# Clinical Features of Depressed Children and Adolescents With Various Forms of Suicidality

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***Objective:*** To examine various forms of suicidality specified in DSM-IV and their clinical characteristics in a large sample of children and adolescents with major depressive disorder (MDD).

***Method:*** Subjects included 553 children and adolescents (aged 7.0–14.9 years) recruited between April 2000 and December 2004 from 23 mental health facilities in Hungary. Subjects received standardized clinical evaluations and best-estimate consensus DSM-IV diagnoses of MDD. All subjects were in a current episode of MDD at their assessment date.

***Results:*** Approximately 68% of the sample had recurrent thoughts of death, 48% had suicidal ideation, 30% had suicide plan, and 12% had attempted suicide. Compared with nonsuicidal peers, suicidal children and adolescents were more severely depressed, had more depressive symptoms, and more likely had comorbid disorders. However, depressed children and adolescents with various forms of suicidality were very similar in clinical characteristics. Feelings of worthlessness, depressed mood, psychomotor agitation, and comorbid separation anxiety and conduct disorders were independent correlates of at least 1 form of suicidality. Only feelings of worthlessness was related to all 4 suicidal behaviors, after adjustment for other depressive symptoms, comorbid disorders, and demographics.

***Conclusion:*** Clinical characteristics differ between nonsuicidal and suicidal children and adolescents but are very similar across various forms of suicidality. Feelings of worthlessness may play a central role in the development of suicidal behavior. Interventions toward the enhancement of self-esteem and amelioration of underlying psychopathology may be crucial for the prevention of suicide attempts in depressed children and adolescents.

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Although childhood depression is associated with a high rate of episode recurrence, multiple coexisting psychiatric disorders, and substantial psychosocial impairment,[1–3] suicidality probably represents its most adverse and clinically serious feature because suicidal behaviors are often repetitive and increase risk for eventual suicide.[4–10] Research has shown that 2 forms of suicidal behavior in clinical samples of depressed youths, namely, suicidal ideation and attempts, are very common. About 60% to 70% of depressed youths have been found to have suicidal ideation or thoughts, and 13% to 39% have attempted suicide.[11–14] However, little information is available about the prevalence and clinical features of recurrent thoughts of death and suicide plan, which have been specified in the DSM-IV as part of diagnostic criteria for major depressive disorder (MDD).[15]

Do suicidal depressed children and adolescents differ from their nonsuicidal peers on clinical parameters, such as depressive symptom profile, severity of depression, illness duration, or comorbid disorders? Do depressed children and adolescents with various forms of suicidality manifest different clinical characteristics? Answers to such questions have important practical implications for early identification and clinical intervention.[16] However, relevant data are few in the literature. According to 1 recent study of symptom presentation,[17] depressed children and adolescents who had a history of clinically significant suicidal ideation (at least with a plan) (N = 43) and nonsuicidal counterparts (N = 92) differed only in hopeless-

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ness and insomnia. Suicidal youths were more likely to have hopelessness and insomnia than nonsuicidal youths, after controlling for demographics.[17] Suicidal youths also were found to be more severely depressed than nonsuicidal youths, but average illness duration did not differ between suicidal and nonsuicidal youths.[17] However, in an earlier study, Kosky and colleagues[18] did not find any significant differences in emotional and behavioral symptoms between suicidal and nonsuicidal depressed children and adolescents.

Information about comorbid psychiatric disorders among suicidal depressed children and adolescents is equivocal. For example, in a comprehensive study of the clinical picture of childhood depression, Ryan et al.[13] found that separation anxiety, phobias with avoidance, overanxious disorder, and conduct disorder were common comorbid disorders in depressed children and adolescents, but these disorders did not differ between suicidal and nonsuicidal youths. Barbe and colleagues[17] found a lack of significant relationship between suicidality and lifetime comorbid disorders in depressed children and adolescents, including dysthymia, anxiety disorders, and disruptive disorders. Similarly, Pfeffer et al.[19] and Borst et al.[20] found no association between conduct disorder and suicidal behavior in child and adolescent patients. In a longitudinal study, in contrast, Kovacs et al.[11] reported that comorbid conduct/substance use disorders increased the risk of suicide attempts 3-fold. Goldston et al.[21] found a higher prevalence of comorbid affective and substance abuse disorders among prior suicide attempters than nonsuicidal adolescent patients. Moreover, Wannan and Fombonne[22] noted that comorbid conduct disorder or substance abuse predicted suicidal behavior among psychiatric outpatient girls only.

Finally, epidemiologic data in the general population have compellingly shown that the rates of suicidal behaviors begin to increase during adolescence and are higher in adolescent girls than in boys.[4,7,23] However, in clinical samples of depressed children and adolescents, age and sex effects on suicidal behavior have not been reported consistently. Several studies have reported a lack of sex differences in both suicidal ideation and suicide attempts.[12,13] Notably, Kovacs et al.[11] followed an outpatient sample of children with affective disorders and found that sex differences of suicidal behavior became pronounced only when youths entered mid-adolescence. Age effects on suicide attempts but not suicidal ideation have been reported by Ryan and colleagues.[13] In 1 recent large-scale study of depressed children and adolescents aged 5.6 to 17.9 years (N = 916), Yorbik et al.[14] reported that age and sex effects on suicidal ideation and attempts were similar to those reported in the general population studies.[7,23]

In the present article, we examined various forms of suicidality specified in DSM-IV (i.e., recurrent thoughts of death, recurrent suicidal ideation, suicide plan, and suicide attempts) and their clinical characteristics in a large clinical sample of children and adolescents with MDD (N = 553). Specifically, our first purpose was to examine the similarities and differences between nonsuicidal and suicidal children and adolescents, in terms of illness history, severity of depression, depressive symptom profiles, and comorbid psychiatric disorders. Our second purpose was to examine whether clinical parameters differed across children and adolescents with various forms of suicidality. Our third purpose was to examine which depressive symptoms or comorbid disorders were independently associated with which form of suicidal behavior. Finally, we aimed to examine age and sex effects on various forms of suicidal behavior.

## METHOD

### Subjects

Data presented here are from an ongoing investigation of the roles of genetic liability and emotion regulatory factors in the risk of childhood-onset depression in 23 mental health facilities in Hungary. The 23 clinical sites, including all of the 7 dedicated child psychiatry inpatient units in Hungary, are estimated to cover about 80% of all referred child psychiatric patients in the nation in 2004. Children and adolescents referred to participating psychiatric facilities were considered as potential subjects if they met the following eligibility criteria: DSM-IV criteria for MDD, aged 7.0 to 14.9 years, at least 1 biological parent available, having a sibling aged 7 years or older, not mentally retarded, and free of major systemic medical disorders. We obtained signed consent from the parent(s) and assent from the child before initial evaluation as required by the institutional review boards at the University of Pittsburgh and in Hungary.

Between April 2000 and December 2004, 864 children and adolescents aged 7.0 to 14.9 years were sequentially evaluated, going through at least the first part of the assessment procedure (described below). Of those, 635 youth met criteria for childhood-onset depression, and 553 were in a current episode of MDD at their assessment date. We restricted this sample to subjects in a current episode of MDD so that our results are more comparable to those reported in prior studies.[13,14] Our sample therefore included 553 currently depressed children and adolescents; 55.2% were boys, mean (SD) age was 11.7 (2.0) years (range, 7.3–14.9), and 94.1% were white. Most of the subjects (78.5%) were in their first major depressive episode (MDE); the mean age at first onset of MDE was 10.6 years (SD = 2.3), the mean illness duration was 59.2 weeks (SD = 69.8, median = 30.0 weeks), and 19.2% had the illness more than 2 years. A total of 150 patients (27.1%) had a history of psychiatric hospitalization; 22.3% and 30.6% had taken tricyclic antidepressants

(TCAs) and selective serotonin reuptake inhibitors (SSRIs), respectively. With respect to family demographics, 62.0% of the biological parents were married, 20.7% of mothers received education of 12 years or above, and about 31.4% of parents rated their family financial status worse or much worse than that of other families in general.

### Psychiatric Evaluation and Diagnosis

Subjects were evaluated by a semistructured interview, the Interview Schedule for Children and Adolescents-Diagnostic Version (ISCA-D), an extension and modification of the Interview Schedule for Children and Adolescents.[24] The measure includes most DSM-IV Axis I diagnoses as well as some DSM-III disorders and yields ratings for "current" as well as "lifetime" diagnoses. For each item of the ISCA-D, the clinician first interviews the parent about the child's symptoms, then interviews the child, and finally achieves an overall rating for each symptom based on information from both child and parent. Ratings were obtained both for current symptoms (1 month before the interview) and past symptoms (prior to the last month or, alternatively, prior to the current episode).

The assessment procedure was completed in 2 parts approximately 6 weeks apart. At the first part, the "mood disorder module" of the ISCA-D, which includes the MDD symptomatology, was administered to the parent and child. Also, the Intake General Information Sheet was given to the parent, which is a comprehensive demographic and anamnestic data form, covering demographic, family, developmental, physical health, and psychosocial history and characteristics. Children and adolescents who met DSM-IV criteria for a mood disorder at the first part were scheduled for the second part of assessment. The second part included the full diagnostic interview of ISCA-D. Results of the 2 parts of assessment and associated documentation were subjected to final consensus diagnostic procedure using pairs of senior child psychiatrists trained as best-estimate diagnosticians.[25] Diagnoses of MDD and comorbid disorders, as well as onset ages of disorders, were based on best-estimate consensus.

Psychiatric evaluations were conducted by child psychiatrists and psychologists, who had to complete 3 months of training in the semistructured interview technique and reach an average of 85% symptom agreement with "gold standard" ratings (provided by experienced trainers) on 5 consecutive videotaped interviews. Routine follow-up training sessions were held to minimize rater drift. All interviews were audiotaped. Interrater reliability on current depressive symptoms was estimated on a sample of 46 cases using pairs of clinical raters. For all depressive symptoms that count toward a diagnosis of current MDE, kappa coefficients ranged from 0.64 to 0.88, with 80% at or above 0.70. Similar interrater reliability estimates were obtained for other DSM-IV disorders.

### Study Variables

***Suicidality.*** The ISCA-D mood disorder module includes the 4 DSM-IV forms of suicidality (recurrent thoughts of death, recurrent suicidal ideation, suicide plan, and suicide attempts), and each is rated for the past month (current) as well as for the time prior to past month or the onset of the current episode (past). *Thoughts of death* was defined as thinking of not wanting to live (e.g., "I wish I were dead" or "I'd be better off dead"), *suicidal ideation* was defined as thinking about killing self, a *suicide plan* was defined as having a specific plan for killing self, and a *suicide attempt* was defined as having attempted and intent to end one's life. Each form of suicidality was rated as "yes" or "no."

***Depressive symptoms and severity.*** The ISCA-D includes 17 DSM-IV criterion symptoms (depressed mood, irritable mood, anhedonia, weight loss, weight gain, insomnia, hypersomnia, psychomotor agitation, psychomotor retardation, fatigue, feelings of worthlessness, inappropriate guilt, diminished ability to think or concentrate, and the 4 forms of suicidality) and 3 additional symptoms (diurnal variation of mood, lack of reactivity, and distinct sadness). Symptoms were rated on a severity scale as follows: no symptom (0), subthreshold (1), or threshold (2). A composite score of depression severity was calculated by adding the "current episode" summary scores on 16 ISCA-D depressive symptoms excluding the 4 suicidality items for the purpose of the study. A higher summary score represents more severe depression. Alternately, when examining the prevalence of individual depressive symptoms and their associations with suicidality, each depressive symptom was dichotomized to be clinically significant (threshold) or not (subthreshold or no symptom).

***Psychiatric comorbid disorders.*** The following lifetime psychiatric comorbid disorders were included for statistical analysis: various anxiety disorders, dysthymic disorder, attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorder, conduct disorder, and substance abuse disorders. These disorders have often been reported in the literature of adolescent suicidal behavior.[17,19–21]

***Other variables.*** Illness history included illness duration, number of MDEs, lifetime psychiatric hospitalization, and lifetime use of TCAs or SSRIs. Demographic variables included age, sex, maternal married status and education, and family financial status.

### Statistical Analyses

Overall prevalence rates of current and lifetime suicidal behaviors were computed for recurrent thoughts of death, recurrent suicidal ideation, suicide plan, and suicide attempts. Following Kessler et al.,[26] conditional prevalence rates were computed for current suicidal behaviors (e.g., How many children had attempted suicide

among suicidal ideators?). Age-sex–specific prevalence rates were then computed for current suicidal behaviors.

For the comparison of clinical characteristics across nonsuicidal and various suicidal groups, we divided subjects into 5 groups on the basis of current suicidality: nonsuicidality, recurrent thoughts of death only, suicidal ideation without a specific plan or attempt, suicide plan without attempts, or suicide attempts. Chi-square tests were conducted to examine differences and similarities in depressive symptoms and comorbid disorders between nonsuicidal and suicidal children and adolescents and across various suicidal youths. Analysis of variance was performed to examine the differences in depression severity and illness duration among nonsuicidal and different suicidal children and adolescents.

A series of multinomial logistic regression analyses was performed to examine the associations of each form of suicidality with each depressive symptom or comorbid disorder, adjusting for the effects of age and sex. Stepwise multinomial logistic regression analyses were then conducted to examine the independent effects of depressive symptoms and comorbid disorders. Backward and forward stepwise regressions were explored to determine the best model for the prediction of each suicidal behavior. Odds ratios (ORs) and 95% confidence intervals (CIs) were used to present associations of each form of suicidality with depressive symptoms and comorbid disorders. All statistical tests were 2-tailed. SPSS 13.0 (SPSS Inc., Chicago, Ill.) was used for all statistical analyses.

## RESULTS

### Suicidality

By the assessment date, 67.5% of the sample in their lifetime had recurrent thoughts of death, 47.6% had suicidal ideation, 29.8% had suicide plan, and 11.6% had attempted suicide. During the past month (current), 62.2% of the sample had recurrent thoughts of death, 43.9% had recurrent suicidal ideation, 26.9% had suicide plan, and 9.9% had attempted suicide. Among children and adolescents who had recurrent thoughts of death, 68.9% also evidenced suicidal ideation, 41.6% had suicide plan, and 15.4% had actually attempted suicide. Among suicidal ideators, 60.5% had suicide plan and 22.6% had actually attempted suicide. Moreover, 34.2% of patients with a suicide plan had actually attempted suicide.

Age-specific rates of current suicidal behaviors are presented for both boys and girls in Figure 1. For girls, all 4 suicidal behaviors tended to increase with age (thoughts of death, $\chi^2 = 10.54$, df = 3, p = .014; suicidal ideation, $\chi^2 = 21.02$, df = 3, p < .001; suicide plan, $\chi^2 = 22.42$, df = 3, p < .001; and suicide attempts, $\chi^2 = 21.12$, df = 3, p < .001). The rates of suicidal ideation, plan, and attempts were markedly elevated at age 13 to 14 years. For boys, however, all 4 suicidal behaviors had no significant

**Figure 1. Suicidal Behaviors in Children and Adolescents With Major Depressive Disorder by Age and Sex**

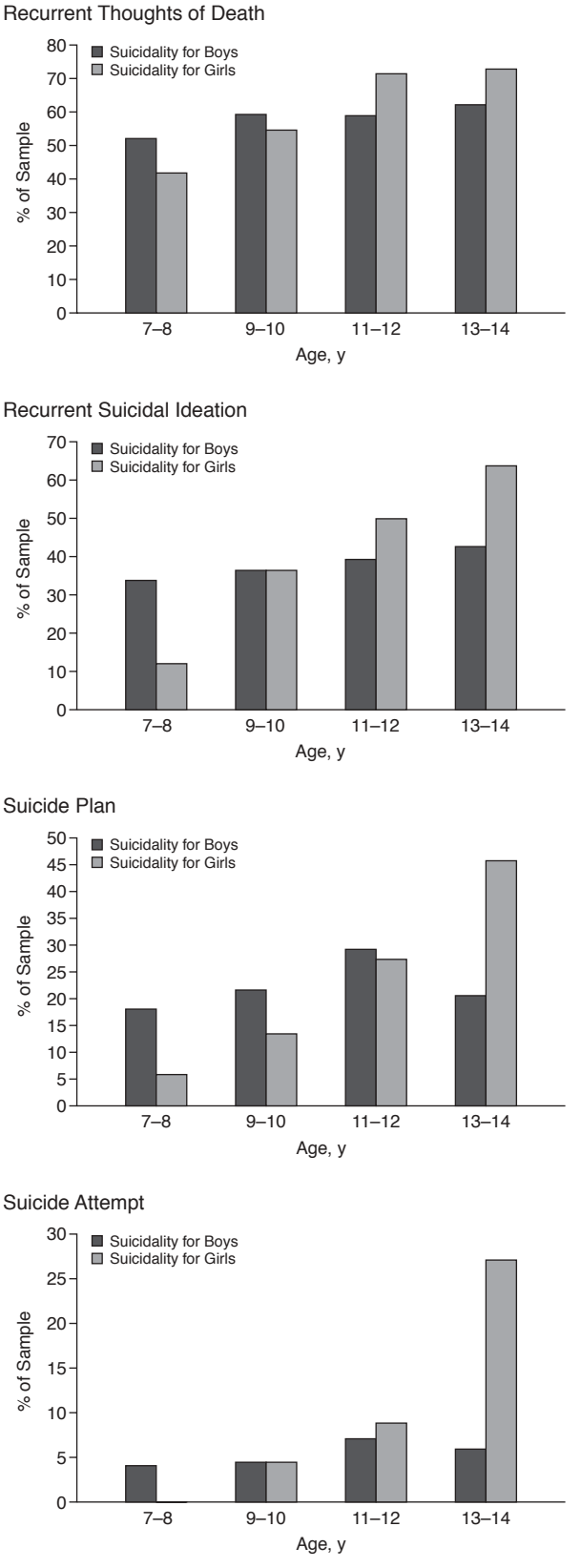
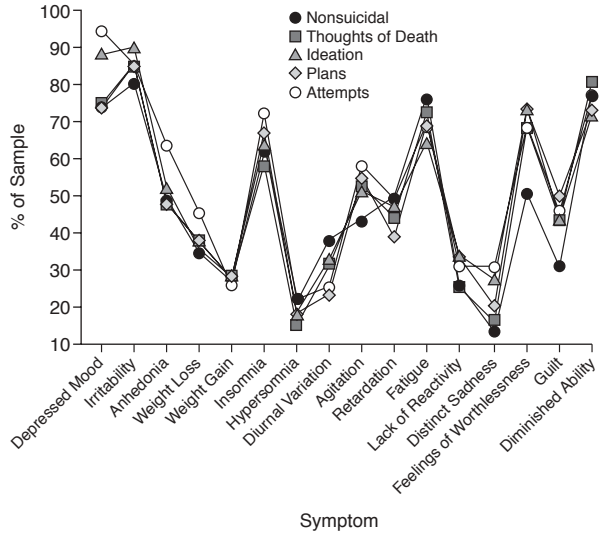


Table 1. Illness History and Depressive Severity of Nonsuicidal and Different Suicidal Depressed Children and Adolescents

| Variable | Nonsuicidal (N = 202) | Suicidal | | | | | Statistic ($F/\chi^2$) | |
|---|---|---|---|---|---|---|---|---|
| | | Total (N = 351) | Thoughts (N = 106) | Ideation (N = 92) | Plan (N = 98) | Attempts (N = 55) | Nonsuicidal vs Suicidal | Across Suicidal Groups |
| Illness duration, mean (SD), wk | 53.21 (63.71) | 62.67 (72.98) | 55.76 (62.92) | 68.47 (77.54) | 68.51 (84.71) | 55.65 (59.12) | 2.37 | 0.88 |
| History of psychiatric hospitalization, % | 23.3 | 29.3 | 21.7 | 31.5 | 22.4 | 52.7 | 2.40 | 19.95[a] |
| Recurrent episode, % | 20.8 | 21.9 | 20.8 | 22.8 | 25.5 | 16.4 | 0.10 | 1.86 |
| History of SSRI use, % | 29.0 | 31.5 | 29.2 | 29.3 | 33.3 | 36.4 | 0.38 | 1.20 |
| History of TCA use, % | 23.4 | 21.7 | 22.6 | 18.5 | 25.8 | 18.2 | 0.21 | 1.96 |
| Current depressive severity (ISCA-D), mean (SD)[b] | 17.81 (5.38) | 19.31 (4.43) | 18.89 (4.10) | 19.41 (4.35) | 19.16 (4.85) | 20.24 (4.40) | 3.17[c] | 1.18 |

[a] $p < .001$.
[b] Summary score of ISCA-D depressive symptoms excluding suicidality items.
[c] $p < .05$.
Abbreviations: ISCA-D = Interview Schedule for Children and Adolescents-Diagnostic Version, SSRI = selective serotonin reuptake inhibitor, TCA = tricyclic antidepressant.

Figure 2. Depressive Symptom Profiles Among Nonsuicidal and Suicidal Children and Adolescents




differences across age groups (all $p > .05$). Significant sex differences were observed only for depressed adolescents at age 13 to 14 years, with girls being more likely than boys to have suicidal ideation ($\chi^2 = 7.36$, df = 1, $p = .007$), suicide plan ($\chi^2 = 11.47$, df = 1, $p = .001$), and suicide attempts ($\chi^2 = 12.24$, df = 1, $p < .001$). Recurrent thoughts of death had no sex differences for all age groups.

Maternal married status, level of education, and family financial status were not found to be significantly related to any of the 4 suicidal behaviors (all $p > .05$).

### Illness History and Severity of Depression

Table 1 presents illness history and current depressive severity of nonsuicidal and various suicidal children and adolescents. Suicidal and nonsuicidal children and adolescents had no significant differences in terms of mean illness duration, history of psychiatric hospitalization, recurrent episode of major depression, and history of SSRI and TCA use. However, suicidal children and adolescents were more severely depressed than nonsuicidal peers (mean ± SD = 19.31 ± 4.43 vs. 17.81 ± 5.38, $F = 3.17$, $p = .014$) after adjustment for age and sex. Across suicidal children and adolescents, no significant differences were found in terms of mean illness duration, recurrent episode of major depression, depression severity, and history of SSRI and TCA use (all $p > .05$), but suicide attempters were more likely than other suicidal peers to have a history of psychiatric hospitalization ($\chi^2 = 19.95$, df = 3, $p < .001$).

### Depressive Symptom Profiles

The rates of depressive symptoms in this sample of depressed children and adolescents ranged between 19% and 84%. Irritability was the most prevalent symptom (84.3%), followed by depressed mood (78.1%), diminished ability to concentrate (76.5%), fatigue (71.6%), insomnia (63.7%), feelings of worthlessness (62.7%), anhedonia (50.8%), and psychomotor agitation (49.9%). Distinct quality of depressed mood and hypersomnia were relatively less common, accounting for 19% of depressed children.

Figure 2 presents depressive symptom profiles of nonsuicidal and different suicidal children and adolescents. Compared with nonsuicidal children and adolescents, suicidal peers were more likely to present depressed mood (80.9% vs. 73.3%, $\chi^2 = 4.38$, df = 1, $p = .036$), irritability (86.5% vs. 80.2%, $\chi^2 = 3.98$, df = 1, $p = .046$), psychomotor agitation (53.8% vs. 43.1%, $\chi^2 = 5.96$, df = 1, $p = .015$), distinct quality of depressed mood (22.5% vs. 13.4%, $\chi^2 = 6.91$, df = 1, $p = .009$), feelings of worthlessness (70.1% vs. 50.0%, $\chi^2 = 22.13$, df = 1, $p < .001$), and inappropriate guilt (45.6% vs. 30.2, $\chi^2 = 12.65$, df = 1, $p < .001$), but less likely to have diurnal variation of mood (28.5% vs. 37.6%, $\chi^2 = 4.93$, df = 1, $p = .026$). After cor-

**Table 2. Associations (odds ratio, 95% CI) of Suicidality With Depressive Symptoms and Comorbid Disorders: Multinomial Logistic Regression With Nonsuicidal Children and Adolescents (N = 202) as Reference**

| Depressive Symptom and Comorbid Disorder | Thoughts of Death (N = 106) | Suicidal Ideation (N = 92) | Suicide Plan (N = 98) | Suicide Attempts (N = 55) |
|---|---|---|---|---|
| Model 1[a,b] | | | | |
| Depressed mood | 1.04 (0.61 to 1.79) | 2.45 (1.21 to 4.98)* | 0.90 (0.52 to 1.57) | 4.75 (1.40 to 16.16)* |
| Irritability | 1.44 (0.76 to 2.73) | 2.66 (1.22 to 5.84)* | 1.70 (0.86 to 3.35) | 2.09 (0.87 to 5.00) |
| Diurnal variation of mood | 0.76 (0.46 to 1.25) | 0.84 (0.50 to 1.42) | 0.53 (0.31 to 0.93)* | 0.64 (0.32 to 1.29) |
| Psychomotor agitation | 1.54 (0.95 to 2.49) | 1.60 (0.96 to 2.66) | 1.82 (1.10 to 3.01)* | 2.52 (1.32 to 4.79)** |
| Fatigue | 0.81 (0.47 to 1.39) | 0.49 (0.28 to 0.84)** | 0.63 (0.37 to 1.10) | 0.51 (0.25 to 1.02) |
| Distinct sadness | 1.23 (0.64 to 2.39) | 2.28 (1.22 to 4.23)** | 1.62 (0.85 to 3.08) | 2.50 (1.20 to 5.20)* |
| Feelings of worthlessness | 2.23 (1.36 to 3.66)** | 2.23 (1.32 to 3.77)** | 2.85 (1.67 to 4.85)*** | 2.37 (1.22 to 4.61)* |
| Inappropriate guilt | 1.77 (1.08 to 2.88)* | 1.77 (1.06 to 2.96)* | 2.27 (1.37 to 3.75)*** | 1.85 (0.98 to 3.50) |
| Comorbid separation anxiety | 0.77 (0.26 to 2.28) | 1.25 (0.45 to 3.50) | 3.44 (1.47 to 8.01)** | 4.72 (1.73 to 12.87)** |
| Comorbid conduct disorder | 3.53 (0.82 to 15.22) | 4.87 (1.12 to 21.20)* | 2.61 (0.51 to 13.48) | 8.58 (1.59 to 46.33)* |
| Model 2[a,c] | | | | |
| Depressed mood | 0.93 (0.53 to 1.63) | 2.18 (1.06 to 4.50)* | 0.69 (0.39 to 1.25) | 3.66 (1.06 to 12.69)* |
| Psychomotor agitation | 1.51 (0.93 to 2.46) | 1.49 (0.89 to 2.51) | 1.70 (1.01 to 2.85)* | 2.18 (1.12 to 4.24)* |
| Feelings of worthlessness | 2.23 (1.34 to 3.68)** | 2.06 (1.21 to 3.52)** | 2.90 (1.68 to 5.01)*** | 2.11 (1.06 to 4.18)* |
| Comorbid separation anxiety | 0.78 (0.26 to 2.35) | 1.14 (0.40 to 3.25) | 3.50 (1.45 to 8.45)** | 4.01 (1.42 to 11.30)** |
| Comorbid conduct disorder | 3.76 (0.85 to 16.58) | 5.42 (1.20 to 24.54)* | 2.65 (0.49 to 14.40) | 9.27 (1.59 to 54.18)* |

[a]Age and sex as covariates were forced to enter to model 1 and model 2.
[b]Model 1: multinomial regression with each level of suicidality as dependent variable and 1 depressive symptom or comorbid disorder as independent variable, adjusting for age and sex. Those symptoms or comorbid disorders that were not significant are not presented.
[c]Model 2: stepwise multinomial regression with each level of suicidality as dependent variable and all depressive symptoms and comorbid disorders in model 1 as independent variables, adjusting for age and sex.
*p < .05.
**p < .01.
***p < .001.

rection for multiple comparisons,[27] the following symptoms remained significant: feelings of worthlessness, inappropriate guilt, and distinct quality of depressed mood.

Across various forms of suicidal children and adolescents, only depressed mood showed a significant difference ($\chi^2 = 15.96$, df = 3, $p < .001$), with the highest prevalence in attempters (94.5%), followed by children and adolescents with suicidal ideation (88.0%), recurrent thoughts of death (74.5%), and suicide plan (73.5%). After correction for multiple comparisons,[27] depressed mood remained significant.

## Psychiatric Comorbidity

Anxiety disorders were evidenced by 33.3% of the sample, with overanxious disorder being the most common anxiety disorder (11.0%), followed by generalized anxiety (9.6%) and separation anxiety disorder (8.5%). ADHD was the second most common comorbid disorder (17.7%), followed by dysthymic disorder (12.7%). The prevalence rates of oppositional defiant disorder and conduct disorder were 5.8% and 3.4%, respectively. Eating disorders were less prevalent in this sample (1.4%), and no patients had a history of alcohol/substance abuse disorders. Compared with nonsuicidal peers, suicidal children and adolescents were more likely to evidence anxiety disorders (38.2% vs. 24.9%, $\chi^2 = 10.18$, df = 1, p = .001) and conduct disorder (4.6% vs. 1.5%, $\chi^2 = 3.65$, df = 1, p = .056). However, across various forms of suicidal children and adolescents, no significant differences were found for all comorbid disorders (all $p > .05$).

## Multivariate Analysis

Multinomial logistic regressions were first conducted to examine the associations between individual depressive symptoms and comorbid disorders and each form of suicidal behavior with the nonsuicidal peers as the reference group, when age and sex were statistically controlled. As shown in model 1 in Table 2, 6 depressive symptoms (depressed mood, irritability, agitation, distinct sadness, feelings of worthlessness, inappropriate guilt) and comorbid separation anxiety and conduct disorders were associated with elevated risk for 1 or more forms of suicidality. Fatigue and diurnal variation of mood were negatively associated with suicidal ideation and suicide plan, respectively.

Stepwise multinomial logistic regression analysis was then conducted to examine which depressive symptoms or comorbid disorders that were significant in model 1 were independently associated with which form of suicidal behavior after controlling for each other and age and sex. As shown in model 2 in Table 2, depressed mood, psychomotor agitation, feelings of worthlessness, comorbid separation anxiety, and conduct disorder were significantly and independently associated with increased risk for at least 1 form of suicidality. Specifically, recurrent thoughts of death were significantly predicted by feelings of worthlessness only (OR = 2.23). Suicidal ideation was associated with depressed mood (OR = 2.18), feelings of worthlessness (OR = 2.06), and comorbid conduct disorder (OR = 5.42). Suicide plan was associated with feelings of worthlessness (OR = 2.90), psychomotor

agitation (OR = 1.70), and comorbid separation anxiety (OR = 3.50). Suicide attempts were significantly associated with conduct disorder (OR = 9.27), separation anxiety (OR = 4.01), depressed mood (OR = 3.66), psychomotor agitation (OR = 2.18), and feelings of worthlessness (OR = 2.11) in order of ORs.

## DISCUSSION

Using data from a large clinical sample of children and adolescents with MDD aged 7 to 14 years (N = 553), we examined various forms of DSM-IV suicidality and clinical characteristics of different suicidal depressed children and adolescents. Our major findings are summarized and discussed as follows.

First, we found that approximately 68% of depressed children and adolescents in their lifetime had recurrent thoughts of death, 48% had suicidal ideation, 30% had suicide plan, and 12% had actually attempted suicide. This is the first report on the rates of recurrent thoughts of death and suicide plan in depressed children and adolescents. The rates of suicidal ideation and attempts in the current sample are in the low range of previous studies.[11,13,14] We also found that close to 15% of depressed children and adolescents who had recurrent thoughts of death, 23% of suicidal ideators, and 34% of suicide planners had actually attempted suicide. These findings suggest that depressed children and adolescents are at high risk for various forms of suicidality and that suicidal thoughts and suicide plan are associated with elevated risk for suicide attempts.

Second, compared with nonsuicidal peers, we found that suicidal children and adolescents were more severely depressed, were more likely to have certain depressive symptoms (depressed mood, irritability, psychomotor agitation, distinct sadness, feelings of worthlessness, and inappropriate guilt), and were more likely to have comorbid anxiety and conduct disorders. The association between depressive severity and suicidality has been reported in patients with MDD.[17,28,29] However, research has yielded mixed results on the associations between depressive symptom presentation and psychiatric comorbidity and suicidality.[13,17,19,21,22] For example, Barbe et al.[17] found that 2 DSM depressive symptoms (hopelessness and insomnia), but no comorbid disorders, were associated with suicidality. Robbins and Alessi[16] found that suicidal behavior in adolescent psychiatric patients was associated with depressed mood, negative self-evaluation, anhedonia, insomnia, poor concentration, indecisiveness, lack of reactivity of mood, psychomotor disturbance, and alcohol and drug use. Wannan and Fombonne[22] reported that comorbid conduct disorder or substance abuse predicted suicidal behavior for psychiatric outpatient girls only. Taken together, these findings suggest that clinical symptom presentation and psychiatric comorbidity differ between suicidal and nonsuicidal depressed children and adolescents. Suicidal depressed children and adolescents may represent a group of more severely depressed patients with more depressive symptoms and comorbid disorders.

Third, our findings indicate that clinical characteristics appear to be very similar across depressed children and adolescents with various forms of suicidal behavior. With regard to depressive symptoms presentation, we found that only depressed mood of 16 ISCA-D depressive symptoms differed significantly across 4 groups of suicidal children and adolescents, with suicide attempters having more depressed mood. No significant differences were found across various suicidal children and adolescents in terms of illness duration, depressive severity, and psychiatric comorbidity. Our findings are similar to those of Kosky et al.,[30] who did not find any difference in depressive symptoms between suicidal ideators and attempters in child and adolescent psychiatric outpatients. These findings suggest that various forms of suicidality represent 1 feature of depression rather than characterize subgroups of depressed children and adolescents at risk and thus have the same diagnostic implication for depression.[15,30,31]

Fourth, we found that 3 depressive symptoms (i.e., depressed mood, psychomotor agitation, and feelings of worthlessness) and comorbid anxiety and conduct disorders were independent and significant correlates of at least 1 form of suicidal behavior. Close examination of our results revealed that recurrent thoughts of death were independently related to feelings of worthlessness only, suicidal ideation and plan were related to 2 symptoms and 1 comorbid disorder, and suicide attempts were related to all 3 symptoms and both comorbid disorders. Feelings of worthlessness were the only symptom that was independently related to all 4 forms of suicidal behavior after controlling for other symptoms, comorbid disorders, and demographics. These findings suggest that feelings of worthlessness may play a central role in the increasing suicidality from nonsuicidality through recurrent thoughts of death or suicidal ideation to suicide attempts. The progression of suicidal thoughts to suicidal acts depends on accumulating precipitants in the presence of feelings of worthlessness, such as depressed mood, psychomotor agitation, and comorbid anxiety and conduct disorders. The co-occurrence of certain acute stressors and adverse events of antidepressants may also act as precipitants or triggers and thereby increase risk for suicidal behavior.[3,4,32,33] Prospective studies are warranted to examine the central role of feelings of worthlessness and various psychosocial and clinical precipitants for suicidal risk in depressed children and adolescents.

Finally, we found that age and sex had significant interacting effects on all 4 suicidal behaviors, consistent with a recent, large study of 201 depressed children and 715 depressed adolescents,[14] an early follow-up study of childhood depression,[11] and most community studies.[4,23] For example, Yorbik and colleagues[14] found that, com-

pared with depressed children, depressed adolescents had expressed more suicidal ideation, seriousness of suicidal acts, and medical lethality of suicidal acts. They also found that female depressed adolescents were more likely to have suicidal ideation and to attempt suicide than male adolescents.[14] Kovacs et al.[11] followed an outpatient sample of 134 depressed children for up to 12 years and found no significant sex differences in initial assessments of suicidal ideation and attempts at the mean age of 11 years. However, when youths entered mid-adolescence, girls were more likely to have suicidal ideation and attempts than boys.[11] Although some small studies have yielded different results,[12] taking the 3 relatively large studies together, it may be concluded that suicidality in depressed children and adolescents increases with age and that sex differences become significant in middle adolescence (about age 13–14 years), with female adolescents being more likely to take suicidal actions.

In interpreting the results of these analyses, however, 3 important limitations need to be born in mind. First, although the sample size is large, the study subjects reported here were selected for a genetic study of depressed children and adolescents in Hungary. Subjects in the study must live with at least 1 biological parent and have at least 1 sibling aged 7 years or above. At present, it is not known how cultural differences, which may exist between Hungarian and American samples, may affect the presentation and assessment of child psychiatric disorders. Future studies are therefore warranted to investigate the extent to which these findings can be generalized to other samples. Second, the clinical interview with ISCA-D from which these data were gathered was not designed with the assessment of suicidality as a primary goal. As a result, no detailed histories were taken of the dates, lethality, and consequences when certain suicidal behavior occurred. Third, limited differences in individual depressive symptoms across suicidal children and adolescents may be due to the fact that all subjects were currently in an episode of MDD at the time of the assessment. We do not know whether the similarities and differences observed in this clinically depressed sample can be generalized to nonclinical samples. Finally, no causal relationships can be concluded based on the current cross-sectional study. Prospective, longitudinal studies are needed to investigate the continuum from suicidal thoughts through suicidal action and the pathway from feelings of worthlessness to suicidal behavior.

In summary, our findings indicate that suicidal depressed children and adolescents are more severely depressed and are more likely to have certain depressive symptoms and comorbid disorders than nonsuicidal peers. Clinical characteristics were very similar across various forms of suicidality. Feelings of worthlessness may play a central role in the development of suicidality. Whether suicidal ideators act on their ideation may depend on a number of precipitants such as depressed mood, agitation, and anxiety and conduct disorders, in conjunction with feelings of worthlessness. These findings have several important clinical implications for the intervention and prevention of suicidal behavior in depressed children and adolescents.

First, given the interaction of age and sex on suicidality, depressed adolescent girls who are at high risk for suicidal behavior should be given close attention by clinicians and parents. Second, intervention toward the amelioration of underlying psychopathology should be the first step for prevention of suicide attempts. Third, depressed children and adolescents with feelings of worthlessness may represent a unique group of patients at high risk for various forms of suicidality. This group of patients may need more careful management than depressed patients without feelings of worthlessness. Psychological therapy, which can help depressed children and adolescents to reframe their misperception of self and enhance their self-esteem, may be crucial for clinical treatment of suicidality. Finally, interventions should also address precipitating factors, such as depressed mood, agitation, comorbid anxiety and conduct disorders, and acute stressors for the effective treatment of suicidality and prevention of suicide attempts.

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*Editor's Note:* We encourage authors to submit papers for consideration as a part of our Focus on Childhood and Adolescent Mental Health section. Please contact Melissa P. DelBello, M.D., at delbelmp@email.uc.edu.

  