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Adolescent Suicide Risk Screening in the Emergency Department

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Abstract

Objectives—Many adolescents who die by suicide have never obtained mental health services. In response to this, the National Strategy for Suicide Prevention recommends screening for elevated suicide risk in emergency departments (EDs). This cross-sectional study was designed to examine 1) the concurrent validity and utility of an adolescent suicide risk screen for use in general medical EDs and 2) the prevalence of positive screens for adolescent males and females using two different sets of screening criteria.

Methods—Participants were 298 adolescents seeking pediatric or psychiatric emergency services (50% male; 83% white, 16% black or African American, 5.4% Hispanic). The inclusion criterion was age 13 to 17 years. Exclusion criteria were severe cognitive impairment, no parent or legal guardian present to provide consent, or abnormal vital signs. Parent or guardian consent and adolescent assent were obtained for 61% of consecutively eligible adolescents. Elevated risk was defined as 1) Suicidal Ideation Questionnaire-Junior [SIQ-JR] score of ≥ 31 or suicide attempt in the past 3 months or 2) alcohol abuse plus depression (Alcohol Use Disorders Identification Test-3 [AUDIT-3] score of ≥ 3 , Reynolds Adolescent Depression Scale-2 [RADS-2] score of ≥ 76). The Beck Hopelessness Scale (BHS) and Problem Oriented Screening Instrument for Teenagers (POSIT) were used to ascertain concurrent validity.

Results—Sixteen percent ($n = 48$) of adolescents screened positive for elevated suicide risk. Within this group, 98% reported severe suicide ideation or a recent suicide attempt (46% attempt and ideation, 10% attempt only, 42% ideation only) and 27% reported alcohol abuse and depression. Nineteen percent of adolescents who screened positive presented for nonpsychiatric reasons. One-third of adolescents with positive screens were not receiving any mental health or substance use treatment. Demonstrating concurrent validity, the BHS scores of adolescents with positive screens and the POSIT scores of those with positive screens due to alcohol abuse and depression indicated substantial impairment. The addition of alcohol abuse with co-occurring depression as a positive screen criterion did not result in improved case identification. Among the subgroup screening positive due to depression plus alcohol abuse, all but one (>90%) also reported

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severe suicide ideation and/or a recent suicide attempt. This subgroup (approximately 17% of adolescents who screened positive) also reported significantly more impulsivity than other adolescents who screened positive.

Conclusions—The suicide risk screen showed evidence of concurrent validity. It also demonstrated utility in identifying 1) adolescents at elevated risk for suicide who presented to the ED with unrelated medical concerns and 2) a subgroup of adolescents who may be at highly elevated risk for suicide due to the combination of depression, alcohol abuse, suicidality, and impulsivity.

Keywords

adolescent; emergency department; suicide risk; public health; depression; screening

Tragically, suicide is the third leading cause of death among adolescents,¹ and a history of suicide attempts is common among adolescents who die by suicide.²⁻⁴ The nationally representative Youth Risk Behavior Survey revealed that 8.4% of high school students in the United States attempted suicide in the past year, and a total of 16.9% seriously considered a suicide attempt.⁵

Primary risk factors for suicide attempts and suicide among adolescents include previous suicide ideation and behavior, depressive disorders, and alcohol use, in addition to other factors such as conduct disorder or aggressive behavior, a history of sexual abuse, and exposure to adverse life events.⁶⁻⁸ Further, the presence of depression with comorbid alcohol or substance abuse is predictive of more chronic depressive episodes,^{9,10} more severe alcohol-related problems,¹¹ and escalated risk of suicidal behaviors¹² and suicide.¹³

Unfortunately, the majority of adolescents who die by suicide have never received any type of psychiatric treatment or mental health service.^{2,4,14,15} “Psychological autopsy studies” involve examining available records and documents (health care, forensic, school, medical examiner, toxicology results, suicide notes) and conducting structured interviews with the families, friends, teachers, and health care professionals of the youths who died by suicide. In one such study of 53 completed suicides, Marttunen et al.⁴ reported that only 44% of the females and 34% of the males had ever had contact with the psychiatric care system. In a similar study, Shaffer et al.¹⁴ reported that only 24 of 120 youth had been evaluated or treated by a mental health professional during the 3 months prior to their suicide.¹⁴

The emergency department (ED) is ideally suited for the identification of adolescents who are at elevated risk for suicidal behavior and suicide. Approximately 30% of adolescents seek ED services each year.¹⁶ Moreover, many adolescents use the ED as their primary source of health care, and research indicates that the incidence of risk factors such as depression and alcohol abuse are higher in adolescents who use the ED in this manner.¹⁷ Finally, in a retrospective study, Gairin et al.¹⁸ reported that 39% of a consecutive sample of 219 suicide deaths (ages 16–93 years) had attended an ED in the year prior to their death.¹⁸ Taken together, these studies support the ED as a strong potential setting for adolescent suicide risk screening.

This study examined the concurrent validity and utility of an ED-based screening protocol for elevated risk of suicidal behavior and suicide among adolescents. Evidence-based psychosocial treatments for adolescent alcohol abuse¹⁹ and depression^{20–24} exist, and the newer antidepressants have demonstrated some benefit for adolescents.²⁵ However, as noted above, many adolescents at elevated risk for suicide have never obtained any mental health services. The study aims to take a first step in addressing this problem by closely examining a screening protocol designed to identify adolescent males and females at elevated risk.

Previous projects have demonstrated the feasibility of adolescent depression screening^{26,27} and suicide risk screening for youths with psychiatric complaints²⁸ in pediatric emergency settings. In addition, the key issues relevant to screening for suicide risk in pediatric emergency settings were recently reviewed.²⁹ This study builds upon these contributions by screening adolescents who present with psychiatric and nonpsychiatric complaints and by taking into account the heterogeneity that characterizes suicidal adolescents. In this study, we examine two sets of screen criteria, defining a positive screen as either 1) severe suicide ideation or recent attempt or 2) co-occurring depression and alcohol abuse. To our knowledge, this is the first adolescent suicide risk screening study implemented in the ED with adolescents who present for nonpsychiatric complaints.

METHODS

Study Design and Population

This was a cross-sectional convenience sample of adolescents (ages 13–17 years). The study was approved by the institutional review board of the university. Written informed consent was obtained from the parent or guardian, and written informed assent was obtained from the adolescent. During the assent process, participants were informed that their parent/guardian and ED physician would be notified if they screened as “high risk” for suicide, as defined by the study risk management protocol. Screening was conducted by research staff members, with a bachelor's degree or higher, who were trained in the informed consent process, administration of self-report measures, and suicide-specific risk management protocol.

The study was conducted at the ED of a university teaching hospital. In 2007, the ED had over 75,000 visits. Consecutive adolescents seeking care were approached for study participation during late afternoon/evening shifts (three per week) between April 2007 and May 2008. Patients were included regardless of whether they were seeking nonpsychiatric or psychiatric care, both of which are offered in our ED. Exclusion criteria included 1) severe cognitive impairment, 2) no parent or legal guardian present, 3) abnormal vital signs, and 4) parent/guardian or adolescent do not speak English. Sixty-one percent of eligible adolescents participated.

Survey Content and Administration

Adolescents, without their parents present, completed the screen self-report measures in a written format, requiring 5 to 10 minutes. If the adolescent's medical condition prevented

him or her from completing written forms, study measures were administered verbally. Demographic information was collected in an interview format with the parent or guardian.

Screen Survey

Depression—The 30-item self-report Reynolds Adolescent Depression Scale 2nd Edition (RADSD-2) was used to screen for depression. Developed for community-based screening, it is brief and easy to read, has excellent psychometric properties, and has extensive grade- and sex-based norms.³⁰ The validated clinical cutpoint of 76 was used.³⁰

Suicide Ideation and Recent Suicide Attempt—The Suicidal Ideation Questionnaire-Junior (SIQ-JR) is a 15-item self-report scale assessing the frequency of a wide range of suicidal thoughts.³¹ It was developed for community-based screening, is relatively brief, and has grade- and sex-based norms. Total scores have excellent, well-documented psychometric properties.^{31,32} The SIQ-JR total scores of psychiatrically hospitalized adolescents have been found to be significant predictors of suicidal thoughts and attempts 6 months posthospitalization.³³ In this study, a positive screen was defined as a score at or above the empirically established clinical cutpoint of 31.³¹ The occurrence of one or more suicide attempts during the previous 3 months was assessed with a dichotomous indicator, with further information requested for “yes” responses.

Alcohol Abuse—Alcohol consumption was assessed using the three-item Alcohol Use Disorders Identification Test (AUDIT-3).³⁴ The AUDIT-3 has been validated for use with adolescents in the ED³⁵ and, compared to other brief screening tools, has shown superior discrimination in identifying adolescents with alcohol use disorders. The three items of the AUDIT-3 assess frequency of alcohol consumption, typical quantity of alcohol use, and frequency of binge drinking (six or more drinks on one occasion). A cutpoint of 3 or greater was used in this study because it was determined to be optimal for identifying adolescents with alcohol use disorders.³⁵

Positive Screen Criteria—A positive screen for elevated suicide risk was defined as a score at or above the clinical cutpoint of the SIQ-JR,³¹ a recent history of a suicide attempt, or a combination of scores at or above the cutpoint on both the RADSD-2³⁰ and the AUDIT-3.³⁵ The latter combination criteria were used, in addition to direct questioning about suicide ideation and behavior, because depression combined with alcohol use has been associated with increased risk of suicidal behaviors¹² and suicide¹³ and because suicide ideation has not been strongly linked with suicide attempts in adolescent males.³⁶ This is critical, as males are approximately four times more likely to die by suicide than females.¹

Adolescents who screened positive for elevated suicide risk completed additional measures. If an adolescent was determined to be at “high risk” for suicide (acute risk requiring immediate attention, defined in study risk management protocol), the study screening staff notified ED personnel and the study project director. The risk determination was made by a licensed mental health professional.

Other Measures

Alcohol Abuse—For positively screened adolescents, the full 10 items of the AUDIT-10³⁷ were used to assess alcohol abuse in detail. The AUDIT-10 was used to provide feedback to adolescents about problem areas related to drinking that were determined by a confirmatory factor analysis.³⁸

Alcohol Consequences—A 17-item scale from the Problem Oriented Screening Instrument for Teenagers (POSIT) was used to assess adolescent alcohol-related consequences.^{39,40} This scale was used to assess the concurrent validity of the three-item AUDIT alcohol screen.

Beck Hopelessness Scale—The Beck Hopelessness Scale (BHS) is a 20-item true–false self-report scale that assesses the extent of negative attitudes about the future.^{41,42} It is scored by summing the answers to each item (as 0 or 1), with a total score ranging between 0 and 20. Concurrent validity has been established in studies reporting significant correlations between BHS scores and measures of depression and suicide ideation in psychiatrically hospitalized adolescents.⁴³ Studies have also reported that adolescents with a history of suicide attempts had significantly higher BHS scores than community samples and inpatients without a history of attempts.⁴⁴

Services—The Services Assessment Record Review (SARR, available from first author CAK) was completed by interview with parents and is available for 41 of the 48 adolescents with positive screens. It assesses which types of services the adolescent has used in the past year (including health, mental health, substance use, and other services) as well as the frequency of use for those services. It also assesses history of psychiatric medications prescribed during the past year.

Impulsivity—The 30-item self-report Barratt Impulsivity Scale (BIS-11) has three factors that assess motor impulsiveness, nonplanning, and attentional impulsiveness.⁴⁵ Each item is scored with a four-point Likert scale from 1 to 4, with total scores ranging between 30 and 120. The BIS-11 is correlated with other measures of impulsivity and aggression, appears to discriminate between more impulsive groups such as prison inmates and less impulsive groups such as college students, and has been associated with increased levels of substance use and suicidality.⁴⁵

Medical Chart Abstraction

Chief complaints were extracted from medical charts and coded by trained research assistants, in keeping with the criteria described by Gilbert et al.⁴⁶ All data were independently coded by two research staff. We used two primary and six secondary categories: nonpsychiatric complaint (medical, unintentional injury, intentional injury by other) and psychiatric complaint (psychiatric-nonsuicidal, suicide ideation, suicide attempt). The intercoder percentage agreement for the six secondary categories was 97.6%. Adolescents were determined to have nonsuicidal self-injuries if they inflicted self-harm without any evidence of even possible fleeting suicidal intent. This classification is in accordance with a widely accepted taxonomy of suicidal behavior set forth by O'Carroll et

al.⁴⁷ and Silverman et al.⁴⁸ Such injuries were classified into “nonpsychiatric complaint” if there were no psychiatric symptoms recorded, and into “psychiatric complaint” if they co-occurred with a psychiatric symptom (e.g., superficial cut, depressive symptoms).

Data Analyses

Data were analyzed in SPSS Version 15 (SPSS Inc., Chicago, IL). Descriptive statistics are reported. Chi-square tests were used for comparisons involving categorical variables and *t*-tests were used for group comparisons of continuous variables. Internal consistencies were calculated using the alpha coefficient.

RESULTS

A total of 491 adolescents meeting inclusion/exclusion criteria were approached and 298 consented (61% consent rate). There were 148 males and 150 females ranging in age from 13 years to 17 years (mean \pm standard deviation [SD] = 15.02 \pm 1.39 years). The consent rate was not significantly different for females compared to males (63.56% vs. 57.42%, $\chi^2(1, N = 491) = 1.933$; $p = 0.16$). Similarly, there were no age differences between those who did and did not consent (mean \pm SD = 15.04 \pm 1.37 vs. mean \pm sd = 15.04 \pm 1.38, $t(489) = -0.037$; $p = 0.97$). The racial/ethnic distribution for consented subjects was as follows: 83% ($n = 247$) white, 16% ($n = 48$) black or African American, 2.4% ($n = 7$) American Indian or Alaskan Native, and 3.0% ($n = 9$) Asian (participants could select more than one race; see Table 1). Of the sample, 5.4% ($n = 16$) were Hispanic. Due to institutional review board regulations that limited the data available to us prior to study consent, we were unable to obtain racial/ethnic information for subjects who refused participation.

Positive Versus Negative Screens for Elevated Suicide Risk

Among consenting adolescents, 295 adolescents (99.0%) completed the suicide risk screen and 48 adolescents (16%) screened positive for elevated suicide risk. Sex was the only demographic variable differentiating positive and negative screens. Females screened positive for elevated suicide risk significantly more than males ($n = 32$ or 21.3% of females vs. $n = 16$ or 10.8% of males, $\chi^2(1, N = 295) = 6.24$; $p < 0.01$). Table 1 presents demographic characteristics and screening results for the positively screened adolescents in comparison to the total sample. (Note: Three adolescents did not complete enough of the screening measures for the screens to be considered valid.)

Figure 1 presents detailed findings on reasons that adolescents screened positive for elevated suicide risk. Of the 48 adolescents who screened positive, 98% ($n = 47$) screened positive due to a recent suicide attempt and/or suicide ideation as measured on the SIQ-JR. Forty-six percent ($n = 22$) of the adolescents reported a recent attempt paired with suicide ideation, 10% ($n = 5$) reported only a recent attempt, and 42% ($n = 20$) reported only suicide ideation. Largely overlapping with this, 27% ($n = 13$) screened positive due to the combination of alcohol abuse and depression. In comparing the two sets of screen criteria, only one additional suicide risk case was identified by the alcohol abuse plus depression screen criterion. The screen measures each exhibited high internal consistency in this sample (RADS-2, $\alpha = 0.95$; SIQ-JR, $\alpha = 0.97$; AUDIT-3, $\alpha = 0.89$).

Positive screen adolescents who presented for psychiatric versus nonpsychiatric chief complaints did not differ in terms of demographic characteristics (age, sex, and race/ethnicity) or scores on depression, suicide ideation, or alcohol/substance use scales (RADS-2, SIQ-JR, Suicide Attempt Question; AUDIT-10, POSIT, BHS).

Screening Validity

Adolescents who screened positive for depression and alcohol abuse, with or without suicide ideation or recent suicide attempt, reported significantly more negative consequences from alcohol use on the POSIT than those not screening positive for depression and alcohol abuse (mean \pm SD = 6.8 \pm 5.6 vs. mean \pm SD = 1.1 \pm 2.6, $t(12.86) = 3.44$; $p < 0.01$). Similarly, these adolescents reported significantly more impulsivity on the BIS-11 than those who reported significant suicide ideation or a recent suicide attempt but not depression and alcohol abuse (mean \pm SD = 83.8 \pm 8.2 vs. mean \pm SD = 76.0 \pm 12.1, $t(42) = 2.04$; $p < 0.05$). Adolescents who screened positive for elevated suicide risk had results on the BHS (mean \pm SD = 11.7 \pm 5.3) comparable to or higher than those previously reported for psychiatrically hospitalized adolescents (mean \pm SD = 6.9 \pm 4.9).⁴⁹ This supports the screen's concurrent validity, as BHS scores have shown predictive validity for suicide attempts in adolescents⁴³ and for eventual suicide in adults.⁴² Validation measures demonstrated high internal consistency in this sample (AUDIT-10, $\alpha = 0.92$; POSIT, $\alpha = 0.94$; BHS, $\alpha = 0.88$; BIS, $\alpha = 0.82$).

Within the total sample of screened adolescents, mean scores on all screen measures were significantly higher for adolescents with a psychiatric chief complaint compared to those with a nonpsychiatric chief complaint. SIQ-JR mean (\pm SD) scores were higher: 40.82 (\pm 27.01) versus 6.26 (\pm 7.87), $t(63.78) = 9.96$, $p < 0.01$. RADS-2 mean (\pm SD) scores were higher: 81.73 (\pm 13.64) versus 53.04 (\pm 13.63), $t(293) = 14.72$, $p < 0.01$. Similarly, AUDIT-3 mean (\pm SD) scores were higher 1.55 (\pm 2.41) versus 0.58 (\pm 1.40), $t(70.79) = 3.02$, $p < 0.01$.

Screening Utility

Among adolescents who screened positive for elevated suicide risk, 19% ($n = 9$) presented for nonpsychiatric reasons and 35.4% ($n = 17$) presented for complaints other than suicide ideation and behavior, including psychiatric and nonpsychiatric complaints. Figure 2 displays the chief complaints for all adolescents with positive suicide risk screens.

There were no significant differences in the proportion of positively screened adolescents who were obtaining mental health services based on whether they presented with a nonpsychiatric or psychiatric chief complaint. Sixty-seven percent of positively screened adolescents presenting with a psychiatric complaint were receiving mental health services, compared to 50% of positively screened adolescents presenting with a nonpsychiatric complaint ($n = 41$, degrees of freedom = 1, $p = 0.434$). Among all adolescents who screened positive (with services data), 23 (56.1%) were currently obtaining mental health treatment, two (4.9%) were obtaining substance abuse treatment and mental health treatment, and one (2.4%) was obtaining substance abuse treatment only. Fifteen positively screened adolescents (36.6%) were not receiving any mental health or substance use treatment.

DISCUSSION

This study demonstrated the concurrent validity and potential utility of a brief suicide risk screening protocol for adolescents seeking emergency services that addresses multiple suicide risk factors in boys and girls. Sixteen percent of consented adolescents screened positive for elevated suicide risk, which was defined as significant current suicidal thinking, a recent suicide attempt, or a combination of alcohol abuse and depression. The broad screening criteria were used due to the multiple and overlapping risk factors for suicidal behavior and suicide among adolescents,⁵⁰ and the previous finding that self-reported suicide ideation is not a predictor of suicide attempts among male adolescents.³⁶

Nearly twice as many females as males screened positive for elevated suicide risk. This was the only demographic variable that differentiated positive and negative screens. This is consistent with the higher prevalence rates of suicide ideation and suicide attempts in adolescent females versus males,⁵ which are primary suicide risk screen criteria. However, this finding, and the national prevalence rates for nonlethal suicidality, also reflect the difficulty in identifying high-suicide-risk males for whom the rate of death by suicide is four to five times higher than that of females.¹ Research consistently indicates that males are less likely to engage in professional help seeking than females.⁵¹ The ED may be one place where these high-risk adolescent males can be successfully identified, and one-third of adolescents who screened positive in this study were male. This risk identification may be the first step in meeting the challenge of reducing the toll of suicide among adolescent males.

A surprising finding in this study was that, after taking into account adolescents' suicidal thoughts and behaviors as positive screen criteria, the combination of alcohol abuse and depression identified only one additional positive screen. Ninety-eight percent of positive screens were associated with a recent suicide attempt and/or current significant suicidal thoughts, defined as a score above the clinical cutpoint on the standardized SIQ-JR.³¹ Consistent with previous studies indicating a strong link between alcohol abuse, depression, and suicidality,^{9,10,12,13} almost all of the 27% who screened positive for alcohol abuse and depression also screened positive for suicide attempt and/or current suicidal thoughts. This suggests that one could shorten the 5- to 10-minute screen protocol to an even briefer screen of 2–5 minutes by screening only for severe suicide ideation or a recent suicide attempt. These time estimates are based on published scale administration times.^{30,31,37}

The data also suggest, however, that the combination of screening tools used in the present study may be important in identifying adolescents at an even more highly elevated level of suicide risk. If resources are limited, this could be particularly important for maximally facilitating the next steps: treatment linkage and engagement. As noted above, adolescents who screened positive for alcohol abuse and depression generally reported some type of suicidality. Further, 17% of adolescents who screened positive reported a recent suicide attempt, alcohol abuse, and depression. Because those who screened positive for alcohol abuse and depression in our study reported significantly higher levels of impulsivity than other adolescents who screened positive, and because a recent suicide attempt is a risk factor for another suicide attempt and suicide,⁵² this subgroup may be at a highly elevated level of

risk. Longitudinal outcome research is needed to determine the relative predictive validity of the briefer and more comprehensive screen criteria.

Protocols have been developed to screen adolescent ED patients for depression.^{26,27} Moreover, Horowitz et al.²⁸ developed a four-item screen to identify suicide risk in child and adolescent ED patients using the SIQ to establish the criterion. However, the study by Horowitz only involved screening children and adolescents who presented with psychiatric chief complaints (as determined by a triage nurse). Our study's screening protocol builds upon these previous efforts by screening for suicide risk in adolescents who present with nonpsychiatric and psychiatric chief complaints and by examining the potential utility of screening for a broader range of suicide risk factors. The screen protocol we used showed evidence of strong concurrent validity. Those who screened positive had BHS scores in the clinical range, and previous research indicates that BHS scores predict suicide attempts and eventual suicide.^{42,43} Those who screened positive for alcohol and depression reported significant alcohol-related functional impairment and less treatment received for injuries. Given that depression may characterize only approximately 50% of male suicides,⁵³ depression screening alone is insufficient to detect elevated suicide risk. Furthermore, among males, suicide attempts in young adulthood have not been associated with higher rates of reported suicide ideation during adolescence.³⁶ Public health concerns may be better served through broader suicide screening measures, and this protocol offers a short, efficient means of screening for suicide risk in adolescent ED patients.

LIMITATIONS

The present study was conducted at one university hospital and the sample was predominantly white, which may limit the generalizability of findings. As a university ED with specialized psychiatric emergency services available, it is possible that psychiatric complaints were somewhat overrepresented in this sample. Further, because the study consent rate was 61% of consecutive patients meeting eligibility criteria, it is possible that some characteristic of adolescents or parents who refused consent may have been meaningful to screening for elevated suicide risk. However, this consent rate is similar to that obtained for other ED-based suicide screening protocols.^{26,27} Another possible limitation includes sole reliance on a self-report screening strategy. However, such a strategy has maximum feasibility in the ED setting and showed evidence of concurrent validity. Additionally, baseline assessments of functioning were not obtained for negatively screened adolescents, which somewhat limited the scope of data concerning the screening survey's concurrent validity.

CONCLUSIONS

The suicide risk screen protocol demonstrated strong concurrent validity and utility in identifying adolescents with elevated suicide risk who may not otherwise have been identified. Sixteen percent of study-eligible adolescents who were seeking ED services and assented to study participation (with parent or guardian consent) screened positive for elevated suicide risk; one-third of these adolescents were not receiving any mental health or substance use treatment. Among those who screened positive, a significant minority (19%)

presented for nonpsychiatric reasons and perhaps would not have been otherwise identified. This subgroup included at-risk males who, as a group, are at particularly high risk for suicide. Finally, the screen criterion of severe suicide ideation or recent suicide attempt performed as well in case identification as the more comprehensive screen criteria that also included depression and alcohol abuse.

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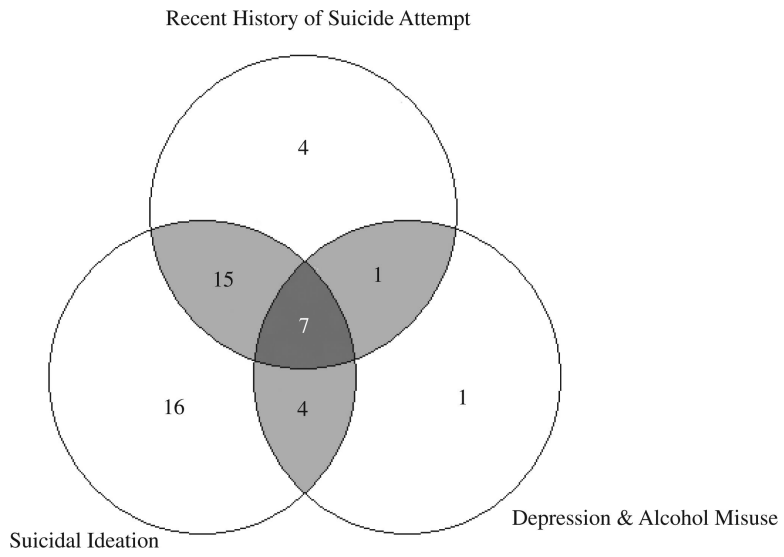


Figure 1.
Reasons for positive suicide risk screens; $n = 48$.

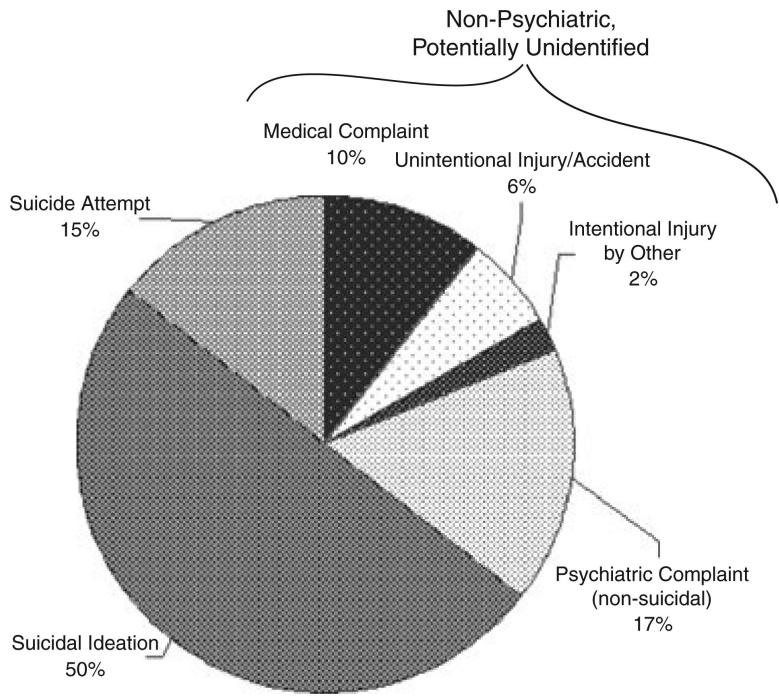


Figure 2. Chief complaints for adolescents with positive suicide risk screens; $n = 48$.

Table 1

Comparisons of Adolescents with Negative and Positive Screens

Clinical/Demographic Variable	Negative Screens (<i>n</i> = 247)	Positive Screens (<i>n</i> = 48)
SIQ-JR	5.96 ± 6.34	52.48 ± 20.88
RADS-2	53.95 ± 13.92	85.40 ± 12.55
AUDIT-3 (for alcohol use)	0.53 ± 1.33	2.11 ± 2.61
Age, yr	15.00 ± 1.37	15.10 ± 1.33
Male	131 (53.0)	16 (33.3)*
Female	116 (47.0)	32 (66.7)*
Hispanic	4 (5.7)	2 (4.2)
Race [†]		
White	207 (83.8)	40 (83.3)
Black or African American	39 (15.8)	6 (12.5)
Asian	8 (3.2)	1 (2.1)
American Indian or Alaskan Native	4 (1.6)	3 (6.3)
Other race	7 (2.8)	2 (4.2)

Data are reported as mean ± SD or number (%).

AUDIT-3 = Alcohol Use Disorders Identification Test; RADS-2 = Reynolds Adolescent Depression Scale-2; SIQ-JR = Suicidal Ideation Questionnaire-Junior.

*The greater proportion of females screening positive was significant ($p < 0.01$).

[†]Participants could respond "Yes" to multiple categories.