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Original article

Precipitating Circumstances of Suicide Among Youth Aged 10–17 Years by Sex: Data From the National Violent Death Reporting System, 16 States, 2005–2008

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A B S T R A C T

We examined the circumstances that precipitated suicide among 1,046 youth aged 10–17 years in 16 U.S. states from 2005 to 2008. The majority of deaths were among male subjects (75.2%), non-Hispanic whites (69.3%), those aged 16–17 years (58.1%), those who died by hanging/strangulation/suffocation (50.2%) and those who died in a house or an apartment (82.5%). Relationship problems, recent crises, mental health problems, and intimate partner and school problems were the most common precipitating factors and many differed by sex. School problems were reported for 25% of decedents, of which 30.3% were a drop in grades and 12.4% were bullying related. Prevention strategies directed toward relationship-building, problem-solving, and increasing access to treatment may be beneficial for this population.

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In 2008, suicide was the third leading cause of death for youth aged 10–17 years in the United States, preceded only by unintentional injury and homicide [1]. Suicide is more common among youth who have mental health and substance abuse problems, low self-esteem, peer and parental relationship problems, intimate partner problems, previous exposure to suicidal behavior, and academic difficulties [2–4]. In this brief, we examine characteristics and precipitating circumstances among 1,046 youth suicide decedents reported in the National Violent Death Reporting System (NVDRS) between 2005 and 2008. A better understanding of the most common circumstances preceding youth suicide may help focus suicide prevention strategies for this population. Eighteen states currently participate in NVDRS: Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin. However, Ohio and Michigan only began collecting data in 2010 and are thus excluded from this study.

Methods

The NVDRS is a state-based surveillance system that collects data on all suicides, as well as other violent deaths, using standardized variable definitions across all states [5]. NVDRS data include victim demographics, mechanism of injury, location of injury and death, autopsy and toxicology results, and precipitating circumstances, such as mental health history. Data sources include death certificates and coroner/medical examiner and law enforcement reports, which are linked by decedent in a single data repository.

The data used for this analysis include calendar years 2005–2008 and represent all data received as of November 2010. Decedents were selected if their manner of death was suicide and their age was between 10 and 17 years (n = 1,058). Each incident

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Table 1
Percentage[a] of suicide decedents aged 10–17 years, by sex and associated circumstances—National Violent Death Reporting System, 16 states,[b] 2005–2008

Associated circumstances[c]	Male%	Female%	Total%	*p* value M/F
Mental health/substance abuse				
Current depressed mood	36.1	40.5	37.2	.212
Current mental health problem	32.3	47.1	36.2	<.0001
Current mental health treatment for those with current mental health problem	24.8	37.2	28.0	.638
Ever received mental health treatment	32.2	44.6	35.4	<.0001
Alcohol problem	6.5	2.9	5.6	.035
Other substance abuse problem	17.8	10.3	15.9	.006
Interpersonal				
Intimate partner problem (e.g., boyfriend, girlfriend, father/mother in teen pregnancy)	25.9	29.3	26.8	.126
Other relationship problem (e.g., non-intimate-partner, such as parent or friend)	49.7	55.0	51.1	.029
Suicide of family member or friend within past 5 years	4.5	5.0	4.5	.761
Other death of family member or friend within past 5 years	5.2	9.1	6.2	.031
Perpetrator of interpersonal violence within past month	3.2	2.5	3.0	.582
Victim of interpersonal violence within past month	.7	3.7	1.5	.001
Life stressor				
Crisis in past or impending 2 weeks	43.8	38.4	42.4	.154
Physical health problem	2.5	4.1	2.9	.181
Job problem	1.2	.0	.9	.121[d]
Recent criminal legal problem	10.9	5.0	9.3	.007
Noncriminal legal problem	2.6	2.5	2.6	.917
Financial problem	1.0	.4	.9	.688[d]
School problem	27.7	20.7	25.9	.100
Suicide event				
Left a suicide note	28.3	37.2	30.6	.009
Disclosed intent to commit suicide	28.4	31.4	29.2	.365
History of suicide attempt(s)	12.3	35.5	18.3	<.0001

[a] Percentages might exceed 100% because multiple circumstances might have been coded.
[b] Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, North Carolina, New Jersey, New Mexico, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.
[c] n = 932 (690 male and 242 female). Circumstances were unknown for 114 deaths.
[d] Fisher exact owing to cell size <5.

was reviewed by two researchers to ensure it met the case criteria; 12 cases were found to be miscoded based on manner of death or age and were excluded, leaving 1,047 cases (787 male and 259 female) for analysis.

Decedents were characterized based on demographics, mechanism and location of injury, toxicology results, and 22 potential precipitating circumstances. Chi-square and Fisher exact tests were used to assess significant differences in these characteristics by sex. Statistical analyses were conducted with SPSS 18.0 (SPSS Inc., Chicago, IL).

Results

The majority of deaths were among male subjects (75.2%), non-Hispanic whites (69.3%), those aged 16–17 years (58.1%), those who died by hanging/strangulation/suffocation (50.2%), and those who died in a house or an apartment (82.5%) (data not shown). Male subjects were nearly equally likely to use hanging/strangulation/suffocation (46.0%) or a firearm (44.6%), whereas female subjects primarily used hanging/strangulation/suffocation (62.9%), followed by firearm (20.5%) and poisoning (10.8%) (data not shown).

Table 1 displays precipitating circumstances and the percentage for which they were present in suicides with known circumstances (n = 932). Overall, the two most prominent precipitating circumstances were having non-intimate-partner relationship problems (e.g., one or both parents, friends) (51.1%) and a crisis in the past 2 weeks (42.4%). Mental health issues were also common among decedents; approximately 37% of decedents were identified as having a depressed mood and/or current mental health problems, and 29.2% disclosed to others their intent to commit suicide. Intimate partner problems were evident for more than 25% of decedents; 18.3% had a history of suicide attempts, and nearly 16% had substance abuse problems. School problems were reported for 25.9% of decedents, of which 30.3% were a drop in grades and 12.4% were bullying related (data not shown). The remaining circumstances were prevalent among .9%–15% of the decedents. Among the approximately 75% of decedents tested for alcohol, 1 in 10 tested positive. Among the approximately 50% tested for other drugs, one in seven tested positive for antidepressants and/or marijuana, with other drugs present at lower levels (data not shown).

The prevalence of some precipitating circumstances also differed by sex of the decedent (Table 1). Higher proportions of male subjects had precipitating alcohol, substance abuse, and recent criminal problems, whereas higher proportions of female subjects had current mental health problems, a history of mental health treatment, non-intimate-partner relationship problems, experienced the death of a family member or friend within the past 5 years, been a victim of violence within the past month, and a history of suicide attempts. A higher proportion of female than male subjects also left a suicide note.

Table 2
Number[a] and percentage[b] of suicide decedents aged 10–17 years who had received a diagnosis of a current mental health problem, by diagnosis—National Violent Death Reporting System, 16 states[c], 2005–2008

Mental health problem	Male		Female		Total	
	No.	%	No.	%	No.	%
Depression/ dysthymia	135	60.5	83	72.8	218	64.7
Bipolar disorder	27	12.1	19	16.7	46	13.6
Anxiety disorder	4	1.8	5	4.4	9	2.7
Schizophrenia	4	1.8	2	1.8	6	1.8
PTSD	2	.9	1	.9	3	.9
OCD	1	.4	1	.9	2	.6
ADD/ADHD	51	22.9	9	7.9	60	17.8
Eating disorder	1	.4	4	3.5	5	1.5
Other	23	10.3	11	9.6	34	10.1
Unknown	30	13.5	7	6.1	37	11.0

No. = number of; PTSD = posttraumatic stress disorder; OCD = obsessive-compulsive disorder; ADD/ADHD = attention deficit disorder/attention deficit hyperactivity disorder.
[a] n = 337 (223 male and 114 female).
[b] Percentages might exceed 100% because multiple diagnosis categories might have been coded.
[c] Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, North Carolina, New Jersey, New Mexico, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin.

There were noticeable differences in mental health conditions by sex among decedents reporting current mental health problems (n = 337) (Table 2). Although both male (60.5%) and female (72.8%) subjects experienced high levels of depression/dysthymia, male subjects were nearly three times more likely to experience attention deficit hyperactivity disorder. Female subjects were more likely to experience bipolar, anxiety, and eating disorders.

Discussion

This study quantified the contributing factors in youth suicides across a broad population of 16 U.S. states. Our findings that youth suicide predominantly consisted of male subjects, as well as both male and female subjects who had a recent crisis, mental health problems, and/or intimate partner problems before death, were similar to findings in other studies that describe characteristics of adult suicide decedents [6–9]; however, the proportion of youth decedents who had non-intimate-partner relationship problems (51.1%) and the proportion who died by strangulation/hanging (50.2%) were striking. Among adult suicide decedents during the same data years, only 10.1%–11.8% of the decedents had non-intimate-partner relationship problems and 18.8%–23.1% died by strangulation [6–9]. Problems at school also played a large role in youth suicide, and a high proportion of both male and female decedents were known to be sad, depressed, or suicidal by family members, friends, or other acquaintances. Additionally, our findings showed that among the suicide decedents with school problems (25% of the total), roughly one in eight were recently bullied. These findings help put bullying in a larger context of other suicide circumstances. Overall, the findings from this study suggest a complex interaction of multiple relationship, mental health, and school stressors, and suggest numerous opportunities to intervene and prevent suicidal behavior.

These findings must be viewed cautiously because the results represent only 16 U.S. states. Also, although this report highlights the most common suicide-related circumstances in NVDRS, other important circumstances may be underestimated or not included in this surveillance system. NVDRS obtains circumstance information from coroner/medical examiner and law enforcement reports and interviews, which might not reflect all information known about the incidents.

This brief highlights some common circumstances preceding youth suicide. Future studies are planned to describe the nature of the other relationship problems, the intimate partner problems, and the school problems for this population in greater detail to further inform prevention strategies. The findings in this report have several implications for youth suicide prevention efforts, including increasing youths' ability to cope with school-related problems and conflict, and helping youth build positive relationships with parents, other family members, teachers, classmates, and intimate partners. Additionally, prevention efforts may need to address youths' barriers to accessing effective mental health and substance abuse treatment, as well as monitor youth currently in treatment.

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References

[1] Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. Source data from WISQARS is the National Vital Statistics system from the National Center for Health Statistics, 2008. Available at: http://www.cdc.gov/injury/wisqars/index.html. Accessed September 20, 2011.
[2] Madge N, Hawton K, Corcoran P, et al. Psychological characteristics, stressful life events and deliberate self-harm: Findings from the Child & Adolescent Self-harm in Europe (CASE) study. Eur Child Adolesc Psychiatry 2011;20:499–508. http://dx.doi.org/10.1007/s00787-011-0210-4.
[3] Portzky G, Audenaert K, van Heerignen K. Psychosocial and psychiatric factors associated with adolescent suicide: A case-control psychological autopsy study. J Adolesc 2009;32:849–62.
[4] Borowsky IW, Ireland M, Resnick MD. Adolescent suicide attempts: Risks and protectors. Pediatrics 2001;107:485–93.
[5] Paulozzi LJ, Mercy J, Frazier L, Annest JL. CDC's National Violent Death Reporting System: Background and methodology. Inj Prev 2004;10:47–52.
[6] Karch DL, Logan J, Patel N. Surveillance for violent deaths—National violent death reporting system, 16 states, 2008. MMWR Surveill Summ 2011;60:1–54.
[7] Karch DL, Dahlberg LL, Patel N. Surveillance for violent deaths—National Violent Death Reporting System, 16 states, 2007. MMWR Surveill Summ 2010;59:1–50.
[8] Karch DL, Dahlberg LL, Patel N, et al. Surveillance for violent deaths—National violent death reporting system, 16 states, 2006. MMWR Surveill Summ 2009;58:1–44.
[9] Karch DL, Lubell KM, Friday J, et al. Surveillance for violent deaths—National Violent Death Reporting System, 16 states, 2005. MMWR Surveill Summ 2008;57:1–45.