as a member of a racial minority ($p = 0.043$). No other differences were found.

Demographic and clinical characteristics of the sample of 119 adolescents have been described elsewhere.¹⁵ The subset of the original sample we examined in this study included 65 females (66%) and 34 males (34%), ranging in age from 13 to 18 years (mean = 15.3 years, standard deviation [SD] = 1.38 years); 80% identified their primary race as white, 15% as Hispanic; 11% as black or African American, 2% as American Indian or Alaskan Native, and 6% as other race. Forty participants (40%) had a history of a prior suicide attempt; 35 (35%) had reported a suicide attempt that precipitated the index admission. Baseline scores on the CGAS ranged from 31–61 ($N = 98$, mean = 42.94, SD = 7.60). Psychiatric disorders, as assessed with the K-SADS-PL, were prevalent in our sample, with 85% of the adolescents meeting criteria for a current major depressive episode, 44% for a phobic anxiety disorder, 41% for attention-deficit/hyperactivity disorder, 39% for a disruptive behaviors disorder, 26% for posttraumatic stress disorder, 17% for a substance use disorder, 10% for an eating disorder, and 9% for bipolar disorder. Based on the CI-BPD, 37% also met criteria for borderline personality disorder.

Descriptive Findings

Only two participants (2%) did not receive any treatment during the follow-up period. Nineteen participants (20%) who received treatment during the follow-up period reported one or more weeks of follow-up in which they were not involved in any form of treatment. Thus 78 participants (79%) received some form of psychiatric care during all weeks for which follow-up data were available. Two of these participants (2%) were involved in medication management for the entire follow-up period and did not receive any individual psychosocial therapy. Sixty-three participants (64%) received some form of psychosocial

intervention (i.e., outpatient, IOP, partial hospital, residential, inpatient) throughout the follow-up period.

Figure 1 shows the percentage of participants (not mutually exclusive) who were involved in each form of treatment assessed in this study. Of the 26 participants treated in the emergency department, 18 (69%) reported a single emergency department visit, 6 (23%) reported two visits, and 2 (8%) reported four visits. Of the 28 participants (28%) who received inpatient care during the follow-up period, 17 (61%) were hospitalized once, 6 (21%) were hospitalized twice, 3 (11%) were hospitalized three times, and 2 (7%) were hospitalized four times. The total duration of inpatient treatment ranged from 1 to 104 days (median length of admission 7 days, mean duration 9.81 days), demonstrating the wide variability in the use of intensive services in this sample.

Figure 2 depicts the most intensive level of treatment at any point during the follow-up interval, as reported by 68 participants (69%) discharged to outpatient care. As evidenced in the graph, 45 participants (66%) were maintained in outpatient treatment and did not need additional intensive services in the 6-month follow-up. Only 4 participants (6%) discharged to outpatient care discontinued outpatient services altogether without utilizing more intensive services, while 8 (12%) discontinued outpatient therapy but had medication management as their highest level of care during the follow-up interval. Finally, another subset of those discharged to outpatient care ($n = 23$; 34%) needed more intensive services (i.e., partial hospital, inpatient, or residential) at some time during the follow-up interval.

Eight participants (8%) were initially treated with medication alone following discharge, and 3 continued with medication management alone throughout the follow-up period. The remaining 5 individuals eventually received more intensive services, with 3 being rehospitalized and 2 starting outpatient treatment.

Other participants were discharged to more intensive forms of treatment. Nine (9%) were discharged to residential programs and of these, 4 were rehospitalized, 4 remained in residential treatment for the duration of the follow-up period, and only one was transitioned to outpatient therapy. Ten participants (10%) were discharged to IOP or partial hospital programs and of these, 7 subsequently were managed in outpatient therapy with no additional intensive treatments, while 3 were rehospitalized. Thus, for the most part, those who were discharged to more intensive services, such as residential treatment or IOP, continued to need ongoing intensive services and were thus appropriately identified during the index admission.

Family History Variables

Nineteen participants (19%) reported a history of completed suicide in at least one biological or non-biological relative, while 41 (41%) reported a family history of attempted suicide. Twenty-one participants (21%) reported a history of a suicide attempt in a biological parent or sibling. Neither a family history of a suicide attempt nor of suicide completion had a significant effect on any of the treatment utilization categories. Eighty-one participants (82%) reported a family history of depression and/or mania in any biological or non-biological relative. These individuals were less likely to receive emergency, inpatient, or

residential care and more likely to participate in outpatient treatment compared to participants without family histories of mood disorders (Table 1).

Individual Variables

Females received individual therapy more often than males (79% vs. 98%; $\chi^2[1, n = 91] = 9.96, p = 0.002$). The same pattern was evident in participants' involvement in medication management (72% of females vs. 44% of males; $\chi^2[1, n = 89] = 6.89, p = 0.009$). There were no significant effects of gender on other types of treatment utilization.

Significant differences in utilization of various forms of treatment were found based on participants' CGAS scores (Table 2). The mean CGAS scores for participants who were admitted to the emergency department, hospitalized for psychiatric reasons, or placed in residential care were significantly lower than those of participants who did not receive these forms of treatment. Conversely, participants who engaged in outpatient treatment had higher mean CGAS scores than those who did not. There was no significant relationship between level of functioning and participation in a partial or day program, nor were there significant relationships between level of functioning and the use of any specific types of outpatient care.

A suicide attempt as a precipitant for a participant's index hospitalization was also associated with differences in follow-up treatment utilization. The 35 (35%) participants who were admitted due to a suicide attempt were more likely to receive residential care than those who were admitted for suicide ideation or risk but had not made an attempt (29% vs. 13% respectively, $\chi^2[1, N = 99] = 3.93, p = 0.047$). Participants who were admitted for a suicide attempt were also more likely to participate in IOP treatment (13%) than those who were not admitted for an attempt (2%), though actual counts are too small for reliable statistical analyses. There were no other significant differences between participants based on the reason for their index hospitalizations.

Differences in treatment utilization were also observed between participants who attempted suicide during the follow-up period ($n = 19, 19\%$) and those who did not ($n = 79, 80\%$) (data missing for 1 patient). A suicide attempt during the follow-up period was associated with an increased likelihood of receiving inpatient, emergency, or residential care (Table 3). Participants who attempted suicide were also less likely to be involved in outpatient treatment.

The associations between treatment use and the presence of specific psychiatric disorders were also examined. There were no differences in treatment utilization between those with and without current major depressive episode. However, those with bipolar disorder were more likely to receive pharmacotherapy ($\chi^2[1, n = 88] = 6.02, p = 0.014$). A diagnosis of bipolar disorder did not yield significant differences with regard to any other treatment modality.

Participants diagnosed with anxiety disorders were less likely to need residential treatment than were participants without an anxiety disorder ($\chi^2[1, n = 98] = 4.24, p = 0.040$), but they were more likely to attend individual outpatient therapy ($\chi^2[1, n = 98] = 6.86, p = 0.009$). A

diagnosis of anxiety disorder did not yield significant differences with regard to medication management, IOP/partial hospital, residential, inpatient, emergency, other forms of outpatient treatment (e.g., group, family), or outpatient therapy in general.

A diagnosis of conduct disorder was associated with an increased likelihood (35%) of receiving residential care ($\chi^2 [1, N = 99] = 6.40, p = 0.011$) but the opposite effect was found with regard to outpatient care ($\chi^2 [1, N = 99] = 5.90, p = 0.015$). A diagnosis of conduct disorder did not yield significant differences with regard to medication management, IOP/partial hospital, inpatient, emergency treatment, or specific forms of outpatient therapy.

Meeting the criteria for borderline personality disorder at baseline was associated with an increased likelihood of involvement in group therapy during the follow-up period ($\chi^2 [1, n = 91] = 5.62, p = 0.018$). A diagnosis of borderline personality disorder did not yield significant differences with regard to other forms of outpatient therapy or outpatient therapy in general, medication management, or IOP/partial hospital, residential, inpatient, or emergency treatment.

There were no significant associations between diagnosis and treatment utilization for substance use disorders (17%), attention-deficit/hyperactivity disorder (42%), and oppositional defiant disorder (32%).

DISCUSSION

Key Findings

In general, the participants in this study reported high rates of treatment utilization over the course of the 6-month follow-up period. All but two participants received some form of treatment, and the majority of individuals were consistently in treatment throughout the follow-up period. Outpatient care was the most common form of treatment, although many participants received more intensive care, including inpatient, residential, and emergency treatment.

The rates of involvement in follow-up treatment in our sample were generally higher than reported in other studies. For instance, only 2% of participants in this study failed to receive any treatment after being discharged from the hospital, compared to 28% in a study of hospitalized children and adolescents published by James et al. in 2010.¹⁰ Rates of treatment utilization among the current sample were also substantially higher than the two thirds reported by Daniel et al. in 2004.¹¹

One possible explanation for these high rates of follow-up treatment in our sample is that treatment utilization following psychiatric hospitalization may be increasing over time. Recruitment for our study occurred between 2006 and 2010. Comparison studies with low rates of involvement in treatment, such as the study by Spirito et al. 1992,²¹ were published much earlier than that, and a more recent study from that same hospital published in 2011⁹ found higher levels of treatment attendance than in the 1992 study. Changes in patterns of treatment utilization for these different cohorts could be due to factors such as changes in insurer willingness to fund an array of services and a greater awareness of the importance of

receiving ongoing mental health treatment following a period of intensive care such as hospitalization. It is also important to consider that all participants in our study received a discharge plan upon leaving the hospital, which may have contributed to their high rates of subsequent treatment utilization. Participants in the study also received comprehensive care during their inpatient treatment, including diagnostic evaluation and safety assessment, therapeutic support, medication management, and aftercare planning to help facilitate continuity by easing the transition to outpatient care. In addition to the practical benefits of a formal discharge plan, it is important to consider that inpatients often develop a positive institutional transference toward care which may help explain the apparent high prevalence of accessing treatment following hospitalization.

However, at the same time, the sample in our study generally appeared to be more clinically acute than samples in other studies (e.g., Spirito et al. 2002⁷) in which participants were not necessarily hospitalized. This difference in characteristics of the samples may partially account for varying patterns of treatment utilization. In 2002, Spirito et al. reported that, in their study, adolescents who were hospitalized following a suicide attempt demonstrated increased adherence to outpatient treatment compared to the individuals who were evaluated in the emergency department and then released. They suggested that the hospitalization may have alerted patients' families to the seriousness of the attempts and, consequently, the importance of compliance with treatment. Furthermore, it is notable that a substantial subset of those discharged to outpatient care in our study needed more intensive services within 6 months.

The results of our study indicate that a family history of psychopathology had few effects on participants' treatment utilization. Two important findings, however, were that participants with family histories of mania and/or depression were generally less likely to be involved in intensive forms of treatment and more likely to receive outpatient care than participants without family histories of mood disorders. These results may indicate that the parents and guardians of adolescents with a family history of mood disorders were more aware of the severity of the adolescents' conditions and/or of the importance of receiving treatment. Consequently, these individuals may have taken greater care to ensure that their children received ongoing outpatient care, thus decreasing the need for more intensive care.

In spite of these findings, characteristics of participants' families did not influence treatment utilization in expected ways. The results of this study failed to support the findings of King et al. published in 1997 regarding the negative influence of maternal depression on compliance with individual and family therapy.¹³ While this discrepancy may be due to the fact that King et al. specifically measured compliance with treatment, while this study focused on utilization, there may be a more substantial explanation for these inconsistent findings. Given the similarities between the participants in the present study and those in the sample evaluated by King et al., it is unlikely that the differences in treatment utilization were due to characteristics of the samples. It is possible, however, that a cohort effect could account for these differences. since recruitment in the King et al. study occurred 10 years before our study began. It is therefore possible that, while maternal psychopathology may have significantly interfered with treatment utilization in the past, increased attention by the professional community may have increased recognition by parents who have experienced

emotional problems of the need for their children to receive ongoing treatment. This hypothesis is also consistent with the findings that participants in this study with a family history of mood disorders tended to receive more outpatient care and relied less on some forms of intensive treatment relative to other participants. Although it is possible that changes in the involvement of family members in the therapy could have contributed to the cohort effect, this did not match our subjective experience, with family involvement and responsiveness appearing to be fairly stable during the course of the study.

In general, participants' CGAS scores were associated with expected differences in treatment utilization. In a study published in 1997, Goethe et al. reported that poorer functioning was associated with a greater likelihood of hospitalization during the follow-up period.²² Participants who received outpatient care tended to have higher CGAS scores, while the use of more intensive forms of treatment was associated with lower scores. These findings suggest that participants who experienced greater impairment generally received the increased intensity of care that they needed, while participants whose functioning was not as severely disrupted relied on less intensive forms of treatment.

With regard to the occurrence of suicide attempts during the follow-up period, participants who made attempts were more likely to receive emergency, inpatient, and residential care and less likely to be involved in outpatient treatment than participants who did not attempt suicide. These findings suggest that, like the participants who attempted suicide prior to the index hospitalization, these individuals often received the more intensive treatment warranted by their continued risk for suicide. The high rate of re-attempts in our sample (19%) in light of high rates of outpatient treatment engagement possibly indicates a need for improved outpatient care, longer length of inpatient stays, and more elaborate discharge and transition planning.

The only effect of a major mood disorder in this study was an increased likelihood among participants with bipolar disorder to receive treatment involving medication alone. This finding is not surprising, given the importance of pharmacological treatment in managing this illness.²³ The absence of any other effects of major mood disorders on treatment utilization supports the findings of a study reported by Goethe et al. in 1999,²⁴ in which the presence of a major mood disorder did not predict future inpatient hospitalization. However, in the Goethe et al. study, schizophrenia/schizoaffective and substance use disorders were significant predictors of future inpatient admissions. As these disorders typically begin to emerge during late adolescence, we were unable to assess their effects on treatment utilization in our study.

A diagnosis of conduct disorder had significant effects on treatment utilization, including an increased likelihood of receiving residential treatment and decreased use of outpatient care. These findings may indicate a need for long-term, intensive care for suicidal adolescents with conduct disorder, especially when associated conduct problems may lead to the removal of adolescents from their home and family environments. At the same time, the less frequent use of outpatient treatment among individuals with conduct disorder may be related to issues of treatment noncompliance that necessitate the provision of care in the more restrictive environment afforded by residential treatment. For example, in 2008, Burns et al.

reported that adolescents who were psychiatrically hospitalized for a suicide attempt demonstrated poorer compliance with subsequent individual therapy if they met criteria for conduct disorder, oppositional defiant disorder, or attention-deficit/hyperactivity disorder.⁸ Comorbidity of depression and conduct disorder may also contribute to clinical severity, further increasing the need for intensive care among adolescents with both disorders.

Finally, to our knowledge, this is the first study to assess the effects of borderline personality disorder on treatment utilization by adolescents. However, we found that the only effect of this disorder was that patients who met the criteria for borderline personality disorder were more likely to participate in group therapy. It is conceivable that this finding was influenced by the widespread use of dialectical behavior therapy as an intervention method for suicidal individuals with borderline personality disorder.²⁵ The absence of other effects of borderline personality disorder may again be due to the overall clinical severity of illness among the participants in this study. While borderline personality disorder is a severe psychiatric disorder, it may not have greatly affected participants' use of treatment in light of their already significant mental health concerns.

Limitations

This study had several limitations. First, participants were primarily white, and there were approximately twice as many females as males in the sample. Consequently, it is important to consider that it may not be possible to generalize the results of this study to other populations. It should also be noted that the participants were all recruited from a single psychiatric hospital in the Northeast. Given the findings reported by Fontanella et al. in 2008 that decisions regarding adolescents' follow-up care were influenced by the hospital in which the individuals were treated and by the availability of service providers,²⁶ it is possible that the findings of this study would not be replicated in samples from other hospitals or geographic regions. Data on the mean duration of the index hospitalization for our adolescent sample were also not available; this information might have been helpful in evaluating the adequacy of the inpatient treatment received.

In measuring treatment utilization, it would have been helpful to have obtained the reports from the participants' treatment providers, in addition to interviewing adolescents and their caregivers. This would have served to corroborate or discredit participants' reports and therefore potentially increase the accuracy of the data. In addition, reports from providers could have yielded informative naturalistic data on the therapeutic orientations of treatment providers in the community. Finally, it would have been more beneficial to have multiple follow-up time points which would have allowed us to use more powerful statistical methods such as latent growth modeling. Finally, the potential confound of complex comorbidity was not analyzed as this was beyond the scope of our investigation.

CONCLUSIONS

Overall, the results of this study suggest that adolescents whose suicidal ideation or attempts are serious enough to warrant hospitalization are involved in follow-up treatment at high rates, both immediately after discharge from the hospital and over the course of the subsequent 6 months. Furthermore, individuals who demonstrate greater clinical severity of

illness, as evidenced by suicide attempts either immediately before the index hospitalization or during the follow-up period, receive intensive care at higher rates relative to adolescents who experience suicidal ideation alone; this suggests that these individuals with more clinically severe symptoms are generally gaining access to the care they need. Some concerns regarding adolescents' mental health treatment persist, however. Despite relatively high rates of treatment utilization, particularly of outpatient care, the incidence of suicide attempts and participation in intensive treatment during the follow-up period were high, with 19 participants attempting suicide, and 28 receiving inpatient psychiatric care. These findings indicate the importance not only of increasing treatment utilization and decreasing barriers to treatment among those individuals who are receiving inadequate amounts of care, but also of improving outpatient treatment in order to reduce rates of suicide attempts and decrease the need for intensive care among this high-risk population.

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Figure 1.
Percentage of participants engaged in various modalities of treatment

Figure 2.
Highest-intensity treatment during follow-up among those discharged to outpatient care.

Table 1

Treatment utilization by adolescents with and without a family history of depression/mania

	Family history n = 81* n (%)	No family history N = 18* n (%)	χ^2
Outpatient	77 (95.1)	14(77.8)	5.92 ^a
Partial hospital	20 (25.6)	2 (11.8)	1.51
Residential	10 (12.3)	8 (44.4)	10.20 ^c
Inpatient	18 (22.2)	10 (55.6)	8.07 ^b
Emergency department	18 (22.2)	8 (47.1)	4.45 ^a

^a $p < 0.05$;^b $p < 0.01$;^c $p < 0.001$

* Percentages reflect the number of participants for which data on that form of treatment were available. For partial hospital, data were missing for 3 participants in the family history group and 1 in the no family history group; for emergency department, data were missing for 1 participant in the no family history group.

Table 2

Mean baseline CGAS scores by forms of treatment received

Form of treatment	Treatment		<i>U</i>	<i>Z</i>
	Received	Not received		
	Score (SD)	Score (SD)		
Outpatient	43.5 (7.6)	36.6 (4.0)	163.0	2.59 ^b
Partial hospital	41.6 (6.6)	43.6 (7.9)	685.5	1.05
Residential	38.0 (4.9)	44.0 (7.77)	357.00	3.15 ^b
Inpatient	39.7 (6.9)	44.2 (7.5)	618.5	2.73 ^b
Emergency department	40.3 (7.1)	44.0 (7.6)	648.5	2.10 ^a

^a
 $p < 0.05$;^b
 $p < 0.01$

Table 3

Treatment utilization by adolescents who attempted suicide during follow-up versus those who did not

Form of treatment	Suicide attempt <i>n</i> = 19 [*] <i>n</i> (%)	No suicide attempt <i>n</i> = 79 [*] <i>n</i> (%)	χ^2
Outpatient	14 (73.7)	76 (96.2)	10.36 ^c
Partial hospital	7 (38.9)	15 (19.7)	2.98
Residential	9 (47.4)	8 (10.1)	14.82 ^c
Inpatient	13 (68.4)	15 (19.0)	18.34 ^c
Emergency department	12 (63.2)	14 (17.9)	15.92 ^c

Note:

^{*}
 $p < 0.05$;^{**}
 $p < 0.01$;^c
 $p < 0.001$

^{**} Information about whether a suicide attempt occurred during follow-up missing for 1 participant. Percentages reflect number of participants for which data on form of treatment were available. For partial hospital, data missing for 1 participant in the suicide attempt group and 3 participants in the no suicide attempt group; for emergency department, data missing for 1 participant in the no suicide attempt group.