Prevalence and Mental Health Treatment of Suicidal Ideation and Behavior Among College Students Aged 18–25 Years and Their Non–College-Attending Peers in the United States

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ABSTRACT

Objective: College students have been the focus of many studies on suicidal ideation with or without suicidal behavior. Little attention has been given to their non–college-attending peers on these issues. We examined the 12-month prevalence and mental health treatment of suicidal ideation with or without suicidal behavior among college students aged 18–25 years and their non–college-attending peers in the United States.

Methods: We assessed data from 135,300 persons aged 18–25 years who participated in the 2008–2013 National Surveys on Drug Use and Health. Descriptive analyses and multivariate logistic regression models were applied.

Results: Compared with full-time college students, high school students, those not enrolled in a school or college, and part-time college students were more likely to attempt suicide with a plan (model-adjusted prevalence = 0.67% vs 1.09%, 1.06%, and 1.07%, respectively). The mental health treatment rate among full-time college students with suicidal ideation with or without suicidal behavior was similar to the rates among the other 3 counterparts. The effects of race/ethnicity and serious mental illness on receipt of mental health treatment were significantly larger among those who did not perceive unmet treatment need than among those who perceived unmet treatment need ($P = .019$ and $P = .001$, respectively).

Conclusions: Compared to full-time college students, non–college-attending young adults and part-time college students were at higher risk for attempting suicide with a plan. Suicide prevention and intervention strategies should emphasize increasing access to mental health treatment among both college students with suicidal ideation with or without suicidal behavior and their non–college-attending peers (particularly among minorities and those who seem to be at low risk because they are without serious mental illness and report no need for mental health treatment).

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Suicidal ideation with or without suicide plan or attempt (ie, suicidal ideation with/without behavior; SIB) and death by suicide among young adults are major public health concerns. The prevalence of having serious thoughts of suicide (suicidal ideation) is higher among young adults than older age groups.[1–4] Having suicidal ideation only often indicates the initial stage of SIB progression, but having suicidal ideation and a plan is regarded as a psychiatric emergency since it is related to suicide attempts and death by suicide.[5–9] About 20% of young adults with suicidal ideation attempted suicide in 2012.[2] Many young suicide attempters have long-term mental, physical, and social health problems that last into their later adulthood.[10] Suicide attempt is the strongest known predictor for death by suicide,[11–13] and suicide is the third leading cause of death among persons aged 15–24 years in the United States.[1]

Distinct prediction and prevention strategies are needed for suicidal ideation, suicide plan, suicide attempt with a plan, and suicide attempt without a plan,[14,15] as previous studies have supported the notion of the suicidality spectrums (suicidal ideation, suicide plan, and suicide attempt) as separate entities.[15–17] However, none of the existing studies examined the 12-month prevalence of these 4 distinct SIB categories among young adults. Furthermore, although mental health treatment can reduce suicide risk,[11,18–20] little is known about how receipt of mental health treatment varies by the 4 SIB categories among young adults.

Only 41% of US adults aged 18–24 years were enrolled in college in 2012.[21] However, college students have been the focus of many studies on SIB or mental health treatment.[22–31] Little attention has been given to their non–college-attending peers on these critical issues. While college students and their non–college-attending peers had similar overall rates of psychiatric disorders,[32] none of the existing studies systematically examined the 4 distinct SIB categories and mental health treatment among the following 4 young-adult groups: full-time college students, part-time college students, those without school/college enrollment, and those still enrolled in high school.

This study examined the 12-month prevalence and mental health treatment of the 4 distinct SIB categories among the 4 young-adult groups in the United States. These results could be informative for clinicians, college professionals, policymakers, and the general public. Consistent with the aspirational goals proposed by the recent Suicide Research Prioritization Plan of Action,[13] our ultimate goal is to provide data that can inform the development of effective suicide prevention and intervention strategies.

Clinical Points

- Full-time college students have been the focus of many studies on suicidal ideation with or without suicidal behavior or mental health treatment. Yet, little attention has been given to their non–college-attending peers on these issues.
- Clinicians should pay special attention to non–college-attending young adults, part-time college students, and high-school students because they are at higher risk for attempting suicide with a plan compared with full-time college students.

METHODS

Data Source

We examined restricted data from 135,300 persons aged 18–25 years who participated in the 2008–2013 National Surveys on Drug Use and Health (NSDUH), conducted by the Substance Abuse and Mental Health Services Administration. NSDUH provides nationally representative data on SIB and mental health treatment among the civilian, noninstitutionalized population aged 18 years or older in the United States. Excluded from the survey are persons without a household address (eg, homeless persons not living in shelters), active-duty military personnel, and residents of institutional group quarters (eg, hospitals or prisons). Data were collected by interviewers during in-person visits to households and noninstitutional group quarters. Audio computer-assisted self-administered interviewing was used, providing respondents with a private, confidential way to record answers.[2,33]

Measures

Suicidal ideation with/without behavior. The 2008–2013 NSDUH questionnaires asked all adult respondents if at any time during the past 12 months they had thought seriously about trying to kill themselves. Those who reported that they had suicidal ideation were asked if they made any plans to kill themselves and if they tried to kill themselves in the past 12 months.

Indicators of physical and mental health status that may be related to suicidal ideation and behavior. NSDUH captured a respondent's self-rated health and the number of emergency room visits (for any reason) in the past year and assessed whether a respondent had a major depressive episode and substance use disorders in the past year based on the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (*DSM-IV*), criteria.[34] Nicotine dependence among cigarette smokers was assessed using the Nicotine Dependence Syndrome Scale.[35] NSDUH also asked adult respondents if they were told by a doctor or other health professional that they had anxiety disorder in the past year. Data on these measures demonstrated good validity and reliability.[36–38]

The severity of mental illness is strongly associated with receipt of mental health treatment.[2,11,13,18] We used serious mental illness (yes/no) as a covariate when assessing factors associated with receipt of mental health treatment among young adults with SIB. Serious mental illness is defined as a mental disorder (excluding developmental and substance use disorders) that results in serious functional impairment substantially interfering with or limiting major life activities.[2,39]

Mental health treatment, self-perceived unmet treatment need, and substance use treatment. NSDUH asked all adults to report whether they perceived a need for mental health treatment, whether they received outpatient or inpatient mental health treatment, and whether they received prescription medications for mental health problems in the previous year. Since adults receiving substance use treatment also tended to receive mental health treatment,[40] we assessed if adults received substance use treatment for illicit drug or alcohol use problems in the past year.

Sociodemographics. Since sociodemographic factors are associated with SIB prevalence and receipt of mental health treatment,[3,15,41] we examined age, gender, race/ethnicity, having a college degree (yes/no), health insurance, family income as a percentage of the Federal Poverty Level, employment status, and region.[2]

Statistical Analyses

First, among persons aged 18–25 years, bivariate multinomial logistic regression models were applied to estimate and test the differences in sociodemographic characteristics, health status, mental health, and substance use between those without SIB and each of the SIB groups. Second, descriptive analyses were conducted to estimate the unadjusted 12-month prevalence of SIB among the 4 young-adult groups. Third, multivariate multinomial logistic regression modeling was applied to estimate model-adjusted 12-month prevalence (MAP) of SIB among these groups. Fourth, descriptive analyses were conducted to estimate receipt of mental health treatment in the past year among the 4 young-adult groups with SIB. Finally, multivariate logistic regression modeling was applied to examine factors associated with receipt of mental health treatment in the past year among young adults with SIB.

Multicollinearity was assessed based on variance inflation factors during multivariate modeling and was not found in the final multivariate models. All analyses used SUDAAN software[42] to account for NSDUH's complex sample design and sampling weights. Using PREDMARG and PRED_EFF statements in SUDAAN,[42–46] we obtained MAPs and model-adjusted risk ratios (MARRs) from average marginal predictions in the final multivariate models.

RESULTS

Prevalence of Suicidal Ideation and Behavior

Among young adults with suicidal ideation, 18.11% attempted suicide in the previous year.[2] Table 1 shows differences in sociodemographic characteristics, health status, mental health, and substance use between those without SIB and each of the SIB groups. The MAP of SIB was similar to the corresponding unadjusted prevalence of SIB (Table 2).

Table 1. Characteristics of the Study Sample Without or With Suicidal Ideation or Behavior Among Persons Aged 18–25 Years From the 2008–2013 National Surveys on Drug Use and Health (N = 135,300[a])[b]

Variable	No Suicidal Ideation, Plan, or Attempt (n = 125,900)[a]	Suicidal Ideation Only (n = 6,100)[a]	Suicidal Ideation and Plan Only (n = 1,600)[a]	Suicidal Ideation and Attempt, but No Suicide Plan (n = 400)[a]	Suicidal Ideation, Plan, and Attempt (n = 1,300)[a]
Group					
Full-time college enrollment	33.22 (0.37)	32.36 (0.88)	32.67 (1.71)	**23.03 (2.78)**	**22.58 (1.59)**
Part-time college enrollment	8.32 (0.11)	**10.60 (0.55)**	9.45 (1.00)	7.81 (1.63)	8.87 (1.07)
No school enrollment	51.79 (0.33)	**49.46 (0.88)**	48.80 (1.75)	**59.23 (3.17)**	**55.35 (1.83)**
High school enrollment	5.54 (0.09)	6.28 (0.42)	**7.93 (0.93)**	6.98 (1.42)	**8.98 (0.97)**
Age in years					
18–19	26.28 (0.24)	**31.32 (0.82)**	**33.15 (1.65)**	**38.35 (3.34)**	**40.68 (1.79)**
20–21	24.89 (0.21)	26.04 (0.79)	27.65 (1.54)	29.94 (3.23)	25.14 (1.62)
22–23	24.84 (0.18)	**23.24 (0.76)**	**21.07 (1.35)**	**16.09 (2.32)**	**18.93 (1.41)**
24–25	23.99 (0.20)	**19.40 (0.68)**	**18.14 (1.33)**	**15.62 (2.34)**	**15.25 (1.51)**
Gender					
Male	50.66 (0.20)	**45.43 (0.85)**	**41.08 (1.67)**	**38.94 (3.52)**	**42.32 (1.92)**
Female	49.34 (0.20)	**54.57 (0.85)**	**58.92 (1.67)**	**61.06 (3.52)**	**57.68 (1.92)**
Race/ethnicity					
Non-Hispanic white	58.55 (0.32)	**61.68 (0.87)**	**63.28 (1.70)**	**44.06 (3.28)**	**54.38 (2.00)**
Non-Hispanic black	14.20 (0.21)	**12.23 (0.55)**	12.24 (1.07)	17.13 (2.55)	16.72 (1.44)
Non-Hispanic Native American/Alaska Native	0.62 (0.03)	0.66 (0.13)	1.13 (0.37)	1.47 (0.81)	**1.10 (0.25)**
Non-Hispanic Native Hawaiian/ Pacific Islander	0.43 (0.03)	0.52 (0.14)	0.31 (0.18)	0.73 (0.52)	0.26 (0.17)
Non-Hispanic Asian	4.88 (0.15)	5.08 (0.41)	4.68 (0.98)	4.77 (1.83)	3.67 (0.98)
Non-Hispanic more than one race	1.68 (0.05)	**2.79 (0.32)**	2.15 (0.38)	**5.03 (1.23)**	**3.07 (0.69)**
Hispanic	19.63 (0.25)	**17.04 (0.73)**	**16.21 (1.33)**	**26.81 (3.40)**	20.80 (1.68)
Education					
Not a college graduate	85.29 (0.19)	**88.26 (0.58)**	**90.22 (1.12)**	**97.20 (1.05)**	**96.38 (0.66)**
College graduate	14.71 (0.19)	**11.74 (0.58)**	**9.78 (1.12)**	**2.80 (1.05)**	**3.62 (0.66)**
Family income as % of Federal Poverty Level					
< 100%	25.43 (0.33)	25.33 (0.81)	**29.27 (1.70)**	**38.89 (3.54)**	**32.96 (1.76)**
100%–199%	24.07 (0.20)	24.30 (0.73)	24.19 (1.40)	25.67 (2.77)	**28.69 (1.79)**
≥ 200%	47.54 (0.35)	47.07 (0.92)	**43.21 (1.73)**	**33.90 (3.02)**	**36.45 (1.78)**
Unknown	2.96 (0.30)	3.30 (0.45)	3.32 (0.60)	1.55 (0.77)	1.89 (0.47)
Health insurance					
Private insurance only	54.24 (0.29)	**52.24 (0.91)**	**49.06 (1.69)**	**31.09 (2.89)**	**38.02 (1.88)**
Medicare	0.56 (0.03)	0.65 (0.11)	0.53 (0.20)	**2.59 (1.14)**	**1.29 (0.50)**
Medicaid only	13.01 (0.17)	12.85 (0.58)	13.54 (1.21)	**19.89 (2.45)**	**22.00 (1.57)**
Uninsured	25.46 (0.22)	**27.17 (0.79)**	**28.84 (1.47)**	**34.65 (3.50)**	**30.83 (1.80)**
Other	6.73 (0.10)	7.09 (0.44)	8.02 (1.04)	**11.79 (2.04)**	7.85 (0.99)
Employment status					
Full-time	39.37 (0.27)	**32.80 (0.80)**	**27.88 (1.41)**	34.68 (3.39)	**26.90 (1.62)**
Part-time	27.17 (0.20)	**30.57 (0.79)**	**31.58 (1.56)**	24.62 (3.02)	**25.57 (1.67)**
Unemployment	11.86 (0.14)	**15.52 (0.63)**	**17.00 (1.28)**	**18.92 (2.55)**	**21.96 (1.57)**
Not in the labor force	21.60 (0.23)	21.12 (0.74)	23.53 (1.50)	21.78 (2.72)	**25.57 (1.60)**
Self-rated health					
Excellent	30.72 (0.20)	**18.90 (0.69)**	**15.00 (1.21)**	**19.86 (2.56)**	**15.43 (1.37)**
Very good	41.63 (0.19)	40.38 (0.84)	40.75 (1.69)	**32.99 (3.02)**	**32.65 (1.79)**
Good	22.58 (0.17)	**29.97 (0.78)**	**31.78 (1.56)**	**34.38 (3.37)**	**33.38 (1.78)**
Fair/poor	5.06 (0.09)	**10.75 (0.55)**	**12.47 (1.12)**	**12.76 (2.02)**	**18.54 (1.55)**
Number of past year emergency department visits					
None	66.99 (0.19)	**57.56 (0.85)**	**51.41 (1.67)**	**40.36 (3.27)**	**33.99 (1.76)**
1 Visit	15.53 (0.13)	**18.55 (0.68)**	**21.86 (1.33)**	**25.77 (2.91)**	**25.24 (1.60)**
2 Visits	11.34 (0.13)	**14.09 (0.62)**	12.41 (1.02)	**16.13 (2.38)**	**20.74 (1.61)**
3+ Visits	4.82 (0.08)	**8.71 (0.46)**	**13.51 (1.14)**	**15.23 (2.18)**	**17.65 (1.40)**
Past-year major depressive episode					
Yes	5.74 (0.09)	**40.57 (0.83)**	**55.10 (1.66)**	**45.83 (3.24)**	**53.26 (1.85)**
No	93.75 (0.09)	**58.45 (0.83)**	**43.66 (1.66)**	**52.24 (3.24)**	**45.62 (1.85)**
Past-year anxiety disorder					
Yes	4.8 (0.08)	**16.62 (0.66)**	**22.66 (1.38)**	**18.69 (2.46)**	**25.40 (1.60)**
No	95.20 (0.08)	**83.38 (0.66)**	**77.34 (1.38)**	**81.31 (2.46)**	**74.60 (1.60)**
Past-year serious mental illness					
Yes	0.78 (0.03)	**41.68 (0.86)**	**55.55 (1.64)**	**48.18 (3.34)**	**53.00 (1.89)**
No	99.22 (0.03)	**58.32 (0.86)**	**44.45 (1.64)**	**51.82 (3.34)**	**47.00 (1.89)**
Perceived unmet need for mental health treatment					
Yes	5.47 (0.09)	**33.67 (0.82)**	**44.12 (1.76)**	**40.77 (3.38)**	**39.70 (1.86)**
No	94.32 (0.09)	**66.16 (0.82)**	**55.58 (1.76)**	**58.47 (3.38)**	**59.63 (1.86)**
Nicotine dependence					
Yes	13.79 (0.15)	**19.68 (0.67)**	**23.17 (1.33)**	**26.10 (2.78)**	**34.53 (1.82)**
No	86.21 (0.15)	**80.32 (0.67)**	**76.83 (1.33)**	**73.90 (2.78)**	**65.47 (1.82)**

(continued)

Table 1 (continued). Characteristics of the Study Sample Without or With Suicidal Ideation or Behavior Among Persons Aged 18–25 Years From the 2008–2013 National Surveys on Drug Use and Health (N = 135,300[a])[b]

Variable	No Suicidal Ideation, Plan, or Attempt (n = 125,900)[a]	Suicidal Ideation Only (n = 6,100)[a]	Suicidal Ideation and Plan Only (n = 1,600)[a]	Suicidal Ideation and Attempt, but No Suicide Plan (n = 400)[a]	Suicidal Ideation, Plan, and Attempt (n = 1,300)[a]
Alcohol use					
12-month alcohol use disorder	14.09 (0.15)	**27.22 (0.81)**	**28.96 (1.54)**	**32.94 (3.19)**	**36.23 (1.77)**
12-month alcohol use, but no alcohol use disorder	63.30 (0.19)	**56.03 (0.85)**	**54,32 (1.67)**	**46.98 (3.62)**	**48.65 (1.87)**
Lifetime use, but no 12-month alcohol use	7.23 (0.11)	**5.90 (0.41)**	6.06 (0.74)	6.35 (1.32)	7.23 (1.01)
Never use	15.39 (0.16)	**10.85 (0.56)**	**10.76 (1.08)**	13.73 (2.93)	**7.89 (1.07)**
Illicit drug use					
12-month illicit drug use disorder	6.69 (0.10)	**18.89 (0.72)**	**21.90 (1.39)**	**23.13 (2.74)**	**29.93 (1.76)**
12-month illicit drug use, but no illicit drug use disorder	27.30 (0.20)	**33.44 (0.87)**	**34.60 (1.57)**	**33.54 (3.17)**	**31.71 (1.77)**
Lifetime use, but no 12-month illicit drug use	22.27 (0.17)	**19.37 (0.67)**	**17.39 (1.25)**	19.55 (2.57)	**18.05 (1.34)**
Never use	43.74 (0.22)	**28.30 (0.78)**	**26.11 (1.53)**	**23.78 (3.23)**	**20.31 (1.62)**
Received past-year substance use treatment[c]					
Yes	1.29 (0.04)	**2.96 (0.29)**	**4.59 (0.68)**	**5.40 (1.63)**	**10.55 (1.23)**
No	98.71 (0.04)	**97.04 (0.29)**	**95.41 (0.68)**	**94.60 (1.63)**	**89.45 (1.23)**

[a]The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files has to be rounded to the nearest 100, which intends to minimize potential disclosure risk.
[b]All values represent the annual average weighted percentage distributions (standard errors). Boldface means the percentage is significantly different from the corresponding percentage among young adults without SIB (suicidal ideation with/without behavior; $P < .05$).
[c]Substance use treatment includes treatment for illicit drug or alcohol use at a hospital overnight as an inpatient, a residential drug/alcohol rehabilitation facility where the person stayed overnight, a drug/alcohol rehabilitation facility as an outpatient, a mental health facility as an outpatient, an emergency department, a private doctor's office, or prison/jail.

Table 2. Unadjusted and Model-Adjusted 12-Month Prevalence of Suicidal Ideation With and Without Behavior Among Persons Aged 18–25 Years From the 2008–2013 National Surveys on Drug Use and Health (N = 135,300[a])[b]

	Unadjusted Prevalence			
College Students and Non–College-Attending Peers	Suicidal Ideation Only	Suicidal Ideation and Plan Only	Suicidal Ideation and Attempt, but No Suicide Plan	Suicidal Ideation, Plan, and Attempt
Full-time college enrollment	4.33 (4.08–4.58)	1.14 (1.00–1.28)	0.20 (0.14–0.26)	0.65 (0.55–0.75)
Part-time college enrollment	5.56 (4.97–6.15)[c]	1.30 (1.03–1.57)	0.27 (0.15–0.39)	1.00 (0.76–1.24)[c]
No school/college enrollment	4.23 (4.03–4.43)	1.09 (0.99–1.19)	0.33 (0.27–0.39)[c]	1.03 (0.93–1.23)[c]
High school enrollment	4.93 (4.28–5.58)	1.63 (1.26–2.00)[c]	0.36 (0.23–0.50)[c]	1.51 (1.18–1.84)[c]
	Model-Adjusted Prevalence			
College Students and Non–College-Attending Peers	Suicidal Ideation Only[d]	Suicidal Ideation and Plan Only[d]	Suicidal Ideation and Attempt, but No Suicide Plan[d]	Suicidal Ideation, Plan, and Attempt[d]
Full-time college enrollment	4.17 (3.91–4.44)	1.09 (0.95–1.24)	0.21 (0.16–0.28)	0.67 (0.57–0.79)
Part-time college enrollment	5.50 (4.97–6.08)[c]	1.30 (1.05–1.62)	0.27 (0.17–0.41)	1.07 (0.84–1.35)[c]
No school/college enrollment	4.40 (4.19–4.63)	1.15 (1.04–1.27)	0.34 (0.28–0.41)[c]	1.06 (0.95–1.18)[c]
High school enrollment	4.62 (4.03–5.29)	1.50 (1.18–1.92)[c]	0.27 (0.17–0.42)	1.09 (0.86–1.39)[c]

[a]The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files has to be rounded to the nearest 100, which intends to minimize potential disclosure risk.
[b]All values are the annual average weighted percentages (95% CI).
[c]This estimate was significantly different from the estimate of those with full-time college enrollment within each table cell.
[d]Covariates included in the final multinomial logistic regression model: age, gender, race/ethnicity, education (non-college graduate/college graduate), employment, health insurance, self-rated health, past-year major depressive episode (yes/no), past-year anxiety disorder (yes/no), nicotine dependence (yes/no), alcohol use (12-month alcohol use disorders; 12-month alcohol use, but no alcohol use disorders; and lifetime alcohol use, but no 12-month alcohol use; or never use), and illicit drug use (12-month illicit drug use disorders; 12-month illicit drug use, but no illicit drug use disorders; and lifetime illicit drug use, but no 12-month illicit drug use; or never use).

Part-time college students had higher MAP of having suicidal ideation only than full-time college students (5.50% vs 4.17%, respectively; relative risk [RR] = 1.32; 95% confidence interval [CI], 1.17–1.49). The MAP of having suicidal ideation and plan only was higher among high school students than among full-time college students (1.50% vs 1.09%, respectively; RR = 1.38; 95% CI, 1.06–1.80). Those without school/college enrollment had higher MAP of attempting suicide without a plan than full-time college students (0.34% vs 0.21%, respectively; RR = 1.61; 95% CI, 1.11–2.34). Full-time college students had lower MAP of attempting suicide with a plan than high school students, those without school/college enrollment, and part-time college students (0.67% vs 1.09%, 1.06%, and 1.07%; RRs = 0.62, 0.63, 0.63; respectively).

Prevalence of Receipt of Mental Health Treatment

Table 3 reveals that among young adults with SIB, full-time college students and the other 3 young-adult groups had similar overall mental health treatment rates. Among those who attempted suicide with a plan, the other 3 groups did not differ from full-time college students in 3 other examined outcomes, except that those without school/college enrollment had a lower outpatient mental health treatment rate than full-time college students (27.44% vs 36.44%).

Table 3. Past-Year Prevalence of Receipt of Mental Health Treatment Among Persons Aged 18–25 Years Who Had Suicidal Ideation With and Without Behavior in the Past 12 Months From the 2008–2013 National Surveys on Drug Use and Health (n = 9,500[a])[b]

Mental Health Treatment	Suicidal Ideation Only (n = 6,100)[a]	Suicidal Ideation and Plan Only (n = 1,600)[a]	Suicidal Ideation and Attempt, but No Suicide Plan (n = 400)[a]	Suicidal Ideation, Plan, and Attempt (n = 1,300)[a]
Inpatient mental health treatment[c]				
Full-time college enrollment	1.62 (0.38)	4.06 (1.05)	13.33 (5.19)	18.19 (2.77)
Part-time college enrollment	3.13 (1.14)	7.12 (2.89)	…	19.92 (4.68)
No school/college enrollment	3.32 (0.42)[d]	8.01 (1.20)[d]	13.41 (3.03)	23.25 (2.16)
High school enrollment	3.58 (1.41)	7.62 (3.26)	…	28.18 (5.40)
Outpatient mental health treatment[e]				
Full-time college enrollment	20.97 (1.19)	32.06 (3.24)	40.85 (6.88)	36.44 (3.66)
Part-time college enrollment	19.26 (2.32)	33.54 (5.49)	…	28.50 (5.40)
No school/college enrollment	15.62 (0.83)[d]	25.65 (2.00)	23.98 (4.11)[d]	27.44 (2.26)[d]
High school enrollment	18.96 (2.72)	25.14 (4.85)	…	33.05 (5.39)
Receipt of prescription medication for mental health problems				
Full-time college enrollment	23.55 (1.32)	33.88 (2.97)	44.06 (6.86)	37.10 (3.80)
Part-time college enrollment	22.11 (2.29)	41.16 (5.38)	…	34.76 (5.39)
No school/college enrollment	24.88 (0.98)	31.52 (2.12)	30.09 (4.14)	38.89 (2.51)
High school enrollment	19.22 (2.66)	21.88 (4.24)[d]	…	38.82 (5.58)
Any mental health treatment above				
Full-time college enrollment	31.28 (1.40)	44.01 (3.34)	55.99 (6.67)	49.96 (4.05)
Part-time college enrollment	32.87 (2.79)	51.41 (5.51)	…	46.24 (5.89)
No school/college enrollment	29.68 (1.06)	39.06 (2.35)	41.16 (4.74)	45.93 (2.50)
High school enrollment	27.28 (3.00)	33.44 (5.29)	…	54.92 (5.70)

[a]The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files has to be rounded to the nearest 100, which intends to minimize potential disclosure risk.
[b]All values represent the annual average weighted percentage (standard errors).
[c]Inpatient mental health services include services received for a mental health problem at a private or public psychiatric hospital, a psychiatric unit of a general hospital, a medical unit of a general hospital, another type of hospital, a residential treatment center, etc.
[d]This estimate was significantly different from the estimate of those with full-time college enrollment within each table cell ($P < .05$).
[e]Outpatient mental health services include services received for a mental health problem at the office of a private therapist, psychologist, psychiatrist, social worker, or counselor that was not part of a clinic; a doctor's office that was not part of a clinic; an outpatient medical clinic; a partial day hospital or day treatment program; etc.
Symbol: … = low statistical precision, no estimates reported.

Correlates of Receipt of Mental Health Treatment

Among young adults with SIB, 36.58% perceived unmet need for mental health treatment. The prevalence of past 12-month treatment was higher among young adults with SIB and perceived unmet treatment need (47.77%) than among young adults with SIB but without perceived unmet treatment need (27.79%). The final multivariate logistic regression pooled model for receipt of mental health treatment among young adults with SIB identified 2 interactions (race/ethnicity and perceived unmet treatment need [$P = .019$]; serious mental illness and perceived unmet treatment need [$P = .001$]). To better understand how these factors were associated with receipt of mental health treatment, stratified multivariate models by perceived unmet treatment need were conducted (Table 4).

Among young adults with SIB and perceived unmet treatment need, receipt of mental health treatment was associated with the following characteristics: attempting suicide with or without a plan (MARRs = 1.25–1.40), being female (MARR = 1.21), not being in the labor force (MARR = 1.20), having health insurance (MARRs = 1.31–1.65), having serious mental illness (MARR = 1.27), having 3 or more emergency department visits (MARR = 1.31), and receiving substance use treatment (MARR = 1.52).

Among young adults with SIB, but without perceived unmet treatment need, in addition to similar characteristics noted previously, receipt of mental health treatment was also associated with the following characteristics: those aged 24–25 years (MARR = 1.35), those without full-time employment (MARRs = 1.16–1.31), and self-rated nonexcellent health (MARRs = 1.24–1.79). Having a college degree was not related to receipt of mental health treatment among young adults with SIB but without perceived unmet treatment need. In contrast, among their counterparts with perceived unmet treatment need, those without a college degree were less likely to receive mental health treatment than college graduates (MARR = 0.82).

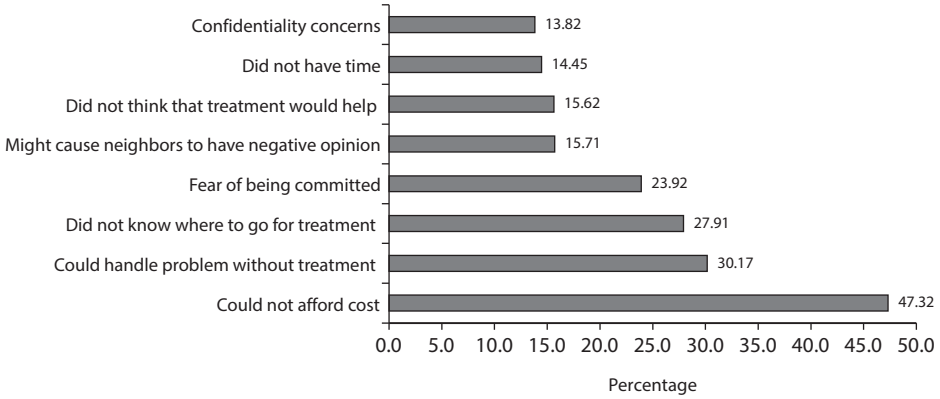
Among young adults with SIB and perceived unmet treatment need, the MAPs of mental health treatment were 51.87% among non-Hispanic whites, 40.77% among non-Hispanic blacks, 34.95% among non-Hispanic Asians, and 38.20% among Hispanics. Hispanics and non-Hispanic blacks and Asians were less likely to receive mental health treatment than non-Hispanic whites (MARRs = 0.67–0.79). Among young adults with SIB, but without perceived unmet need, the MAPs of mental health treatment were 33.60% among non-Hispanic whites, 14.98% among non-Hispanic blacks, 22.46% among non-Hispanic Asians, and 21.52% among Hispanics. Hispanics and non-Hispanic blacks and Asians were less likely to receive mental health treatment than non-Hispanic whites (MARRs = 0.45–0.67). Importantly, these minorities had even lower rates of mental health treatment among young adults with SIB who did not perceive unmet need for treatment. The race/ethnicity effect on receipt of mental health treatment was larger among young adults with SIB but without perceived unmet treatment need than among their counterparts with SIB and perceived unmet treatment need ($P = .019$).

Table 4. Multivariate Logistic Regression Showing Factors Associated With Receipt of Mental Health Treatment in the Past Year Among Persons Aged 18–25 Years Who Had Past-Year Suicidal Ideation With and Without Behavior From the 2008–2013 National Surveys on Drug Use and Health (n = 9,500[a])[b]

Variable	MARR for Receipt of Mental Health Treatment (95% CI): Received Treatment vs Did Not Receive Treatment		
	Total (n = 9,500)[a]	Among Those Who Perceived Unmet Treatment Need (n = 3,500)[a]	Among Those Who Did Not Perceive Unmet Treatment Need (n = 6,000)[a]
College students and non–college-attending peers			
Full-time college	1.00	1.00	1.00
Part-time college	1.13 (1.00–1.27)	1.11 (0.95–1.30)	1.12 (0.94–1.34)
No school/college enrollment	0.96 (0.88–1.04)	0.93 (0.84–1.04)	0.98 (0.87–1.12)
High school enrollment	0.99 (0.85–1.15)	0.83 (0.66–1.05)	1.10 (0.90–1.35)
Suicidality intensity			
Suicidal ideation only	1.00	1.00	1.00
Suicidal ideation, suicide plan only	**1.15 (1.05–1.25)**	**1.17 (1.05–1.30)**	1.12 (0.98–1.28)
Suicidal ideation, suicide attempt, but had no plan	**1.32 (1.14–1.53)**	**1.25 (1.02–1.54)**	**1.41 (1.15–1.72)**
Suicidal ideation, suicide plan, and suicide attempt	**1.34 (1.22–1.47)**	**1.40 (1.25–1.57)**	**1.29 (1.13–1.48)**
Age in years			
18–19	1.00	1.00	1.00
20–21	1.00 (0.91–1.10)	0.95 (0.84–1.07)	1.06 (0.93–1.21)
22–23	1.03 (0.93–1.14)	0.97 (0.85–1.11)	1.09 (0.93–1.26)
24–25	**1.17 (1.05–1.30)**	1.01 (0.88–1.16)	**1.35 (1.16–1.57)**
Gender			
Male	1.00	1.00	1.00
Female	**1.21 (1.12–1.30)**	**1.21 (1.09–1.34)**	**1.22 (1.10–1.35)**
Race/ethnicity			
Non-Hispanic white	1.00	1.00	1.00
Non-Hispanic black	**0.60 (0.53–0.69)**	**0.79 (0.65–0.94)**	**0.45 (0.36–0.55)**
Non-Hispanic Native American/Alaska Native	0.75 (0.53–1.07)	0.92 (0.56–1.51)	0.62 (0.38–1.00)
Non-Hispanic Native Hawaiian/ Pacific Islander	0.78 (0.46–1.34)	0.47 (0.13–1.73)	1.03 (0.68–1.55)
Non-Hispanic Asian	**0.69 (0.55–0.86)**	**0.67 (0.48–0.95)**	**0.67 (0.50–0.89)**
Non-Hispanic more than one race	0.89 (0.70–1.12)	0.90 (0.67–1.21)	0.85 (0.59–1.24)
Hispanic	**0.69 (0.61–0.77)**	**0.74 (0.63–0.87)**	**0.64 (0.54–0.75)**
Education			
Not a college graduate	**0.87 (0.78–0.98)**	**0.82 (0.71–0.94)**	0.95 (0.79–1.15)
College graduate	1.00	1.00	1.00
Employment status			
Full-time	1.00	1.00	1.00
Part-time	**1.12 (1.02–1.23)**	1.08 (0.95–1.21)	**1.16 (1.01–1.34)**
Unemployment	**1.14 (1.03–1.27)**	0.99 (0.85–1.15)	**1.30 (1.12–1.51)**
Not in the labor force	**1.25 (1.14–1.38)**	**1.20 (1.06–1.36)**	**1.31 (1.13–1.52)**
Health insurance			
Private insurance only	**1.59 (1.44–1.76)**	**1.35 (1.19–1.53)**	**1.87 (1.59–2.19)**
Medicare	**1.79 (1.38–2.31)**	**1.65 (1.25–2.19)**	**1.88 (1.19–2.97)**
Medicaid only	**1.51 (1.34–1.70)**	**1.31 (1.12–1.53)**	**1.69 (1.42–2.03)**
Uninsured	1.00	1.00	1.00
Other	**1.58 (1.38–1.80)**	**1.36 (1.15–1.62)**	**1.82 (1.48–2.23)**
Self-rated health			
Excellent	1.00	1.00	1.00
Very good	1.09 (0.98–1.21)	0.93 (0.81–1.17)	**1.24 (1.06–1.45)**
Good	**1.17 (1.05–1.31)**	1.03 (0.90–1.19)	**1.30 (1.11–1.53)**
Fair/poor	**1.36 (1.19–1.54)**	0.99 (0.84–1.18)	**1.79 (1.49–2.16)**
Past-year major depressive episode			
Yes	**1.17 (1.06–1.28)**	1.11 (0.98–1.24)	**1.22 (1.07–1.40)**
No	1.00	1.00	1.00
Serious mental illness in the past year			
Yes	**1.57 (1.42–1.73)**	**1.27 (1.09–1.46)**	**1.82 (1.60–2.08)**
No	1.00	1.00	1.00
Number of past year emergency department visits			
None	1.00	1.00	1.00
1 Visit	**1.33 (1.23–1.45)**	**1.21 (1.09–1.35)**	**1.45 (1.28–1.63)**
2 Visits	**1.15 (1.04–1.27)**	1.14 (0.99–1.29)	1.16 (0.99–1.35)
3+ Visits	**1.47 (1.33–1.61)**	**1.31 (1.15–1.48)**	**1.62 (1.41–1.86)**
Received past-year substance use treatment[c]			
Yes	**1.79 (1.61–1.98)**	**1.52 (1.33–1.75)**	**2.07 (1.78–2.40)**
No	1.00	1.00	1.00
Perceived unmet need for mental health treatment			
Yes	**1.27 (1.18–1.36)**		
No	1.00		
Interaction effect between race/ethnicity and perceived unmet need for mental health treatment	*P* = .019		
Interaction effect between serious mental illness and perceived unmet need for mental health treatment	*P* = .001		

[a]The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files has to be rounded to the nearest 100, which intends to minimize potential disclosure risk.
[b]Significant MARRs are in boldface.
[c]Substance use treatment includes treatment for illicit drug or alcohol use at a hospital overnight as an inpatient, a residential drug/alcohol rehabilitation facility where the person stayed overnight, a drug/alcohol rehabilitation facility as an outpatient, a mental health facility as an outpatient, an emergency department, a private doctor's office, or prison/jail.

Figure 1. Self-Reported Reasons for Not Receiving Mental Health Treatment in the Past Year by Adults Aged 18–25 Years Who Had 12-Month Suicidal Ideation and Behavior and Perceived an Unmet Need for Mental Health Treatment in the Past Year: 2008–2013 National Surveys on Drug Use and Health (n = 1,800)[a]



[a]441,300 adults aged 18–25 years (annual average) had 12-month suicidal ideation or behavior, did not receive mental health treatment, but perceived unmet treatment need in the past year.

Among young adults with SIB and perceived unmet treatment need, the MAPs of mental health treatment were 51.80% among those with serious mental illness and 39.26% among those without serious mental illness. Among young adults with SIB but without perceived unmet treatment need, the MAPs of mental health treatment were 38.88% among those with serious mental illness and 21.35% among those without serious mental illness. Although those with serious mental illness tended to receive mental health treatment regardless of their status of perceived unmet treatment need, the effect of serious mental illness on receipt of mental health treatment was larger among young adults with SIB but without perceived unmet treatment need than among their counterparts with SIB and perceived unmet treatment need ($P = .001$).

Reported Reasons for Not Receiving Mental Health Treatment

Figure 1 presents several self-reported reasons for not receiving mental health treatment in the past year by young adults aged 18–25 years with SIB who perceived unmet need for mental health treatment, including an inability to afford treatment (47.32%), being able to handle their mental health problems without treatment (30.17%), not knowing where to go for treatment (27.91%), and having fear of being committed to treatment (23.92%).

DISCUSSION

To our knowledge, this study is the first to use recent nationally representative data to examine the prevalence and mental health treatment of 12-month SIB among college students and their non–college-attending peers in the United States. We find that SIB is not uncommon among both college students (full-time and part-time) and their non–college-attending peers. Among young adults with suicidal ideation, 18.11% attempted suicide in the previous year, which was comparable to the prevalence in 2012.[2] Significant differences in the MAP of SIB among these disparate groups suggest the importance of targeted efforts. On the basis of our multivariate results, suicide prevention efforts are especially highlighted for non–full-time college students because they are at increased risk for suicide attempt with a plan, for high school students because they have a higher risk for having suicidal ideation and plan only, and for part-time college students because they have an elevated risk for having suicidal ideation only.

Mental health treatment can reduce suicide risk among adults with SIB.[11,17–19,47] Also, the Garrett Lee Smith Memorial Act (GLSMA) funds suicide prevention programs focusing on persons aged 10–24 years particularly in states, tribes, and colleges and shows reduction in suicide rates.[48,49] Yet, our study shows that only 34.41% of young adults with 12-month SIB received mental health treatment in the past year. The overall 12-month prevalence of mental health treatment among full-time college students with SIB was similar to the prevalence rates among the other 3 groups regardless of their perceived unmet treatment need. Thus, effective efforts are needed for suicide prevention and promotion of mental health treatment not only on college campuses but also at workplaces and high schools and in local communities.

Age, Education, and Gender

Among young adults with SIB and perceived unmet treatment need, age was not associated with receipt of mental health treatment, but those with a college degree tended to receive mental health treatment. Among young adults with SIB but without perceived unmet treatment need, those aged 24–25 years were more likely to receive mental health treatment than those aged 18–19 years, but being a college graduate was not related to receipt of mental health treatment. Female young adults with SIB were more likely than their male counterparts to receive mental health treatment regardless of their perceived unmet treatment need.

Race/Ethnicity

Compared with their non-Hispanic white counterparts with SIB, non-Hispanic blacks and Asians and Hispanics were less likely to receive mental health treatment and were even less likely to receive mental health treatment among those without perceived unmet treatment need than among those with perceived unmet treatment need. Taken together, these results suggest the importance of understanding sociocultural norms of these minority young adults,[50–53] screening for their SIB, helping them understand the effectiveness of mental health treatment for SIB, and facilitating their access to mental health treatment.

Health Insurance

Regardless of perceived unmet treatment need, uninsured young adults with SIB tended not to receive mental health treatment compared with their insured counterparts. Among suicide attempters who did not receive mental health treatment but perceived unmet treatment need, almost half felt they could not afford the costs. These results are informative for current mental health parity and the Affordable Care Act (ACA) efforts. Under the ACA, some uninsured suicide attempters may be covered under their parents' health insurance or have Medicaid or private insurance.[54] Further research is needed to monitor the prevalence of SIB among young adults and mental health treatment by insurance status over time.

Mental Disorders

Consistent with previous studies,[3,9,10,55,56] we found that the MAP of the 4 SIB categories varied by mental illnesses (major depressive episode, serious mental illness, anxiety disorder, alcohol and illicit drug use disorders, and nicotine dependence) among the 4 young-adult groups (data not shown). It is important to screen for and treat these mental illnesses among young adults with SIB. Young adults with SIB but with neither serious mental illness nor perceived unmet treatment need are less likely to receive mental health treatment; thus, suicide prevention programs should particularly target them.

Perceived Unmet Treatment Need and Self-Reported Treatment Barriers

The lack of perceived need for mental health treatment may contribute to low prevalence of mental health treatment among young adults with SIB. We found that among young adults with SIB who did not receive mental health treatment, over 70% did not perceive unmet treatment need. Even among young adults who perceived unmet treatment need, but did not receive treatment, over 30% reported that they could handle the problem without treatment. These adults neither understand the effectiveness of mental health treatment nor view their SIB as a warning sign to seek treatment.

Our results are important as they may help develop effective suicide prevention strategies and inform the GLSMA suicide prevention programs. An inability to afford treatment or not knowing where to go for treatment indicates the importance of improving treatment access. Having fear of being committed to treatment may suggest the importance of fully understanding mental health treatment. Factors associated with receipt of mental health treatment among young adults with SIB, but without perceived unmet treatment need, are essential for developing more effective suicide prevention strategies.

This study has several limitations. The 2008–2013 NSDUH questionnaires did not measure desire for death among adult respondents. To reduce false positives (without serious intention to die),[57] NSDUH did not ask respondents whether they made suicide plans and attempts once they reported that they did not seriously think about killing themselves in the previous 12 months. Thus, we could not estimate the prevalence of past-year desire for death and prevalence of attempting suicide with neither plans nor ideation in the past 12 months among young adults with SIB. The endorsement of suicidal ideation and plan was based on single questions that could be interpreted differently by respondents. We could not examine the onset time and severity of SIB, methods of suicide attempts, sexual orientation, the timing of receipt of mental health treatment, and minimally adequate treatment[58] because the NSDUH did not collect these data. It was impossible to determine whether SIB occurred before or after mental health treatment was received. NSDUH was a self-reported survey and was subject to underreporting sensitive and often stigmatized behaviors (eg, SIB) due to social desirability bias. The study included assessment of SIB only in those aged 18 years or older; thus, the high school sample did not include younger subjects who may have different results. In addition, while the high school category is needed to allow complete assessment of the 18- to 25-year age range, treatment and prevention services for high school students may be quite different than those for the other groups. Finally, since NSDUH did not cover homeless persons not living in shelters and active duty military personnel, our study might have underestimated the already significant SIB differences between college-attending and non–college-attending peers.

Despite these limitations, this study provides valuable information about the 12-month prevalence of 4 distinct SIB categories and the prevalence and correlates of 12-month mental health treatment among college students with SIB and their non–college-attending peers. It is critical to promote public awareness about SIB[11,53,54] and risk and protective factors for receiving mental health treatment among young adults with SIB.[11,13] Under the ACA, more young adults with SIB may be covered by health insurance with time. However, they may not seek mental health treatment if they do not perceive treatment need. Importantly, clinicians can screen for and identify young adults with SIB during their routine practice and help them get access to effective mental health treatment in time, which may eventually reduce suicide risk among young adults. In addition to full-time college students, suicide prevention and intervention strategies need to focus on part-time college students and non–college-attending peers and to improve their access to mental health treatment.

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REFERENCES

1. Understanding Suicide. CDC Web site. Available at: http://www.cdc.gov/violenceprevention/pdf/suicide_factsheet-a.pdf. Accessed April 20, 2016.
2. Substance Abuse and Mental Health Services Administration. *Results from the 2012 National Survey on Drug Use and Health: Mental Health Findings*. NSDUH Series H-47, HHS Publication No. (SMA) 13-4805. Rockville, MD: Substance Abuse and Mental Health Services Administration. 2013.
3. Han B, McKeon R, Gfroerer J. Suicidal ideation among community-dwelling adults in the United States. *Am J Public Health*. 2014;104(3):488–497.
4. Nock MK, Borges G, Bromet EJ, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *Br J Psychiatry*. 2008;192(2):98–105.
5. Suicide Facts at a Glance 2015. CDC Web site. Available at: http://www.cdc.gov/violenceprevention/pdf/suicide-datasheet-a.pdf. Accessed April 20, 2016.
6. Nakagawa A, Grunebaum MF, Oquendo MA, et al. Clinical correlates of planned, more lethal suicide attempts in major depressive disorder. *J Affect Disord*. 2009;112(1–3):237–242.
7. Coryell W, Young EA. Clinical predictors of suicide in primary major depressive disorder. *J Clin Psychiatry*. 2005;66(4):412–417.
8. Brown GK, Henriques GR, Sosdjan D, et al. Suicide intent and accurate expectations of lethality: predictors of medical lethality of suicide attempts. *J Consult Clin Psychol*. 2004;72(6):1170–1174.
9. Nock MK, Borges G, Bromet EJ, et al. Suicide and suicidal behavior. *Epidemiol Rev*. 2008;30(1):133–154.
10. Goldman-Mellor SJ, Caspi A, Harrington H, et al. Suicide attempt in young people: a signal for long-term health care and social needs. *JAMA Psychiatry*. 2014;71(2):119–127.
11. The 2012 National Strategy for Suicide Prevention: Goals and Objectives for Action. US Department of Health and Human Services (HHS) Office of the Surgeon General and National Action Alliance for Suicide Prevention Web site. Available at: http://www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/full-report.pdf. Updated September 2012. Accessed October 15, 2014.
12. Suominen K, Isometsä E, Suokas J, et al. Completed suicide after a suicide attempt: a 37-year follow-up study. *Am J Psychiatry*. 2004;161(3):562–563.
13. A Prioritized Research Agenda for Suicide Prevention: An Action Plan to Save Lives. Action Alliance for Suicide Prevention's Web site. Available at: http://actionallianceforsuicideprevention.org/sites/actionallianceforsuicideprevention.org/files/Agenda.pdf. Updated 2014. Accessed August 1, 2014.
14. Nock MK, Green JG, Hwang I, et al. Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry*. 2013;70(3):300–310.
15. Han B, Compton WM, Gfroerer J, et al. Prevalence and correlates of past 12-month suicide attempts among adults with past-year suicidal ideation in the United States. *J Clin Psychiatry*. 2015;76(3):295–302.
16. Oquendo MA, Baca-García E, Mann JJ, et al. Issues for *DSM-V*: suicidal behavior as a separate diagnosis on a separate axis. *Am J Psychiatry*. 2008;165(11):1383–1384.
17. American Psychiatric Association. *Diagnostic and Statistical Manual for Mental Disorders*. Fifth Edition. Washington, DC: American Psychiatric Association; 2013.
18. Jacobs DG, Baldessarini RJ, Conwell Y, et al; Work Group on Suicidal Behaviors. *Practice Guideline for the Assessment and Treatment of Patients With Suicidal Behaviors*. Washington, DC: American Psychiatric Association; 2003.
19. Bruce ML, Ten Have TR, Reynolds CF 3rd, et al. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. *JAMA*. 2004;291(9):1081–1091.
20. While D, Bickley H, Roscoe A, et al. Implementation of mental health service recommendations in England and Wales and suicide rates, 1997–2006: a cross-sectional and before-and-after observational study. *Lancet*. 2012;379(9820):1005–1012.
21. America's Young Adults: Special Issue, 2014. Federal Interagency Forum on Child and Family Statistics Web site. Available at: www.childstats.gov/pdf/ac2014/YA_14.pdf. Updated July 2014. Accessed July 2, 2014.
22. Taliaferro LA, Rienzo BA, Pigg RM Jr, et al. Spiritual well-being and suicidal ideation among college students. *J Am Coll Health*. 2009;58(1):83–90.
23. Eisenberg D, Hunt J, Speer N. Mental health in American colleges and universities: variation across student subgroups and across campuses. *J Nerv Ment Dis*. 2013;201(1):60–67.
24. Eisenberg D, Chung H. Adequacy of depression treatment among college students in the United States. *Gen Hosp Psychiatry*. 2012;34(3):213–220.
25. Zivin K, Eisenberg D, Gollust SE, et al. Persistence of mental health problems and needs in a college student population. *J Affect Disord*. 2009;117(3):180–185.
26. Wang MC, Lightsey OR Jr, Tran KK, et al. Examining suicide protective factors among black college students. *Death Stud*. 2013;37(3):228–247.
27. Arria AM, Caldeira KM, Vincent KB, et al. Discontinuous college enrollment: associations with substance use and mental health. *Psychiatr Serv*. 2013;64(2):165–172.
28. Cranford JA, Eisenberg D, Serras AM. Substance use behaviors, mental health problems, and use of mental health services in a probability sample of college students. *Addict Behav*. 2009;34(2):134–145.
29. Eisenberg D, Golberstein E, Gollust SE. Help-seeking and access to mental health care in a university student population. *Med Care*. 2007;45(7):594–601.
30. Hunt J, Eisenberg D. Mental health problems and help-seeking behavior among college students. *J Adolesc Health*. 2010;46(1):3–10.
31. Buchanan JL. Prevention of depression in the college student population: a review of the literature. *Arch Psychiatr Nurs*. 2012;26(1):21–42.
32. Blanco C, Okuda M, Wright C, et al. Mental health of college students and their non-college-attending peers: results from the National Epidemiologic Study on Alcohol and Related Conditions. *Arch Gen Psychiatry*. 2008;65(12):1429–1437.
33. National Survey on Drug Use and Health. SAMHSA Web site. Available at: http://www.samhsa.gov/data/population-data-nsduh. Accessed April 20, 2016.
34. American Psychiatric Association. *Diagnostic and Statistical Manual for Mental Disorders*. Fourth Edition. Washington, DC: American Psychiatric Association; 1994.
35. Shiffman S, Waters A, Hickcox M. The nicotine dependence syndrome scale: a multidimensional measure of nicotine dependence. *Nicotine Tob Res*. 2004;6(2):327–348.
36. Grucza RA, Abbacchi AM, Przybeck TR, et al. Discrepancies in estimates of prevalence and correlates of substance use and disorders between two national surveys. *Addiction*. 2007;102(4):623–629.
37. Jordan BK, Karg RS, Batts KR, et al. A clinical validation of the National Survey on Drug Use and Health assessment of substance use disorders. *Addict Behav*. 2008;33(6):782–798.
38. Substance Abuse and Mental Health Services Administration. *Reliability of Key Measures in the National Survey on Drug Use and Health*. Office of Applied Studies, Methodology Series M-8, HHS Publication No. SMA 09-4425. Rockville, MD: Office of Applied Studies, Substance Abuse and Mental Health Services Administration: 2010.
39. Kott P, Hedden S, Aldworth J, et al. A revised strategy for estimating the prevalence of mental illness. SAMHSA Web site. Available at: http://www.samhsa.gov/data/sites/default/files/NSDUHrevisedMImethods2012/NSDUHrevisedMImethods2012.pdf. Updated October 2013. Accessed August 2, 2014.
40. Brennan PL, Kagay CR, Geppert JJ, et al. Predictors and outcomes of outpatient mental health care: a 4-year prospective study of elderly Medicare patients with substance use disorders. *Med Care*. 2001;39(1):39–49.
41. Han B, Compton WM, Gfroerer J, et al. Mental health treatment patterns among adults with recent suicide attempts in the United States. *Am J Public Health*. 2014;104(12):2359–2368.
42. Shah B, Barnwell B, Bieler G. *SUDAAN User's Manual*. Version 9.1 ed [computer program]. Research Triangle Park, NC: Research Triangle Institute. 2005.
43. Zhang J, Yu KF. What's the relative risk? a method of correcting the odds ratio in cohort

studies of common outcomes. *JAMA*. 1998;280(19):1690–1691.
44. McNutt LA, Wu C, Xue X, et al. Estimating the relative risk in cohort studies and clinical trials of common outcomes. *Am J Epidemiol*. 2003;157(10):940–943.
45. Greenland S. Model-based estimation of relative risks and other epidemiologic measures in studies of common outcomes and in case-control studies. *Am J Epidemiol*. 2004;160(4):301–305.
46. Bieler GS, Brown GG, Williams RL, et al. Estimating model-adjusted risks, risk differences, and risk ratios from complex survey data. *Am J Epidemiol*. 2010;171(5):618–623.
47. Web-based Injury Statistics Query and Reporting System (WISQARS). CDC Web site. Available at: http://www.cdc.gov/injury/wisqars/. Accessed April 20, 2016.
48. Goldston DB, Walrath CM, McKeon R, et al. The Garrett Lee Smith Memorial Suicide Prevention Program. *Suicide Life Threat Behav*. 2010;40(3):245–256.
49. Walrath C, Garraza LG, Reid H, et al. Impact of the Garrett Lee Smith youth suicide prevention program on suicide mortality. *Am J Public Health*. 2015;105(5):986–993.
50. Range LM, Leach MM, McIntyre D, et al. Multicultural perspectives on suicide. *Aggress Violent Behav*. 1999;4(4):413–430.
51. Orbach I. A taxonomy of factors related to suicidal behavior. *Clin Psychol Sci Pract*. 1997;4(3):208–224.
52. Langhinrichsen-Rohling J, Friend J, Powell A. Adolescent suicide, gender, and culture: a rate and risk factor analysis. *Aggress Violent Behav*. 2009;14(5):402–414.
53. Kessler RC, Berglund P, Borges G, et al. Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *JAMA*. 2005;293(20):2487–2495.
54. Han B, Gfroerer J, Kuramoto SJ, et al. Medicaid expansion under the Affordable Care Act: Potential changes in receipt of mental health treatment among low-income nonelderly adults with serious mental illness. *Am J Public Health*. 2015;105(10):1982–1989.
55. Drum DJ, Brownson C, Denmark AB, et al. New data on the nature of suicidal crises in college students: shifting the paradigm. *Prof Psychol*. 2009;40(3):213–222.
56. Caine ED. Forging an agenda for suicide prevention in the United States. *Am J Public Health*. 2013;103(5):822–829.
57. Plöderl M, Kralovec K, Yazdi K, et al. A closer look at self-reported suicide attempts: false positives and false negatives. *Suicide Life Threat Behav*. 2011;41(1):1–5.
58. Wang PS, Lane M, Olfson M, et al. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):629–640.

Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Suicide section. Please contact Maria A. Oquendo, MD, at moquendo@psychiatrist.com.