**Supplementary Methods**

**Supplementary material on randomized recruitment from shifts in Emergency Departments (S1).** Each center provided their weekly schedule of hours during which staff would be available for screening. For each site and week, we randomly selected 5 screening windows of 5 hours each within the schedule of availability, with more weight given to times when higher numbers of youth within the eligible age range present to the ED. There were two primary purposes for this procedure. First, due to feasibility and funding issues, it would not be possible for sites to screen at all available times – the study budget would cover 25 hours of effort per week per site. Second, because of the first constraint, if sites were allowed to screen at any time, they might have chosen times that were more convenient or even approached only patients that were “easy”, thereby enrolling a lower-risk population or introducing other types of selection bias. By making the timing random, we were able to capture a fairly representative sample of youth and eliminate most, if not all, of the potential for selection bias from the side of study staff.

**Supplementary Material on the Scoring of the IAT (S2)**

This version of the IAT consists of 7 blocks of trials. Blocks 1, 2, and 5 are separate sorting (no associations) practice blocks and are not included in the D-algorithm calculation. Any trials with a response time of greater than 10,000 ms are deleted. Blocks 3 and 6 involve congruent (Me-Life/Not Me-Death associations) and incongruent (Me-Death/Not Me-Life associations) responses respectively. The order of the congruent and incongruent blocks are counterbalanced. We found that there were no order effects, nor was there an interaction between order and group. (Wald Chi-square= 0.83, p<0.37), which is consistent with the fact that the order of presentation was randomized.

These blocks each have 20 trials and are used to calculate one D-score. Blocks 4 and 7 match their previous block’s responses, but they each have 40 trials and are used to calculate another D-score. We followed the steps described below:

1. The “inclusive” standard deviation for all the trials in Blocks 3 and 6 and likewise for all trials in blocks 4 and 7 are computed
2. Four mean latency response times, from the onset of the stimuli to the correct response being made on each trial for each block (3, 4, 6, and 7), are computed.
3. Two mean difference scores are calculated, one for blocks 3 and 6 (i.e., block 3 – block 6), and another for blocks 4 and 7, such that lower values indicate faster congruent responses.
4. Each difference score is divided by its associated ‘inclusive’ standard deviation.
5. Finally, the D-algorithm score is derived by equal-weight averaging of the two separate D-scores from step

**Supplementary materials S3: 10-fold cross-validation methods.**

The results of the 10-fold cross-validation of the full population models (both univariable and multivariable) are described in Table S4a. For each fold, we calculated the area under the precision-recall curve (AUPRC), the proportion of three-month attempts for comparison with the AUPRC, and the AUC for comparison with AUCs reported in the manuscript.

The AUPRC shows that the univariable IAT model may not be better than chance as a predictor of three-month attempt. The multivariable model is not significantly better than the univariable model. The multivariable model is a better-than-chance predictor according to the AUPRC. The cross-validated AUCs show that the univariable model is not better than chance and the multivariable model is better than the univariable model at predicting three-month attempt.

The full population models in the mansucript show a univariable model AUC of 0.58 (0.52, 0.65) and a multivariable model AUC of 0.87 (0.84, 0.90). The cross-validated univariable model AUC has a mean and 95% CI of 0.588 (0.436, 0.740) and the multivariable model had an AUC mean and 95% CI of 0.876 (0.789, 0.963). The point estimates are very similar and the confidence limits are a little wider for the cross-validated results which is expected due to the smaller sample size estimating them.

Table S1: List of measures used for baseline and follow-up assessments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Domain | Measure | # items | Sample item(s) | comments |
| Suicidality | Ask Suicide Screening Questions (ASQ) (Horowitz et al., 2012) | 4 | ASQ-3: In the past week you had thoughts of killing yourself? | ASQ-3 used to define suicidal ideation; baseline and three months |
|  | Columbia Suicide Severity Rating Scale (C-SSRS) (Posner et al., 2011) | 6-7 | In the past month, have you had thoughts of killing yourself | Covers lifetime severity of thoughts, attempts, other suicidal behavior, severity of suicidal ideation, baseline and three months.  At follow-up youth and/or parent report |
|  | Suicide Rumination Scale  (King et al., 2019) | 2 | When I have suicidal thoughts, it is hard to think about other things; My suicidal thoughts repeat over and over in my head |  |
| Depression | Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer & Williams, 2001; Richardson et al., 2010) | 9 | PHQ-9, item 9, “Over the past two weeks, how often have you been bothered by… thoughts that you would be better off dead, or of hurting yourself? | First two items, PHQ-2 measure mood and anhedonia |
| Hopelessness | Mood and Feelings Questionnaire (Angold et al.,1995) | 1 | How hopeless do you feel now (3-point scale)? | 3-point Likert scale |
| Anxiety | Short Screen for Anxiety Related Emotional Disorders (SCARED) (Birmaher et al., 1999) | 5 | People tell me I worry too much. | 3-point Likert scale |
| Agitation | Brief Agitation Measure (BAM) (Ribeiro, Bender, Selby, Hames, & Joiner, 2011) | 3 | I feel so stirred up, I want to scream. | 7-point Likert scale |
| Sleep | Patient Reported Outcomes Measurement Information System (PROMIS), short form (Cella et al., 2007) | 4 | My sleep was refreshing. | 5-point Likert scale |
| Adaptive  functioning | From Patient Health Questionnaire-10 (Eisenberg, Hunt, & Speer 2013) | 1 | Over the past two weeks, how hard has it been for you to do what you need to do and get along with others? |  |
| Alcohol Use | Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998; Chung, Colby, Barnett, & Monti, 2002; Saunders, Aasland, Babor, De La Fuente, & Grant,1993) | 3 | How many drinks with alcohol in it do you have on a day when you were drinking? | Baseline and three months |
| Binge Eating | Eating Attitudes Test (EAT) (Ocker, Lam, Jensen, & Zhang, 2007) | 1 | I have gone on eating binges where I feel that I may not be able to stop | 6-point scale for frequency from never to once a day or more |
| Dieting | Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2012) | 1 | During the past 30 days, did you ever take any diet powders, or liquids without a doctors advice, or did you vomit or take laxatives to keep from gaining weight? |  |
| Stressful Life Events | Life Events Checklist (Gray, Litz, Hsu, & Lombardo, 2004) | 4 | Surveys loss due to death or relationship break-up, suspended or expelled from school, arrested, parents separated or divorced |  |
| Positive Emotion | Positive and Negative Affective Symptoms (PANAS) (Laurent et al., 1999) | 5 | Joyful, Cheerful, Lively, Happy, Proud |  |
| Exposure to Violence | DISC-IV Trauma Screen (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) | 2 | Have you ever been in a situation where you or someone close to you was going to be killed… or to be hurt very badly? |  |
| Drug Use | National Institute on Drug Abuse—Modified Alcohol, Smoking and Substance Involvement Screening Test (version 31) of the Drug Use Scale (National Institute for Drug Abuse, 2013) | 1 |  | Focus on cannabis use of at least monthly over the past three months |
| Impulsivity/  aggression | Impulsive-Aggressive Quick Screen from the Impulsive Pre-meditated Aggression Scale (Stanford, Greve, & Dickens, 1995) | 1-4 | Over the past three months, have there been times when you have become angry in a way that you at times became angry and engaged with others in a way that was out-of-control and inappropriate? |  |
|  | UPPS (Urgency, Premeditation (lack of), Perseverance (lack of), Sensation Seeking) Urgency Subscale (Miller, Zeichner, & Wilson, 2012) | 4 | When I feel rejected, I will often say things I wish I hadn’t. | 4-point Likert scale |
|  | Youth Risk Behavior Survey (Martins & Alexandre, 2012; Peleg-Oren, Saint-Jean, Cardenas, Tammara, & Pierre, 2009) | 1 |  |  |
| Non-suicidal self-injury (NSSI) | Youth Risk Behavior Survey (CDC, 2012)  Methods and Functional Assessment of Self-Mutilation (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007) | 2 | During the past 12 months, how many times did you do something to purposely hurt yourself without wanting to die, such as cutting or burning yourself on purpose?  What methods have used (total # methods)? |  |
| Peer victimization  Parent-child  connection | Peer Victimization and Perpetration Questionnaire—Peer Victimization, and Bully Perpetration (Brunstein-Klomek et al., 2011; Brunstein-Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Brunstein-Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2008) | 4 (two items each) |  | 5-item Likert scale |
| Homicidal thoughts |  | 1-2 | In the past month, have you had any thoughts about wanting to kill someone else?  If yes, “do you currently have any intent or plan to kill someone |  |
| Connectedness | Parent-child connectedness scale (Resnick et al., 1997) | 2 | How much do people in your family understand you? | 5-item Likert Scale |
|  | School Connectedness Scale (Resnick et al., 1997) | 2 | You feel like you are a part of the school. | 5-item Likert from strongly disagree to strongly agree |
|  | Social connectedness: How I feel about friends from Hemingway’s Adolescent Connectedness Scale (Karcher & Sass, 2010) | 2 | I have friends I’m really close to and trust completely. |  |
| Childhood Physical and Sexual Abuse | Childhood Trauma Questionnaire, Short Form (CTQ-SF) (Bernstein et al, 2003; Garisch & Wilson, 2015) | 2 | People in my family have hit me so hard that it left me with bruises or marks. | One item each for physical and sexual abuse |
| Gender Identity |  | 1 | What is your current gender identity? |  |
| Sexual identity | Kann et al., 2011; Loosier & Dittus, 2010; Savin-Williams & Vrangalova, 2013 | 1 | Do you see yourself as… (straight, mostly straight, etc.)? |  |
| Demographics | Age, gender, racial and ethnic identification, mother and father education, welfare status, pubertal status | 12 |  | Youth and parent report |

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| Supplemental Table S2: Demographic and clinical variables by three-month attempt | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial Emergency Department (ED) Visit and three-month follow-up** | |  | |
|  | **No (N = 1594)** | **Yes (N = 85)** | **Overall (N = 1679)** | **P-value** |
| **Race** |  |  |  | 0.6953 |
| American Indian or Alaska Native | 19 (1.2%) | 1 (1.2%) | 20 (1.2%) |  |
| Asian or Native Hawaiian or Other Pacific Islander | 24 (1.5%) | 2 (2.4%) | 26 (1.5%) |  |
| Black or African American | 368 (23.1%) | 18 (21.2%) | 386 (23.0%) |  |
| White | 886 (55.6%) | 53 (62.4%) | 939 (55.9%) |  |
| Multi-racial | 110 (6.9%) | 4 (4.7%) | 114 (6.8%) |  |
| Unknown or unavailable | 187 (11.7%) | 7 (8.2%) | 194 (11.6%) |  |
| **Ethnicity** |  |  |  | 0.8363 |
| Hispanic or Latinx | 336 (21.1%) | 15 (17.6%) | 351 (20.9%) |  |
| Not Hispanic or Latinx | 1089 (68.3%) | 59 (69.4%) | 1148 (68.4%) |  |
| Unknown | 91 (5.7%) | 5 (5.9%) | 96 (5.7%) |  |
| MISSING | 78 (4.9%) | 6 (7.1%) | 84 (5.0%) |  |
| **Gender** |  |  |  | <.0012 |
| Male | 586 (36.8%) | 16 (18.8%) | 602 (35.9%) |  |
| Female | 1008 (63.2%) | 69 (81.2%) | 1077 (64.1%) |  |
| **Age in Years** |  |  |  | 0.6651 |
| mean (standard deviation) | 15.1 (1.61) | 15.1 (1.43) | 15.1 (1.60) |  |
| median (quartile 1 quartile 3) | 15.2 (13.8 16.4) | 15.1 (14.0 16.1) | 15.2 (13.8 16.4) |  |
| **Childs grade in school** |  |  |  | 1.0003 |
| 5th - 8th grade | 519 (32.6%) | 28 (32.9%) | 547 (32.6%) |  |
| 9th - High School graduate | 1018 (63.9%) | 54 (63.5%) | 1072 (63.8%) |  |
| Child does not attend school | 8 (0.5%) | 0 (0.0%) | 8 (0.5%) |  |
| MISSING | 49 (3.1%) | 3 (3.5%) | 52 (3.1%) |  |
| **Amount of school completed by childs mother/stepmother** |  |  |  | 0.6553 |
| High school graduate or less | 420 (26.3%) | 23 (27.1%) | 443 (26.4%) |  |
| Some college/technical training | 438 (27.5%) | 22 (25.9%) | 460 (27.4%) |  |
| College graduate/professional training | 657 (41.2%) | 34 (40.0%) | 691 (41.2%) |  |
| Don't know/Not applicable | 30 (1.9%) | 3 (3.5%) | 33 (2.0%) |  |
| MISSING | 49 (3.1%) | 3 (3.5%) | 52 (3.1%) |  |
| **Amount of school completed by child’s father/stepfather** |  |  |  | 0.3803 |
| High school graduate or less | 595 (37.3%) | 29 (34.1%) | 624 (37.2%) |  |
| Some college/technical training | 299 (18.8%) | 22 (25.9%) | 321 (19.1%) |  |
| College graduate/professional training | 497 (31.2%) | 22 (25.9%) | 519 (30.9%) |  |
| Don't know/Not applicable | 146 (9.2%) | 8 (9.4%) | 154 (9.2%) |  |
| MISSING | 57 (3.6%) | 4 (4.7%) | 61 (3.6%) |  |
| **Family currently receives public assistance (i.e., food stamps, Medicaid)** |  |  |  | 0.2722 |
| No | 882 (55.3%) | 42 (49.4%) | 924 (55.0%) |  |
| Yes | 655 (41.1%) | 40 (47.1%) | 695 (41.4%) |  |
| MISSING | 57 (3.6%) | 3 (3.5%) | 60 (3.6%) |  |
| **Suicidal Ideation in past week) (Ask Suicide-Screening Questionnaire: ASQ-3)** |  |  |  | <.0012 |
| Yes | 285 (17.9%) | 58 (68.2%) | 343 (20.4%) |  |
| No | 1190 (74.7%) | 21 (24.7%) | 1211 (72.1%) |  |
| No response | 117 (7.3%) | 6 (7.1%) | 123 (7.3%) |  |
| MISSING | 2 (0.1%) | 0 (0.0%) | 2 (0.1%) |  |
| **Columbia Suicide Severity Rating Scale: Lifetime Suicide Ideation Severity Score** |  |  |  | <.0011 |
| mean (standard deviation) | 1.9 (1.97) | 4.3 (1.22) | 2.1 (2.01) |  |
| median (quartile 1 quartile3) | 2.0 (0.0 4.0) | 5.0 (4.0 5.0) | 2.0 (0.0 4.0) |  |
| **Number of Non-Suicidal Self Injury methods used over the last 12 months** |  |  |  | <.0011 |
| mean (standard deviation) | 0.8 (1.54) | 2.6 (2.45) | 0.9 (1.65) |  |
| median (quartile 1 quartile 3) | 0.0 (0.0 1.0) | 2.0 (1.0 4.0) | 0.0 (0.0 1.0) |  |
| **In the past 12 months, have you ever harmed or hurt your body on purpose, such as cutting or burning your skin, or hitting yourself, without wanting to die?** |  |  |  | <.0012 |
| 0 times | 1066 (66.9%) | 19 (22.4%) | 1085 (64.6%) |  |
| 1-2 times | 258 (16.2%) | 20 (23.5%) | 278 (16.6%) |  |
| 3-4 times | 83 (5.2%) | 13 (15.3%) | 96 (5.7%) |  |
| 5 or more times | 185 (11.6%) | 33 (38.8%) | 218 (13.0%) |  |
| MISSING | 2 (0.1%) | 0 (0.0%) | 2 (0.1%) |  |
| **Any history of Suicide attempts or Suicidal Behavior** |  |  |  | <.0013 |
| No attempts and no suicidal behavior | 995 (62.4%) | 9 (10.6%) | 1004 (59.8%) |  |
| No attempts, but past suicidal behavior | 154 (9.7%) | 9 (10.6%) | 163 (9.7%) |  |
| 1 previous attempt | 125 (7.8%) | 9 (10.6%) | 134 (8.0%) |  |
| Multiple attempts | 301 (18.9%) | 54 (63.5%) | 355 (21.1%) |  |
| MISSING | 19 (1.2%) | 4 (4.7%) | 23 (1.4%) |  |
| **Thoughts that you would be better off dead or of hurting yourself in some way. (Item 9 from the Patient Health Questionnaire-9)** |  |  |  | <.0013 |
| Not at all | 1145 (71.8%) | 18 (21.2%) | 1163 (69.3%) |  |
| Several days | 222 (13.9%) | 17 (20.0%) | 239 (14.2%) |  |
| More than half the days | 91 (5.7%) | 17 (20.0%) | 108 (6.4%) |  |
| Nearly every day | 130 (8.2%) | 33 (38.8%) | 163 (9.7%) |  |
| MISSING | 6 (0.4%) | 0 (0.0%) | 6 (0.4%) |  |
| **When you have suicidal thoughts, how long do they last?** |  |  |  | <.0013 |
| I have never had suicidal thoughts (not applicable) | 674 (42.3%) | 3 (3.5%) | 677 (40.3%) |  |
| A few seconds or minutes | 299 (18.8%) | 3 (3.5%) | 302 (18.0%) |  |
| Less than 1 hour / some of the time | 263 (16.5%) | 13 (15.3%) | 276 (16.4%) |  |
| 1-4 hours / a lot of time | 172 (10.8%) | 27 (31.8%) | 199 (11.9%) |  |
| 4-8 hours / most of day | 83 (5.2%) | 17 (20.0%) | 100 (6.0%) |  |
| More than 8 hours / continuous | 84 (5.3%) | 21 (24.7%) | 105 (6.3%) |  |
| MISSING | 19 (1.2%) | 1 (1.2%) | 20 (1.2%) |  |
| **Suicidal Rumination 2-item scale** |  |  |  | <.0011 |
| mean (standard deviation) | 3.0 (3.22) | 7.4 (2.59) | 3.2 (3.33) |  |
| median (quartile 1 quartile3) | 2.0 (0.0 6.0) | 8.0 (6.0 10.0) | 2.0 (0.0 6.0) |  |
| **Hopelessness: I thought there was nothing good for me in the future.** |  |  |  | <.0012 |
| Not true | 936 (58.7%) | 13 (15.3%) | 949 (56.5%) |  |
| Sometimes | 487 (30.6%) | 39 (45.9%) | 526 (31.3%) |  |
| True | 171 (10.7%) | 33 (38.8%) | 204 (12.2%) |  |
| **Patient Health Questionnaire- 9 (PHQ-9): Total Score Depression Severity** |  |  |  | <.0011 |
| mean (standard deviation) | 8.7 (7.07) | 16.3 (7.13) | 9.1 (7.27) |  |
| median (quartile 1 quartile3) | 7.0 (3.0 13.0) | 17.0 (11.0 22.0) | 8.0 (3.0 14.0) |  |
| **Alcohol Use Detection Identification Test- Concise (AUDITC): Total Score** |  |  |  | 0.9811 |
| mean (standard deviation) | 0.3 (1.10) | 0.3 (0.97) | 0.3 (1.10) |  |
| median (quartile 1 quartile 3) | 0.0 (0.0 0.0) | 0.0 (0.0 0.0) | 0.0 (0.0 0.0) |  |
| **Drug Use Scale: Used cannabis monthly or more often in the past three months** |  |  |  | 0.0333 |
| No | 1446 (90.7%) | 71 (83.5%) | 1517 (90.4%) |  |
| Yes | 143 (9.0%) | 14 (16.5%) | 157 (9.4%) |  |
| MISSING | 5 (0.3%) | 0 (0.0%) | 5 (0.3%) |  |
| **In the past month, have you had any thoughts about wanting to kill someone else?** |  |  |  | 0.0083 |
| No | 1482 (93.0%) | 71 (83.5%) | 1553 (92.5%) |  |
| Yes | 110 (6.9%) | 13 (15.3%) | 123 (7.3%) |  |
| MISSING | 2 (0.1%) | 1 (1.2%) | 3 (0.2%) |  |
| **Behavior Agitation Measure (BAM): Total Score (Higher scores reflect greater severity of agitation symptoms)** |  |  |  | <.0011 |
| mean (standard deviation) | 9.4 (5.77) | 14.4 (5.01) | 9.6 (5.84) |  |
| median (quartile 1 quartile 3) | 8.0 (3.0 14.0) | 15.0 (11.0 18.0) | 9.0 (3.0 14.0) |  |
| **Anxiety (short Screen for Anxiety Related Emotional Disorders [SCARED])** |  |  |  | <.0011 |
| mean (standard deviation) | 3.1 (2.37) | 4.6 (2.13) | 3.1 (2.38) |  |
| median (quartile 1 quartile3) | 3.0 (1.0 5.0) | 5.0 (3.0 6.0) | 3.0 (1.0 5.0) |  |
| **Patient Reported Outcomes Measurement Information System (PROMIS): Sleep Disturbance Raw Score** |  |  |  | <.0011 |
| mean (standard deviation) | 11.7 (4.18) | 13.7 (3.96) | 11.8 (4.19) |  |
| median (quartile 1 quartile 3) | 11.0 (9.0 15.0) | 13.0 (11.0 17.0) | 12.0 (9.0 15.0) |  |
| **Two-item Trauma Screen** |  |  |  | 0.1721 |
| mean (standard deviation) | 0.4 (0.63) | 0.5 (0.67) | 0.4 (0.63) |  |
| median (quartile 1 quartile 3) | 0.0 (0.0 1.0) | 0.0 (0.0 1.0) | 0.0 (0.0 1.0) |  |
| **People in my family have hit me so hard that it left me with bruises or marks.** |  |  |  | 0.0762 |
| No | 1345 (84.4%) | 66 (77.6%) | 1411 (84.0%) |  |
| Yes | 241 (15.1%) | 19 (22.4%) | 260 (15.5%) |  |
| MISSING | 8 (0.5%) | 0 (0.0%) | 8 (0.5%) |  |
| **Someone has tried to touch me in a sexual way or tried to make me touch them.** |  |  |  | <.0012 |
| No | 1333 (83.6%) | 54 (63.5%) | 1387 (82.6%) |  |
| Yes | 252 (15.8%) | 28 (32.9%) | 280 (16.7%) |  |
| MISSING | 9 (0.6%) | 3 (3.5%) | 12 (0.7%) |  |
| **Gender minority** |  |  |  | 0.0112 |
| No | 1498 (94.0%) | 74 (87.1%) | 1572 (93.6%) |  |
| Yes | 96 (6.0%) | 11 (12.9%) | 107 (6.4%) |  |
| **Sexual minority** |  |  |  | <.0012 |
| No | 1102 (69.1%) | 31 (36.5%) | 1133 (67.5%) |  |
| Yes | 492 (30.9%) | 54 (63.5%) | 546 (32.5%) |  |
| **Over the last two weeks, how hard has it been for you to do what you need to do and get along with others?** |  |  |  | <.0012 |
| Not difficult at all | 770 (48.3%) | 15 (17.6%) | 785 (46.8%) |  |
| Somewhat, very, or extremely difficult | 823 (51.6%) | 69 (81.2%) | 892 (53.1%) |  |
| MISSING | 1 (0.1%) | 1 (1.2%) | 2 (0.1%) |  |
| **Family Connectedness** |  |  |  | <.0011 |
| mean (standard deviation) | 7.6 (1.82) | 6.4 (1.65) | 7.5 (1.83) |  |
| median (quartile 1 quartile 3) | 8.0 (6.0 9.0) | 6.0 (5.0 8.0) | 8.0 (6.0 9.0) |  |
| **Peer connectedness** |  |  |  | <.0011 |
| mean (standard deviation) | 7.8 (2.09) | 6.1 (2.47) | 7.7 (2.14) |  |
| median (quartile 1 quartile 3) | 8.0 (7.0 9.0) | 6.0 (4.0 8.0) | 8.0 (6.0 9.0) |  |
| **School connectedness** |  |  |  | <.0011 |
| mean (standard deviation) | 6.9 (2.09) | 4.9 (1.91) | 6.8 (2.12) |  |
| median (quartile 1 quartile 3) | 7.0 (6.0 8.0) | 5.0 (3.0 6.0) | 7.0 (5.0 8.0) |  |
| **Impulsive Aggression Quick Screen** |  |  |  | 0.0041 |
| mean (standard deviation) | 0.4 (0.82) | 0.7 (0.95) | 0.5 (0.83) |  |
| median (quartile 1 quartile 3) | 0.0 (0.0 1.0) | 0.0 (0.0 1.0) | 0.0 (0.0 1.0) |  |
| **Impulsivity (Urgency Score)** |  |  |  | <.0011 |
| mean (standard deviation) | 2.5 (0.87) | 2.9 (0.71) | 2.5 (0.87) |  |
| median (quartile 1 quartile 3) | 2.5 (1.8 3.0) | 3.0 (2.5 3.5) | 2.5 (1.8 3.3) |  |
| **Peer victimization** |  |  |  | <.0011 |
| mean (standard deviation) | 3.1 (1.75) | 4.1 (2.40) | 3.2 (1.80) |  |
| median (quartile 1 quartile 3) | 2.0 (2.0 4.0) | 3.0 (2.0 6.0) | 2.0 (2.0 4.0) |  |
| **Bully perpetration** |  |  |  | 0.2071 |
| mean (standard deviation) | 2.3 (0.92) | 2.5 (1.22) | 2.3 (0.94) |  |
| median (quartile 1 quartile 3) | 2.0 (2.0 2.0) | 2.0 (2.0 2.0) | 2.0 (2.0 2.0) |  |
| **During the past 12 months, how many times were you in a physical fight?** |  |  |  | 0.0813 |
| 0 times | 1132 (71.0%) | 56 (65.9%) | 1188 (70.8%) |  |
| 1 time | 223 (14.0%) | 9 (10.6%) | 232 (13.8%) |  |
| 2 or 3 times | 157 (9.8%) | 9 (10.6%) | 166 (9.9%) |  |
| 4 or more times | 82 (5.1%) | 10 (11.8%) | 92 (5.5%) |  |
| MISSING | 0 (0.0%) | 1 (1.2%) | 1 (0.1%) |  |
| **Total number of negative life events** |  |  |  | <.0011 |
| mean (standard deviation) | 0.4 (0.59) | 0.7 (0.74) | 0.4 (0.61) |  |
| median (quartile 1 quartile 3) | 0.0 (0.0 1.0) | 1.0 (0.0 1.0) | 0.0 (0.0 1.0) |  |
| **Death Implicit Association Test** |  |  |  | 0.0081 |
| mean (standard deviation) | -0.4 (0.34) | -0.3 (0.39) | -0.4 (0.34) |  |
| median (quartile 1 quartile 3) | -0.4 (-0.6 -0.2) | -0.3 (-0.6 -0.1) | -0.4 (-0.6 -0.2) |  |
| Demographic and clinical variables considered in the model selection, and the IAT score. 1 Wilcoxon rank-sum test. 2 Chi-squared test. 3 Fisher's exact test (Monte Carlo approximation for tables larger than 2X2). | | | | |

Supplementary Table S3a and S3b: Variable inflation Factor for covariates used in logistic regression for full sample (S3a) and for those without suicidal ideation within the past week at baseline (S3b)

**Table S3a: Full sample**

| **Predictor** | **Variance Inflation Factor** |
| --- | --- |
| Columbia Suicide Severity Rating Scale (C-SSRS\_: Lifetime Suicide Ideation Severity Score | 1.61595 |
| Life Events Scale (LES): Total number of negative life events | 1.03402 |
| School Connection | 1.18135 |
| Ask Suicide-Screening Questionnaire (ASQ3) (Suicidal Ideation in past week) No response | 1.11131 |
| Ask Suicide-Screening Questionnaire (ASQ3) (Suicidal Ideation in past week) Yes | 1.59190 |
| Death Implicit Association Test (IAT) Continuous Score | 1.01660 |

**Table S3b: Non-Suicidal Ideation subgroup model**

| **Predictor** | **Variance Inflation Factor** |
| --- | --- |
| Life Events Scale (LES:) Total number of negative life events | 1.02523 |
| Social connection | 1.02338 |
| Death Implicit Association (IAT) Continuous Score | 1.00490 |
| Any history of suicide attempts (1 previous attempt) | 1.01404 |
| Any history of suicide attempts (multiple attempts) | 1.04492 |
| Any history of Suicide attempts or Suicidal Behavior No attempts, but past suicidal behavior (i.e., preparatory behavior for an attempt, aborted or interrupted attempt) | 1.02205 |

**Table S4a: Results of 10-fold cross-validation**

| **Fold** | **Test set three-month attempt percentage** | **Test set univariable IAT1 model AUPRC2** | **Test set multivariable IAT model AUPRC** | **Test set univariable IAT model AUC3** | **Test set multivariable IAT model AUC** |
| --- | --- | --- | --- | --- | --- |
| 1 | 0.029762 | 0.05653 | 0.09106 | 0.730061 | 0.862963 |
| 2 | 0.041667 | 0.04592 | 0.28991 | 0.5874 | 0.945833 |
| 3 | 0.041667 | 0.04024 | 0.18416 | 0.509317 | 0.845536 |
| 4 | 0.035714 | 0.04200 | 0.25464 | 0.582305 | 0.933962 |
| 5 | 0.035714 | 0.04576 | 0.20388 | 0.494856 | 0.90535 |
| 6 | 0.089286 | 0.15374 | 0.28815 | 0.560784 | 0.847495 |
| 7 | 0.041667 | 0.07998 | 0.12805 | 0.61047 | 0.864241 |
| 8 | 0.035714 | 0.04576 | 0.21225 | 0.494856 | 0.909465 |
| 9 | 0.053571 | 0.16266 | 0.20989 | 0.663173 | 0.824598 |
| 10 | 0.083832 | 0.19105 | 0.20529 | 0.647059 | 0.822596 |

**Table 4b: Mean and Standard Deviation across 10-folds**

| **three-month attempt percentage test mean** | **three-month attempt percentage test SD4** |
| --- | --- |
| 0.048859 | 0.020864 |

| **Univariable AUPRC test mean** | **Univariable AUPRC test SD** |
| --- | --- |
| 0.086366 | 0.058953 |

| **Multivariable AUPRC test mean** | **Multivariable AUPRC test SD** |
| --- | --- |
| 0.20673 | 0.063224 |

| **Univariable AUC test mean** | **Univariable AUC test SD** |
| --- | --- |
| 0.58803 | 0.077561 |

| **Multivariable AUC test mean** | **Multivariable AUC test SD** |
| --- | --- |
| 0.87620 | 0.044423 |

**Table 4c: 10-folds cross validation AUPRC, outcome percentage, and AUC 95% Wald interval**

| **three-month attempt percentage** | **Univariable AUPRC mean** | **Multivariable AUPRC mean** | **Univariable AUC mean** | **Multivariable AUC mean** |
| --- | --- | --- | --- | --- |
| 0.049 (0.008, 0.090) | 0.086 (0, 0.202) | 0.207 (0.083, 0.331) | 0.588 (0.436, 0.740) | 0.876 (0.789, 0.963) |

**1Implicit Association Test; 2Area Under the Precise Recall Curve; 3Area Under the Curve; 4Standard Deviation**

**Supplemental Table S5a: Implicit Association Test (IAT) Score Models for prediction of first-time suicide attempts (no previous suicide attempt)**

**IAT Score Model Results**

| **Effect** | **Odds Ratio Estimate** | **Lower 95% Confidence Limit for Odds Ratio** | **Upper 95% Confidence Limit for Odds Ratio** | **P-value** |
| --- | --- | --- | --- | --- |
| IAT (Continuous) | 10.678 | 1.602 | 71.191 | 0.0144 |

**Supplementary Table: S5b: IAT score and covariates in predicting a first-time suicide attempt**

| **Effect** | **Odds Ratio Estimate** | **Lower 95% Confidence Limit for Odds Ratio** | **Upper 95% Confidence Limit for Odds Ratio** | **P-value** |
| --- | --- | --- | --- | --- |
| IAT (Continuous) | 4.292 | 0.698 | 26.378 | 0.1159 |
| Hopelessness  Sometimes vs Not true | 9.088 | 1.346 | 61.341 | 0.0001 |
| Hopelessness  True vs Not true | 55.288 | 8.391 | 364.291 |

| **Response Operating Curve Model** | **Area under the Curve** | **Lower 95% Wald Confidence Limit** | **Upper 95% Wald Confidence Limit** |
| --- | --- | --- | --- |
| IAT only | 0.6851 | 0.5419 | 0.8283 |
| other covariates only | 0.8125 | 0.7056 | 0.9193 |
| IAT + other covariates | 0.8495 | 0.7559 | 0.9431 |

**Table S5c: Comparison of Area Under the Curves (AUCs) between Implicit Association Test (IAT) only, covariates only, and IAT plus covariates in predicting first-time attempts**

| Supplemental Table S6a: Implicit Association Test (IAT) D values between those who attempted and those how did not: full sample | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial ED Visit and three-month follow-up** | |  | |
|  | **No (N = 1594)** | **Yes (N = 85)** | **Overall (N = 1679)** | **P-value** |
| **IAT Continuous Score** |  |  |  | 0.0081 |
| Mean (Standard Deviation) | -0.4 (0.34) | -0.3 (0.39) | -0.4 (0.34) |  |
| Minimum, quartile 1, median, quartile 3, maximum | -1.3, -0.6, -0.4, -0.2, 0.6 | -1.3, -0.6, -0.3, -0.1, 0.6 | -1.3, -0.6, -0.4, -0.2, 0.6 |  |
| 1 Kruskal-Wallis test. | | | | |

| Supplemental Table S6b Implicit Association D values between those who attempted and those how did not: Male subgroup | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial ED Visit and three-month follow-up** | |  | |
|  | **No (N = 586)** | **Yes (N = 16)** | **Overall (N = 602)** | **P-value** |
| **IAT Continuous Score** |  |  |  | 0.0671 |
| Mean (Standard Deviation) | -0.4 (0.33) | -0.3 (0.30) | -0.4 (0.33) |  |
| Minimum, quartile 1, median, quartile 3, maximum | -1.3, -0.6, -0.4, -0.2, 0.6 | -0.8, -0.5, -0.2, -0.1, 0.3 | -1.3, -0.6, -0.4, -0.2, 0.6 |  |
| 1 Kruskal-Wallis test. | | | | |

| Supplemental Table S6c: Implicit Association D values between those who attempted and those how did not: Female subgroup | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial ED Visit and three-month follow-up** | |  | |
|  | **No (N = 1008)** | **Yes (N = 69)** | **Overall (N = 1077)** | **P-value** |
| **IAT Continuous Score** |  |  |  | 0.0451 |
| Mean (Standard Deviation) | -0.4 (0.34) | -0.3 (0.40) | -0.4 (0.35) |  |
| Minimum, quartile 1, median, quartile 3, maximum | -1.3, -0.7, -0.4, -0.2, 0.6 | -1.3, -0.6, -0.3, -0.1, 0.6 | -1.3, -0.6, -0.4, -0.2, 0.6 |  |
| 1 Kruskal-Wallis test. | | | | |

| Supplemental Table S6d: Implicit Association D values between those who attempted and those how did not: Suicidal ideation at baseline | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial ED Visit and three-month follow-up** | |  | |
|  | **No (N = 285)** | **Yes (N = 58)** | **Overall (N = 343)** | **P-value** |
| **IAT Continuous Score** |  |  |  | 0.7731 |
| Mean (Standard Deviation) | -0.3 (0.34) | -0.3 (0.38) | -0.3 (0.35) |  |
| Minimum, quartile 1, median, quartile 3, maximum | -1.3, -0.6, -0.3, -0.1, 0.6 | -1.3, -0.6, -0.4, -0.1, 0.6 | -1.3, -0.6, -0.3, -0.1, 0.6 |  |
| 1 Kruskal-Wallis test. | | | | |

| Supplemental Table S6e: Implicit Association D values between those who attempted and those how did not: non-suicidal at baseline | | | | |
| --- | --- | --- | --- | --- |
|  | **Suicide attempt/death between initial ED Visit and three-month follow-up** | |  | |
|  | **No (N = 1190)** | **Yes (N = 21)** | **Overall (N = 1211)** | **P-value** |
| **IAT Continuous Score** |  |  |  | 0.0081 |
| Mean (Standard Deviation) | -0.4 (0.33) | -0.2 (0.39) | -0.4 (0.33) |  |
| Minimum, quartile 1, median, quartile 3, maximum | -1.3, -0.7, -0.4, -0.2, 0.6 | -0.8, -0.5, -0.2, -0.0, 0.5 | -1.3, -0.7, -0.4, -0.2, 0.6 |  |
| 1 Kruskal-Wallis test. | | | | |