#### **ORIGINAL PAPER**



# Social Functioning Mediates the Relation Between Symptoms of Depression, Anxiety, and Suicidal Ideation Among Youth

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#### **Abstract**

In order to accurately identify youth at risk for suicide, it remains crucial to explore the interplay of risk factors that predict suicidal behavior. Thus, the purpose of this study was to explore whether social functioning, a putative risk factor, would be positively associated with symptoms of depression and anxiety in youth with a history of suicide attempts. Additionally, it was postulated that poor social functioning would mediate the relation between depression, anxiety symptoms, and a higher frequency of suicidal ideation among this population. A sample of youth (ages 10-17) with a history of suicide attempts was recruited for this study (N=507) from three behavioral health clinics in Georgia. Data from this study consisted of questionnaires and clinician-based ratings collected on electronic medical records. Results supported the hypothesis that there is a positive correlation between poor social functioning, depressive, and anxiety symptoms. Furthermore, social functioning mediated the relation between these symptoms and a higher frequency of suicidal ideation. Given the findings of this study, it bears importance to explore how social functioning may impact the onset of suicidal ideation and behavior broadly in youth at risk for suicide. Perhaps designing interventions that improve social functioning among youth with symptoms and anxiety and depression will mitigate future suicide risk.

Keywords Suicide · Youth · Depression · Anxiety · Social functioning

# **Highlights**

- Poor social functioning mediates the relation between symptoms of anxiety and depression and suicidal ideation.
- Recognizing poor social functioning as a risk factor for suicide can aid in more effective prediction and intervention.
- Effective interventions for poor social functioning should target symptoms of anxiety and depression as these constructs are related.

Suicide (i.e., "death caused by injuring oneself with the intent to die"; Centers for Disease Control and Prevention [CDC], 2021) is a growing problem for adolescents in the United States. For the last several years, suicide has been the second most prevalent cause of death for adolescents (CDC, 2021). In the last decade for which we have data (2009–2018), the rate of suicide for children ages 10–17 in

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the U.S. has increased from 3.12 per 100,000 to 5.47 per 100,000, which represents more than a 75% increase in completed suicides amongst these youth. Additionally, there are certain groups of adolescents that have seen an even sharper increase, such as Black (84%) and Asian youth (147%; CDC, n.d.). Nevertheless, the increases are across the board, with no demographic immune. In addition to completed suicides, suicide attempts (i.e., "when someone harms themselves with any intent to end their life, but they do not die as a result of their actions"; CDC, 2021) are also highly common in youth. In a sample of adolescents ages 12–17 who reported to pediatric emergency departments for any reason, King and colleagues (2019) found that nearly 5% attempted suicide within the next three months. Adolescent and young adult women have been found to have a higher rate of attempting suicide compared to men (odds



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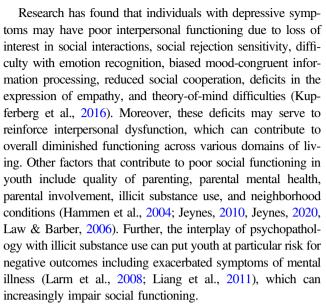
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ratio 1.96), while same-aged men have a higher rate of completed suicides than women (odds ratio 2.50; Miranda-Mendizabal et al., 2019). Though historically, Caucasian youth have been considered most at risk for suicide, completed suicide and suicidal behavior among ethnic minorities has increased across African American, Latinx, Asian American, and Indigenous youth in the United States (Balis & Postolache, 2008). This striking increase in suicide risk, combined with the high prevalence of suicidal behavior among youth, has led to a call for a comprehensive public health strategy to target suicide that includes upstream prevention, improved recognition of risk factors, and mental health services for those identified at risk (King et al., 2018).

A key component of suicide prevention is the ability to recognize those who are at risk. However, this has been elusive, and a recent meta-analysis suggests that we are no better at predicting suicide now than we were 50 years ago (Franklin et al., 2017). Our failure to accurately predict suicidal behavior is a large reason why King and colleagues (2018) have called for increased research examining suicide risk factors. In spite of the dire need for future research on this topic, risk factors for suicide among youth that have been identified include mental disorders, depressed mood, previous suicide attempts, as well as triggering psychosocial stressors to name a few examples (Bilsen, 2018; Schlagbaum et al., 2020). In particular, racial discrimination is a psychosocial stressor that can put youth at increased risk of death ideation (thoughts of death on the continuum of suicidal ideation), which bears importance given pervasive racial inequality that persists throughout the United States, and the world more broadly (Walker et al., 2017).

# Symptoms of Depression, Anxiety, and Deficits in Social Functioning

Among adolescents, symptoms of depression and anxiety often co-occur, with rates of clinical diagnostic comorbidity as high as 75% (Garber & Weersing, 2010). Diagnostically, these disorders share similar symptoms (e.g., fatigue, sleep difficulties, concentration problems), which may account for part of the overlap between these disorders. Further, risk factors such as general negative affectivity, intergenerational transmission, as well as cognitive and neurological biases in processing information are common among individuals with both anxiety and/or depressive symptoms (Garber & Weersing, 2010). Furthermore, individuals experiencing symptoms of depression and/or anxiety may be at greater risk of experiencing unpleasant interactions with others due to many biological, psychological, and social factors that impair their social functioning.



Impaired social functioning may be of particular concern in youth because it may lead to social withdrawal, perceived loneliness, perceived social isolation, and little to no social support during a stage of development when peer relations are critically important (e.g., Vanhalst et al., 2018; Wölfer & Scheithauer, 2013) According to the Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010), the absence of reciprocal interpersonal connections may increase the likelihood of experiencing thoughts of suicide. Based on this theory, it is posited that feeling alone (i.e., thwarted belongingness) as well as perceived burdensomeness contribute to suicidal ideation (Joiner, 2005; Van Orden et al., 2010) because of the hopelessness associated with social isolation. Thus, impaired social functioning, which is often an antecedent of social isolation, may unfortunately exacerbate symptoms of depression and anxiety leading to increased suicidal ideation. Moreover, empirical literature on school shooters suggests that there is a pattern of psychopathology in tandem with social isolation that can even contribute to peer violence, suggesting the importance of further elucidating the interplay of mental health and social deficits among adolescents (Jeynes, 2020).

Thus, the goal of this study is to improve identification of youth at high risk for suicide on the basis of exploring how symptoms of anxiety and depression, along with deficits in social functioning may contribute to suicidal ideation among youth with an attempt history. Though previous research has shown that youth with previous attempts are more likely to experience depression, anxiety, and poor social functioning (López-Steinmetz et al., 2021), literature has not identified why this may be the case and how precisely these constructs relate to one another. The current study may be of unique importance because it will explore whether social functioning is an underlying mechanism connecting symptoms of psychopathology with suicidal



ideation. As youth with a history of childhood-onset depression and anxiety are more likely to experience negative outcomes including suicide throughout their lifetime (Weissman et al., 1999), the early identification of individuals most at risk may be crucial to improving mental health outcomes and preventing suicide attempts throughout the lifespan.

# The Current Study

The current study examines the relation between symptoms of anxiety and depression, social functioning, and suicidal ideation (i.e., thinking about attempting suicide) among adolescents with a history of suicide attempts. On the basis of existing literature and consistent with theory (Garber & Weersing, 2010; Joiner, 2005; Kupferberg et al., 2016; Van Orden et al., 2010), we hypothesized that among youth with a lifetime suicide attempt: (1) symptoms of depression and anxiety would be positively associated with poor social functioning; (2) symptoms of depression, anxiety, and poor social functioning would be positively associated with higher frequency of suicidal ideation, and (3) poor social functioning would significantly mediate the relation between (a) depressive symptoms and the frequency of suicidal ideation and (b) anxiety symptoms and frequency of suicidal ideation. Specifically, we anticipate youth who are experiencing depressive and/or anxiety symptoms will have poorer social functioning, which in turn, will increase their frequency of thinking about suicide.

# Method

# **Participants**

Participants presented to one of three Behavioral Health Clinics in rural Georgia and indicated a lifetime endorsement of suicide attempt. The final sample consisted of 507 youth aged 10 to 17 ( $M_{\rm age} = 14.91$ , SD = 1.85); 70% females and 30% males. Most of the youth were White (51.7%), followed by Black/African American (27.5%), Hispanic (17.4%), and Asian American (1.0%). An additional 2.4% of youth self-identified as multiracial or other.

# Measures

The Columbia - Suicide Severity Rating Scale (C-SSRS; Posner et al., 2008), a semi-structured clinical interview, was used to assess lifetime suicide attempt and recent (i.e., 1 month) suicidal ideation. The C-SSRS has been widely used in clinical practice and has demonstrated sound psychometric properties among adolescents and clinical

samples. To identify youth who had attempted suicide in their lifetime and include them in the current analyses, the following C-SSRS item (yes/no) was administered: "In your lifetime, have you made a suicide attempt or done anything to harm yourself?" In order to assess frequency of recent suicidal ideation, the following item was used as an outcome variable: "In the past month, how many times have had thoughts about killing vourself?" Response options for this item included: "1 = Less than once a week, 2 = Once a week, 3 = 2-5 times a week, 4 = Daily or almost daily, 5 =Many times each day." Past investigations have documented good predictive validity of the suicidal attempt and ideation items, by predicting future suicidal behavior (Conway et al., 2017; Gipson et al., 2015), and adequate concurrent and divergent validity, by showing moderate correlations in the expected directions with other measures of suicide risk and behavioral health (Kerr et al., 2014; Posner et al., 2011).

The Child and Adolescent Needs and Strengths Comprehensive assessment (CANS; Kisiel et al., 2010) is a multi-purpose tool that provides a comprehensive assessment of child and caregiver problems, issues, and strengths. The CANS assesses a child's trauma experiences, traumatic stress symptoms, child strengths, life domain functioning, child behavioral/emotional needs, child risk behaviors, and caregiver needs and strengths. In the current study, the CANS was used to gather psychosocial information about a child's severity of impairment across several areas of functioning and was intended to assist with intervention planning, with each item indicating an area of potential need based on the clinician's rating of the child's impairment in functioning.

In terms of psychiatric functioning, the clinician was asked to base their ratings on symptom severity criteria for that specific diagnosis. For the two questions separately assessing symptoms of depression and anxiety, the following scale was used: "0 = no evidence of depression/anxiety, 1 = mild emotional problem/needs watching (brief duration of depression/anxiety or impairment of peer, family, or academic functioning that does not lead to gross avoidance behavior), 2 = moderate level of emotional problem/needs action plan (any diagnosis of depression/anxiety), and 3 = severe level of depression/anxiety: Needs immediate/intensive action (emotional symptoms that prevent the child from any participation in school, friendship groups, or family life)".

To assess social functioning, a four-level rating system was used to indicate the degree of the impairment, and thus, an actionable need, over a 30-day window. For the current study, the clinician was asked to rate the Life Domain: Social Functioning using the following categories and action levels: "0 = no evidence of a need/no need for action, 1 = watchful waiting/prevention mild need, 2 = action needed/moderate need, and 3 = immediate intensive action/



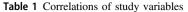
severe need". This item rates social skills and relationships by including age appropriate behavior and the ability to make and sustain relationships. Of note, social functioning is different from interpersonal (strengths) in that functioning is a description of how the individual is doing currently; whereas, strengths are longer-term assets. Higher scores on this item indicate poorer social functioning. Previous research has supported the use of the individual items of the CANS as a measure of severity of impairment across areas of functioning (Kisiel et al., 2009a). The CANS has also shown adequate concurrent, discriminant, and predictive validity when used among child serving organizations (Kisiel et al., 2009b; Sieracki et al., 2008).

#### **Procedures**

This study was approved by the appropriate Institutional Review Board (IRB) and adhered to the IRB-approved protocol. As part of the Garrett Lee Smith (GLS) Grant, intake data were collected via electronic mental health records for every youth aged 10-17 years old seeking mental health services between January of 2016 and April of 2019 at one of three rural behavioral health community centers. All consenting youth who presented at intake were eligible to participate in the study. However, for the purposes of this study, only youth who endorsed a previous lifetime suicide attempt and completed all the measures used to assess the variables of interest were included in the study as the sample of suicidal youth. The intake clinician administered a battery of self-report measures as well as questionnaires based on clinician's ratings, including the C-SSRS and the CANS. The survey battery of measures took participants approximately 1 h to complete.

# **Data Analysis**

The key hypotheses were obtained by fitting two saturated (i.e., just-identified) path analytic models using Mplus v8.4 (Muthen & Muthen, 1998-2017) with symptoms of depression and anxiety as continuous independent variables and social functioning as a potential mediating variable and suicidal ideation as the dependent variable, with the addition of covariates. The null hypothesis is that the sum of the two indirect paths—from the predictors (i.e., depression/anxiety symptoms) to the mediator (poor social functioning) and from the mediator to the outcome (suicidal ideation)—is equal to zero, indicating no indirect effect. We tested for the significance of indirect (mediated) effects using the percentile bootstrap with 3,000 draws to generate empirical confidence intervals for the products of the coefficients composing the mediated paths (MacKinnon, 2008). Missing data were accommodated



Variable	1	2	3	4
1. Depressive symptoms	_			
2. Anxiety symptoms	0.41*	_		
3. Poor social functioning	0.18*	0.16*	_	
4. Suicidal ideation frequency	0.24*	0.23*	0.28*	_

<sup>\*</sup>p < 0.001

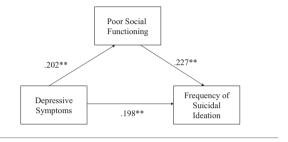


Fig. 1 Model with standardized regression coefficients depicting poor social functioning as a mediator in the relation between depressive symptoms and frequency of suicidal ideation. N = 507. Age, gender, and race are included in the model as covariates. \*\*p < 0.01

with the Full Information Maximum Likelihood estimation feature in Mplus.

# **Results**

Correlations among the four primary study variables (i.e., depressive symptoms, anxiety symptoms, poor social functioning, and frequency of suicidal ideation) are presented in Table 1. All correlations were significant at p <0.001. To test the associations among study constructs in the context of mediational models, we examined these relations as paths, adjusting for demographic covariates (i.e., age, gender, race), which were modeled as exogenous predictors of the study variables. Hypotheses 1 and 2 concern predictive relations among variables depicted in Figs. 1 and 2, with standardized coefficients shown. Consistent with Hypothesis 1, symptoms of depression (b = 0.23, 95%CI: 0.078, 0.382) and anxiety (b = 0.16, 95% CI: 0.033, 0.290) were positively associated with poor social functioning. In line with Hypothesis 2, symptoms of depression (b = 0.39, 95% CI: 0.122, 0.645), anxiety symptoms (b =0.30, 95% CI: 0.094, 0.501), and poor social functioning (b = 0.40, 95% CI: 0.184, 0.619) were all positively associated with the frequency of suicidal ideation.

The primary hypothesis focused on the mediation of the link from symptoms of depression and anxiety to frequency of suicidal ideation by poor social functioning in youth who reported a suicide attempt in their lifetime. In the first model (see Fig. 1) examining poor social functioning as a



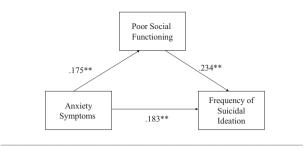


Fig. 2 Model with standardized regression coefficients depicting poor social functioning as a mediator in the relation between anxiety symptoms and frequency of suicidal ideation. N = 507. Age, gender, and race are included in the model as covariates. \*\*p < 0.01

potential mediator, the total effect of depressive symptoms on the frequency of suicidal ideation was positive and significant, with a point estimate of 0.48, 95% CI 0.216–0.730, standardized estimate of 0.24. Consistent with Hypothesis 3, this effect was significantly mediated by poor social functioning, ab = 0.09, 95% CI 0.024–0.180. The confidence interval excluded zero, indicating a significant medium indirect effect of symptoms of depression on frequency of suicidal ideation via poor social functioning, supporting the mediation hypothesis. Furthermore, the standardized effect size for the indirect effect was 0.05 (CI: 0.013–0.090), indicating that the frequency of suicidal ideation increased by 0.05 standard deviations for every 1-SD increase in depressive symptoms indirectly via poor social functioning.

In the second model examining poor social functioning as a mediator (see Fig. 2), the total effect of anxiety on the frequency of suicidal ideation was also positive and significant, with a point estimate of 0.36, 95% CI 0.156–0.570, standardized estimate of 0.22. Consistent with Hypothesis 3, this effect was significantly mediated by poor social functioning, ab = 0.07, 95% CI 0.013–0.134. Again, the confidence interval excluded zero, indicating a significant medium indirect effect of poor social functioning on the frequency of suicidal ideation via anxiety. The standardized effect size for the indirect effect was 0.04 (CI: 0.008–0.082), indicating that the frequency of suicidal ideation increased by 0.04 standard deviations for every 1-SD increase in anxiety indirectly via poor social functioning.

# Discussion

As suicide is one of the leading causes of death in youth (Hawton et al., 2013), it is imperative to understand its correlates. The phenomenology of suicidality in youth remains different than at other stages of the lifespan,

perhaps due to the unique nature of this developmental window. Though adolescents are at increased risk of suicide attempts compared to children or adults (Crosby et al., 2011), they are less likely to die by suicide than adults (Shain, 2016). While psychopathology and psychosocial difficulties have been linked to suicidality in youth (Lewinsohn et al., 1996; Gili et al., 2019), it is a phenomenon that remains difficult to predict. Of note, depressive and anxiety disorders are among the most common forms of psychopathology in youth and across the lifespan (Hosman et al., 2009). Consequently, the purpose of this study was to explore the relation between depression and anxiety symptoms, poor social functioning, and suicidal ideation, with social functioning proposed as a mediator between psychopathology and suicidal ideation in youth with a history of a suicide attempts. We hope that in studying the relation among these constructs, there will be improved efforts to effectively identify youth at risk for suicide.

It was hypothesized that symptoms of depression and anxiety would be positively associated with poor social functioning. This hypothesis was supported, as there were small, positive statistically significant correlations between depressive symptoms and social functioning, as well as anxiety symptoms and social functioning. This finding suggests that poor social functioning is associated with depressive and anxiety symptomatology in youth with a history of suicide attempts. These results are consistent with research suggesting that youth with depression (Birmaher et al., 2004) and anxiety symptoms display poorer social functioning (Forbes et al., 2019; Settipani & Kendall, 2013). In addition, it was postulated that symptoms of depression, anxiety symptoms, and poor social functioning would be positively associated with a higher frequency of suicidal ideation. Depression and anxiety symptoms, as well as poor social functioning had a positive moderate, statistically significant correlation with suicidal ideation. These findings correspond with previous research demonstrating a robust correlation between poor social functioning and suicidal ideation in youth (Van Meter et al., 2019), as well as depression and anxiety symptomatology with suicidal ideation (Kessler et al., 1999).

Lastly, it was hypothesized that poor social functioning would significantly mediate the relation between symptoms of depression and the frequency of suicidal ideation, as well as the relation between anxiety symptoms and frequency of suicidal ideation. These hypotheses were supported, with social functioning mediating the relation between symptoms of depression and suicidal ideation, as well as anxiety symptoms and suicidal ideation.

In adolescents, the current best predictor of a future suicide attempt is a previous attempt (Apter & King, 2006; Langhinrichsen-Rohling & Lamis, 2008), making adolescents with a previous suicide attempt a critical population



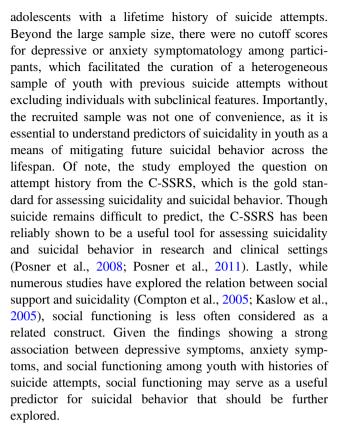
to study in order to elucidate additional risk factors and prevent future attempts in this already high-risk group. The present study sample is also unique as it sampled adolescents presenting to clinics in rural areas. Examining correlates of suicidal behavior in rural adolescents is important as youth in rural areas die by suicide at twice the rate of their urban counterparts (Fontanella et al., 2015). Further, female gender is related to endorsing a previous suicide attempt in rural adolescents even when considering psychiatric functioning, impulsivity, legal functioning, and previous inpatient hospitalizations (Florez et al., 2019), which may account for the overrepresentation of female adolescents in the present sample. Other demographics are important when examining suicide risk in adolescents such as race/ethnicity, sexual identity, and socioeconomic status (measured by maternal education level and receipt of public assistance; Xiao & Lindsey, 2021), though examination of these variables was beyond the scope of the present study. Finally, other factors such as bullying victimization (Stanley et al., 2016; Moore et al., 2017), sleep disturbances (Goldstein et al., 2008), substance use (Esposito-Smythers & Spirito, 2004), family cohesion, peer support, school connectedness, and neighborhood support (Xiao & Lindsey, 2021) may be associated with adolescent suicide risk, though these were not assessed in the present study.

# **Future Directions**

Though there is limited research that directly looks at the relations between the observed variables among youth with a history of suicide attempts, previous literature suggests that poor social functioning mediates the relation between psychopathology and suicidal behavior without factoring in attempt history. Moreover, the quality of familial and friend relationships contribute differently to this relation (Van Meter, 2019). Thus, future studies should continue to differentiate between qualitative components of social functioning to most accurately predict suicidal behavior among youth with symptoms of depression and anxiety who have previously attempted suicide. Furthermore, it would be beneficial to explore the relation between these constructs among youth who meet full criteria for mental disorders as the current study focused on symptoms. Lastly, as qualitative facets of social functioning (i.e., family conflict) contribute to suicidal behavior differently across various mental disorders, it would be helpful to unpack the complexities of these relations going forward.

# **Strengths and Limitations**

The sample size of participants is a notable strength of this study, with few previous studies having recruited 500+



Although this study has numerous strengths, it also has several weaknesses. As this study is correlational and not longitudinal in nature, we cannot be certain that anxiety and depressive symptoms precede problems with social functioning. Indeed, it is possible that poor social functioning may lead to symptoms of anxiety and depression in adolescents (Nilsen et al., 2013). Therefore, prospective studies are necessary to further explore the relation between the observed constructs. Additionally, it should be noted that because we collected self-report data, results may be subject to social desirability bias on behalf of the participants. Moreover, this study only involved clinician-based ratings to assess symptoms of depression and anxiety, social functioning, and suicidal ideation, with only one item that measured each individual construct.

Given these limitations, a multi-methods approach would enhance future research on the relation between these constructs. Furthermore, because this study did not specifically recruit individuals with clinical diagnoses of depression and anxiety, characteristics of participants in the sample may be divergent from individuals who meet criteria for these diagnoses. Finally, while social functioning is the proposed mediator of interest, other mediators may account for the relation between symptoms of depression, anxiety symptoms, and the frequency of suicidal ideation among lifetime suicide attempters. In conclusion, due to the cross-sectional nature of this study, it may be beneficial to conduct a longitudinal study in the future. As understanding risk for suicide in youth remains an urgent health concern, it



is imperative to elucidate the complex relations between risk and protective factors for suicidality and suicidal behavior in this population.

#### Conclusion

The present study found poor social functioning to be a partial mediator of the relations between symptoms of depression and anxiety and suicidal ideation in a sample of adolescents who previously attempted suicide. These findings are important because suicide is one of the leading causes of death in youth (Hawton et al., 2013), and the findings suggest a mechanism (i.e., poor social functioning) that may result in suicide. Identification of this mechanism provides a potential intervention point to prevent suicide attempts among youth. If at-risk adolescents are accurately identified, they can receive adequate, evidence-based treatments that may be crucial in preventing future attempts. For example, there is robust evidence that supports Dialectical Behavior Therapy (DBT) as an effective intervention for youth who engage in self-harm or experience suicidal ideation, even among high-risk adolescents (e.g., individuals with borderline personality disorder symptoms; Kothgassner et al., 2021). DBT may be a particularly effective intervention for youth with social deficits because it targets interpersonal functioning in one of its four modules, in addition to taking place in the context of group psychotherapy.

In conclusion, the goal of this study is to provide a foundation for future clinical research aimed at reducing suicidal ideation in youth with histories of suicide attempts by enhancing current protocols (such as DBT) or designing novel interventions that target deficits in social functioning. Though psychopathology is clearly linked to suicidal behavior, interventions that address social functioning specifically may more effectively prevent future suicide behavior among adolescents with an attempt history. Given the unique developmental period of adolescence and the frequency with which suicidal behavior occurs among youth, it is imperative to identify and support adolescents most at risk for suicide.

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# **Compliance with Ethical Standards**

Conflict of Interest The authors declare no competing interests.

Informed Consent Obtained.

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