

Nonsuicidal Self-Injury in Preadolescents

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abstract

OBJECTIVES: There is a dearth of literature on the prevalence and predictors of nonsuicidal self-injury (NSSI) history and onset among preadolescent youth. This gap in the literature is significant given evidence suggesting that NSSI is a robust predictor of negative mental health outcomes, and that early onset NSSI may be associated with a more severe course of self-injurious thoughts and behaviors. This study aimed to evaluate sociodemographic characteristics, psychiatric disorders, and suicidal ideation (SI) in relation to NSSI onset and history in preadolescents.

METHODS: Data were drawn from the Adolescent Brain and Cognitive Development (ABCD) study, which recruited a diverse sample of 11 875 youth aged 9 to 10 years. The primary outcome measures were lifetime history and recent onset of NSSI. Measures included sociodemographics and the K-SADS diagnostic interview assessing psychopathology and SI.

RESULTS: Female sex and identifying as Black were associated with lower odds of lifetime NSSI. Identifying as a sexual minority, having unmarried parents, and a low family income were associated with higher odds of lifetime NSSI. Although depression was most predictive of NSSI history and onset, a range of internalizing and externalizing disorders, greater comorbidity, and SI also were predictive.

CONCLUSIONS: Given that NSSI was associated with a range of mental health disorders and comorbidity, it may be best conceptualized as a transdiagnostic phenomenon. Findings highlight key sociodemographic and diagnostic factors that may help to direct screening efforts in preadolescents, particularly sexual minority status and depression.



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WHAT'S KNOWN ON THIS SUBJECT: There is a dearth of national studies on sociodemographic and diagnostic predictors of preadolescent nonsuicidal self-injury (NSSI). This gap is significant given that NSSI predicts poor psychological outcomes, and that early onset NSSI may predict a more severe course of self-injury.

WHAT THIS STUDY ADDS: Results suggest that preadolescents who are male, white, identify as a sexual minority, have unmarried parents, and low family income had increased odds of NSSI. NSSI was also associated with numerous internalizing and externalizing disorders, greater comorbidity, and suicidal ideation.

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Nonsuicidal self-injury (NSSI) is defined as the deliberate, self-inflicted damage of body tissue without suicidal intent and for purposes not socially or culturally sanctioned.¹ Functions of NSSI are varied but are often characterized as interpersonal (eg, communication of distress, peer bonding) and/or intrapersonal (eg, emotion regulation, self-punishment) in nature.² Prevalence estimates suggest that ~17% of community-sampled adolescents have engaged in NSSI at least once over their lifetime, although rates vary.³ NSSI engagement is concerning in its own right, because it can be medically dangerous and highly reinforcing; it also often leaves physical scarring, and is a stigmatized behavior.⁴⁻⁶ Furthermore, NSSI is associated with increased risk of prospective mental health problems. Indeed, a history of any NSSI puts individuals at 4 times higher odds of engaging in subsequent suicidal behavior, thereby representing 1 of the strongest predictors of suicidal behavior.^{7,8} Further, a meta-analysis found NSSI to be an even stronger predictor of future suicide attempts than past history of attempted suicide,⁹ underscoring the public health implications of NSSI.

The probability of NSSI onset increases through late childhood into adolescence.¹⁰ Despite growing evidence that preadolescent youth are engaging in NSSI,¹⁰⁻¹² studies examining correlates of NSSI and predictors of its onset among preadolescents are rare. However, there is emerging retrospective evidence that earlier age of NSSI onset is predictive of worse outcomes.^{12,13} Two recent studies found that preadolescent NSSI onset is associated with a more severe course of NSSI and increased risk of suicidal behavior.^{12,13} Although these studies highlight the clinical importance of NSSI onset in preadolescence, they are based on retrospective recall in adulthood in often homogenous samples.

Current Study

Given the established risk associated with NSSI, and recent evidence highlighting the elevated risk of a preadolescent onset, research is needed to thoroughly characterize the nature and scope of preadolescent engagement in NSSI at the national level. Identifying factors associated with NSSI onset and history among preadolescents is vital to improve the detection of at-risk youth and establish a reference point for future efforts to monitor progress in addressing this public health issue. The current study aimed to analyze data from the Adolescent Brain and Cognitive Development (ABCD) Study, an epidemiologic study of youth aged 9 to 10 years. One previous ABCD study estimated the prevalence of NSSI and examined family-related correlates.¹⁴ The current study expands upon these findings by evaluating sociodemographic characteristics, diagnostic factors, and suicidal ideation (SI) in relation to lifetime NSSI history in preadolescents. It further aimed to examine temporally primary diagnoses and SI in relation to subsequent NSSI onset.

METHODS

Participants

Under a nondisclosure agreement data use agreement, data were drawn from the ABCD study,¹⁵ a large-scale longitudinal investigation of child health and brain development. Between 2016 to 2018, 11 875 youth aged 9 to 10 years were enrolled from 22 sites across the United States. Participants were recruited to reflect the sociodemographic composition of the US population, as put forth by the US Census Bureau's American Community Survey. The current study used data from the Curated Annual Release 5.0, which became available June 2023 and included complete baseline data.¹⁶ Additional information regarding study design and sampling recruitment is provided elsewhere.¹⁷⁻¹⁹

Measures

Sociodemographic Variables

All sociodemographic information was drawn from the parent-completed demographic questionnaire except sexual orientation, which was drawn from child-report. Parents provided information about their child's race (white, Black, American Indian/Alaskan Native, Asian American, multiracial, or other) and ethnicity (Hispanic or not Hispanic). Categories for race were collapsed into white, Black, multiracial, and other race. The small number of unweighted cases of NSSI for the American Indian/Alaskan Native and Asian American racial groups required collapsing these groups into an other category to permit analysis. Parents also reported their own education level, annual family income, and marital status. Parental income categories were collapsed into 5 categories ranging from "<\$25 000" to "\$100 000 and greater," parental education was collapsed into 4 categories ranging from "less than high school" to "college graduate," and parental marital status was collapsed into "married" and other. Sexual orientation was drawn only from the child-completed background information survey and was not based on parent-report. To assess sexual orientation, youth were asked if they were gay or bisexual. Potential responses were "yes," "maybe," "no," and "I do not understand this question." Participants who responded yes or maybe were combined to create a "gay, bisexual, or questioning" group and compared with participants who responded no, forming the heterosexual group, as well as to a third group consisting of participants who did not understand the question.

Nonsuicidal Self-Injury, Suicidal Ideation, DSM-5 Psychiatric Disorders, and Psychiatric Treatment Utilization

A computerized version of the Kiddie Schedule for Affective Disorders and Schizophrenia, Present and Lifetime Version, using Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5²⁰) criteria was used to obtain parent- and child-reports of current (past 2

weeks) and past (before the past 2 weeks) NSSI, SI, and DSM-5 psychiatric disorders.¹⁹ On the basis of concepts drawn from the Columbia Classification Algorithm of Suicide Assessment,²¹ to assess the presence versus absence of NSSI, respondents are asked, “Sometimes when kids get upset or feel numb, they may do things to hurt themselves, like scratching, cutting, or burning themselves. In the past 2 weeks, how often have you [has your child] done any of these things or other things to try to hurt yourself [himself or herself]?” If respondents endorse yes, the following question is presented to ensure only self-injurious acts without suicidal intent are recorded: “Were you [was your child] trying to kill yourself [themselves] when you [they] did these things?” These questions are also asked about lifetime. To assess the presence versus absence of any SI, a range of SI subtypes was assessed (inclusive of passive SI, nonspecific active SI, active SI with method, active SI with intent, and active SI with plan). DSM-5 psychiatric disorders assessed can be found in Table 1.

Following standard clinical practice,²² a child was coded as having NSSI, SI, or a disorder if a positive response or diagnosis resulted from either parent- or child-report data.

Psychiatric treatment utilization was drawn solely from parent-report of their child ever having received mental health services.

Statistical Analysis

We employed cross-tabulations to estimate the weighted lifetime, current (ie, past 2-week), and recent-onset (engagement in past 2 weeks only) prevalence of NSSI. We employed bivariate logistic regression to examine 5 sets of potential correlates of lifetime history of NSSI: Sociodemographic characteristics, any diagnosis, number of diagnoses (0, 1, 2, 3+ diagnoses), specific diagnoses, and SI. We subsequently conducted 5 separate multivariable models, each of which covaried the other variables within each set of correlates where applicable (eg, in the sociodemographic multivariable model, we included all sociodemographic

TABLE 1 Bivariate and Multivariable Associations of Sociodemographic Factors and Lifetime History of Nonsuicidal Self-Injury

Predictor	NSSI	Multivariable ^a	
	% (SE)	OR (95% CI)	P
Sex			
Female	7.49 (0.40)	0.65 (0.56–0.75)	<.001
Male	10.76 (0.44)	1.00	—
Race			
Black	7.74 (0.64)	0.72 (0.56–0.92)	<.01
Multiracial	11.06 (1.01)	1.19 (0.94–1.51)	.14
Other	6.21 (0.90)	0.64 (0.45–0.92)	.01
White	9.55 (0.38)	1.00	—
Ethnicity			
Hispanic	9.29 (0.65)	0.94 (0.76–1.15)	.54
Not Hispanic	9.16 (0.34)	1.00	—
Parental education			
Less than high school	8.77 (2.28)	1.06 (0.53–2.12)	.87
High school or GED	8.54 (0.71)	0.83 (0.64–1.08)	.17
Some college	9.92 (0.75)	0.91 (0.74–1.13)	.41
College graduate	9.16 (0.37)	1.00	—
Parent marital status			
Other	10.43 (0.55)	1.24 (1.03–1.50)	.03
Married	8.40 (0.35)	1.00	—
Annual family income			
<\$25 000	10.52 (0.83)	1.51 (1.12–2.03)	<.01
\$25 000–\$49 999	9.95 (0.81)	1.30 (1.00–1.68)	.05
\$50 000–\$74 999	9.25 (0.79)	1.18 (0.94–1.48)	.16
\$75 000–\$100 000	8.97 (0.80)	1.15 (0.92–1.45)	.23
>\$100 000	8.13 (0.43)	1.00	—
Sexual orientation			
Gay, bisexual, or questioning	28.67 (4.41)	4.51 (2.85–7.13)	<.001
Did not understand question	9.74 (0.63)	1.19 (1.00–1.42)	.05
Heterosexual	8.63 (0.33)	1.00	—

Weighted prevalence of NSSI is presented for each predictor; unweighted N = 11 835; all sociodemographic data were derived from parent-report only except for sexual orientation, which was derived from child-report only. GED, General Educational Development. —, not applicable.

^a Multivariable analyses controlled for all other sociodemographic factors.

variables); the latter 4 multivariable analyses also covered all sociodemographic variables.

In examining temporal predictors of recent onset of NSSI, analyses were restricted to participants without an NSSI history before the past 2 weeks. We used bivariate logistic regression to examine sociodemographic characteristics, any past diagnosis (ie, before the past 2 weeks), number of past diagnoses, specific past diagnoses, and any past SI as predictors of past 2-week NSSI. We produced multivariable models predicting recent NSSI onset, which were conducted in a parallel manner to the multivariable models examining correlates of NSSI history. To maintain clean temporal separation between predictors and recent NSSI onset, sociodemographic covariates in these models were limited to those conceptualized as static (ie, sex, race, and ethnicity).

Finally, we used cross-tabulations to examine prevalence of psychiatric treatment utilization among youth with a lifetime NSSI history. We employed multivariable logistic regression to examine whether lifetime NSSI history was associated with psychiatric treatment utilization after adjusting for all sociodemographic variables.

All analyses were conducted using SPSS 27.0, and ABCD weighting¹⁸ (to the American Community Survey) was used to produce prevalence estimates.

RESULTS

In the sample of preadolescents with nonmissing NSSI history data (unweighted $N = 11\,835$), the weighted lifetime prevalence of NSSI was 9.17% (SE = 0.30) and past 2-week prevalence of NSSI was 4.24% (SE = 0.21). The weighted prevalence of recent NSSI onset was 2.17% (SE = 0.15).

Correlates of lifetime NSSI

Sociodemographic correlates of lifetime NSSI are presented in Table 1. In multivariable analyses, female sex, identifying as Black and as either American Indian/Alaskan Native, Asian American, or other racial category were associated with lower odds of lifetime NSSI. Identifying as a sexual minority or not understanding the question, having a family income of <\$25 000, and having unmarried parents were associated with higher odds of lifetime NSSI.

Diagnostic correlates of lifetime NSSI are presented in Table 2. In the multivariable model adjusting for all sociodemographic variables, major depressive disorder (MDD), social anxiety, generalized anxiety disorder, posttraumatic stress disorder, conduct disorder, and oppositional defiant disorder (ODD) were significantly associated with lifetime NSSI. In separate multivariable models, also adjusting for sociodemographic covariates, having any disorder increased the odds of lifetime NSSI, and the odds of lifetime NSSI

TABLE 2 Diagnostic Correlates of Lifetime History Of Nonsuicidal Self-Injury

Predictor	NSSI % (SE)	Multivariable ^a	
		OR (95% CI)	P
Any disorder	13.44 (0.53)	2.45 (2.09–2.86)	<.001
1 disorder	10.26 (0.63)	1.80 (1.49–2.18)	<.001
2 disorders	11.48 (1.01)	2.08 (1.63–2.66)	<.001
3+ disorders	23.59 (1.46)	4.82 (3.90–5.96)	<.001
0 disorders	5.63 (0.32)	1.00	—
Psychosis	18.40 (5.45)	1.36 (0.76–2.44)	.30
MDD	26.41 (2.18)	2.79 (2.16–3.61)	<.001
Separation anxiety	17.45 (1.35)	1.21 (0.93–1.56)	.16
Social anxiety	16.86 (1.88)	1.46 (1.09–1.95)	.01
Specific phobia	11.99 (0.71)	1.1 (0.93–1.32)	.26
Generalized anxiety disorder	23.33 (2.13)	1.42 (1.06–1.90)	.02
Posttraumatic stress disorder	29.00 (3.36)	1.61 (1.08–2.39)	.02
Obsessive compulsive disorder	15.63 (1.79)	1.16 (0.91–1.48)	.23
Conduct disorder	27.25 (4.42)	2.05 (1.44–2.92)	<.001
ODD	16.99 (1.31)	1.75 (1.44–2.14)	<.001
Eating disorders	19.64 (5.63)	0.93 (0.49–1.76)	.82

For analyses examining any disorder and number of disorders, the reference group is no disorders. Horizontal lines serve as demarcations of separate models. Weighted prevalence of NSSI is presented for each predictor; unweighted $N = 11\,835$. —, not applicable.
^a Multivariable analyses controlled for sociodemographic factors and other diagnoses.

increased in a dose-dependent manner as the number of disorders increased.

In a univariate analysis, SI (odds ratio [OR] 7.68; 95% confidence interval [CI] 6.60–8.93; $P < .001$) was significantly and robustly associated with NSSI history. In a multivariable model adjusting for sociodemographic factors, lifetime SI (OR 7.59; 95% CI 6.46–8.92; $P < .001$) remained significant. As sensitivity analyses, these analyses were repeated with passive and active SI, respectively (Supplemental Table 3). The results were largely unchanged.

Temporally Primary Predictors of Recent NSSI Onset

Results of univariate and multivariable models examining static sociodemographic features (ie, sex, race, ethnicity) as predictors of recent NSSI onset are presented in Supplemental Table 4. In a multivariable model, only sex was a significant predictor of recent NSSI onset. Results of the multivariable model examining temporally primary diagnostic predictors of recent NSSI onset are presented in Supplemental Table 5. Psychosis and eating disorders were excluded from analyses predicting recent onset of NSSI because of their very low past prevalence. In multivariable analysis, only previous MDD, specific phobia, and ODD were significantly predictive of recent NSSI onset. In a separate multivariable model, having any previous disorder increased the odds of recent NSSI onset; having 2 and 3+ disorders increased odds further.

We also examined previous SI as a temporal predictor of recent NSSI onset. In a univariate model, previous SI (OR 4.26; 95% CI 3.13–5.79; $P < .001$) predicted recent NSSI onset. This finding held after controlling for child sex, race, and ethnicity (OR 4.19; 95% CI 3.04–5.79; $P < .001$). In sensitivity analyses, both passive and active SI were significant univariate predictors of NSSI onset. However, in the multivariable model, only passive SI remained significant (see Supplemental Table 3).

Psychiatric Treatment Utilization

Of those with a history of NSSI, 36.71% (SE = 1.67) endorsed a history of any mental health treatment. Youth with an NSSI history were more likely to receive mental health treatment than youth without an NSSI history (OR 3.47; 95% CI 2.97–4.04; $P < .001$), even after adjusting for sociodemographic variables (OR 3.29; 95% CI 2.78–3.89; $P < .001$).

DISCUSSION

In the first national population-based US sample to assess NSSI in preadolescent youth to date, the lifetime and past 2-week prevalence of NSSI were 9.1% and 4.2%, respectively. These findings suggest critically high rates of NSSI for this early developmental period.

Several key sociodemographic variables were associated with increased odds of lifetime NSSI history. Male sex was significantly associated with NSSI history and onset. Although the previous literature is mixed with regard to sex differences in rates of NSSI, a recent meta-analysis found female sex prospectively predicted NSSI.²³ However, our finding that males may be at greater risk than females during the preadolescent period mirrors data on suicide and depression in prepubertal youth, suggesting males may be at greater risk for these outcomes at a younger age.^{24,25} Given NSSI onset before age 12 years may be associated with worse course of NSSI and greater risk for suicidal behavior,^{12,13} the present results highlight the importance of screening for NSSI in preadolescents, particularly among males, who may otherwise be overlooked given previous studies highlighting female risk in older age groups.

Findings from the current study extend previous research with sexual minority adolescents,²⁶ indicating preadolescent sexual minority youth are at similarly elevated risk for NSSI compared with heterosexual youth. One out of every 4 sexual minority preadolescents reported a lifetime history of NSSI; the effect size in this sample was comparable to that for adolescents in a recent meta-analytic review of NSSI and sexual orientation.²⁷ The reasons for elevated risk among sexual minority preadolescents require further exploration, although research suggests that, in sexual minority adolescents and adults, minority-specific stress may play an important role.²⁸ Further, there may be

fewer resources available to support youth's sexual identities in preadolescence, because many supportive resources target adolescents and young adults. Research identifying factors relevant to elevated risk in this population is needed.

Findings suggested racial minority preadolescents (with the exception of biracial youth) were less likely to engage in NSSI compared with white peers. However, because rates of suicide in Black youth are rising in the United States,²⁹ additional research is needed to examine whether rates of NSSI in Black youth may begin to follow a similar trajectory. Additionally, the current study did not examine experiences of racial discrimination, which may serve as a more sensitive indicator of elevated NSSI risk in minoritized youth.³⁰

Finally, 2 family-level factors were associated with elevated rates of lifetime NSSI. Odds of NSSI were higher for preadolescents whose primary caregiver was unmarried and whose household income was <\$25 000 per year. These findings are consistent with previous research in smaller samples documenting associations between parent income and NSSI in preadolescents.³¹ Findings are also well aligned with previous analyses from the ABCD study, indicating increased financial stress and low parental monitoring were associated with greater risk for SI, NSSI, and suicide attempt (SA).¹⁴ Family income is a key indicator of a family's access to resources, and understanding its role in risk for psychological outcomes is critical to provide evidence that can be acted upon. Similarly, marital status has direct implications for taxes and social resource eligibility. Thus, studying these variables in relation to NSSI can support policy-level changes to reduce population-level risk.

Consistent with the conceptualization of NSSI as a transdiagnostic phenomenon, multiple diagnostic factors were associated with lifetime history of NSSI and NSSI onset. Specifically, diagnostic comorbidity increased risk for lifetime history of NSSI in youth in a dose-response fashion. In line with previous research examining NSSI correlates in adolescent samples,^{32–34} MDD emerged as the strongest single diagnostic predictor both cross-sectionally and temporally. ODD was the only other disorder to significantly predict NSSI in both cross-sectional and temporal analyses. This was a relatively novel finding in that, to our knowledge, only 1 previous study has examined self-reported ODD symptomatology in relation to NSSI, and this study was conducted with an adolescent sample.³⁵ Our results extend these findings to preteens and to the clinical diagnosis of ODD. Furthermore, our findings appear to suggest a robust pattern, given that ODD is more common among males,^{36,37} and that ODD remained a significant predictor even after accounting for the higher prevalence of NSSI among preadolescent boys in both cross-sectional and temporal multivariable models.

Collectively, these findings highlight the utility of considering general psychopathology severity, and MDD and ODD in particular, when screening for risk for NSSI in preadolescents. Given our robust findings for ODD and the contrasting paucity of previous research on this disorder in relation to NSSI, future prospective evaluations of their association are warranted.

To our knowledge, no studies have tested whether SI predicts onset of NSSI among youth. Our findings indicated that a history of SI significantly predicted >7 times elevated odds of lifetime NSSI and >4 times elevated odds of subsequent NSSI onset. Results demonstrate the importance of monitoring youth with histories of SI for NSSI, because SI onset may precede NSSI onset in a subset of preadolescents. This finding is consistent with evidence suggesting that a common function of NSSI is to cope with SI.^{38,39}

Limitations

There are a number of limitations of this work that warrant consideration. First, our assessment of NSSI was limited to a dichotomous indicator of presence versus absence. Assessment of NSSI methods, severity, frequency, and functions could provide more nuanced information regarding NSSI risk. That said, engaging in any NSSI is predictive of prospective risk for NSSI,⁴⁰ as well as suicidal thoughts and behavior^{7,8}; thus, it remains important to assess for any NSSI history. An additional limitation is this study's reliance on retrospective report. Future waves of ABCD data will be needed to more rigorously test the temporal relations among sociodemographic factors, mental health diagnoses, SI, and NSSI. Relatedly, epidemiologic data suggest that rates of psychiatric symptoms and disorders are higher when assessed prospectively,⁴¹ and thus retrospective report of lifetime history may underestimate the true prevalence of NSSI in preadolescents; forthcoming ABCD longitudinal data will provide important insight on how these rates evolve.

Clinical Implications

Previous work examining NSSI among youth has tended to focus on adolescent samples, missing a critical period for detection and intervention during preadolescence. The current study has many strengths, most notably, the contribution of new information on correlates and predictors of NSSI in a national sample of preadolescents. Although NSSI is a low base rate behavior, this population-based sample allowed for meaningful conclusions to be drawn regarding predictors of lifetime history and onset of NSSI. Findings highlight key sociodemographic and diagnostic factors associated with NSSI risk that could be used to focus screening efforts to target high-risk preadolescents. Screening efforts followed by referral may be particularly well suited to be conducted by pediatric health care providers. Our findings suggest that, although youth with a history of NSSI are more likely to engage in psychiatric treatment than those without, >60% of youth with NSSI had no history of psychiatric care. Identifying ways to engage families in psychiatric services may be critical for improving long-term outcomes in these preadolescent youth. Further, there is limited evidence for the effectiveness of treatments directly targeting NSSI in youth⁴²; results of this study suggest that a transdiagnostic approach may be indicated for at-risk preadolescents.

ABBREVIATIONS

ABCD: Adolescent Brain and Cognitive Development
CI: confidence interval
DSM-5: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
MDD: major depressive disorder
NSSI: nonsuicidal self-injury
ODD: oppositional defiant disorder
OR: odds ratio
SI: suicidal ideation

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REFERENCES

1. International Society for the Study of Self-injury. What is self-injury? Available at: <https://www.itriples.org/what-is-nssi>. Accessed, April 10, 2023
2. Klonsky ED, Glenn CR. Assessing the functions of nonsuicidal self-injury: psychometric properties of the Inventory of Statements About Self-injury (ISAS). *J Psychopathol Behav Assess*. 2009;31(3): 215–219
3. Swannell SV, Martin GE, Page A, Hasking P, St John NJ. Prevalence of nonsuicidal self-injury in nonclinical samples: systematic review, meta-analysis and meta-regression. *Suicide Life Threat Behav*. 2014;44(3):273–303
4. Burke TA, Piccirillo ML, Moore-Berg SL, Alloy LB, Heimberg RG. The stigmatization of nonsuicidal self-injury. *J Clin Psychol*. 2019;75(3): 481–498
5. Burke TA, Hamilton JL, Cohen JN, Stange JP, Alloy LB. Identifying a physical indicator of suicide risk: nonsuicidal self-injury scars predict suicidal ideation and suicide attempts. *Compr Psychiatry*. 2016;65:79–87
6. Nock MK, Prinstein MJ. A functional approach to the assessment of self-mutilative behavior. *J Consult Clin Psychol*. 2004;72(5): 885–890
7. Franklin JC, Ribeiro JD, Fox KR, et al. Risk factors for suicidal thoughts and behaviors: a meta-analysis of 50 years of research. *Psychol Bull*. 2017;143(2):187–232
8. Kiekens G, Hasking P, Boyes M, et al. The associations between nonsuicidal self-injury and first onset suicidal thoughts and behaviors. *J Affect Disord*. 2018;239:171–179
9. Ribeiro JD, Franklin JC, Fox KR, et al. Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: a meta-analysis of longitudinal studies. *Psychol Med*. 2016;46(2):225–236
10. Gandhi A, Luyckx K, Baetens I, et al. Age of onset of non-suicidal self-injury in Dutch-speaking adolescents and emerging adults: an event history analysis of pooled data. *Compr Psychiatry*. 2018;80:170–178
11. Plener PL, Allroggen M, Kapusta ND, Brähler E, Fegert JM, Groschwitz RC. The prevalence of nonsuicidal self-injury (NSSI) in a representative sample of the German population. *BMC Psychiatry*. 2016;16(1):353
12. Ammerman BA, Jacobucci R, Kleiman EM, Uyeji LL, McCloskey MS. The relationship between nonsuicidal self-injury age of onset and severity of self-harm. *Suicide Life Threat Behav*. 2018;48(1): 31–37
13. Muehlenkamp JJ, Xhunga N, Brausch AM. Self-injury age of onset: a risk factor for NSSI severity and suicidal behavior. *Arch Suicide Res*. 2019;23(4):551–563
14. DeVille DC, Whalen D, Breslin FJ, et al. Prevalence and family-related factors associated with suicidal ideation, suicide attempts, and self-injury in children aged 9 to 10 years. *JAMA Netw Open*. 2020;3(2):e1920956
15. ABCD Curated Annual Release 5.0. doi:10.15154/8873-zj65
16. Yang R, Jernigan T. Adolescent Brain Cognitive Development Study (ABCD) 2.0.1 Release. 2019
17. Volkow ND, Koob GF, Croyle RT, et al. The conception of the ABCD study: from substance use to a broad NIH collaboration. *Dev Cogn Neurosci*. 2018;32:4–7
18. Garavan H, Bartsch H, Conway K, et al. Recruiting the ABCD sample: design considerations and procedures. *Dev Cogn Neurosci*. 2018;32:16–22
19. Barch DM, Albaugh MD, Avenevoli S, et al. Demographic, physical and mental health assessments in the adolescent brain and cognitive development study: rationale and description. *Dev Cogn Neurosci*. 2018;32:55–66
20. Kaufman J, Townsend LD, Kobak K. The Computerized Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS): Development and Administration Guidelines. In: *64th Annual Meeting, AACAP*. 2017
21. Posner K, Oquendo MA, Gould M, Stanley B, Davies M. Columbia Classification Algorithm of Suicide Assessment (C-CASA): classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *Am J Psychiatry*. 2007;164(7):1035–1043
22. Copeland WE, Keeler G, Angold A, Costello EJ. Traumatic events and posttraumatic stress in childhood. *Arch Gen Psychiatry*. 2007;64(5):577–584
23. Fox KR, Franklin JC, Ribeiro JD, Kleiman EM, Bentley KH, Nock MK. Meta-analysis of risk factors for nonsuicidal self-injury. *Clin Psychol Rev*. 2015;42:156–167
24. Kovacs M, Goldston D, Gatsonis C. Suicidal behaviors and childhood-onset depressive disorders: a longitudinal investigation. *J Am Acad Child Adolesc Psychiatry*. 1993;32(1):8–20
25. Walsh RFL, Sheehan AE, Liu RT. Suicidal thoughts and behaviors in preadolescents: findings and replication in two population-based samples. *Depress Anxiety*. 2021;38(1):48–56
26. Liu RT. Temporal trends in the prevalence of nonsuicidal self-injury among sexual minority and heterosexual youth from 2005 through 2017. *JAMA Pediatr*. 2019;173(8):790–791
27. Liu RT, Sheehan AE, Walsh RFL, Sanzari CM, Cheek SM, Hernandez EM. Prevalence and correlates of non-suicidal self-injury among lesbian, gay, bisexual, and transgender individuals: a systematic review and meta-analysis. *Clin Psychol Rev*. 2019;74:101783
28. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull*. 2003;129(5):674–697
29. Curtin SC, Hedegaard H. Centers for Disease Control and Prevention. Suicide rates for females and males by race and ethnicity: United States, 1999 and 2017. Available at: https://www.cdc.gov/nchs/data/hestat/suicide/rates_1999_2017.htm. Accessed April 10, 2023
30. Rojas-Velasquez DA, Pluhar EI, Burns PA, Burton ET. Nonsuicidal self-injury among African American and Hispanic adolescents and young adults: a systematic review. *Prev Sci*. 2021;22(3): 367–377
31. Baetens I, Claes L, Martin G, et al. Is nonsuicidal self-injury associated with parenting and family factors? *J Early Adolesc*. 2014;34(3): 387–405
32. Nock MK, Joiner TE Jr, Gordon KH, Lloyd-Richardson E, Prinstein MJ. Nonsuicidal self-injury among adolescents: diagnostic

- correlates and relation to suicide attempts. *Psychiatry Res.* 2006;144(1):65–72
33. Hankin BL, Abela JRZ. Nonsuicidal self-injury in adolescence: prospective rates and risk factors in a 2 1/2-year longitudinal study. *Psychiatry Res.* 2011;186(1):65–70
34. Taliaferro LA, Muehlenkamp JJ, Borowsky IW, McMorris BJ, Kugler KC. Factors distinguishing youth who report self-injurious behavior: a population-based sample. *Acad Pediatr.* 2012;12(3):205–213
35. Cerutti R, Manca M, Presaghi F, Gratz KL. Prevalence and clinical correlates of deliberate self-harm among a community sample of Italian adolescents. *J Adolesc.* 2011;34(2):337–347
36. Loeber R, Burke JD, Lahey BB, Winters A, Zera M. Oppositional defiant and conduct disorder: a review of the past 10 years, part I. *J Am Acad Child Adolesc Psychiatry.* 2000;39(12):1468–1484
37. Demmer DH, Hooley M, Sheen J, McGillivray JA, Lum JAG. Sex differences in the prevalence of oppositional defiant disorder during middle childhood: a meta-analysis. *J Abnorm Child Psychol.* 2017;45(2):313–325
38. Czyz EK, Glenn CR, Busby D, King CA. Daily patterns in nonsuicidal self-injury and coping among recently hospitalized youth at risk for suicide. *Psychiatry Res.* 2019;281:112588
39. Klonsky ED. The functions of deliberate self-injury: a review of the evidence. *Clin Psychol Rev.* 2007;27(2):226–239
40. Plener PL, Schumacher TS, Munz LM, Groschwitz RC. *The Longitudinal Course of Nonsuicidal Self-Injury and Deliberate Self-Harm: A Systematic Review of the Literature.* Borderline Personal Disord Emot Dysregulation; 2015
41. Moffitt TE, Caspi A, Taylor A, et al. How common are common mental disorders? Evidence that lifetime prevalence rates are doubled by prospective versus retrospective ascertainment. *Psychol Med.* 2010;40(6):899–909
42. Fox KR, Huang X, Guzmán EM, et al. Interventions for suicide and self-injury: a meta-analysis of randomized controlled trials across nearly 50 years of research. *Psychol Bull.* 2020;146(12):1117–1145