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Self-injurious Behaviors in a College Population

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ABSTRACT

OBJECTIVE. The goal was to assess the prevalence, forms, demographic and mental health correlates of self-injurious behaviors in a representative college sample.

METHODS. A random sample of undergraduate and graduate students at 2 northeastern US universities were invited to participate in an Internet-based survey in the spring of 2005. Thirty-seven percent of the 8300 invited participants responded.

RESULTS. The lifetime prevalence rate of having ≥1 self-injurious behavior incident was 17.0%. Seventy-five percent of those students engaged in self-injurious behaviors more than once. Thirty-six percent reported that no one knew about their self-injurious behaviors and only 3.29% indicated that a physician knew. Compared with non-self-injurers, those with repeat self-injurious behavior incidents were more likely to be female, bisexual or questioning their sexual orientation. They were less likely to be Asian/Asian American and >24 years of age. When controlling for demographic characteristics, those with repeat self-injurious behavior incidents were more likely to report a history of emotional abuse or sexual abuse, ever having considered or attempted suicide, elevated levels of psychological distress, and ≥1 characteristic of an eating disorder. A dose-response gradient was evident in each of these areas when single-incident self-injurious behaviors were compared with repeat-incident self-injurious behaviors.

CONCLUSIONS. A substantial number of college students reported self-injurious behaviors in their lifetimes. Many of the behaviors occurred among individuals who had never been in therapy for any reason and who only rarely disclosed their self-injurious behaviors to anyone. Single self-injurious behavior incidents were correlated with a history of abuse and comorbid adverse health conditions but less strongly than were repeat self-injurious behavior incidents. The reticence of these clients to seek help or advice renders it critical that medical and mental health providers find effective strategies for detecting and addressing self-injurious behaviors.

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Key Words

self-injury, young adults, mental health

Abbreviations

SIB—self-injurious behaviors
CI—confidence interval
OR—odds ratio

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SELF-INJURIOUS BEHAVIORS (SIB) are those in which an individual inflicts harm to his or her body purposefully, for reasons not recognized or sanctioned socially and without the obvious intention of committing suicide.[1,2] This study seeks to expand on the small body of knowledge available regarding the prevalence, nature, and correlates of SIB in a college population. It is the largest US study conducted on SIB in this population and raises important questions about SIB detection, treatment, and prevention.

Although they are sometimes assumed to be a form of suicidal behavior, SIB are, by definition, acts that occur without suicidal intent.[3–5] In his characterization of SIB as reflecting an impulse control disorder known as the "deliberate self-harm syndrome,"[6] Favazza identified 4 major forms of non-socially sanctioned SIB, major, stereotypic, compulsive, and impulsive. Although the first 3 categories are associated primarily with clinical populations, characteristics of both compulsive and impulsive SIB may be increasingly evident in the non-clinical populations as well. Existing studies suggest that the average age of onset for SIB in clinical populations peaks in middle to late adolescence, followed by a decline in early adulthood.[7–9] Although SIB are most often associated with the term "cutting," they encompass a wide variety of behaviors, including but not limited to carving or cutting skin and subdermal tissue, scratching, burning, ripping or pulling skin or hair, swallowing toxic substances, bruising, and breaking bones.

Despite the widespread concern that the practice is increasing in adolescent and young adult populations,[10,11] there exists no reliable estimate of the prevalence of SIB in the general, nonclinical, US adolescent and young adult population. What is known is derived from clinical samples or is not differentiated from suicide-related behaviors. For example, although the Centers for Disease Control and Prevention track self-inflicted injuries through emergency department data, they do not differentiate between self-inflicted injuries with and without suicidal intent.[12] The few studies that have been conducted with US community samples of adolescents and young adults are limited by the use of small, convenience-based samples. Estimates of SIB prevalence in those studies ranged from 12% to 38%.[3,13–15] Much larger studies conducted in the United Kingdom and Australia found prevalence rates among high school students that ranged from 5% to 13%.[16–19]

The relationship between suicide and SIB is complex. Although most studies suggest that SIB represent a method of temporarily alleviating distress, persons in clinical populations who engage in SIB are more likely also to engage in suicide-related behaviors.[20–27] SIB are also associated with eating disorders, a history of abuse or trauma, and psychological distress in clinical populations.[28–31] There is some evidence of these associations in nonclinical populations as well.[3,13,32]

There are few or conflicting findings about the associations between SIB and gender, ethnicity, or socioeconomic status. No research examining the association between SIB and other demographic factors, such as adolescent family composition or sexual orientation, has been conducted to date. For example, although some research suggests that female individuals are 1.5 to 3.0 times more likely to self-injure than male individuals,[8,33] other studies suggest that the gender gap may be narrower than this.[7,34–37] Similarly, research findings linking race and SIB are mixed, with some studies suggesting that SIB may be more common among white individuals[38–40] and others showing similarly high rates in minority samples.[30,41] Parallels between SIB and eating disorders have led to the same assumptions made about eating disorders—that SIB are likely to be most prevalent among middle- and upper-income individuals,[42] no existing research supports this contention. Indeed, other researchers reported SIB in low-income populations as well.[9] There is some evidence linking SIB to sexual orientation, such that the incidence of SIB is elevated among those who report exclusive homosexual attraction or some same-sex attraction.[43]

METHODS

Sample

A random sample of 8300 undergraduate and graduate students (33.7% of the total combined population) from 2 northeastern universities were invited to participate in an Internet-based survey, the Survey of College Mental Health and Well Being, in the spring of 2005. The sample was drawn by the university registrar, with software designed for that purpose. The demographic profile of those invited was identical to that of the whole student population in both universities. Invitees were sent a postcard alerting them to the study. This was followed by an e-mail letter containing descriptive information and a link to the survey. A total of 3069 individuals (37%) completed the survey. Cases in which a majority of the responses were missing were eliminated ($n = 115$). Cases in which SIB status could not be determined because of missing data ($n = 65$) were also excluded from these analyses. A total of 2875 cases (34.6%) were retained for analysis. Sample demographics were largely representative of the overall student population, although there were significantly more females (56.3%; 95% confidence interval [CI]: 54.6–58.1%; 47.6%) than in the population from which they were drawn.

Study Design and Questionnaire

All participants completed demographic items and a series of questions that assessed a variety of risk factors and comorbid conditions known to be linked with SIB in clinical populations or community surveys. All participants also answered a set of questions about recent

psychological distress, suicide-related behaviors, and help-seeking behaviors.

Assessment of SIB

All respondents received a screening question for SIB, which asked, "Have you ever done any of the following with the intention of hurting yourself?" A list of 16 SIB (described below) was then presented. The SIB were identified through examination of existing SIB surveys[44,45] (A. R. Favazza, MD, written communication, 2004), review of existing literature, and interviews the study team conducted with mental health providers and self-injurers. Individuals were later asked about suicidal intent. Those who selected "to practice suicide" or "to commit suicide" were omitted from the SIB category, because by definition SIB represent acts undertaken without suicidal intent.

Lifetime frequency of SIB, age of onset, current SIB status, perceived severity, body parts affected, and formal help-seeking were also assessed. All of these questions were developed specifically for this study. Perceived severity was assessed with 4 questions, as follows. (1)"Have you ever intentionally hurt yourself more severely than you expected?" (2) "How many times have you intentionally hurt yourself more severely than you expected?" (3) "Have you ever intentionally hurt yourself so badly that you should have been seen by a medical professional (even if you were not)?" (4) "Have you ever sought medical treatment (not therapy) for any of the injuries you intentionally caused?" Help-seeking was assessed by asking respondents to indicate whether (1) anyone knew about their SIB even if they had not discussed SIB with them, (2) they had ever been in psychotherapy for any reason (not including family or couples therapy), and (3) they had ever disclosed or discussed SIB with a mental health professional, physician, or other health care provider.

Correlates of SIB

Demographic characteristics and conditions known or thought to be comorbid with SIB in the clinical population were measured. These included gender, age, international student status, race/ethnicity, father's and mother's education levels (used as a proxy for socioeconomic status), sexual orientation, and family composition during high school. Following the US Census codes, race/ethnicity codes included non-Hispanic black, non-Hispanic white, and Hispanic. An Asian/Asian American category was included to reflect the significant number of Asian/Asian American individuals in each university. The "other" category included American Indian/Alaskan native, Middle Eastern or East Indian, native Hawaiian or Pacific Islander, biracial/biethnic, and multiracial/multiethnic. These categories were collapsed into 4 groups for purposes of the following analyses: white, black, Asian, and other. Sexual orientation included 4 response options, that is, straight, gay or lesbian, bisexual, and questioning. Participants were allowed to select all that applied. For the purposes of these analyses, the 51 respondents who chose ≥2 sexual orientations were categorized as questioning.

Respondent reports of suicidal ideation, gestures, behaviors, and attempts, eating disorders, history of abuse, and mental distress were also elicited. Lifetime suicide-related behaviors were measured with a binary response option taken from a study conducted by Savin-Williams and Ream,[46] which asked, "Have you ever seriously considered suicide or attempted suicide?" A binary variable reflecting the presence of 4 characteristics of disordered eating as defined by *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, was coded as positive if respondents indicated that they had ever repeatedly (1) severely restricted eating, (2) binged or purged, (3) overexercised to lose or to manage weight, or (4) used laxatives to lose or to manage weight. Mental distress in the past 30 days was assessed with the K-6 scale. The K-6 scale was designed to detect levels of non-specific distress that separate serious mental illness from noncases.[47] The presence or absence of abuse history was measured with 3 questions developed for this study, as follows. (1) "Have you ever been in a physically abusive relationship (including family relationships, romantic relationships, acquaintances, and friendships)?" (2) "Have you ever experienced sexual touching or penetration against your will?" (3) "Have you ever been in a relationship that was emotionally abusive (including family relationships, romantic relationships, acquaintances, and friendships)?"

Statistical Analyses

All analyses were conducted with SPSS software, version 13 (SPSS Inc, Chicago, IL). Descriptive statistics, crude odds ratios (ORs), and adjusted ORs with 95% CIs were used to examine the relationship between SIB and all correlates. ORs were obtained from binary logistic regression equations with 2 dichotomous outcomes, namely, (1) a single reported SIB incident versus no SIB incident ($n = 121$) and (2) repeat SIB incidents versus no SIB incident ($n = 347$). Because number of SIB incidents were not known for all SIB respondents, analyses for these two groups were confined to only those whose status was known. Predictors included all demographic variables, history of abuse, and the presence of mental health conditions, including mental distress, characteristics of eating disorders, and suicide-linked behaviors. All models were analyzed first with univariate logistic regression analyses. Those analyses were followed by multivariate logistic regression analyses to produce adjusted ORs, controlling for all demographic characteristics. Since population parameters for key demographic characteristics were known, all logistic regression analyses were weighted to control for gender differences in

the sample and the population and to equalize differences in response rates in each university.

RESULTS

Study Population

As shown in Table 1, the sample contained more female subjects than male subjects; subjects were largely between 18 and 24 years of age. More than one half of subjects were white, with Asian/Asian American being the next most represented ethnic/racial category. More than 80% were attending college as domestic students, rather than international students. A majority of the study subjects reported that their mother and father had college educations, and more than one half reported living with both parents in high school.

SIB

As shown in Table 2, of the 2875 individuals included in these analyses, 490 (17.0%) reported having practiced SIB without suicidal intent at some point in their lives. The 12-month prevalence rate for SIB was 7.3% (n = 210). Another 9.7% (n = 280) had not practiced SIB in ≥1 year. The majority (70.8%) of those who had self-injured indicated that they had engaged in the practice ≥2 times. They reported an average age of onset of 15 to 16 years. Of repeat self-injurers who reported having stopped SIB (n = 179), 79.8% reported ceasing SIB within 5 years after starting; 40% (n = 71) reported stopping SIB within 1 year after starting.

Twenty-one percent (n = 102) of all self-injurers indicated that they had injured themselves more severely than expected on ≥1 occasion; 47.0% of those respondents reported having injured themselves more severely than expected more than once. A total of 9.9% (n = 12) of all single-SIB incident respondents and 25.4% (n = 88) of repeat-SIB incident respondents indicated that they had hurt themselves so badly that they should have been treated by a medical professional. Overall, 6.5% (n = 32) of all self-injurers sought medical help for their injuries.

Rates of help-seeking among self-injurers were notably low. Nearly 40% of all of SIB respondents reported that no one was aware of their SIB; among repeat SIB respondents (n = 346), this figure was 31%. Very few self-injurers (3.2%) disclosed SIB to a physician or allied

TABLE 1 Characteristics of Study Participants (N = 2875)

Characteristic	No. (%)
Gender	
Female	1618 (56.3)
Male	1245 (43.5)
Age	
18–20 y	1142 (39.7)
21–24 y	958 (33.3)
>24 y	756 (26.2)
Student status	
Domestic	2339 (81.9)
International	516 (18.1)
Race/ethnicity	
Non-Hispanic white	1853 (64.7)
Non-Hispanic black	106 (3.7)
Hispanic	124 (4.3)
Asian/Asian American	491 (17.1)
Other	291 (10.2)
Father's education	
Less than high school	109 (3.8)
High school	184 (6.5)
Some post-high school	284 (10.0)
College graduate	2258 (79.7)
Mother's education	
Less than high school	118 (4.2)
High school	235 (8.2)
Some post-high school	387 (13.5)
College graduate	2118 (74.1)
Sexual orientation	
Heterosexual	2629 (92.3)
Homosexual	63 (2.2)
Bisexual	83 (2.9)
Questioning	74 (2.6)
Family composition while in high school	
Both parents	2316 (80.7)
Parent and stepparent	96 (3.3)
One parent	289 (10.1)
Grandparents or other relatives[a]	174 (6.0)

The sum of subgroup numbers may not be equal to the total N because of missing data.

[a] This category reflects individuals who indicated that they lived with other relatives, on their own, with friends, or at boarding school for most of their high school years.

TABLE 2 Description of SIB (n = 490)

Characteristic	No (%)
Lifetime frequency of SIB	
Once	118 (25.4)
2–5 times	154 (33.2)
6–10 times	72 (15.5)
11–20 times	45 (9.7)
≥21 times	75 (15.2)
Age of onset of SIB	
Childhood (<10 y)	24 (5.1)
Early adolescence (10–14 y)	118 (24.9)
Middle adolescence (15–16 y)	128 (27.0)
Late adolescence (17–20 y)	161 (34.0)
Early adulthood (21–24 y)	22 (4.6)
Adulthood (>24 y)	21 (4.4)
Severity	
Hurt more severely than expected	102 (21.1)
Hurt more severely than expected more than once	49 (10.0)
Hurt so badly that should have been treated by a medical professional (even if not treated)	46 (9.4)
Help-seeking	
Sought medical treatment for self-inflicted injuries at any time	32 (6.5)
Anyone knew	315 (64.2)
Been in therapy for any reason	241 (53.0)
Disclosed or discussed SIB with mental health professional	105 (21.4)
Physician knew	16 (3.2)
Other health care provider knew	8 (1.6)

The sum of subgroup numbers may not be equal to the total N because of missing data.

medical health professional, and less than one fourth (21.4%) reported disclosing SIB to or discussing SIB with a mental health professional. Among repeat self-injurers, 5.4% disclosed SIB to a physician or allied medical health professional and 25.7% reported disclosing or discussing SIB with a mental health professional. Just over half (57.1%) of repeat self-injurers had ever been to therapy for any reason.

Table 3 describes specific forms and body locations affected most often by self-injurers. In addition to the forms presented, self-injurers reported that they had engaged in fighting or other aggressive activities with the intention of getting hurt (5.7%), tried to break bones (4.1%), ingested a caustic substance or sharp object (1.6%), broken bones (1.2%), dripped acid onto the skin (1.2%), and/or mutilated the genitals or rectum (0.6%). In addition to the body locations listed, self-injurers were most likely to report the face (7.1%), feet (4.9%), shoulders (2.9%), lips (2.0%), back (1.4%), genitals (1.4%), and buttocks (0.8%), as affected sites. Sixty percent of those who engaged in SIB reported experience with >1 form of SIB. Of those who reported repeat SIB incidents, 70% used multiple methods to self-injure, with the majority (51.4%) reporting 2 to 4 methods. Just more than one half (57.6%) of all self-injurers and just less than 70% of repeat-SIB incident respondents reported affecting >1 area with SIB.

The most common methods reported by both male and female subjects were scratching or pinching with fingernails or other objects to the point that bleeding occurred or marks remained on the skin, banging or punching objects to the point of bruising or bleeding, cutting, and punching or banging oneself to the point of bruising or bleeding. Female subjects were 2.3 times (95% CI: 1.4–3.9 times) more likely to scratch or to pinch and 2.4 times (95% CI: 1.3–4.2 times) more likely to cut. Male subjects were 2.8 times (95% CI: 1.5–5.0 times) more likely than female subjects to punch an object with the intention of injuring themselves. Male subjects were 1.8 times (95% CI: 1.1–3.1 times) more likely to injure their hands, whereas female subjects were 2.3 times (95% CI: 1.7–4.6 times) more likely to injure their wrists and 2.4 times (95% CI: 1.2–4.4 times) more likely to injure their thighs.

TABLE 3 Forms and Locations of Most Common SIB

	Proportion of Self-Injurers, %
Behavior	
Severely scratched or pinched with fingernails or objects to the point that bleeding occurred or marks remained on skin	51.6
Banged or punched objects to the point of bruising or bleeding	37.6
Cut	33.7
Punched or banged oneself to the point of bruising or bleeding	24.5
Ripped or tore skin	15.9
Carved words or symbols into skin	14.9
Interfered with the healing of wounds	13.5
Burned skin	12.9
Rubbed glass or sharp objects into skin	12.0
Engaged in trichotillomania	11.0
Location of injury on body	
Arms	47.3
Hands	38.0
Wrists	29.0
Thighs	17.6
Stomach	16.1
Calves	11.0
Head	10.8
Fingers	10.8

Demographic Characteristic, Abuse History, and Mental Health Condition Correlates of SIB

Few demographic characteristics were associated with single and multiple SIB incidents. There were no differences between individuals with a single SIB incident and no SIB incidents. Compared with those with no SIB incidents, respondents with repeat SIB incidents were significantly more likely to be female than male (adjusted OR: 1.5; 95% CI: 1.1–1.9). They were also more likely to be bisexual (adjusted OR: 4.2; 95% CI: 0.5–7.2) or questioning their sexual orientation (adjusted OR: 2.7; 95% CI: 1.5–5.0) than to be heterosexual. They were also less likely to be over 24 than in the 18 to 20 years of age range (adjusted OR: 0.7; 95% CI: 0.5–1.0). Although there was a very modest significant effect for ethnicity for repeat SIB incidents when white was compared with all other ethnic groups combined (adjusted OR: 0.8; 95% CI: 0.6–1.0), the only specific group to show significantly less repeat SIB incidents than white respondents were Asian or Asian Americans (adjusted OR: 0.7; 95% CI: 0.4–1.0).

Overall, 53.3% of all self-injurers reported having experienced physical, sexual, and/or emotional abuse (Table 4). Twelve percent ($n = 62$) of all self-injurers reported physical abuse, 20% ($n = 99$) reported sexual abuse, and 44% ($n = 215$) reported emotional abuse. Crude ORs showed that individuals with a single SIB incident were significantly more likely to report a history of emotional and physical abuse than were individuals with no SIB. However, only emotional abuse remained significant in the multivariate model. Respondents with repeat SIB incidents were significantly more likely to report a history of emotional, sexual, and physical abuse, with emotional abuse and sexual abuse remaining significant in the multivariate model. These effects did not differ for male and female individuals.

Descriptive and multivariate analyses for no SIB incident, a single SIB incident, and repeat SIB incidents and suicidal behavior, elevated levels of distress, and characteristics of an eating disorder are shown in Table 5. Of all self-injurers, 75.9% reported having considered or at-

TABLE 4 History of Abuse Risk Factors for SIB

	No. (%)			OR (95% CI)			
				Single SIB Incident Versus No SIB		>1 SIB Incident Versus No SIB	
	No SIB (n = 2381)	Single SIB Incident (n = 121)	>1 SIB Incident (n = 347)	Univariate Model	Multivariate Model[a]	Univariate Model	Multivariate Model[a]
Sexual abuse							
Yes	217 (9.1)	19 (15.7)	79 (22.7)	1.9[b] (1.1–3.2)	1.0 (0.4–2.0)	3.1[c] (2.3–4.1)	1.8[b] (1.2–2.8)
No	2164 (90.8)	102 (84.3)	268 (77.2)	1.0	1.0	1.0	1.0
Emotional abuse							
Yes	479 (20.1)	41 (33.8)	165 (47.5)	2.3[c] (1.5–3.4)	1.9[d] (1.1–3.3)	4.4[c] (3.4–5.7)	3.7[c] (2.5–5.1)
No	1902 (79.9)	80 (66.1)	182 (52.4)	1.0	1.0	1.0	1.0
Physical abuse							
Yes	120 (5.2)	10 (8.8)	46 (14.6)	1.7 (0.9–3.4)	1.3 (0.5–3.1)	3.1[c] (2.3–4.1)	1.1 (0.7–1.9)
No	2261 (94.8)	111 (91.2)	301 (85.4)	1.0	1.0	1.0	1.0

Data were derived from multivariate logistic regression analysis with comorbid mental health conditions entered as predictors of dichotomously coded SIB.

[a] All effects were adjusted simultaneously for gender, international student status, age, race/ethnicity, parental education status, sexual orientation, family composition while in high school, and other abuse variables.

[b] $P < .05$.

[c] $P < .001$.

[d] $P < .01$.

TABLE 5 Mental Health Condition Correlates of SIB

	No. (%)			OR (95% CI)			
				Single SIB Incident Versus No SIB		>1 SIB Incident Versus No SIB	
	No SIB (n = 2381)	Single SIB Incident (n = 121)	>1 SIB Incident (n = 347)	Univariate Model	Multivariate Model[a]	Univariate Model	Multivariate Model[a]
Suicidal ideation, plan, gesture, or attempt							
Within lifetime	153 (6.4)	25 (20.6)	135 (38.9)	3.8[b] (2.3–6.1)	3.1[b] (1.8–5.2)	10.6[b] (8.0–14.0)	7.4[b] (5.4–10.1)
Never	2228 (93.5)	96 (79.3)	212 (61.1)	1.0	1.0	1.0	1.0
Perceived level of distress (K-6)							
6–13	1629 (68.4)	65 (53.7)	146 (42.0)	1.0	1.0	1.0	1.0
14–18	627 (26.3)	39 (32.2)	144 (41.4)	1.6[c] (1.0–2.3)	1.3 (0.9–2.1)	2.6[b] (2.0–3.3)	1.8[b] (1.3–2.4)
19–24	93 (3.9)	15 (12.3)	55 (15.8)	4.0[b] (2.2–7.3)	3.1[b] (1.6–6.2)	6.6[b] (4.6–9.7)	3.5[b] (2.2–5.7)
≥1 characteristics of eating disorder							
Yes	467 (19.6)	30 (24.8)	157 (45.2)	1.3 (0.9–2.0)	1.0 (0.6–1.6)	3.6[b] (2.7–4.2)	2.0[b] (1.5–2.7)
No	1914 (80.4)	91 (75.2)	190 (54.8)	1.0	1.0	1.0	1.0

Data were derived from multivariate logistic regression analysis with comorbid mental health conditions entered as predictors of dichotomously coded SIB.

[a] All effects were adjusted simultaneously for gender, international student status, age, race/ethnicity, parental education status, sexual orientation, and family composition while in high school.

[b] $P < .001$.

[c] $P < .05$.

tempted suicide, reported elevated levels of distress (K-6 score of ≥13) in the past 30 days, and/or had ≥1 characteristic of an eating disorder. Specifically, 34.2% (n = 160) of all self-injurers reported having considered or attempted suicide, 64.3% (n = 301) reported elevated levels of distress in the past 30 days, and 28.1% (n = 187) reported ≥1 characteristic of an eating disorder. The prevalence of each mental health condition increased from no SIB incident to a single SIB incident to repeat SIB incidents (Table 5). Persons with a single SIB incident were significantly more likely to report suicidal thoughts and behaviors and elevated levels of distress in the past 30 days than were persons with no SIB incident. Respondents with repeat SIB incidents were significantly more likely than respondents with no SIB incident to report suicidal thoughts and behaviors, high distress levels, and ≥1 characteristic of an eating disorder.

DISCUSSION

There is a widely held belief that SIB are increasing in prevalence in the general adolescent and young adult population. Although lack of adequate empirical data for earlier cohorts prevents empirical testing of this assumption, trends among this age group in other indicators of mental health suggest that this perception may be well founded. For example, findings from a national study of youths with intentional self-inflicted injuries taken from community hospital inpatient utilization data from 1990 to 2000 showed an increase in rates of cutting (from 4.3% to 12.2%) and more severe psychiatric diagnoses that were treated with shorter inpatient stays.[48] Youth suicide rates have increased 36% since 1970 and 150% since 1950[49] and, in a meta-analyses of anxiety in the US population, Twenge[50] found that average US children reported more anxiety than psychiatric patients in the

1950s. Similarly, data from the National Comorbidity Surveys showed strong cohort effects for major depressive disorder, with the youngest cohorts showing increased rates of the disorder.[51] A 2003 national survey of directors of counseling centers at colleges and universities in the United States found that 81.4% reported seeing more students with serious psychological problems than just 5 years ago.[52] These findings are consistent with national trends in the general population showing increased use of mental health services over the past decade.[48] SIB communities on Internet message boards are now prevalent and visited frequently, and may provide a means for spreading the practice.[53] The tendency for SIB to follow epidemic-like patterns in institutional settings such as hospitals and detention facilities[54–57] and to become somewhat addictive[58] may be reflected in nonclinical settings such as high schools and colleges. Although any one of these trends may be an artifact of other changes, when taken as a whole they suggest a concerning trend.

In this context, the current study is an important step in understanding the scope and nature of SIB without suicidal intent and related help-seeking in a college population. Our prevalence rate of 17% is consistent with other studies and suggests that SIB in this population do warrant serious consideration. Three fourths of those who reported SIB indicated that they had practiced SIB on ≥2 occasions and reported engaging in a wide variety of practices. This finding is not entirely consistent with existing literature based on clinical populations, which found a much higher rate of repeat SIB.[59]

SIB are popularly assumed to represent a female phenomenon. This assumption is not fully supported by existing literature.[60] In addition, many SIB studies have been conducted in clinical settings where women are overrepresented. Our findings did show that significantly more female subjects than male subjects engaged in SIB, but these gender effects applied only to repeat SIB incidents and were not strong (OR: <2.0). The fact that SIB are popularly associated with cutting may account for the belief that SIB represent a female phenomenon, because we did find that women were more likely than men to cut.

Few other demographic characteristics predicted SIB strongly. Bisexuality or questioning sexual orientation was related significantly to both single SIB and repeat SIB incidents, although the number of such individuals was small. Homosexual and heterosexual sexual orientations were not associated with SIB status. Although other studies found homosexual individuals to be at greater risk for SIB,[43] this might be an artifact of the fact that suicidal behaviors were included in the definition of SIB. International students were more likely than domestic students to report a single SIB incident, but this might be a result of small sample sizes, because the effect was reversed with repeat SIB incidents. Overall, we cannot conclude that international students were at greater risk for single SIB incidents.

Our finding that the majority of SIB respondents reported an age of onset in the middle adolescent years is similar to other studies.[59–61] Consistent with the assumption that SIB represent an increasingly popular method of regulating distress for adolescents and young adults, we found that respondents >24 years of age were slightly less likely to report SIB than were the younger cohorts. This effect was not strong, however. Moreover, although the sample contained graduate students, the majority of those students were <30 years of age and perhaps similar to the younger cohorts. Despite the tendency for SIB to be concentrated in the adolescent years, the variation in age of onset suggests that there may be different developmental trajectories in SIB.[60] Investigation of these differences may yield important information useful for clinical detection and treatment.

Our findings suggest that rates of detection and treatment of SIB are remarkably low. Despite the fact that 1 of 5 respondents who reported SIB indicated that they had injured themselves more severely than expected or badly enough that they should have received medical treatment, very few ever sought medical help. This low level of engagement with health providers among self-injurious individuals is similar to community-based studies of school-aged children in the United Kingdom and Australia.[16,17] The tendency to avoid professional help-seeking was also reflected in the findings related to informal help-seeking. These findings reinforce the contention that SIB generate shame and often are experienced as very isolating. The fact that so many of those who self-injured clearly were functioning well enough to go undetected by the health care system raises important questions about whether those who practice SIB in a college population are likely to suffer poor future outcomes disproportionately, compared with non-self-injurious youth. The strong association with suicide-related behaviors and heightened distress suggest so, but future studies of other measures of well-being, such as academic performance, are needed.

Those who engaged in SIB were more likely to report elevated distress scores. This is similar to community studies that showed self-harm to be associated with psychiatric disorders.[62] SIB are recognized widely as a method of coping with distress,[14,25] and some view it as a highly functional alternative to suicide.[1,42] Our study, like those documenting a relationship between SIB and suicide in clinical settings,[25–27] showed a definitive link between the 2 behaviors. The findings do not provide evidence that SIB are part of a continuum of suicidal behavior, only that they may signal underlying unresolved distress. Indeed, 66% of all those who had engaged in SIB reported never having considered or attempted suicide.

Consistent with other research,[7,9,34,63,64] a history of

abuse was correlated with SIB, although this varied according to the type of abuse. Physical abuse was unrelated to SIB once control factors were added to the models. Emotional abuse was related to both single incidents of SIB and repeat SIB, whereas sexual abuse was more prevalent among respondents with repeat SIB. Our finding that emotional abuse was a more-powerful predictor of SIB status than sexual abuse is not consistent with existing literature, perhaps because emotional abuse has been defined largely as parental neglect.[30,60] Our findings also suggested that gender moderated these effects.

The results presented here should be considered in light of 4 limitations. First, the response rate, although typical of Internet-based surveys,[65] was not as high as is regarded ideal, which might have biased the results in unknown ways. Although the sample was large and mostly representative of the population of students from which it was drawn, it did contain significantly more female subjects than the college population. This might have biased the overall estimates of SIB slightly upward in the case of gender. Second, the external validity of the data was limited because of sampling from 2 elite universities in the Northeast. Compared with the national American College Health Association Assessment for 2003, the sample for the 2 schools in this study was similar to the national student population in terms of sexual orientation and involvement in fraternal organizations. However, our sample contained more graduate students, international students, male students, and minority students.[66] A regional bias is not likely to be great, because there are not strong regional differences in conditions that correlate with SIB, such as major depressive disorders or suicide-related behaviors.[51,67] Moreover, research showed no differences in rates of suicide at colleges compared with respect to selectivity, competitiveness, or prestige.[68] Third, our findings may not be generalizable to the noncollege population of persons in this age group or to younger cohorts (eg, middle and high school students). Non-college-bound youths may be at higher risk for SIB, because studies have shown that self-harm that includes suicide attempts is more prevalent among those with less educational achievement and lower socioeconomic status.[4,67] However, SIB are often compared with eating disorders, which show no clear socioeconomic status trend.[69,70] If SIB are increasing in prevalence among younger cohorts, then students now in middle school or high school ultimately may have a higher lifetime prevalence than the college population we studied. Fourth, our findings cannot date definitively the onset of SIB relative to the presence of risk factors such as emotional abuse or comorbid conditions such as eating disorders or suicide-related behaviors.

CONCLUSIONS

This study marks a needed step forward in assessing SIB prevalence and practices in a community sample of adolescents and young adults. Our findings suggest that medical providers and therapists see a significant number of adolescents and young adults whom they may fail to recognize as self-injurious. Some of these are at heightened risk for severe distress and suicide-related behaviors. The reticence of those who practice SIB to seek advice from anyone makes it critical that medical and mental health providers find effective strategies for recognizing, treating, and preventing SIB. Existing interview tools such as the home environment, education and employment, eating, peer-related activities, drugs, sexuality, suicide/depression, and safety from injury and violence tool (which contains a single optional question on SIB)[71] and the American Medical Association Guidelines for Adolescent Preventive Services[72] are useful first steps in detecting SIB in clinical settings. However, in light of the current evidence, expanded inquiry about SIB might be considered a standard and necessary part of all routine history and physical examinations of later adolescent and early young adult patients. Clearly, more research into the root causes, detection, prevention, and treatment of SIB is a public health imperative.

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