Prediction of Adolescent Suicidal Events by Residual Depressive Symptoms After Intensive Treatment

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Abstract

Objective: Adolescents with a history of depression are at a high risk of recurrent suicidal ideation (SI) and attempts. To enhance risk prediction, we examined the association of individual residual symptoms of depression to suicidal events (suicide attempts, emergency room visits, and inpatient hospitalization) 6 months after discharge from treatment.

Methods: A retrospective post hoc analysis of patients aged 12–18 years examined depression symptoms at admission and discharge. Patients in an intensive treatment program (December 2013–September 2022) received psychosocial and medication management. The Quick Inventory of Depressive Symptomatology, Adolescent Version, assessed depressive symptoms at entry and discharge (n = 1,029), and suicidal events postdischarge were tracked (n = 736). Analysis of variance analyzed symptom severity changes, and logistic regression used residual symptoms and controls (age, sex, previous attempt, and nonsuicidal self-injury) to predict suicidal events.

Results: Sad mood, view of self, and SI improved the most, while mood and sleep disturbance were most prevalent at discharge. Sleep disturbance (odds ratio [OR] = 2.09, 95% CI, 1.24–3.53, $P < .01$) and SI (OR = 2.22, 95% CI, 1.26–3.90, $P < .01$) were the strongest predictors of hospitalization, and, together with anhedonia (OR = 1.40, 95% CI, 1.02–1.93, $P < .05$), they consistently predicted suicidal events during follow-up.

Conclusion: Residual sleep disturbance, SI, and anhedonia after treatment indicated risk post discharge and might inform continuity of care planning. These findings encourage further research about the relationships between specific residual symptoms and suicidal events.

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Suicide is the fourth leading cause of death globally for ages 15–29 years.[1] In 2023, over 49,000 Americans died by suicide, with a rate of 13.5 per 100,000 for ages 15–24 years.[2] Depression is a major risk factor, yet a meta-analysis revealed that predicting suicide attempts remains ineffective, highlighting the need to explore novel risk factors.[3] Current treatment for suicidal youth primarily targets depression.[3] This study aims to determine if residual symptoms can predict near-term suicidal events in high-risk youth after their overall depression decreases with treatment. We take a novel and rigorous approach by controlling all other residual symptoms of depression and for other risk factors for future attempts.

Although achieving complete remission from depression is the major goal of the treatment of suicidal individuals, 10%–30% of patients are refractory to treatment, and the persistence of residual depressive symptoms predicts poor longer-term outcomes.[4,5] The common residual symptoms in adults that forecast poor outcomes include low or sad mood,[6–8] anhedonia,[6] sleep disturbances,[6–10] fatigue,[6,8] decreased concentration,[7] and appetite/weight disturbance.[9] While much of the literature primarily focuses on adults, a similar set of residual symptoms is noticed in adolescents even after treatment.[11] These include low mood, fatigue, concentration issues,[11] sleep disturbances,[11,12] and appetite changes.[12]

Several studies in adolescents have examined whether depressive symptoms at baseline or during treatment predict suicidal events. Lack of sleep, reduced appetite,[13] nonsuicidal self-injury[14] (NSSI), and suicidal ideation (SI)[15–19] were shown to predict suicide attempts in youth after treatment. In those with previous suicidal attempts,

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Clinical Points

- Clinicians often focus on total depression severity, overlooking residual symptoms that may still pose significant risks.
- Persistent sleep disturbance, suicidal ideation, and anhedonia, despite depression improvement, predict risk for suicidal events within 6 months postdischarge.
- Close monitoring, frequent follow-ups, and targeted interventions for residual symptoms may be effective to prevent suicidality.

symptoms of severe anhedonia[20] and higher levels of SI[15] at the end of treatment predicted further suicidal attempts. Similarly, adolescents admitted to the emergency room (ER) for SI reported within the past week have higher chances of attempting suicide 2 months following their discharge.[21]

While overall depression severity score is important, it is also necessary to examine specific symptoms as they differ by underlying biology, impact of individual functioning, and associated risk factors.[22] Although individual symptoms of depressive disorder have been linked to a history of suicide attempts, many studies do not specifically investigate symptoms that persist following treatment, and/or examine associations with future suicide attempts. These studies also do not document their relative strength or account for their intercorrelation. Furthermore, suicidal events other than suicide attempts, such as rehospitalization and ER visits, are rarely tracked as research outcomes. Longitudinal studies that examine the relative predictive value of specific residual symptoms for future suicidal events might offer a strategy to distinguish those at greatest risk following intensive treatment. Information obtained from these studies could stratify risk, indicate who is in greatest need of careful monitoring, and guide optimal discharge planning.

Objectives

The primary objective of this study is to explore the predictive capability of residual symptom severity and residual symptom clinical significance to future suicidal events (suicide attempt, ER visit, inpatient stay, or any of the three, hereafter "any event"). We formulated the following objectives:

1. Do some depressive symptoms change in severity more than others over the course of intensive treatment for suicidality?
2. Does residual severity differ among certain symptoms at the end of intensive treatment?
3. Do one or more residual depressive symptoms at discharge offer unique prediction to suicidal events after controlling for the other symptoms of depression and known risk factors for adolescent suicidality?

Whereas several residual depressive symptoms have been implicated relevant to each of our objectives, we did not have the bases for specific hypotheses for these objectives because the approach of including all symptoms in multivariate models and thus examining prediction to suicidal events after controlling for other symptoms has not been previously studied to our knowledge.

METHODS

IRB approval was obtained to conduct a study using preexisting data from the clinical database of the Suicide Prevention and Resilience Program at Children's (SPARC), which operates out of Children's Medical Center in Dallas, Texas.

Participants

Patients were drawn from an intensive outpatient program where adolescents (aged 12–18 years) receive treatment for suicidality.[23] Admission to the program requires worsening SI with intent or a recent suicide attempt. This is determined by licensed practitioners using clinical interviews and reviewed by the program psychiatrist. Most patients entering the program have a primary diagnosis of major depressive disorder (MDD) based on clinical evaluation. Patients with primary diagnoses such as substance use disorders, aggression, eating disorders, or other significant disruptive behavioral problems are not candidates. While clinicians conduct a clinical interview and complete a suicidality rating scale at both intake and discharge, no formal diagnostic interview instruments are utilized. Patients and parents also fill out self- and parent-report scales at intake and discharge.

The program includes group therapy (3 hours, twice weekly for 4–6 weeks), individual therapy, family therapy, parent education (1 hour each weekly), and medication management as needed. Collaborative discharge decisions are made with the family when the patient shows significant improvement in depression and SI. Upon discharge, patients are referred to their respective community providers, and nearly all of them continue to receive therapy and medication management. Parents complete follow-up calls assessing suicide-related events for their child at 6 months postdischarge. Information obtained from these calls includes whether the patient has received treatment (medication/therapy) as an outpatient and/or inpatient since discharge.

Measures

Quick Inventory of Depressive Symptomatology, Adolescent Version. Depressive symptoms were assessed using the Quick Inventory of Depressive Symptomatology, Adolescent Version (QIDS-A_{17}-SR)[24,25] at admission and discharge. This is a 17-item self-report scale that measures symptom severity over the past 7 days. Each item measures severity on a Likert scale from 0 (normal functioning) to 3 (severe impairment). Following the original scoring guidelines, these 17 items were condensed to 9 symptom domains for analyses corresponding to *DSM-5-TR* diagnostic criteria for MDD, ie, sad/irritable mood, anhedonia, sleep disturbance, appetite/weight disturbance, psychomotor disturbance, energy level, concentration/decision making, view of self, and SI. The symptom domains of sad/irritable mood, sleep disturbance, appetite/weight disturbance, and psychomotor disturbance are calculated as the maximum of 2 or more items. This yields a single score for each domain ranging between 0 and 3. These 9 scores showed good internal consistency in our sample ($\alpha = .85$ at admission, .86 at discharge). Scores for each symptom domain were used in parametric analyses of change from admission to discharge, residual symptom severity at discharge, and predictive capability to suicidal events.[26]

In addition to using the original ordinal Likert scale scores from 0 to 3 in our analyses, we dichotomized each symptom such that scores of 0/1 (none/mild) were designated as "low" and 2/3 (moderate/severe) were designated as "high." These dichotomous scores were tested in separate models from the ordinal scores to predict suicidal events. Thus, this instrument yielded both a measure of severity and a cutoff for each of the 9 depression symptoms. Dichotomizing is advantageous as clinicians often focus on moderate-to-severe symptoms while making treatment decisions.

Columbia-Suicide Severity Rating Scale. The Columbia-Suicide Severity Rating Scale (C-SSRS) [27] was administered to all participants during intake sessions by trained doctoral- and master's-level clinicians to assess suicidal thoughts and behaviors at admission and discharge. The presence of lifetime suicide attempts and NSSI were used in this study.

Outcome/event identification and classification at follow-up. The occurrence of an actual suicide attempt, suicide-related ER visits, and depression- or suicide-related inpatient admissions were obtained from a follow-up telephone interview with parents 1 and 6 months postdischarge. Formal diagnoses at each event were not obtained.

Analysis

For Objective 1, we used a 1-way repeated-measures multivariate analysis of variance (MANOVA) to assess changes in symptom severity over treatment, with treatment timepoint (admission vs discharge) as the independent variable and 9 ordinal symptom scores as dependent variables. Following a finding of a significant multivariate effect of treatment timepoint on symptom change, we then examined univariate effect sizes for each symptom to compare changes from admission to discharge. Univariate *P* values were adjusted for multiple testing using the Holm-Bonferroni procedure.

For Objective 2, we applied a 1-way repeated-measures ANOVA to evaluate differences in symptom severity at discharge. Symptom was the independent variable (9 levels), and an ordinal severity score (0–3) served as the dependent variable. A series of 36 paired-samples *t* tests were used post hoc to test which pairs of symptoms differed. The resulting *P* values were adjusted for multiple testing using the Holm-Bonferroni procedure.

Because the use of Likert scale variables for Objectives 1 and 2 conflicts with the assumption of normality, we also performed nonparametric analyses using the Wilcoxon signed-rank and Kendall coefficient of concordance tests, respectively, to evaluate robustness. They yielded substantially similar results to our parametric approach, so we have not reported details here.

For Objective 3, 8 multiple logistic regression models were used to examine prediction offered by residual symptoms at discharge to the 4 suicide-related events that were our outcomes of interest: suicide attempt, inpatient stay, ER visit, and any event. For each event, we examined 2 models. In the first (ordinal model), depressive symptoms were expressed on a Likert scale from 0 (no symptoms) to 3 (severe symptoms). In the second (low/high model), each depressive symptom was dichotomized as "low" (none/mild) or "high" (moderate/severe).

Covariates

For the first 2 objectives focused on within-subject effects, no external covariates were included. For the third objective, each model included all 9 depressive symptoms, with each symptom's unique contribution to predicting suicidal events assessed after controlling for the other symptoms. Each model also included control for known risk factors for adolescent suicidality: age, sex, lifetime suicide attempt, and lifetime NSSI.

RESULTS

Between December 2013 and September 2022, 1,344 unique patients were admitted to the SPARC program. Out of 1,344 unique patients, 1,049 (78.1%) had QIDS at discharge, 1,029 (76.6%) had QIDS at both admission and discharge, and 736 (54.8%) had complete data at admission and discharge and follow-up data to determine presence/absence of at least

Table 1.

Study Sample Demographics, Clinical Characteristics, and Presence of Suicidal Events up to 6 Months After Discharge

			Sample for Objective 3 (n = 736)[a]			
		Sample for Objectives 1 and 2 (n = 1,049)	Suicide attempt	ER visit	Inpatient stay	No event
		Mean (SD) or n (%) n = 1,049	Mean (SD) or n (%) n = 78	Mean (SD) or n (%) n = 108	Mean (SD) or n (%) n = 116	Mean (SD) or n (%) n = 578
Age, y		14.8 (1.5)	14.6 (1.5)	14.5 (1.4)	14.8 (1.5)	14.8 (1.5)
Sex assigned at birth	Female	828 (78.9%)	64 (82.1%)	89 (82.4%)	101 (87.1%)	456 (78.9%)
	Male	221 (21.1%)	14 (17.9%)	19 (17.6%)	15 (12.9%)	122 (21.1%)
QIDS-A_{17}-SR total score	Admission	14.4 (5.7)[b]	15.6 (5.1)[c]	15.8 (5.4)[d]	15.9 (5.2)[e]	13.9 (5.9)[f]
	Discharge	9.9 (5.6)	11.6 (5.8)	11.8 (5.4)	11.4 (5.3)	9.5 (5.5)
Recent attempt[g]	Yes	545 (51.95%)	49 (62.8%)	60 (55.6%)	67 (57.8%)	277 (47.9%)
	No	504	29	48	49	301
Recent NSSI[g]	Yes	689 (65.7%)	60 (76.9%)	80 (74.1%)	89 (76.7%)	361 (62.5%)
	No	360	18	28	27	217
Lifetime attempt[h]	Yes	695 (66.3%)	68 (87.2%)	86 (79.6%)	90 (77.6%)	351 (60.7%)
	No	354	10	22	26	227
Lifetime NSSI[h]	Yes	829 (79.0%)	71 (91.0%)	95 (88.0%)	104 (89.7%)	442 (76.5%)
	No	220	7	13	12	136

[a]Any event (n = 158) + no event (n = 578) = sample for Objective 3 (n = 736). Some participants appear in multiple categories. Ns for each combination of events for 158 who experienced any event: suicide attempt only, n = 16; ER visit only, n = 20; inpatient stay only, n = 23; suicide attempt and ER visit, n = 6; suicide attempt and inpatient stay, n = 11; ER visit and inpatient stay, n = 37; suicide attempt, inpatient stay, and ER visit, n = 45.
[b]n = 1,029.
[c]n = 77.
[d]n = 106.
[e]n = 114.
[f]n = 567.
[g]Between 1 month before admission until discharge.
[h]In lifetime by time of discharge.
Abbreviations: ER = emergency room, NSSI = nonsuicidal self-injury, QIDS-A_{17}-SR = Quick Inventory of Depressive Symptomatology, Adolescent Version, Self-Report.

1 type of suicidal event within 6 months after discharge. Supplementary Table 1 compares baseline characteristics for the samples used for the 3 aims. Only 1 comparison was found to be significantly different: a greater proportion of patients who were included in Objective 3 analyses had a history of a suicide attempt (Cramer $V = .025$). These comparisons suggest that the sample included in the study was representative of the group of patients entering the program on many characteristics.

Exclusions for missing data were made analysis-by-analysis. The average length of stay from admission to discharge was 5.8 weeks (SD = 1.63, n = 1,049). Table 1 depicts the demographics, clinical characteristics, and frequency of events in our sample. Our sample was predominantly composed of Caucasian females. Overall depression severity improved from moderately severe at admission to mild at discharge.

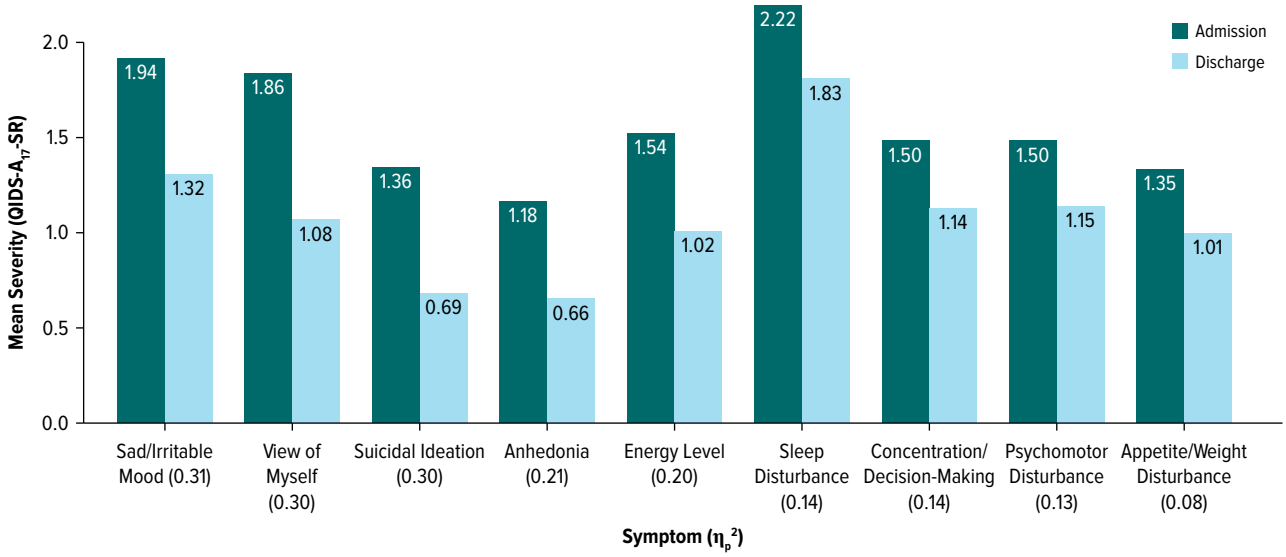
Objective 1 (Figure 1): The MANOVA revealed a significant multivariate effect of treatment timepoint on symptom change. All univariate tests remained significant at $P < .001$ after correction for multiple testing using the Holm-Bonferroni procedure. Sad/Irritable Mood, View of Self, and SI showed the greatest decrease, $F_{1,\ 1028} = 450.88$, 444.05, 429.67, respectively. psychomotor disturbance and appetite/weight disturbance decreased the least, $F_{1,\ 1028} = 153.33$, 89.18, respectively.

Objective 2 (Figure 2): A significant and large effect was observed for the within-subjects difference in symptom severity, $F_{7.08,\ 7420.76} = 252.23$, $P < .001$, $\eta_p^2 = 0.19$. Of the 36 possible pairwise comparisons, 29 showed significant differences within subjects after correction for multiple testing using the Holm-Bonferroni procedure. After adjustment, significant P values ranged from $P < .005$ to $P < .001$, and their corresponding effect sizes ranged from $d = 0.11$ to $d = 1.16$ (where $d = 0.2$, 0.5, and 0.8 represent small, medium, and large effect sizes, respectively), $t_{1048} = 3.61$, 92.48, respectively. Sleep disturbance and sad/irritable mood were found to be the most severe symptoms at discharge.

Objective 3 (Table 2): Four of the 9 residual depressive symptoms—sleep disturbance, anhedonia, psychomotor disturbance, and SI—uniquely predicted 1 or more suicidal events within 6 months postdischarge after controlling for all other depressive symptoms and control covariates. Overall, when symptoms were measured on an ordinal scale, they were found to be

Figure 1.

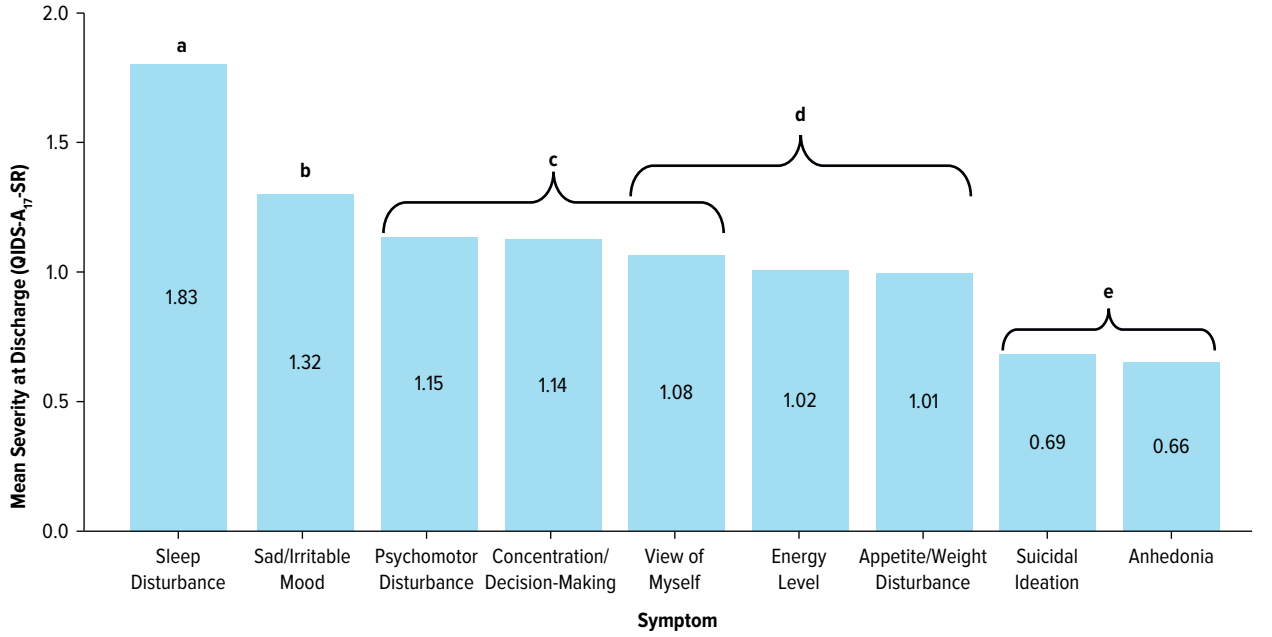
Change in Symptom Severity (QIDS-A$_{17}$-SR) from Admission to Discharge by Symptom in Order of Effect Size[a]



[a]Partial eta squared (η_p^2) effect size used with ANOVA-family tests. Small, medium, and large effect size where $\eta_p^2 \geq 0.01$, $\eta_p^2 \geq 0.06$, and $\eta_p^2 \geq 0.14$, respectively. All symptoms showed decreases that were large in effect size, except "Psychomotor Disturbance" and "Appetite/Weight Disturbance," which were of medium effect size.
Abbreviation: QIDS-A-SR = Quick Inventory of Depressive Symptomatology, Adolescent Version, Self-Report

Figure 2.

Residual Severity (QIDS-A$_{17}$-SR) at Discharge by Symptom[a]



[a]Symptoms within the same groups (a–e) were not significantly different in severity from each other but were different from symptoms in other groups. For example, severity of "Energy Level" and "Appetite/Weight Disturbance" (both in group d) were not significantly different from each other but were different in severity from all symptoms that were not included in group d.
Abbreviation: QIDS-A-SR = Quick Inventory of Depressive Symptomatology, Adolescent Version, Self-Report

Table 2.

Unique Prediction of Suicidal Events up to 6 Months After Discharge by Residual Symptoms at Discharge From Program[a]

	Dependent variables (events)			
Independent variables[b]	Suicide attempt (n = 723)	ER visit (n = 728)	Inpatient stay (n = 728)	Any event (n = 724)
Ordinal models[c]	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Sleep disturbance	1.38* [1.01–1.89]			
Psychomotor disturbance	0.65* [0.46–0.92]			
Anhedonia		1.45* [1.05–2.00]	1.40* [1.02–1.93]	1.37* [1.03–1.82]
Suicidal ideation	1.43* [1.02–2.01]		1.52** [1.14–2.04]	1.43** [1.10–1.85]
Low/high models[d]	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Sleep disturbance	1.93* [1.03–3.59]		2.09** [1.24–3.53]	1.82** [1.16–2.85]
Suicidal ideation		1.85* [1.04–3.28]	2.22** [1.26–3.90]	1.95** [1.18–3.22]

[a]This table reports the significant predictors from 8 logistic regression models, 2 for each of the 4 events used as dependent variables. Only findings from the depressive symptoms that had significant prediction are reported here. Statistics are reported in the cells as follows: odds ratio, *$P < .05$/**$P < .01$, [95% confidence interval].
[b]Each model included as independent variables all 9 symptoms of depression. Each model also included control variables as covariates: age, sex, and lifetime suicide attempts and non-suicidal self-injury (not shown). Thus, there were 13 independent and control variables in each model.
[c]In the ordinal models, each depressive symptom was measured on a Likert scale from 0 (no symptoms) to 3 (severe symptoms).
[d]In the low/high models, each depressive symptom was dichotomized as low (no/mild; scores of 0 or 1 on the Quick Inventory of Depressive Symptomatology, Adolescent Version, Self-Report [QIDS-A_{17}-SR]) or high (moderate/severe; scores of 2 or 3 on QIDS-A_{17}-SR). For example, model 7 examined prediction of Inpatient Stay using depressive symptoms measured in low/high models format. After control for demographics and the other 8 symptoms of depression, 2 symptoms made a significant ($P < .01$) contribution to prediction of inpatient stay: sleep disturbance and suicidal ideation.
Abbreviation: ER = emergency room.

significant predictors more frequently than when they were dichotomized as low/high. Sleep disturbance consistently predicted suicide attempts in both ordinal and low/high models. However, its association with inpatient stays and any event was present only in the low/high model. Anhedonia predicted ER visits, inpatient stays, and any event in the ordinal model. Psychomotor disturbance was the only symptom found to decrease the odds of a suicidal event, but only in the ordinal model predicting suicide attempts. SI predicted inpatient stays and any event in both ordinal and low/high models, while only predicting suicide attempts in the ordinal model and ER visits in the low/high model.

DISCUSSION

We present data from a clinically relevant sample of suicidal adolescents, using a rigorous method to examine the unique contribution of residual symptoms of depression following treatment to the prediction of suicidal events. We used variables that are routinely gathered as part of a clinical interview, offering a practical approach to information about risk. We not only controlled for known indicators of suicidal events but also examined all symptoms in the same model, thus accounting for shared variance among symptoms and the overall depression severity. When controlling for other depressive symptoms and known risk factors for adolescent suicidality, SI, sleep disturbance, and anhedonia emerged as robust predictors of suicide-related outcomes following discharge. A longitudinal perspective that captures adequate information about relatively rare events such as suicide attempts is a strength of this study and allows for exploration of hypotheses regarding directional influences.

Traditional treatments for suicidality focus broadly on managing depression, yet suicide rates remain high.[28] Our findings align with recent calls to adopt a symptom-based rather than a diagnosis-based approach to clinical management and research.[29] Our study challenges the conventional focus on global depression and advocates for consideration of individual symptoms.[22] In our sample, SI was one of the most responsive symptoms to treatment, and levels were low for the group at discharge. Even within this narrow range, there was a linear relationship to future attempts. Given that SI fluctuates over time, it is possible that clinicians might focus at discharge on improvement from the higher levels at admission. However, even persistent low-level ideation at discharge might indicate potential to develop serious ideation under stressful circumstances. Persistent sleep disturbance, SI, and anhedonia, therefore, might necessitate frequent follow-up to monitor for intent, plans, and access to means to prevent future suicide attempts.

Residual sleep disturbance and SI may require supplemental, targeted interventions. Promising treatments include Cognitive Behavioral Therapy for Insomnia (CBT-I)[30] and light therapy,[31] which have also shown effects on reducing SI. Antidepressants alone often fail to fully address suicidal thoughts or behaviors[28]; however, pharmacologic treatments,

specifically lithium,[32] ketamine,[33] and intranasal esketamine,[34] have shown promise in reducing SI. Evidence-based treatments, such as cognitive behavioral therapy for suicide prevention,[35] dialectical behavior therapy,[36] and mindfulness-based CBT,[37] have also demonstrated significant improvements in both depression and SI.

Anhedonia is a cardinal symptom and has been linked to poor outcomes such as the recurrence of depression,[38,39] poor response to treatment, and[40,41] increased SI risk in adults,[20,42,43] and to a lesser extent in adolescents with a history of attempts.[20,44] It has also been highlighted as a persistent residual symptom in adolescents.[20] Our findings support and extend the significance of anhedonia and suggest the need for future research to examine the mechanisms that underlie the relationship between anhedonia and suicidal events.

Future research directions include the development of cutoffs for persistent symptoms that have adequate sensitivity and specificity in predicting suicide events. This information could contribute to the decisions of clinicians working with suicidal youth. Our findings might also inform programs targeting specific residual symptoms related to suicidal risk and improve preventive efforts.

Limitations of our study include that it was a retrospective analysis of a limited sample of adolescents in a single intensive treatment program. We measured depression using a self-report scale. Diagnostic interview–based elicitation of symptoms might yield different ratings. Although we added methodological rigor to this study, we examined a simple model. However, suicide is a complex public health issue, influenced by social determinants such as economic and public policies that may intensify individual risk factors, elevate stress levels, and worsen mental health, thereby increasing susceptibility to suicidal thoughts and behaviors.[45] Furthermore, postdischarge suicide risk is affected by social stress,[46] financial issues,[47] and isolation,[48] which were not included in our model. Studies that identify moderators that interact with ideation to promote vulnerability would improve our ability to predict future suicidal events. We followed *DSM-5-TR* criteria by combining ratings of psychomotor slowing and agitation to create a measure of psychomotor disturbance. From our analyses alone, we cannot say whether psychomotor slowing or agitation drives the surprise finding that psychomotor disturbance decreased the likelihood of suicidal events. Additionally, we did not have follow-up data about psychotropic medication, which might have influenced our outcomes. We had a significant amount of incomplete follow-up data, particularly for our third aim. We found, for example, that there was a small but significant difference in lifetime suicide attempt between those who were included in the study and those on whom data were missing. Although we controlled for lifetime suicide attempt in event prediction, it is possible that the results might be different if the sample had a higher density of youth with lifetime suicide attempts.

To conclude, despite overall improvement in depression, persistent sleep disturbance, SI, and anhedonia were predictors of near-term suicidal events postdischarge. Clinicians should closely monitor youth with these symptoms even if their depression improves, as they remain at higher risk for recurring suicidal events. Further research is needed to determine the levels of sleep, SI, and anhedonia persistence that mark higher levels of vulnerability, and whether extended inpatient or intensive outpatient care and targeted interventions can reduce suicidal events in the near future in youth with residual symptoms.

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Supplementary Material

Article Title: Prediction Of Adolescent Suicidal Events By Residual Depressive Symptoms After Intensive Treatment

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LIST OF SUPPLEMENTARY MATERIAL FOR THE ARTICLE

1. Table 1

DISCLAIMER

This Supplementary Material has been provided by the authors as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

Supplementary Table 1

Demographic and Clinical Characteristic Comparisons Between Included and Excluded Patients[a]

		Excluded from Objective 1 & 2 (n = 295)	Included in Objective 1 & 2 (n = 1049)	Between-Subjects Differences	Excluded from Objective 3 (n = 608)	Included in Objective 3 (n = 736)	Between-Subjects Differences
		Mean (*SD*) or *n* (%)	Mean (*SD*) or *n* (%)	*p* (|*d*| or *V*)[b]	Mean (*SD*) or *n* (%)	Mean (*SD*) or *n* (%)	*p* (|*d*| or *V*)[b]
Age (Years)		14.75 (1.54)	14.79 (1.52)	.737 (0.022)	14.75 (1.53)	14.80 (1.51)	.598 (0.029)
Sex Assigned at Birth	Female	238 (80.68%)	828 (78.93%)	.513 (.018)	477 (78.45%)	589 (80.03%)	.478 (.019)
	Male	57 (19.32%)	221 (21.07%)		131 (21.55%)	147 (19.97%)	
QIDS-A_{17}-SR Total Score	Admission	14.67 (5.78)[c]	14.44 (5.74)[d]	.566 (0.040)	14.68 (5.68)[e]	14.33 (5.80)[f]	.269 (0.062)
	Discharge	-[g]	-	-	9.81 (5.53)[h]	9.91 (5.60)	.791 (0.018)
Lifetime Attempt[i]	Yes	202 (68.47%)	695 (66.25%)	.474 (.020)	425 (69.90%)	472 (64.13%)	.025* (.061)
	No	93 (31.53%)	354 (33.75%)		183 (30.10%)	264 (35.87%)	
Lifetime NSSI[i]	Yes	241 (81.69%)	829 (79.03%)	.315 (.027)	488 (80.26%)	582 (79.08%)	.591 (.015)
	No	54 (18.31%)	220 (20.97%)		120 (19.74%)	154 (20.92%)	

*Significant at $p < .05$

[a]Total sample size at entry = 1344. Only 20 participants (< 2%) in analyses for Objective 2 were missing in analyses for Objective 1. Thus, comparisons between the included and excluded participants for these two Objectives were based on the sample for Objective 2. Under pairwise deletion, the sample size of some comparisons within a column varied slightly (footnotes c through h).

[b]For independent-samples *t* tests (Age, QIDS-A_{17}-SR Total Score Admission & Discharge), Cohen's *d* was used as the measure of effect size, where $|d| < 0.20$ can be interpreted as negligible. For χ^2 tests (Sex Assigned at Birth, Lifetime Attempt, Lifetime NSSI), Cramer's *V* was used as the measure of effect size, where $V < 0.10$ can be interpreted as negligible for $df = 1$.

[c]$n = 263$

[d]$n = 1029$

[e]$n = 569$

[f]$n = 723$

[g]$n = 0$

[h]$n = 313$

[i]In lifetime by time of discharge.

Abbreviation: QIDS-A_{17}-SR – Quick Inventory of Depressive Symptomatology, Adolescent Version, Self-Report