

ORIGINAL ARTICLE

Multi-informant reports of depressive symptoms and suicidal ideation among adolescent inpatients

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Abstract

Objective: Suicide is a leading cause of death among adolescents, and suicidal thoughts represent key predictors to suicidal behavior. Yet, suicidal thoughts can be challenging to accurately assess. Symptoms that commonly co-occur with suicidal thoughts, such as depressive symptoms, may provide valuable information for predicting these thoughts. Although clinicians commonly collect multi-informant reports about adolescent depressive symptoms, these reports often yield discrepant findings as individual predictors of adolescents' suicidal thoughts.

Method: We tested the ability of specific patterns of multi-informant reports to predict adolescents' suicidal thoughts. Ninety adolescent inpatients and their parents (i.e., "dyads") reported on adolescent depressive symptoms, and adolescents completed self-report assessments of suicidal thoughts at baseline and three-month follow-up.

Results: Dyads displayed variability in reporting patterns, and these patterns uniquely predicted suicidal thoughts. Adolescents reporting elevated depressive symptoms displayed increased concurrent suicidal thoughts relative to adolescents reporting subthreshold depressive symptoms, regardless of parent report. Yet, only adolescents who reported elevated depressive symptoms and whose parents reported subthreshold adolescent depressive symptoms displayed increased future suicidal thoughts.

Conclusions: Identifying patterns of multiple informants' reports about adolescent depressive symptoms may improve the prediction of suicidal thoughts. These findings have important implications for assessing adolescents at risk for suicide.

KEYWORDS

adolescence, depressive symptoms, multi-informant assessment, suicidal ideation

INTRODUCTION

Suicide is consistently ranked as one of the leading causes of death worldwide, and it poses a considerable threat to

global public health (World Health Organization. 2014). Suicidal behaviors occur across the lifespan, and from 1999 to 2017, the age-adjusted suicide rate in the United States increased 33% (Hedegaard et al., 2018). Adolescence

marks a period of particular risk for both the initial onset and rapid increase of suicidal behaviors, and suicide is now the second leading cause of death for youth 10–24 years old (Curtin & Heron, 2019; Nock et al., 2013).

The presence of suicidal thoughts (i.e., hereafter referred to as “suicidal ideation”) represents a powerful risk factor for future suicidal behaviors (Brown et al., 2000), and like suicidal behaviors, suicidal ideation is prevalent among adolescents (Nock et al., 2013). These findings illustrate the importance of accurately predicting suicidal ideation among at-risk adolescents. Unfortunately, suicidal ideation can be challenging to predict. These challenges manifest as a function of both available measurement tools and our lack of understanding of how to optimize prediction of ideation using currently available tools. Indeed, across the lifespan, suicidal ideation is largely assessed via self-report in both research and clinical risk assessments. However, relying exclusively on self-reports of suicidal ideation is problematic for multiple reasons. In particular, methodological factors can influence an adolescent’s ability to accurately and consistently report on his or her suicidal ideation (Klimes-Dougan, 1998). Further, adolescents at particular risk for engaging in suicidal behaviors may be motivated to minimize symptoms to avoid intervention (Nock et al., 2010). Therefore, adolescents most at risk for experiencing suicidal ideation or engaging in suicidal behaviors may be missed if researchers and clinicians rely solely on self-report methods to evaluate an individual’s level of risk. Current limitations of assessing suicidal ideation call for research to explore whether such evaluations can be augmented by assessments of psychosocial domains that commonly co-occur with ideation. As such, the current study examined the extent to which information on a commonly assessed, robust risk factor for suicidal thoughts, namely adolescent depressive symptoms, uniquely predicted current and future self-reported suicidal ideation.

Depressive symptoms across a range of severity represent one of the most robust predictors of adolescent suicidal ideation and behaviors (Klein et al., 2005). In other words, although Major Depressive Disorder incrementally predicts suicidal ideation, over-and-above other diagnoses (Nock, 2016), subthreshold levels of depression are also associated with increased risk for suicidal ideation (Balázs et al., 2013). Due to the considerable public health implications of depression worldwide and improved understanding of the importance of early identification, clinical practice guidelines now include the recommendation that depressive symptoms be evaluated routinely within primary care settings for all adolescents over the age of twelve (Zuckerbrot et al., 2018). The inclusion of depression screening in routine clinical care is an important step in the early identification and prevention of depression and

relatedly suicidal symptoms in adolescence. Additionally, “best practices” call for clinicians and researchers to collect collateral information from multiple informants to help overcome the limits of relying solely on self-report discussed previously (De Los Reyes et al., 2015).

Although parent and adolescent reports of adolescent depressive symptoms tend to display relatively low levels of correspondence, this does not mean that all parent-adolescent dyads disagree in their reports. Specific to assessments of youth depressive symptoms, some parent-youth dyads converge in reports of subthreshold or elevated adolescent depressive symptoms, whereas other parent-youth dyads diverge in reports such that youths self-report elevated depressive symptoms and parents report subthreshold adolescent depressive symptoms (Makol & Polo, 2018). Why might some parent-youth dyads display these reporting patterns? Recent theoretical work holds that informants provide discrepant reports, in part, because (1) youths vary in the contexts in which they display mental health concerns (e.g., home, school, peer interactions); and (2) informants vary in the contexts in which they observe youths (De Los Reyes et al., 2013). If so, then patterns of multi-informant reports may yield potent tools for predicting adolescent suicidal ideation.

For example, when parents and adolescents converge in reports of elevated adolescent depressive symptoms, this pattern of reports may signal that the adolescent displays depressive symptoms across contexts and thus a more severe form of the condition (see also Lerner et al., 2017; De Los Reyes et al., 2013, 2016). In turn, dyads who converge in their reports may contain adolescents at relatively high risk for displaying suicidal ideation. Yet, this pattern might not capture all at-risk adolescents. For instance, dyads in which adolescents self-report elevated depressive symptoms and parents report subthreshold adolescent depressive symptoms may contain parents who have little knowledge of the adolescents’ concerns and/or need for care (see also De Los Reyes & Ohannessian, 2016), placing adolescents at risk for experiencing covert maladaptive symptoms such as suicidal ideation.

In the adolescent development literature, there is precedent for not only the existence of these discrepant dyads but also a link between these dyads and poor adolescent outcomes. For instance, when parents view themselves as more knowledgeable about their adolescents’ whereabouts and activities than adolescents perceive their parents’ levels of knowledge to be, adolescents are at increased risk for engaging in substance use (i.e., relative to dyads displaying other reporting patterns; Lippold et al., 2013). Similarly, adolescents who report high levels of rule-breaking behavior relative to their parents’ reports of adolescent rule-breaking also report increased

depressive symptoms (i.e., relative to dyads displaying other reporting patterns; Laird & De Los Reyes, 2013).

Patterns of multi-informant reports may also provide additional information about clinical presentations and treatment outcomes among adolescents admitted for inpatient psychiatric care. For instance, prior work by Makol et al. (2019) identified four unique multi-informant dyads when asking inpatient adolescents and their parents to rate adolescent internalizing symptoms. Specifically, they observed dyads in which adolescent and parent reports converged (i.e., both informants rated adolescent internalizing symptoms as low or high) and dyads which diverged in their ratings (i.e., one informant rated high adolescent internalizing symptoms whereas the other informant rated low adolescent symptoms). These reporting patterns distinguished adolescents on key clinical characteristics at admission (e.g., adolescents with divergent reports were more likely to be admitted with suicidal symptoms), discharge diagnoses, and treatment following discharge. Together, these findings illustrate the value of *strategically* integrating multi-informant assessments to improve prediction of clinical outcomes, versus relying on a single informant's report, or as recently recommended (e.g., Howe et al., 2019), examining informants' reports in isolation of one another.

In this study, we aimed to extend prior research by exploring the extent to which various patterns of adolescent and parent reports of adolescent depressive symptoms may predict risk for suicidal ideation, among adolescents receiving inpatient psychiatric treatment. We examined this question among adolescent psychiatric inpatients for two primary reasons. First, there is an increased rate of depressive symptoms in inpatient settings relative to lower levels of care (e.g., community mental health clinics; Blanz & Schmidt, 2000), yet not all adolescents admitted for inpatient treatment present with heightened depressive symptoms. At first glance, one might assume little opportunity for adolescents and parents to disagree about the magnitude of adolescent depressive symptoms for adolescents admitted to an inpatient level of care. However, prior research clearly demonstrates the presence of multi-informant discrepancies across levels of care and symptom domain, including when assessing internalizing symptoms and suicidal symptoms among inpatient adolescents (Makol et al., 2019; Prinstein et al., 2001). Second, the inpatient setting is one within which individuals may be particularly motivated to downplay or "under-report" their mental health concerns (Busch et al., 2003), further highlighting the need to augment adolescent self-report with information from additional informants. Combined, these unique qualities of the inpatient setting provide a conservative test of our research aims.

Purpose and hypotheses

Specifically, among a sample of adolescent inpatients and their parents, we expected to observe individual differences in reporting patterns, such that we could identify dyads in which parents and adolescents: (1) converged in reports of subthreshold adolescent depressive symptoms (i.e., subthreshold on both adolescent and parent report; "AP-"); (2) converged in reports of elevated adolescent depressive symptoms (i.e., elevated on both adolescent and parent report; "AP+"); (3) diverged such that adolescents self-reported greater adolescent depressive symptoms relative to parent reports about adolescents (i.e., elevated on adolescent report/subthreshold on parent report; "A+/P-"); and (4) diverged such that parents reported greater adolescent depressive symptoms relative to adolescent self-reports (i.e., subthreshold on adolescent report/elevated on parent report "A-/P+"). We hypothesized that adolescents falling in the "AP+" and "A+/P-" dyads would be at increased risk for current and future suicidal ideation.

METHOD

Participants

Adolescent and parent dyads were recruited for a study examining suicidality among youths admitted to an inpatient psychiatric unit at a major urban children's hospital. Exclusion criteria included the presence of any characteristic that impaired a patient's ability to participate in the study, including an inability to speak or write English fluently, the presence of significant cognitive impairment, the presence of psychotic symptoms, or the presence of extremely agitated or violent behavior. A total of 137 dyads agreed to participate, of whom 90 (67.8%) provided data relevant to the current study (e.g., multi-informant ratings of depressive symptoms, explicit self-report measures; see Table 1, for full demographic information)¹ Adolescent participants ranged in age from 12 to 18 years and were predominantly female and White. Adolescents met DSM-IV diagnostic criteria across a variety of Axis I disorder categories, and the number of psychiatric diagnoses for participating adolescents ranged from 1 to 7. Medical

¹Adolescent and parent dyads included in the current study ($n = 90$) did not significantly differ from excluded dyads ($n = 45$) on patient age, number of previous psychiatric hospitalizations, history of suicidal ideation, self-reported recency of suicidal ideation, self-reported severity of suicidal ideation, or adolescent or parent-reported adolescent depression scores. We did observe significant differences for adolescent gender ($t = 1.78, p < .001$) and race ($t = 2.50, p < .001$). Follow-up analyses revealed that neither gender nor race significantly correlated with criterion variables used in this study and thus they were not included as covariates in analyses reported below.

TABLE 1 Demographic characteristics of the sample

Variable	Adolescents (<i>n</i> = 90)	Parents (<i>n</i> = 90)
Age in years <i>M</i> (<i>SD</i>)	14.90 (1.40)	47.44 (6.37)
Sex (% female)	63.3	71.1
Race (%)		
White	88.9	
Hispanic	3.3	
African American	2.2	
Asian	2.2	
Other	3.3	
Diagnosis (%)		
Mood disorder	90.0	
Anxiety disorder	35.6	
Psychotic disorder	2.2	
Eating disorder	22.2	
Impulse control disorder	13.3	
Substance use disorder	15.6	
PTSD	2.2	
Autism spectrum disorder	3.3	
Other	24.4	
Total Number of Diagnoses <i>M</i> (<i>SD</i>)	2.33 (1.13)	
Prior Hospitalizations (%)	46.7	
Relation to adolescent (%)		
Biological mother		66.7
Adoptive/foster mother		4.4
Biological father		21.2
Adoptive/foster father		1.1
Annual household income (%)		
\$0–40,000		16.8
\$41,000–80,000		23.3
\$81,000– >100,000		43.3

record reviews indicated that nearly half of the sample experienced at least one prior inpatient hospitalization due to psychological symptoms. Participating parents ranged in age from 29 to 64 years, were predominantly female, and consisted of predominately biological mothers of the participating adolescent. Participants were economically diverse, with annual household incomes varying widely.²

²Parent and adolescent demographic information remained incomplete for select variables due to unreturned parent history questionnaires, incomplete adolescent self-report, and/or inability to locate information within the adolescent's medical chart. Specific frequency breakdowns were as follows: parent age (*n* = 82), parent gender (*n* = 84), relationship to adolescent (*n* = 84), annual household income (*n* = 76), and recency of adolescent suicidal ideation (*n* = 89).

Measures

Adolescent and parent-reported adolescent depressive symptoms

Dyads completed complementary versions of the *Behavior Assessment System for Children* (BASC, First Edition; Reynolds & Kamphaus, 1992). The BASC is a widely used assessment of general youth functioning which consists of separate self-report and parent-report forms, varying slightly with youth age. The 186-item self-report form and 126-item parent form generate scores meant to describe youth functioning across a variety of internalizing and externalizing domains. Response options on the parent report follow a 4-point scale from *never* to *always*, and response options on the self-report scales consist of *true* or *false* options. For this study, we examined parent report and adolescent self-report items from the depressive symptoms scale. The BASC has demonstrated good internal consistency and validity across numerous populations and symptom profiles (e.g., Nugent et al., 2013). For both adolescent and parent reports, we calculated age-normed *T*-scores (*M* = 50, *SD* = 10). We then used these *T*-scores to identify adolescents who displayed clinically elevated levels of adolescent depressive symptoms based on adolescent and parent reports, with scores over 65 (i.e., 1.5 standard deviations above the mean) indicating clinically relevant or “elevated” symptoms (Reynolds & Kamphaus, 1992).

Adolescent self-report measures of suicidal ideation

Adolescents completed several measures of suicidal ideation. First, adolescents completed the *Beck's Scale for Suicidal Ideation* (SSI; Beck & Steer, 1991), a 21-item self-report questionnaire used to assess *severity* of suicidal ideation. Each of the SSI items consists of four statements reflecting increasing levels of suicidal ideation severity, and each item is scored on a 3-point scale, ranging from 0 to 2. Therefore, total scores can range from 0 to 63, with higher scores reflecting increased suicidal ideation severity. The SSI is a well-established and commonly used measure of suicidal ideation, and it has demonstrated excellent validity and reliability among a variety of populations including adolescent psychiatric inpatients (Steer et al., 1993).

Second, given the similarities in the self-report modalities used to assess adolescent suicidal ideation (i.e., SSI) and depressive symptoms (i.e., BASC), adolescents completed a secondary assessment of their suicidal symptoms to help examine whether observed results were robust to measurement effects. Specifically, adolescents completed two versions of a *Visual Analog Scale* (VAS) to assess how

closely they identified themselves with suicide-related constructs, namely *death* and *suicide*. Specifically, adolescents were presented with 2 horizontal lines with *Death* or *Suicide* labeled on the left and *Life* labeled on the right. Adolescents were asked to draw a single mark on the line indicating which word they identified with more strongly (e.g., “Which is more like you?”). Each response was then measured by hand, with lower responses reflecting a stronger reported association between the self and *Death* or *Suicide*. Visual analog scale scores for the *death* and *suicide* trials were strongly correlated ($r = .89$, $p < .001$). Consequently, scores across these two trials were combined for each participant to create a VAS total score. Additionally, VAS scores were reverse-coded within the current study so that higher scores reflected stronger associations between self and death/suicide, making the direction of scores consistent with other collected variables of suicidal ideation (i.e., severity).

Adolescents also completed the *Self-Injurious Thoughts and Behaviors Interview* (SITBI; Nock et al., 2007), a structured interview assessing the presence, recency, and frequency of an adolescent's experiences across a variety of self-injurious thoughts and behaviors such as suicidal ideation, suicidal intent, suicidal plans, and non-suicidal self-injury. For the current study, we focused specifically on information gathered from the SITBI regarding adolescents' history of and recency of suicidal ideation. Information from the SITBI was primarily used in preliminary and post hoc analyses to describe our current sample and examine group differences (e.g., included vs. excluded adolescents, clinical severity of participants presenting with suicidal ideation vs. no suicidal ideation; see footnotes¹⁻³).

Demographic information and psychiatric history

In addition to the adolescent self-reports described previously, adolescent and parent demographic information and adolescent psychiatric history were obtained from two additional sources. First, parents completed a brief questionnaire eliciting information about basic adolescent and family demographic information (e.g., race, age, income), adolescent psychiatric history, and adolescent treatment history. Second, research assistants gathered additional information (e.g., diagnoses upon admission, medical history) from the adolescent's medical record.

Procedures

Each participant and parent received a packet upon admission to the inpatient unit that included a recruitment

brochure about the current study. Those who expressed interest in this study and met inclusion criteria were approached by a research assistant to discuss and provide informed assent/consent. Upon enrollment, participating parents received a series of questionnaires to complete at home and return to a member of the research team. Participating adolescents met with a research assistant to complete a series of computer-based and paper-based assessments. A chart review was also conducted to gather additional information about adolescent participant's demographics, psychiatric history, reason for current hospitalization, and diagnostic information. A research assistant contacted participating adolescents by telephone 3 months after discharge to conduct a follow-up interview, including the SSI, to assess the adolescent's mood and suicidal symptoms since discharge. Adolescents received a \$25 gift card for each completed time point. A total of 71 adolescents of the 90 included in the current study completed the 3-month follow-up assessment (response rate: 79%).

Data analysis

Our primary aims examined the extent to which patterns of reporting discrepancies of adolescent depression statistically predict adolescent suicidal ideation concurrently and/or longitudinally. Consistent with prior work examining patterns of multi-informant reports (De Los Reyes et al., 2009), we first grouped dyads into one of four reporting patterns, or dyads in which adolescents and parents: (1) converged in reports of subthreshold adolescent depressive symptoms (i.e., “AP-”); (2) converged in reports of elevated adolescent depressive symptoms (i.e., “AP+”); (3) diverged such that adolescents self-reported greater adolescent depressive symptoms relative to parent reports about adolescents (i.e., “A+/P-”); and (4) diverged such that parents reported greater adolescent depressive symptoms relative to adolescent self-reports (i.e., “A-/P+”). We used clinically informed cut-off scores to create our four dyad groups. Given that all scores of adolescent depressive symptoms consist of standardized T-scores, “elevated” symptoms were categorized as any score equal to or greater than 65 (e.g., borderline clinical range; Reynolds & Kamphaus, 1992) and “subthreshold” symptoms reflecting those scores below 65. It is important to determine whether this approach validly reflected the underlying continuous data. Thus, we conducted a sensitivity analysis (i.e., an ANOVA) to test whether the groups differed on the continuous scores used to create them.

Next, we constructed two analyses of variance (ANOVA) models to test relations between reporting patterns and concurrent suicidal ideation. Specifically, reporting pattern group served as the independent variable and severity of suicidal ideation (e.g., SSI severity score)

Variable	1	2	3	4
1 SI Severity- SSI Total Score		.88**	.63**	.02
2 SI Severity- VAS Score			.70**	.09
3 Adolescent Depression T-Score, Self-Report				.22*
4 Adolescent Depression T-Score, Parent-Report				

Note: Analog Scale; * $p < .05$; ** $p < .01$.

Abbreviations: SI, Suicidal Ideation; SSI, Beck Scale for Suicidal Ideation; VAS, Visual Analog Scale.

TABLE 2 Correlations Among Measures of Suicidal Ideation (SI) Severity and Adolescent-reported and Parent-reported BASC Depression T-Scores

and the VAS score were entered separately as dependent variables. Lastly, we conducted a univariate analysis of covariance (ANCOVA) to test whether reporting pattern group longitudinally predicted suicidal ideation severity over three months, controlling for baseline severity of suicidal ideation reported during the initial research session. Similar to the concurrent analyses, reporting pattern group served as the independent variable and the SSI severity score at follow-up was entered as the dependent variable. After adjusting for multiple comparisons (i.e., 11 tests) the corrected p value used to determine statistical significance was .0045. Additionally, all assumptions of the ANOVA tests were met within the current study.

RESULTS

Preliminary analyses and normality assumptions

Scores for all measures used to test our primary aims fell within acceptable ranges of skewness and kurtosis (see Tabachnick and Fidell, 2001). Based on information from the SITBI interview, the majority of participants reported some lifetime history of suicidal ideation ($n = 75$; 83.3%) and suicidal thoughts within the week leading up to their initial research assessment ($n = 59$; 65.6%).³ The mean suicidal ideation severity score was 11.37 ($SD = 12.23$) out

of a possible 38 on the SSI, and the mean VAS score was 144.15 ($SD = 128.60$) out of a possible 400.

We observed significant and positive relations between reports of severity of suicidal ideation. Specifically, as per effect size conventions by Cohen (1988), we observed large-magnitude Pearson r correlations between severity of suicidal ideation as rated on the SSI and VAS (Table 2). We also observed moderate-to-large Pearson r correlations between severity of suicidal ideation and adolescent reported depressive symptoms (Table 2). However, severity of suicidal ideation did not significantly correlate with parent reports of adolescent depressive symptoms, regardless of severity measure completed.

We observed low correspondence between adolescent and parent reports of adolescent depressive symptoms (Table 2). Additionally, adolescent and parent reports of adolescent depressive symptoms significantly differed ($t = -2.68$, $p < .05$, $r = 0.17$), with parents reporting significantly higher mean levels of adolescent depressive symptoms ($M = 65.07$, $SD = 15.59$) than adolescents self-reported ($M = 60.12$, $SD = 12.34$).

Agreement on depressive symptoms and concurrent adolescent suicidal ideation

As described previously, adolescent and parent reports of adolescent depressive symptoms were categorized as either “elevated” or “subthreshold” based on a cut-off T-score of 65. Dyads’ scores were then assigned into one of four groups in which adolescents and parents (adolescent/parent): (1) converged in reports of subthreshold adolescent depressive symptoms (“AP-” = 38.9%); (2) converged in reports of elevated adolescent depressive symptoms (“AP+” = 23.3%); (3) diverged such that adolescents self-reported greater symptoms than parents (“A+/P-” = 13.3%); and (4) diverged such that parents reported greater symptoms than adolescents (“A-/P+” = 24.4%). (Please see Table 3 for mean T-scores and standard deviations for each reporting dyad.) An ANOVA confirmed significant differences between dyads for mean T-scores of adolescent reported adolescent depression (F

³Prior work on Berkson’s Bias (Berkson, 1946) suggests that adolescents not presenting with suicidal ideation may have to meet a higher threshold of clinical severity to warrant an inpatient admission compared to those admitted due to suicidal thoughts or behaviors. Consequently, we conducted post hoc analyses to test differences between those adolescents who reported no history of suicidal ideation and those with reported histories. In the current study, adolescents who reported no history of suicidal ideation ($n = 15$), those who reported a lifetime history of suicidal ideation but denied ideation within the week prior to the initial research session ($n = 15$), and adolescents who reported suicidal ideation within the past week ($n = 59$) did not statistically significantly differ on: (1) adolescent age; (2) number of previous psychiatric hospitalizations; (3) clinician-rated global assessment of functioning (GAF) scores at admission; or (4), number of psychiatric diagnoses at admission.

TABLE 3 Means and standard deviations of adolescent-reported and parent-reported BASC depression T-scores, by reporting dyad

Reporting Dyad	Adolescent report <i>M (SD)</i>	Parent report <i>M (SD)</i>
1 AP-	53.60 (7.44)	52.20 (7.90)
2 AP+	74.00 (4.45)	78.95 (12.94)
3 A+/P-	73.00 (5.62)	57.08 (5.88)
4 A-/P+	50.23 (7.73)	76.68 (10.25)

Note: AP-, Subthreshold on both adolescent and parent report; AP+, Elevated on both adolescent and parent report; A+/P-, Elevated on adolescent report/subthreshold on parent report; A-/P+, Subthreshold on adolescent report/elevated on parent report.

(3, 86) = 71.49, $p < .05$) and parent-reported adolescent depression ($F(3, 86) = 48.26$, $p < .05$).

ANOVAs examining the extent to which the reporting pattern groups statistically predicted concurrent suicidal ideation revealed significant effects ($F(3, 86) = 17.27$, $p < .001$, $\eta^2 = 0.37$; Figure 1). Adolescents from dyads who were “AP+” on adolescent depression reported significantly higher suicidal ideation severity than those from “AP-” dyads. As hypothesized, adolescents from dyads who were “A+/P-” (i.e., adolescent reported elevated depressive symptoms but parents reported subthreshold) also reported significantly higher ideation severity than those from “AP-” dyads. The same was not the case for adolescents from “A-/P+” dyads. We observed similar effects for VAS scores, such that there was a significant main effect of group ($F(3, 86) = 18.70$, $p < 0.001$, $\eta^2 = 0.39$) and

the same patterns of differences across the four groups of dyads described above.

Agreement on depressive symptoms predicting longitudinal adolescent suicidal ideation

Finally, we conducted two ANCOVAs similar to the ones described previously, except here we examined the extent to which reporting patterns predict suicidal ideation severity (i.e., SSI scores) at 3-month follow-up,⁴ with baseline SSI scores included as a covariate. We observed a significant main effect of baseline suicidal ideation severity in predicting suicidal ideation severity during a three-month follow-up assessment ($F(1, 66) = 10.00$, $p < .05$, $\eta^2 = 0.13$). Additionally, we observed a significant main effect of reporting pattern group in predicting suicidal ideation severity at follow-up ($F(3, 66) = 4.73$, $p < .05$, $\eta^2 = 0.17$), even after controlling for baseline severity (Figure 2). Adolescents in the “A-/P+” dyads (i.e., adolescent reported subthreshold depressive symptoms but parents reported elevated) did not report significantly higher ideation severity than those from “AP-” dyads. In contrast to the concurrent relations described previously, there was no significant difference between the “AP+” and “AP-” dyads ($p = .15$). However, here too, “A+/P-” dyads displayed significantly higher suicidal ideation at three-month follow-up, relative to “AP-” dyads ($p < .001$). These results suggest that membership to the “A+/P-” pattern may predict unique risk for later suicidal ideation.

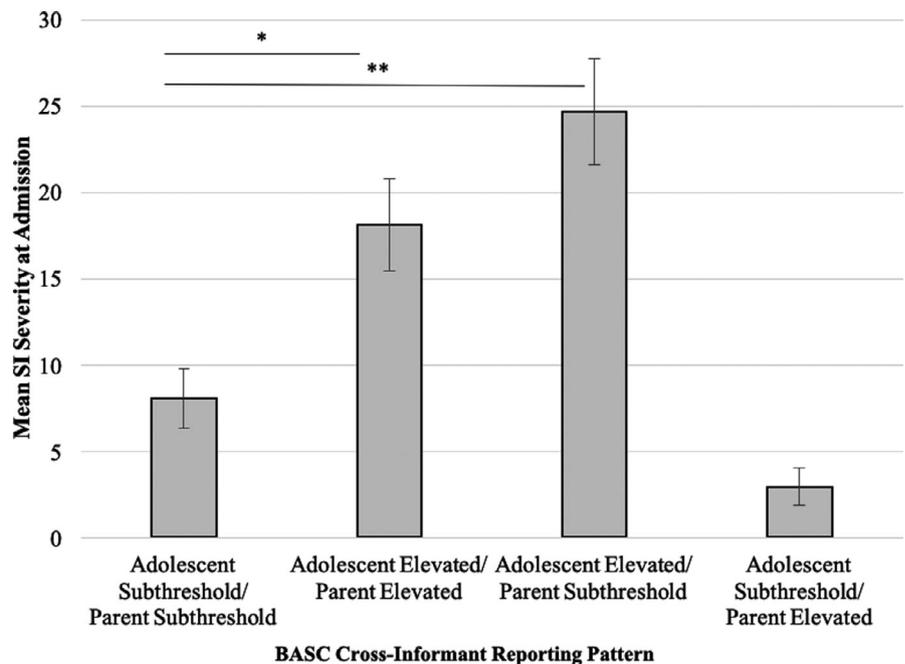


FIGURE 1 Significant relation between reporting pattern of adolescent depressive symptoms and severity of concurrent adolescent suicidal ideation.

Note: ** $p < .01$; *** $p < .001$

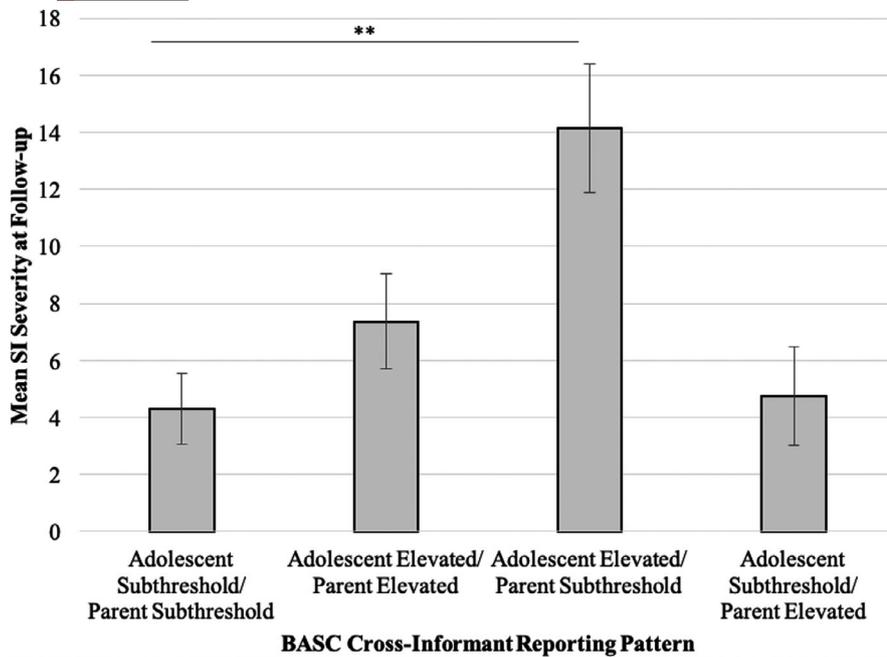


FIGURE 2 Significant relation between reporting pattern of adolescent depressive symptoms and severity of future adolescent suicidal ideation. Note: *** $p < .001$

DISCUSSION

The purpose of the current study was to examine the extent to which the relation between adolescent and parent reports of adolescent depressive symptoms can inform our prediction of adolescent suicidal ideation. We observed two main findings. First, the patterns of correspondence between adolescent and parent reports of adolescent depressive symptoms differentially related to concurrent suicidal ideation severity, suggesting that certain reporting patterns may indicate additional risk for concurrent suicidal ideation. Specifically, adolescents who reported elevated adolescent depressive symptoms also reported significantly higher suicidal ideation severity, relative to dyads in which both the adolescent and parent reported subthreshold adolescent depressive symptoms. Importantly, this pattern was true for adolescents reporting elevated depression symptoms, regardless of whether their parent also reported elevated adolescent depressive symptoms or subthreshold symptoms. Second, patterns of correspondence also differentially predicted future suicidal ideation severity. However, only those dyads wherein adolescents self-reported elevated symptoms and parents reported subthreshold adolescent depressive symptoms predicted significantly higher suicidal ideation relative to those in which both reported subthreshold adolescent depressive symptoms.

Our findings hold several important implications for the clinical assessment and prediction of suicidal ideation. For instance, these findings highlight the clinical utility of collecting multi-informant assessments of adolescent depressive symptoms to further inform our assessments of adolescent risk for suicidal symptoms.

Additionally, our findings suggest that beyond just assessing parallel multi-informant reports of adolescent depressive symptoms, clinicians may gain incrementally valuable information about an adolescent's risk for experiencing current and future suicidal ideation by examining specific patterns of correspondence between adolescent and parent reports of adolescent depressive symptoms. In fact, when predicting future suicidal ideation, only adolescents who reported elevated depressive symptoms and whose parents reported subthreshold adolescent symptoms were at heightened risk for experiencing future suicidal ideation, even after controlling for baseline severity of suicidal thoughts. In other words, although adolescents who report elevated depressive symptoms are at increased risk for concurrent depression, regardless of whether their parents report the adolescents' depressive symptoms are subthreshold or elevated, adolescents who report elevated depressive symptoms and whose parents report subthreshold depressive symptoms are at unique risk for future suicidal ideation. Therefore, relying on adolescent self-report alone results in missed opportunities to identify adolescents at unique risk for suicidal ideation over time. In fact, understanding the degree to which one or both informants report threshold adolescent depressive symptoms provides meaningful information toward predicting negative outcomes. By construction, one cannot obtain this information by interpreting single informants' reports individually or in isolation of one another, as others have recently recommended (e.g., Howe et al., 2019). These findings demonstrate that identifying the magnitude and direction of correspondence among reporters of such symptoms may hold meaningful clinical benefit.

Moreover, our results highlight how identifying reporting pattern dyads may help clinicians tailor certain interventions to meet the unique needs of at-risk adolescents. For instance, the current study illustrates how adolescents who reported elevated depressive symptoms and whose parents reported they were experiencing sub-threshold depressive symptoms represent a clinical group at particular risk for current and future suicidal ideation. In fact, the increased risk among this subgroup of adolescents suggests they would likely benefit from additional clinical monitoring of the adolescents' suicidal symptoms over time and may require more intensive clinical intervention toward improving reporting correspondence. An open question revolves around what exactly this pattern of adolescent and parent reports of depressive symptoms reflects. For instance, the links between this reporting pattern and poor outcomes are in line with prior work from the adolescent development literature (Lippold et al., 2013, 2014), suggesting that the reporting pattern we observed may reflect poor parental monitoring or knowledge about the adolescents' mood concerns, potential targets for additional intervention. Alternatively, this pattern might reflect adolescents' clinical presentations, namely the phenomenology of adolescents' depressive symptoms within this group. For example, relative to other adolescents in our sample, adolescents in this group may be displaying relatively few of the symptoms that a parent might be capable of observing (e.g., anhedonia, sleep, and eating disturbances) and relatively greater internal symptoms (e.g., difficulty concentrating, feeling worthless or guilty). In this respect, perhaps parents who monitor their adolescent a great deal would nonetheless encounter difficulty observing and thus reporting about the depressive symptoms displayed by these adolescents. Thus, further probing of these patterns of adolescent and parent reports could potentially reveal new insights that improve the detection of adolescents at risk for suicidal ideation. As such, these open questions warrant further inquiry.

Limitations and future directions

Several limitations to this study warrant consideration. First, adolescents in the current sample were predominantly identified as White (88.9%). Yet, adolescents from racial and ethnic minorities (e.g., Native American, Hispanic) are at heightened risk for experiencing suicidal thoughts and behaviors (Cash & Bridge, 2009), and racial minorities are less likely to seek care before a suicide attempt (Ahmedani et al., 2015). Consequently, future research should explore the extent to which multi-informant reports of adolescent depression might uniquely predict suicidal ideation among more racially and ethnically diverse populations.

Second, despite efforts to assess suicidal ideation through multiple lenses (e.g., severity, affiliation) and via multiple methods (e.g., self-report questionnaires, VAS ratings), ultimately our assessments of adolescent suicidal ideation relied on adolescent self-report. As mentioned previously, there are several limitations to relying solely on self-report for symptoms such as suicidal ideation (e.g., lack of insight into symptoms, under-reporting to avoid further intervention or to quicken discharge) and those at heightened risk for engaging in suicidal behaviors might also be those less likely to disclose suicidal thoughts (Nock et al., 2010). Consequently, although the current findings provide an important step in clarifying the predictive qualities of exploring multi-method assessments of adolescent depressive symptoms in predicting suicidal symptoms, further research is necessary to examine the extent to which similar findings are observed when adolescent suicidal ideation is measured more objectively. For instance, consistent with prior research, researchers may extend the current study by examining the links between adolescents' depressive symptoms and implicit associations with suicide or death (e.g., Glenn et al., 2017).

Third, the current study did not directly test what factors might be contributing to adolescent-parent reporting differences of adolescent depressive symptoms. In recent work, researchers have observed similar patterns of discrepancy between adolescent and parent reports of adolescent internalizing symptoms and suicidal behaviors as those observed in the current study (see Jones et al., 2019; Makol et al., 2019). One possible explanation for our observed discrepancies between adolescent and parents' reports of adolescent depressive symptoms may lie in the duration or length of adolescent depressive symptoms. In other words, relative to adolescents with a more recent onset of symptoms, adolescents who have experienced depressive symptoms over a longer period of time may benefit from increased agreement in reporting due to increased opportunities for parents to become aware of these symptoms or previous engagement in services. The findings of the current study clearly highlight the importance of identifying the underlying factors driving the discrepancies between adolescent and parent reports of adolescent depressive symptoms. Specifically, identifying such factors can then be used to help inform future treatment uniquely tailored to increase reporting agreement.

CONCLUSIONS

The current study extends prior literature by exploring the extent to which we can augment our prediction of adolescent suicidal symptoms using information about a robust risk factor for suicidal ideation (e.g., depressive

symptoms) that is routinely gathered across a variety of clinical settings. Specifically, we observed that multi-informant reports of adolescent depressive symptoms may further inform our ability to statistically predict current and future suicidal ideation among a high-risk inpatient sample of adolescents. Moreover, our findings highlight that in lieu of relying solely on a single informant (e.g., parent, adolescent), the unique patterns of divergence and convergence between informants may hold clinical value. In particular, within the current study, adolescents who self-reported elevated depressive symptoms but whose parents reported subthreshold adolescent depressive symptoms were at elevated risk for future suicidal ideation, suggesting these adolescents would likely benefit from additional monitoring and interventions tailored to improve their outcomes. This study provides an important first step in exploring how we can augment tools for predicting suicidal thoughts and behaviors using existing methods and routinely collected information about adolescent functioning.

CONFLICTS OF INTEREST

Dr. Nock receives publication royalties from Macmillan, Pearson, and UpToDate. He has been a paid consultant in the past year for Microsoft Corporation, the Veterans Health Administration, Cerebral, and for a legal case regarding a death by suicide. He is an unpaid scientific advisor for Empatica, Koko, and TalkLife. No other disclosures or conflicts of interest to report.

AUTHOR CONTRIBUTION

Tara M. Augenstein: Conceptualization (lead); Data curation (equal); Formal analysis (lead); Investigation (equal); Methodology (equal); Project administration (equal); Resources (equal); Supervision (equal); Writing-original draft (lead); Writing-review & editing (lead). **Katherine F. Visser:** Data curation (equal); Project administration (equal); Writing-original draft (supporting); Writing-review & editing (supporting). **Katie Gallagher:** Data curation (equal); Project administration (equal); Writing-original draft (supporting); Writing-review & editing (supporting). **Andres De Los Reyes:** Conceptualization (supporting); Formal analysis (supporting); Methodology (equal); Writing-original draft (supporting); Writing-review & editing (supporting). **Eugene J. D'Angelo:** Conceptualization (supporting); Funding acquisition (lead); Methodology (supporting); Project administration (supporting); Resources (lead); Supervision (lead); Writing-original draft (supporting); Writing-review & editing (supporting). **Matthew Nock:** Conceptualization (equal); Formal analysis (supporting); Funding acquisition (lead); Investigation (lead); Methodology (equal); Project administration (lead);

Resources (lead); Supervision (lead); Writing-original draft (supporting); Writing-review & editing (supporting).

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