

Twelve-Month Suicidal Symptoms and Use of Services Among Adolescents: Results From the National Comorbidity Survey

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Objective: The study assessed the prevalence of suicidal ideation, suicide plans, and suicide attempts as well as patterns of mental health service use among adolescents. **Methods:** Data came from the National Comorbidity Survey–Adolescent Supplement, a nationally representative sample of 10,123 adolescents aged 13 to 18 years who participated in computer-assisted, face-to-face interviews between February 2001 and January 2004. Prevalences of suicidal thoughts and behaviors in the past year were determined. Past-year use of any mental health treatment and receipt of four or more visits from one provider among youths with suicidal ideation, plans, or attempts were also assessed. Associations were evaluated by using logistic regression. **Results:** During the course of 12 months, 3.6% of adolescents reported suicidal ideation without a plan or attempt, .6% reported a suicide plan without an attempt, and 1.9% made a suicide attempt. Overall, two-thirds of adolescents with suicidal ideation (67.3%) and half of those with a plan (54.4%) or attempt (56.9%) did not have any contact with a mental health specialist in the past year. Different predictors of use of care were identified for each group. **Conclusions:** Adolescent suicidality often is untreated in the United States. Increased outreach efforts to improve treatment access for youths with suicidal ideation and attempts are needed. (*Psychiatric Services* 63: 989–996, 2012; doi: 10.1176/appi.ps.201200058)

Suicide accounts for one in every ten adolescent deaths in the United States (1). Each year, approximately 14% of high school students seriously consider suicide,

11% report having a suicide plan, 6% attempt suicide, and 2% make an attempt that requires medical attention (2). Although the absolute rate of suicide among adolescents is lower

than among adults, it represents a larger proportionate share of years of life lost (3). Psychiatric disorders, including mood, substance use, eating, anxiety, and disruptive behavioral disorders, are highly prevalent among adolescents who contemplate (4,5) and complete (6–9) suicide. Identifying adolescents at risk of suicide has become an important goal of suicide prevention initiatives (10).

Although adolescents with suicidal behaviors are more likely than their nonsuicidal counterparts to use mental health care (11–13), less than half of adolescents who attempt suicide and only about one-third of adolescents who experience suicidal ideation have received mental health services in the past year. Among youths with suicidal thoughts or behaviors, known predictors of use of services include female gender, older age, increased family income, white racial or ethnic background, greater severity of suicidal behavior, and presence of comorbid mental disorders (12–15).

Prior work outside the United States (13,14) has examined treatment-seeking patterns among adolescents with suicidal behaviors but has not studied the full range of service providers (12) and has not differentiated suicidal ideation from attempts (15). Because early treatment dropout is common among younger individuals (16), there is a need to assess the extent to which treated adolescents

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receive more than a single visit with a provider.

This study sought to determine national rates of suicidal ideation, plans, and attempts in the past year among a large, nationally representative sample of adolescents. Because of their stronger empirical foundation, the data are more useful than data collected previously to inform mental health policies for the prevention and treatment of suicidal risk in adolescence. The study also identified demographic and clinical correlates of past-year suicidal thoughts and behaviors; compared the sociodemographic and clinical characteristics of adolescents with and without past-year ideation, plans, and attempts; determined the proportion of adolescents with suicidality who had contact with services and received four or more visits in the previous 12 months; and identified factors associated with the receipt of care.

Methods

Sample

The data are from the National Comorbidity Survey–Adolescent (NCS-A) Supplement, a household and school-based survey of adolescents in the United States conducted during February 2001 and January 2004. A dual sampling frame was used to select a nationally representative sample of 10,123 adolescents aged 13 to 18 years who responded between February 2001 and January 2004 for computer-assisted face-to-face interviews. In addition, one parent or guardian of each participant was asked to complete a self-administered questionnaire regarding the adolescent's mental health. The overall response rate for adolescents was 82.9%, and the response rate for parents whose adolescents consented to participate was 83.3%. Study procedures were approved by the human subjects committees of Harvard Medical School and the University of Michigan. This analysis was deemed exempt from review by the institutional review board of the New York State Psychiatric Institute, where the first author was affiliated when this study began. The sample was weighted for variation within household and school probability of selec-

tion, for differential nonresponse, and for residual discrepancies between the sample and the U.S. population on the basis of sociodemographic and geographic variables (17,18).

Measures

Sociodemographic factors. Factors examined included sex, race-ethnicity, age, parental education level, poverty-income ratio (ratio of a family's income to the family's poverty threshold, the dollar amounts used by the U.S. Census Bureau to determine a family's or person's poverty status), and urbanicity.

Mental health status. Twelve-month DSM-IV mental disorders were assessed by using a modified version of the World Health Organization's Composite International Diagnostic Interview 3.0 (19). Mood disorders (major depressive disorder, dysthymia, and bipolar disorder), substance use disorders, anxiety disorders (agoraphobia, generalized anxiety disorder, separation anxiety disorder, social phobia, specific phobia, panic disorder, and posttraumatic stress disorder), eating disorders (anorexia nervosa and bulimia nervosa), and behavior disorders (attention-deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder) were considered.

Self-perceived overall general medical and mental health was assessed on a 4-point scale (poor, fair, good, or excellent), and responses were dichotomized as poor or fair and good or excellent. Perceived need for help was ascertained by asking adolescents if they felt they might need to see a professional because of problems with their emotions or behavior, and use of psychotropic medication in the past 12 months was determined.

Suicidal ideation, plan, and attempt. Suicidal thoughts and behaviors were examined in a separate section. Suicidal ideation was assessed by asking, "Have you ever seriously thought about killing yourself?" Adolescents who endorsed lifetime suicidal ideation were asked about suicidal ideation, plan, or attempts in the past 12 months. Plans and attempts were assessed regardless of past-year suicidal ideation status. Suicide plan was assessed by asking, "Have you made a plan for killing

yourself in the past 12 months?" and suicide attempt was assessed by asking, "Have you tried to kill yourself in the past 12 months?" The groups with 12-month suicidal ideation only (N=334), 12-month suicide plan but no attempt (N=61), and 12-month suicide attempt (N=163) were used for analyses.

Service use. All respondents were asked whether they had received treatment during the past 12 months "for problems with [their] emotions or behavior." Treatment included mental health specialty outpatient services (psychiatrist, psychologist, social worker, or family counselor), inpatient visits including overnight hospitalization, visits to an outpatient clinic (community mental health center, partial hospitalization or day treatment program, or drug or alcohol clinic), and general medical care. We also examined treatment for mental health concerns received in settings other than specialized mental health care (20). These included visits with human services professionals and complementary or alternative medicine professionals and juvenile-justice and school-based services. In the case of inpatient treatment and school services, the number of nights spent in a hospital or other residential facility and the number of months attending special schools and special classes were also assessed. Minimal treatment duration was defined as four or more visits with a given provider (20,21). A history of prior treatment was defined as use of any services prior to the 12-month period preceding completion of the survey. Use of psychotropic medication was defined as use during the 12 months prior to completion of the survey.

Statistical analyses

All statistical analyses were conducted by using SUDAAN, version 10. Taylor series linearization was used in calculating variance to take into account the complex survey design. Crosstabulations were used to determine weighted prevalence of past-year suicidal ideation, suicide plan, suicide attempt, and service utilization. Multiple logistic regressions were employed to estimate adjusted odds ratios (AORs) and associated 95%

confidence intervals (CIs) for suicidal ideation, plan, or attempt after adjustment for sociodemographic (sex, age, race-ethnicity, parent education, poverty index ratio, and urban residence) and clinical (12-month mental disorder, number of classes of disorders, overall general medical and mental health, and history of any prior treatment) correlates. A subset of corresponding analyses was conducted among those adolescents with suicidal ideation, plan, or attempt to assess associations of mental health treatment and demographic and clinical correlates. Statistical significance was based on two-sided, design-based tests ($p \leq .05$).

Results

Sociodemographic correlates

In the year prior to the survey, 3.6% of adolescents experienced suicidal ideation without a plan or an attempt,

.6% reported having a suicide plan but did not attempt suicide, and 1.9% attempted suicide (Table 1). After adjustment for all sociodemographic covariates, female gender was significantly associated with increased prevalences of suicidal ideation, suicide plan, and suicide attempt. Adolescents aged 16 to 18 were significantly less likely than their younger counterparts to have attempted suicide. Comparison of the combined suicidality subgroups and nonsuicidal youths found that females were significantly more likely than males to report suicidal behavior (AOR=2.34, CI=1.84–2.97), but no differences regarding race-ethnicity, age, parental education, poverty, or urbanicity between the groups were observed.

Mental health correlates

Suicidal ideation, plan, and attempt were significantly associated with any

assessed mental disorder and with the number of classes of mental disorders (Table 2). Mood disorders were strongly associated with all suicide outcomes. Both suicidal ideation and suicide attempts—but not suicide plans—were associated with substance use, anxiety, and disruptive behavior disorders. Only suicide attempts were associated with eating disorders.

Reporting poor or fair mental health rather than good or excellent mental health was associated with increased odds of past-year suicidal ideation, plan, and attempt, whereas poor or fair general medical health was associated with attempt only. Perceived need for help was associated with ideation but not with plan or attempt. Approximately 6% of individuals with ideation and 5% of those with an attempt had a history of prior treatment compared with only 1% of those with a plan. Use of psychotropic

Table 1

Past-year suicidal ideation, suicide plan, and suicide attempt among 10,123 adolescents, by sociodemographic characteristic^a

Characteristic	Suicidal ideation (N=334)			Suicide plan (N=61)			Suicide attempt (N=163)			Wald F test ^b	P
	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI		
Total	3.6			.6			1.9				
Sex ^c										5.0	.011
Male (N=4,953) (reference)	2.6			.2			.9				
Female (N=5,170)	4.7	1.85	1.38–2.48	1.0	3.99	1.60–9.95	3.0	3.27	2.20–4.84		
Race-ethnicity										.1	.936
Non-Hispanic white (N=5,634) (reference)	3.8			.6			1.9				
Other (N=4,489)	3.1	.85	.64–1.14	.7	.86	.36–2.08	1.9	.93	.52–1.65		
Age (years)										3.1	.057
13–15 (N=5,757) (reference)	3.4			.5			2.3				
16–18 (N=4,366)	3.9	1.14	.80–1.64	.8	1.80	.85–3.81	1.4	.61	.40–.93		
Parental education										.2	.794
High school or less (N=4,765)	3.7	1.17	.83–1.63	.7	1.43	.66–3.11	1.9		.62–1.62		
Some college or more (N=5,358) (reference)	3.5			.5			1.9				
Poverty-income ratio ^d										2.1	.142
≤1.5 (N=1,717)	2.7	.68	.41–1.12	.8	1.37	.54–3.50	1.5	.82	.36–1.87		
≤3.0 (N=2,023)	2.7	.64	.42–.99	.7	1.29	.49–3.44	2.6	1.43	.71–2.89		
>3.0 (N=6,383) (reference)	4.0			.5			1.8				
Urbanicity ^e										3.3	.020
Metropolitan (N=4,508)	3.5	.97	.63–1.50	.9	2.06	.73–5.80	2.1	1.24	.65–2.37		
Other urban (N=3,304)	3.6	1.01	.65–1.56	.3	.85	.26–2.76	1.7	.97	.45–2.09		
Rural (N=2,311) (reference)	3.7			.5			1.8				

^a Suicidal ideation involved no suicide plan or attempt; suicidal plan involved no attempt and was assessed independent of assessment of ideation; and suicide attempt was assessed independent of assessment of ideation or plan. AORs and Wald F tests were adjusted for all sociodemographic characteristics. Taylor series linearization method in SUDAAN was employed to account for sample design and all estimates were weighted.

^b df=2

^c Among females, the odds of suicide attempt were significantly greater than for suicidal ideation and suicide plan.

^d Poverty-income ratio was the ratio of a family's income to the family's poverty threshold.

^e Prevalences of suicide plan and suicide attempt by urbanicity were significantly different.

Table 2Past-year suicidal ideation, suicide plan, and suicide attempt among 10,123 adolescents, by clinical characteristic^a

Characteristic	Suicidal ideation (N=334)			Suicide plan (N=61)			Suicide attempt (N=163)			Wald F test ^b	p
	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI		
Mental disorder											
None (N=4,132) (reference)	1.2			.1			.2			1.5	.232
Any (N=2,351)	7.4	4.82	2.90–8.03	1.2	9.01	2.61–31.11	6.8	9.59	3.10–29.61	8.8	.001
Mood (N=1,021) ^c	14.9	3.97	2.75–5.72	5.2	15.18	5.66–40.72	14.4	9.38	5.59–15.75	.3	.714
Substance use (N=854)	11.1	2.53	1.63–3.92	2.0	1.97	.88–4.38	8.3	2.56	1.28–5.11	.2	.823
Anxiety (N=1,950)	9.0	2.77	1.99–3.86	1.6	2.01	.77–5.29	6.0	2.14	1.32–3.46	2.6	.085
Eating (N=76)	14.1	2.90	.80–10.48	3.7	2.18	.36–13.04	26.9	11.40	3.18–40.87		
Disruptive behavior (N=959)	8.0	2.25	1.31–3.87	1.2	2.44	.53–11.18	11.7	6.13	3.18–11.83	3.2	.052
Classes of axis I mental disorder ^d										4.1	.024
0 (N=4,132) (reference)	1.2			.1			.2				
1 (N=1,571)	4.9	4.10	2.73–6.16	.9	10.41	3.85–28.17	2.4	7.05	3.62–13.72		
2 to 5 (N=780)	13.1	12.64	8.51–18.76	2.0	30.71	11.42–82.56	16.1	48.86	22.11–108.01		
Overall general medical health ^e										3.5	.039
Good or excellent (N=8,786) (reference)	3.4			.6			1.5				
Poor or fair (N=1,337)	4.8	.97	.59–1.62	.6	.51	.20–1.27	5.2	2.03	1.06–3.88		
Overall mental health ^f										3.7	.033
Good or excellent (N=9,379) (reference)	3.1			.4			1.3				
Poor or fair (N=744)	10.8	1.86	1.19–2.92	3.6	3.53	1.49–8.35	10.5	3.06	1.70–5.51	.5	.637
Perceived need for help											
No (N=9,530) (reference)	3.1			.5			1.7				
Yes (N=593)	12.0	2.34	1.33–4.10	3.1	2.65	.97–7.24	6.8	1.97	.88–4.41		
History of any treatment ^e										10.3	.000
No (N=6,949) (reference)	2.3			.4			.4				
Yes (N=3,174)	6.3	1.56	1.08–2.27	1.1	1.32	.50–3.48	5.1	5.03	2.74–9.24		
Psychotropic medication ^d										5.4	.008
No (N=9,513) (reference)	3.1			.5			1.3				
Yes (N=610)	11.7	2.38	1.58–3.58	2.9	3.09	.75–12.80	11.3	4.26	2.40–7.56		

^a Suicidal ideation involved no suicide plan or attempt; suicidal plan involved no attempt and was assessed independent of assessment of ideation; and suicide attempt was assessed independent of assessment of ideation or plan. AORs and Wald F tests were adjusted for age, sex, race-ethnicity, and number of class of disorders minus one. Taylor series linearization method in SUDAAN was employed to account for sample design and all estimates were weighted.

^b df=2

^c Adolescents with a mood disorder were significantly more likely to have a suicide plan than suicidal ideation or suicide attempt.

^d Adolescents with 2 to 5 mental disorders and adolescents who used psychotropic medication were significantly more likely to have a suicide attempt than suicidal ideation.

^e Adolescents with poor or fair general medical health and adolescents with a history of any treatment were significantly more likely to have a suicide plan and suicide attempt than suicidal ideation.

^f Adolescents with poor or fair mental health were significantly more likely to have a suicide attempt than suicidal ideation and a suicide plan.

medication also was significantly associated with suicidal ideation and suicide attempt but not with suicide plan.

Mental health service use

Adolescents with suicidal ideation were more than twice as likely and those with a plan were more than three times as likely as those without suicidal ideation to have attended at least one service visit within the past 12 months (Table 3). Suicide attempt was not significantly related to any use of treatment. Approximately two-thirds of adolescents with suicidal ideation

(67.3%), and half of those with a plan (54.4%) or an attempt (56.9%) did not have any contact with a mental health specialist in the past year.

Predictors of service use and intensity

Among adolescents with a suicide plan, only mood disorders predicted increased odds of accessing any treatment (Table 4). In contrast, among those with suicide plans, females (AOR=.02, CI=.00–.29), members of racial-ethnic minority groups (AOR=.09, CI=.01–.84), individuals with 12-month suicidal ideation (AOR=.00, CI=.00–

.16), and individuals with eating (AOR=.01, CI=.00–.26) or behavior (AOR=.14, CI=.05–.45) disorders were all less likely than individuals without those characteristics to receive four or more visits (data not shown). Adolescents from lower socioeconomic backgrounds were significantly more likely than those with more advantageous backgrounds to receive services from general medical providers (suicidal ideation, Wald F=11.0, p=.004; suicide plans, Wald F=10.7, p=.005; or a suicide attempt, Wald F=11.0, p=.018), although no main effect of poverty on access to any treatment or on

Table 3Past-year service use among 10,123 adolescents, by suicidality status^a

Service use	Suicidal ideation (N=334)			Suicide plan (N=61)			Suicide attempt (N=163)			Wald F test ^b p	
	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI		
Any treatment (N=2,098)	52.6	2.52	1.61–3.96	60.9	3.33	1.52–7.31	73.7	1.89	.79–4.50	.4	.663
Any treatment (≥4 visits) (N=1,080)	28.4	1.76	1.05–2.94	39.0	2.41	.84–6.90	45.7	1.58	.92–2.70	.2	.802
Health care (N=1,128)	37.2	2.63	1.61–4.28	45.6	3.11	1.31–7.37	45.8	1.36	.75–2.45	.9	.408
Mental health specialty (N=943)	32.7	2.62	1.56–4.41	45.6	4.10	1.78–9.46	43.1	1.69	.94–3.06	.9	.413
Mental health specialty (≥4 visits) (N=579)	21.3	2.41	1.26–4.63	32.7	3.46	.95–12.57	28.2	1.34	.71–2.53	2.1	.135
General medical (N=237)	5.2	1.11	.39–3.18	1.5	.18	.04–.83	11.2	1.24	.56–2.78	3.9	.028
Nonhealth care (N=1,449) ^c	35.0	1.64	.92–2.92	46.3	2.60	1.15–5.85	54.6	1.44	.86–2.42	.5	.600
School services (N=1,084) ^c	27.5	1.74	1.09–2.78	17.4	.65	.23–1.85	46.7	1.66	.95–2.89	5.4	.009
CAM (N=229) ^{d,e}	10.0	2.00	1.03–3.90	24.8	5.20	1.59–17.01	8.7	.88	.31–2.46	4.0	.026
Human services (N=278)	5.2	.80	.37–1.69	16.0	2.10	.67–6.59	13.3	1.22	.50–2.94	1.0	.375
Juvenile justice (N=146)	2.0	.79	.38–1.61	4.4	1.52	.41–5.73	2.1	.44	.10–1.88	.8	.470

^a Suicidal ideation involved no suicide plan or attempt; suicidal plan involved no attempt and was assessed independent of assessment of ideation; and suicide attempt was assessed independent of assessment of ideation or plan. AORs and Wald F tests were adjusted for sex, race-ethnicity, age, parental education, poverty-income ratio, urbanicity, history of prior treatment, general medical health, mental health, and number of classes of axis I disorders. Taylor series linearization method in SUDAAN was employed to account for sample design and all estimates were weighted.

^b df=2

^c Adolescents who received general medical care and adolescents who received school services were more likely to have suicidal ideation than a suicide plan.

^d Adolescents who received complementary or alternative medicine (CAM) were more likely to have a suicide plan than suicidal ideation.

treatment duration was observed (data not shown). Among adolescents with suicidal ideation, receiving four or more visits was associated with any disorder, any substance use, any behavior disorder, and a greater number of disorder classes (Table 4).

Discussion

The analyses documented four noteworthy findings. First, suicidal ideation and suicide attempt and, to a lesser degree, suicide plan were associated with several mental disorders among adolescents. Second, whereas between one-half and three-quarters of adolescents with suicidal ideation, plan, or attempt had recent contact with any provider, only a minority received four or more visits. Third, most youths with suicidal ideation and half of those with a suicide plan or attempt did not receive specialized mental health services. Fourth, male adolescents with suicidal ideation were significantly less likely than their female counterparts to receive any treatment, although males with a suicide plan were more likely than females to receive four or more visits.

In line with several community studies (13,22–24), we found that 3.6% of the general adolescent population reported thinking seriously about killing themselves in the previous 12 months but had not made a plan or an attempt, .6% reported having a specific plan but had not made an attempt, and 1.9% reported a suicide attempt. Suicidal thoughts and attempts were associated with several psychiatric disorders besides mood disorders. Although suicidal ideation has been associated with mood, eating, anxiety, substance use, and disruptive behavior disorders (4,5,8,25–27), the breadth of the distribution underscores the importance of integrating suicide risk assessment into the routine mental health care of adolescents.

Suicidal ideation, but not suicide plan or attempt, was significantly associated with a perceived need for help. Because young people with suicidal ideation often prefer to handle their problems on their own (28) and tend not to disclose their suicidal thoughts or behaviors (29,30), proactive assessment may be necessary. Proactive identification of suicide risk

among youths with mental health problems raises the question of the availability of effective treatments tailored toward suicide risk reduction. Although adherence to evidence-based treatment guidelines has been shown to improve clinical outcomes of youths with depression and anxiety disorders (31), few evidence-based treatments have been shown to be effective in treating suicidal behavior and risk among young people (32).

Most adolescents with suicidal ideation, plan, or attempt in the past year received mental health care. They received care most commonly from mental health specialists in health care or school settings and only rarely from general medical providers. Because most young people made at least one general medical visit during the course of each year (33), the relatively small percentage of mental health care provided by this sector underscores missed opportunities for clinical detection. Although not all youths with suicidal ideation are in need of services, routine mental health screening provides one promising means of expanding the identification of suicidal ideation and

Table 4Use of mental health treatment among 558 adolescents with past-year suicidal ideation, suicide plan, and suicide attempt, by mental disorder^a

Disorder	Suicide ideation (N=334)						Suicide plan (N=61)						Suicide attempt (N=163)					
	Any treatment (N=165)			≥4 visits (N=82)			Any treatment (N=33)			≥4 visits (N=20)			Any treatment (N=109)			≥4 visits (N=72)		
	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI	%	AOR	95% CI
Any	59.5	2.35	.93-5.97	34.7	4.13	1.53-11.13	64.1	.99	.02-51.35	41.5	29.02	.12-7,277.63	78.9	21.99	2.64-183.21	48.5	4.70	.51-42.87
Mood	59.8	1.38	.76-2.50	35.5	1.66	.82-3.33	70.0	4.15	1.03-16.68	45.8	1.02	.09-11.98	76.5	1.89	.53-6.74	48.5	1.27	.40-4.07
Substance use	60.2	1.93	.63-5.89	50.4	5.13	2.32-11.33	47.1	.98	.14-6.96	22.2	4.09	.01-1,185.60	68.1	.29	.06-1.32	46.8	.70	.17-2.95
Anxiety	61.4	1.65	.69-3.95	29.8	.87	.24-3.09	60.4	.55	.07-4.41	51.5	4.91	.15-158.03	78.5	.71	.23-2.21	49.2	.83	.29-2.38
Eating	70.4	9.05	1.03-79.59	28.0	1.37	.08-22.21	59.0	.69	.08-5.86	5.8	.01	.00-.26	86.2	2.69	.57-12.56	66.1	1.89	.38-9.49
Behavior	70.1	7.43	1.95-28.32	41.9	4.69	1.37-16.04	94.2	— ^b	—	24.9	.14	.05-.45	84.4	1.65	.26-10.38	54.2	.45	.09-2.20
Classes of axis I disorder																		
0 (reference)	29.8			7.4			33.3			17.3			26.7			20.7		
1	52.2	2.23	.86-5.75	23.8	3.18	1.06-9.53	63.6	1.00	.02-66.02	33.0	12.42	.06-2,523.36	83.3	22.67	2.85-180.56	42.9	4.17	.53-32.81
2 to 5	65.0	3.69	1.21-11.27	43.0	7.81	2.42-25.24	64.5	2.11	.15-30.45	47.9	14.11	.20-1,003.71	77.3	5.76	.88-37.67	50.5	3.55	.43-29.18

^a Analyses were adjusted for sex, race, age, poverty-income ratio, urbanicity, history of treatment, general medical health, overall mental health, and number of classes of axis I disorders minus one. Taylor series linearization method in SUDAAN was employed to account for sample design and all estimates were weighted.

^b Estimates were not made because of the small reference group.

behaviors and related mental disorders in general medical settings (34,35). Additional efforts, however, are needed to promote the feasibility of such initiatives through the training of primary care physicians and the coordination of care (36). The youths who attempted suicide were also twice as likely as their nonsuicidal counterparts to report being in poor or fair general medical health, which supports the importance of screening for suicide among adolescents who suffer from a chronic general medical condition (37). However, access to appropriate care may be enhanced through voluntary, school-based mental health screening of high school students to identify at-risk youths who are not receiving mental health care (38). Furthermore, schools are in an advantageous position to render services that are readily accessible to youths and, in particular, members of minority racial and ethnic groups (39).

Female gender was significantly associated with increased prevalences of suicidal symptoms across each suicidal group. However, among youths with recent suicidal ideation, boys were significantly less likely than girls to receive mental health care. Concern over this disproportion is amplified by the fourfold greater risk of suicide among adolescent boys than girls (40). Gender differences in stigma associated with mental health treatment offer one explanation for this pattern (41). Some other possible explanations include gender differences in traditional roles, perceived effectiveness of treatment, social support, or psychological mindedness.

Mental health care provided to adolescents with suicidal thoughts or behaviors often is limited to a few visits. Although it is not possible to assess the quality of mental health care on the basis of visit number and a few visits may have been sufficient for some individuals, the prevailing visit pattern suggests that premature treatment termination was common (42,43). It is encouraging that adolescents with some severe illnesses, such as substance use disorders, behavior disorders, and comorbid psychiatric disorders, had relatively high rates of completing four or more visits in the past year. In addition, interventions

provided in medical settings (44) to engage patients in outpatient care in the community after a suicide attempt have obtained encouraging results (45). Also, among depressed adolescents, a 12-week course of cognitive-behavioral therapy and fluoxetine conferred significant improvement in protecting against suicidal ideation compared with results for placebo or either treatment alone (5), but these results were not found in a recent meta-analysis (46).

Mental health specialists play a vital role in the treatment of adolescents at risk of suicide. Yet gaps in specialty mental health care are evident. For example, approximately one-half of the youths with a suicide plan or attempt did not have contact with a specialist during the past year. Despite broad measures of treatment that spanned a wide range of traditional and non-traditional providers, no evidence of mental health treatment was apparent for many of these high-risk youths. In keeping with a large school-based survey (2), the results of this study indicated that adolescent suicidal behaviors often appear to escape clinical attention. Finally, effective suicide prevention may involve restriction of access to lethal means of completing suicide, such as access to firearms (47,48), which were involved in 43.7% of suicides among 15- to 20-year-olds in 2009 (1).

The study had several limitations that deserve attention. First, the questions regarding suicide plan and attempt were limited to adolescents who had endorsed lifetime suicidal ideation. Some adolescents may plan or attempt suicide without endorsing lifetime suicidal ideation. Second, the utilization data were based on adolescent self-report rather than on service claims or medical record review and therefore are vulnerable to underreporting (49). Third, the cross-sectional nature of the study prevented determination of the chronology of events within the past 12 months and was subject to recall bias. Fourth, the definition of minimal treatment (20,21) was somewhat arbitrary, and some adolescents with less severe conditions may find such brief interventions to be sufficient (50). Fifth, although health insurance status shapes access to care (51) and

continued treatment (16), health insurance information was not available. Sixth, variables pertaining to family-level data, such as family psychiatric history, family discord, or parental criminality, were not available. Finally, the survey was fielded in 2001–2004 and, therefore, does not reflect recent changes in mental health care delivery.

Over the past few decades, several federal policies have sought to improve access among youths to mental health services. Key programs include the State Children's Health Insurance Program (52) for low-income youths; the federal Children's Mental Health Initiative (53), which funds services for youths with serious emotional disturbances; and federally qualified health centers (54). More recently, the Mental Health Parity and Addiction Equity Act (2008) and the Patient Protection and Affordable Care Act (2010) have included provisions to reduce disparities in mental health and general medical and surgical benefits, extend mental health coverage, strengthen the mental health workforce through loan repayment programs for mental health workers in underserved areas, and provide new resources to coordinate services.

Conclusions

Despite recent initiatives, many high-risk adolescents remain untreated. It will be important to track the effects of major policy developments on the pattern and intensity of treatment for adolescents at high risk of suicide. At the same time, prospective research that combines the level of clinical detail available in psychiatric epidemiological studies, such as the National Comorbidity Survey, with mortality data and services claims for the treatment of deliberate self-harm is needed (3,55).

Acknowledgments and disclosures

This research was funded by grants from the Carmel Hill Fund to Columbia University TeenScreen and the Agency for Healthcare Research and Quality (U18 HS02112) (Dr. Olfson) as well as the New York State Psychiatric Institute. This work was also supported by the Intramural Research Program of the National Institute of Mental Health (Z01 MH002808-08). The National Comorbidity Survey Adolescent Supplement (NCS-A) was supported by the National Institute of Mental Health (U01-MH60220). The views and opinions expressed in this article are those of the

authors and should not be construed to represent the views of any of the sponsoring organizations or agencies or the U.S. government.

Dr. Olfson has received research grants from Bristol-Myers Squibb and Eli Lilly & Company. The other authors report no competing interests.

References

1. Web-Based Injury Statistics Query and Reporting System (WISQARS). Atlanta, Center for Disease Control and Prevention, Mar 20, 2012. Available at www.cdc.gov/nceip/wisqars/default.htm
2. Youth risk behavior surveillance: United States, 2009. *Morbidity and Mortality Weekly Report* 59:1–142, 2010
3. Walkup JT, Townsend L, Crystal S, et al: A systematic review of validated methods for identifying suicide or suicidal ideation using administrative or claims data. *Pharmacoepidemiology and Drug Safety* 21(suppl 1):174–182, 2012
4. Harris EC, Barraclough BM: Suicide as an outcome for mental disorders: a meta-analysis. *The British Journal of Psychiatry* 170:205–228, 1997
5. Wolitzky-Taylor KB, Ruggiero KJ, McCart MR, et al: Has adolescent suicidality decreased in the United States? Data from two national samples of adolescents interviewed in 1995 and 2005. *Journal of Clinical Child and Adolescent Psychology* 39:64–76, 2010
6. Brent DA, Baugher M, Bridge J, et al: Age- and sex-related risk factors for adolescent suicide. *Journal of the American Academy of Child and Adolescent Psychiatry* 38: 1497–1505, 1999
7. Bridge JA, Goldstein TR, Brent DA: Adolescent suicide and suicidal behavior. *Journal of Child Psychology and Psychiatry, and Allied Disciplines* 47:372–394, 2006
8. Foley DL, Goldston DB, Costello EJ, et al: Proximal psychiatric risk factors for suicidality in youth: the Great Smoky Mountains Study. *Archives of General Psychiatry* 63: 1017–1024, 2006
9. Shaffer D, Gould MS, Fisher P, et al: Psychiatric diagnosis in child and adolescent suicide. *Archives of General Psychiatry* 53:339–348, 1996
10. Screening and Treatment for Major Depressive Disorder in Children and Adolescents: Recommendation Statement. Rockville, Md, US Preventive Services Task Force, 2009. Available at www.ahrq.gov/clinic/uspstf09/depression/chdeprss.htm
11. Pagura J, Fotti S, Katz LY, et al: Swampy Cree Suicide Prevention Team: help seeking and perceived need for mental health care among individuals in Canada with suicidal behaviors. *Psychiatric Services (Washington, D.C.)* 60:943–949, 2009
12. Pirkis JE, Irwin CE, Jr, Brindis CD, et al: Receipt of psychological or emotional counseling by suicidal adolescents. *Pediatrics* 111:e388–e393, 2003

13. Borges G, Benjet C, Medina-Mora ME, et al: Service use among Mexico City adolescents with suicidality. *Journal of Affective Disorders* 120:32–39, 2010
14. Cheung AH, Dewa CS, Cairney J, et al: Factors associated with use of mental health services for depressed and/or suicidal youth aged 15–24. *Community Mental Health Journal* 45:300–306, 2009
15. Wu P, Katic BJ, Liu X, et al: Mental health service use among suicidal adolescents: findings from a US national community survey. *Psychiatric Services* (Washington, D.C.) 61:17–24, 2010
16. Edlund MJ, Wang PS, Berglund PA, et al: Dropping out of mental health treatment: patterns and predictors among epidemiological survey respondents in the United States and Ontario. *The American Journal of Psychiatry* 159:845–851, 2002
17. Merikangas KR, Avenevoli S, Costello J, et al: National Comorbidity Survey Replication Adolescent Supplement (NCS-A): I. Background and Measures. *Journal of the American Academy of Child and Adolescent Psychiatry* 48:367–369, 2009
18. Kessler RC, Avenevoli S, Costello EJ, et al: Design and field procedures in the US National Comorbidity Survey Replication Adolescent Supplement (NCS-A). *International Journal of Methods in Psychiatric Research* 18:69–83, 2009
19. Kessler RC, Usttin TB: The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research* 13:93–121, 2004
20. 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. *Archives of General Psychiatry* 62:629–640, 2005
21. Wang PS, Demler O, Kessler RC: Adequacy of treatment for serious mental illness in the United States. *American Journal of Public Health* 92:92–98, 2002
22. Lewinsohn P, Rohde P, Seeley J: Adolescent suicidal ideation and attempts: prevalence, risk factors, and clinical implications. *Clinical Psychology: Science and Practice* 3: 25–46, 1996
23. King RA, Schwab-Stone M, Flisher AJ, et al: Psychosocial and risk behavior correlates of youth suicide attempts and suicidal ideation. *Journal of the American Academy of Child and Adolescent Psychiatry* 40:837–846, 2001
24. Garrison CZ, Jackson KL, Addy CL, et al: Suicidal behaviors in young adolescents. *American Journal of Epidemiology* 133: 1005–1014, 1991
25. Brausch AM, Muehlenkamp JJ: Body image and suicidal ideation in adolescents. *Body Image* 4:207–212, 2007
26. Esposito CL, Clum GA: Psychiatric symptoms and their relationship to suicidal ideation in a high-risk adolescent community sample. *Journal of the American Academy of Child and Adolescent Psychiatry* 41:44–51, 2002
27. Waldrop AE, Hanson RF, Resnick HS, et al: Risk factors for suicidal behavior among a national sample of adolescents: implications for prevention. *Journal of Traumatic Stress* 20:869–879, 2007
28. Gould MS, Velting D, Kleinman M, et al: Teenagers' attitudes about coping strategies and help-seeking behavior for suicidality. *Journal of the American Academy of Child and Adolescent Psychiatry* 43: 1124–1133, 2004
29. Mojtabai R, Olfson M: Parental detection of youth's self-harm behavior. *Suicide & Life-Threatening Behavior* 38:60–73, 2008
30. Young TL, Zimmerman R: Clueless: parental knowledge of risk behaviors of middle school students. *Archives of Pediatrics & Adolescent Medicine* 152:1137–1139, 1998
31. Compton SN, March JS, Brent D, et al: Cognitive-behavioral psychotherapy for anxiety and depressive disorders in children and adolescents: an evidence-based medicine review. *Journal of the American Academy of Child and Adolescent Psychiatry* 43:930–959, 2004
32. Spirito A, Esposito-Smythers C, Wolff J, et al: Cognitive-behavioral therapy for adolescent depression and suicidality. *Child and Adolescent Psychiatric Clinics of North America* 20:191–204, 2011
33. Sing M: Differences in Access to Care for Non-Hispanic Asian and Non-Hispanic White Children, 2002–2005 (Statistical Brief 224). Rockville, Md, Agency for Healthcare Research and Quality, 2008. Available at www.meps.ahrq.gov/mepsweb/data_files/publications/st224/stat224.pdf
34. O'Connell ME, Boat T, Warner KE (ed): *Preventing Mental, Emotional and Behavioral Disorders Among Young People: Progress and Possibilities*. Washington, DC, National Academies Press, 2009
35. Wintersteen M: Standardized screening for suicidal adolescents in primary care. *Pediatrics* 125:938–944, 2010
36. Borowsky IW: Expose, heed, and coordinate care: priorities for mental health promotion and suicide prevention. *Pediatrics* 125:1064–1065, 2010
37. Barnes AJ, Eisenberg ME, Resnick MD: Suicide and self-injury among children and youth with chronic health conditions. *Pediatrics* 125:889–895, 2010
38. Husky MM, Sheridan M, McGuire L, et al: Mental health screening and follow-up care in public high schools. *Journal of the American Academy of Child and Adolescent Psychiatry* 50:881–891, 2011
39. Borowsky I, Resnick M, Ireland M, et al: Suicide attempts among American Indian and Alaska Native youth: risk and protective factors. *Archives of Pediatrics & Adolescent Medicine* 153:573–580, 1999
40. Compressed Mortality File: Mortality for 1999–2006. Atlanta, Centers for Disease Control and Prevention. Accessed on Sep 15, 2010. Available at wonder.cdc.gov/cmfc-icd10.html
41. Mojtabai R: Americans' attitudes toward mental health treatment seeking: 1990–2003. *Psychiatric Services* (Washington, D. C.) 58:642–651, 2007
42. Olfson M, Mojtabai R, Sampson NA, et al: Dropout from outpatient mental health care in the United States. *Psychiatric Services* (Washington, D.C.) 60:898–907, 2009
43. Wang J: Mental health treatment dropout and its correlates in a general population sample. *Medical Care* 45:224–229, 2007
44. Rotheram-Borus MJ, Piacentini J, Van Rossem R, et al: Enhancing treatment adherence with a specialized emergency room program for adolescent suicide attempters. *Journal of the American Academy of Child and Adolescent Psychiatry* 35:654–663, 1996
45. Spirito A, Boergers J, Donaldson D, et al: An intervention trial to improve adherence to community treatment by adolescents after a suicide attempt. *Journal of the American Academy of Child and Adolescent Psychiatry* 41:435–442, 2002
46. Dubicka B, Elvins R, Roberts C, et al: Combined treatment with cognitive-behavioural therapy in adolescent depression: meta-analysis. *The British Journal of Psychiatry* 197:433–440, 2010
47. Sarchiapone M, Mandelli L, Iosue M, et al: Controlling access to suicide means. *International Journal of Environmental Research and Public Health* 8:4550–4562, 2011
48. Miller M, Azrael D, Barber C: Suicide mortality in the United States: the importance of attending to method in understanding population-level disparities in the burden of suicide. *Annual Review of Public Health* 33:393–408, 2012
49. Ritter PL, Stewart AL, Kaymaz H, et al: Self-reports of health care utilization compared to provider records. *Journal of Clinical Epidemiology* 54:136–141, 2001
50. Laukkanen E, Hintikka JJ, Kylmä J, et al: A brief intervention is sufficient for many adolescents seeking help from low threshold adolescent psychiatric services. *BMC Health Services Research* 10:261–271, 2010
51. Flisher AJ, Kramer RA, Grosser RC, et al: Correlates of unmet need for mental health services by children and adolescents. *Psychological Medicine* 27:1145–1154, 1997
52. Lurie IZ: Differential effect of the state children's health insurance program expansions by children's age. *Health Services Research* 44:1504–1520, 2009
53. Walrath C, Garraza LG, Stephens R, et al: Trends in characteristics of children served by the Children's Mental Health Initiative: 1994–2007. *Administration and Policy in Mental Health* 36:361–373, 2009
54. Adams SJ, Xu S, Dong F, et al: Differential effectiveness of depression disease management for rural and urban primary care patients. *The Journal of Rural Health* 22:343–350, 2006
55. Rockett I: Counting suicides and making suicides count as a public health problem. *Crisis* 31:227–230, 2010