Letters

RESEARCH LETTER

Suicidal Attempts and Ideation Among Children and Adolescents in US Emergency Departments, 2007-2015

In the United States, suicide is a major public health concern and the second leading cause of death among youths age 10 to 18 years, persisting into early adulthood.[1] Attempted suicide is the strongest predictor of subsequent death by suicide,[2] and many children with suicide attempts (SA) and suicidal ideation (SI) first present to an emergency department (ED).[3] Recent evidence has demonstrated marked increases in SA/SI among children and adolescents presenting to US tertiary children's hospital EDs.[4] Using a nationally representative data set, we tested the hypothesis that rising ED visits for pediatric SA/SI would be observed nationwide in a broad, generalizable sample.

Methods | We performed a repeated cross-sectional analysis of the National Hospital Ambulatory Medical Care Survey (NHAMCS) ED database from 2007 to 2015. NHAMCS data are a nationally representative sample collected annually by the US Centers for Disease Control and Prevention's National Center for Health Statistics. The survey samples approximately 30 000 visits to 300 randomly selected US EDs using multistage probability sampling to allow for the generation of US population-level estimates.[5] The study population included all children younger than 18 years and the primary outcome was children aged 5 to younger than 18 years with a chief complaint or discharge diagnosis of SA or SI, which was identified by the NHAMCS reason-for-visit code (5820, 5820.0) and *International Classification of Diseases, Ninth Revision, Clinical Modification* (E950.0-E958, V62.84) codes.[4] This study was exempted from review by the McGill University Health Centre research ethics board, and patient consent was not required because the data were from a publicly available database operated by the US Centers for Disease Control and Prevention. Survey-weighting procedures were applied to account for the sampling design. Trends were evaluated using a weighted Pearson χ^2 test of proportions (Stata, version 14.1; StataCorp). A 2-tailed *P* value of <.05 was considered statistically significant.

Results | Over the 9-year study period, there were 59 921 unweighted ED visits for children younger than 18 years in the NHAMCS, among which 1613 (2.8%; 95% CI, 2.5%-3.0%; range, 161-198 observations annually) met the inclusion criteria for SA/SI visits. The median age was 13 years (interquartile range, 8-15 years). Most were evaluated in nonteaching and nonpediatric hospitals (**Table**). Notably, 43.1% of SA/SI visits were for children aged 5 to younger than 11 years and only 2.1% were hospitalized. The estimated annual visits for SA/SI between 2007 and 2015 (**Figure**) increased from 580 000 to 1.12 million (92.1%; 95% CI, 68.9%-130.3%; *P* for trend = .004). Conversely, there was no statistically significant change in total ED visits during this time (26.9 million to 31.8 million; 18.2%; 95% CI, −5.4% to 42.2%; *P* for trend = .67). As a proportion of all pediatric ED encounters, SA/SI increased from 2.17% (95% CI, 1.82%-2.58%) in 2007 to 3.50% (95% CI, 2.79%-4.39%) in 2015 (61% increase; *P* for trend < .001). Emergency department visits for SA only similarly increased from 540 000 to 960 000 (79.3%; 95% CI, 62.2%-137.8%; *P* for trend = .02).

Discussion | This analysis of a large, nationwide sample demonstrated that ED visits for SA/SI doubled among youth between 2007 and 2015. These findings parallel a 2-fold increase in SA/SI visits to US tertiary children's hospitals over the same period.[4] An earlier NHAMCS analysis reported a doubling in ED visits for suicidal behavior in all age categories between 1993 and 2008,[6] reflecting an apparent acceleration of pediatric suicide-associated visits to US EDs. Findings suggest a critical need to augment community mental health resources, ED physician preparedness, and post-emergency department risk reduction initiatives to decrease the burden of suicide among children.

A strength of the NHAMCS is its inclusion of hospitals other than academic centers, which are the settings for most published research, thereby giving a more complete picture of health care trends.[5] In this broader setting, NHAMCS data suggest more at-risk young children than described among pediatric hospitals alone. Moreover, NHAMCS population-level estimates highlight the magnitude of this trend (7.3 million pediatric SA/SI visits over 9 years).

Among the study limitations, it is possible that nonsuicidal self-harm was incorrectly coded by physicians as SA/SI. The NHAMCS validation processes minimize data misclassification[5]; however, coding processes may miss cases in which suicidal intent was not elicited, possibly underestimating SA/SI visits. We analyzed SA/SI together[4]; however, SA and SI are different behaviors and likely exist along a spectrum for the risk of future death by suicide. The analysis that was restricted to SA alone revealed a similar trend. No conclusions can be drawn regarding the cause for the observed increase, which is likely multifactorial. We studied only ED visits and not office-based encounters.

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Table. Characteristics of 1613 Unweighted Emergency Department Visits for Suicide Attempts and Suicidal Ideation, 2007 to 2015

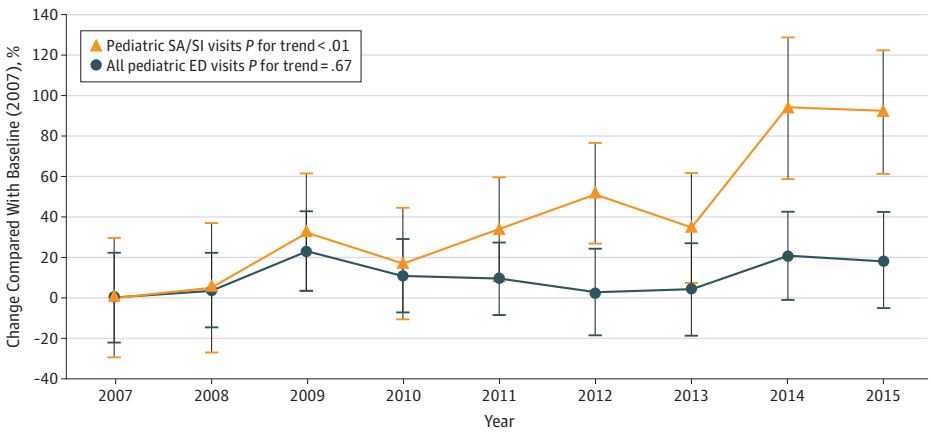
Characteristic	Unweighted Observations, No.	Population Estimate, Millions (95% CI)	Overall Weighted Visits, % (95% CI)
SA/SI visits			
SA	1408	6.40 (5.63-7.16)	87.2 (84.1-89.7)
SI (without SA)	205	0.94 (0.72-1.16)	12.8 (10.3-15.9)
Age group, y			
5-<12	690	3.16 (2.70-3.62)	43.1 (39.6-46.6)
12-<15	403	1.79 (1.49-2.08)	24.3 (21.4-27.6)
15-<18	520	2.39 (2.04-2.74)	32.6 (29.5-35.8)
Sex			
Female	722	3.46 (2.98-3.94)	47.1 (43.6-50.7)
Male	891	3.88 (3.38-4.38)	52.9 (49.3-56.4)
Race[a]			
White	1172	5.28 (4.66-5.90)	72.0 (68.1-75.5)
Black	362	1.75 (1.39-2.11)	23.8 (20.3-27.7)
Other	79	0.31 (0.21-0.41)	4.2 (3.0-5.7)
Type of institution[b]			
Teaching	286	0.89 (0.65-1.13)	12.1 (9.4-15.4)
Nonteaching	1327	6.45 (5.69-7.22)	87.9 (84.6-90.6)
Pediatric	184	0.98 (0.60-1.37)	13.4 (9.3-18.9)
Nonpediatric	1429	6.36 (5.62-7.09)	86.6 (81.1-90.7)
Triage acuity level			
Immediate/emergent	212	0.92 (0.73-1.11)	12.5 (10.3-15.1)
Urgent	455	2.04 (1.68-2.40)	27.8 (24.6-31.4)
Semiurgent	587	2.64 (2.23-3.04)	35.9 (32.0-40.1)
Nonurgent	105	0.51 (0.32-0.69)	6.9 (4.9-9.8)
Unknown/unavailable	254	1.23 (0.90-1.57)	16.8 (13.3-21.0)
Disposition			
Discharged from ED	1561	7.19 (6.36-8.02)	97.9 (97.0-98.6)
Hospitalized	52	0.15 (0.10-0.21)	2.1 (1.4-3.0)
Insurance provider			
Self-pay	108	0.56 (0.35-0.77)	7.6 (5.5-10.5)
Private	696	2.98 (2.58-3.38)	40.6 (36.7-44.7)
Medicare/Medicaid	639	2.97 (2.54-3.40)	40.5 (36.9-44.2)
Other/unknown	170	0.83 (0.59-1.07)	11.3 (8.7-14.5)

Abbreviations: ED, emergency department; SA, suicide attempt; SI, suicidal ideation.

[a] Race is captured by National Hospital Ambulatory Medical Care Survey site representatives as either: white, black/African American, Asian, Native Hawaiian/other Pacific Islander, American Indian/Alaska Native, or more than 1 race reported. The National Hospital Ambulatory Medical Care Survey then recategorizes race/ethnicity as white, black, or other. The recategorized race variable was used for our analyses.

[b] Emergency departments were classified as pediatric hospitals if 85% or more of all visits were for patients younger than 21 years and classified as teaching hospitals if 25% or more of all patients were evaluated by a resident physician.

Figure. Associated Changes in Pediatric Emergency Department (ED) Visits for Suicide Attempts (SA) and Suicidal Ideation (SI)



For children age 5 to younger than 18 years and overall pediatric emergency department visits for all children age younger than 18 years over time. Error bars indicate 95% CI.

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Concept and design: Burstein.
Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Agostino.
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