Suicide Risk Among Adults With Mental Health Emergency Department Visits With and Without Suicidal Symptoms

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ABSTRACT

Objective: To describe risk factors and suicide rates during the year following discharge from mental health emergency department (ED) visits by adults with suicide attempts, suicidal ideation, or neither.

Methods: National cohorts of patients with mental health ED visits for suicide attempts or self-harm (n = 55,323), suicidal ideation (n = 435,464), or other mental health visits (n = 9,144,807) from 2008 to 2012 Medicaid data were followed for suicide for 1 year after discharge. Suicide rates per 100,000 person-years were determined from National Death Index data. Poisson regression models, adjusted for age, sex, and race/ethnicity, estimated suicide rate ratios (RRs). Suicide standardized mortality ratios (SMRs) were estimated from National Vital Statistics System data.

Results: Suicide rates per 100,000 person-years were 325.4 for suicide attempt or self-harm visits (RR = 5.51, 95% CI, 4.64–6.55), 156.6 for suicidal ideation visits (RR = 2.59, 95% CI, 2.34–2.87), and 57.0 for the other mental health ED visits (1.0, reference). Compared to expected suicide general population rates, SMRs were 18.2 (95% CI, 13.0–23.4) for suicide attempt or self-harm patients, 10.6 (95% CI, 9.0–12.2) for suicidal ideation patients, and 3.2 (95% CI, 3.1–3.4) for other ED mental health patients. Among patients with suicide attempt ED visits in the 180 days before their index mental health ED visit, suicide rates per 100,000 person-years were 687.2 (95% CI, 396.5–978.0) for attempt or self-harm visits, 397.4 (95% CI, 230.6–564.3) for ideation visits, and 328.4 (95% CI, 241.5–415.4) for other mental health visits.

Conclusions: In the year following discharge, emergency department patients with suicide attempts or self-harm, especially repeated attempts, have a high risk of suicide.

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Emergency departments (EDs) can play a pivotal role in the management of patients at high suicide risk. ED clinicians can provide mental health assessments and crisis interventions, facilitate inpatient admission for patients at acute risk, and help connect patients who do not require hospital admission to appropriate follow-up care. The large proportion of people who die of suicide who have had ED visits within a year of their death (43.8%) underscores the potential role of EDs in suicide prevention.[1]

Several patient characteristics, such as male sex,[2] older age,[3] mood and substance use disorders,[4,5] psychiatric inpatient care,[6] and suicidal ideation or attempts[7–10] are associated with increased suicide risk. Among patients with suicidal symptoms, use of violent methods[11] and suicidal intent[12] pose especially high risk. Given these risks, ED physicians who evaluate patients with suicidal and other mental health symptoms routinely grapple with difficult decisions concerning the appropriate level of care. These decisions have implications for patient safety and crisis recovery.

In the general population, suicide attempts are strongly associated with increased suicide risk.[13,14] Approximately 1 in 25 patients who attempt suicide will die of suicide within 5 years.[15] The types of psychiatric disorders associated with suicide attempts also appear to influence future suicide risk,[16] and repeat suicide attempts may confer greater risk.[17] However, less is known about the magnitude of suicide risk and clinical factors that influence risk of patients with suicidal ideation in the absence of attempts. In one study, ED patients presenting with suicidal ideation, but not attempts, had a 1-year suicide risk that was roughly 16 times greater than that of general ED patients without suicidal symptoms.[9]

In evaluating suicide risk, it would be helpful to understand the effects of recent events on current risk. It is not known, for example, whether among mental health ED patients with suicidal ideation, those with recent prior ED visits with suicidal ideation are at increased suicide risk. Large cohort studies are needed to connect recent ED visit patterns to future suicide risk. Claims records from mental health ED visits and from the prior 6 months were used to inform suicide risk assessment. The analysis compared 1-year suicide death rates of visits for suicide attempts or self-harm, suicidal ideation, or neither. We further examined relationships of recent clinical diagnoses and ED visit patterns with suicidal risk across these 3 groups to test the hypothesis that repeated nonfatal attempts increase suicide risk. We focused on adults with Medicaid coverage, the largest behavioral health payment source in the US.[18]

Clinical Points

- Assessing suicide risk in emergency department patients with mental health symptoms can be challenging.
- Patients should be evaluated carefully for current as well as recent past suicidal symptoms.
- Patients with a current suicide attempt and a prior attempt in the last 6 months appear to be at especially high risk for dying of suicide shortly after their emergency visit.

METHODS

Sources of Data

The study cohort was identified using 2008–2012 national Medicaid Analytic Extract data purchased from ResDAC (https://www.resdac.org). In addition to demographic data (age, sex, race/ethnicity) collected directly from the beneficiaries, the Medicaid Analytic Extract includes information collected from providers on dates, service setting, and clinical diagnoses of each clinical encounter. Each outpatient visit record includes up to 2 *ICD-9-CM* diagnoses, and each inpatient discharge record includes up to 9 diagnoses. Dates and cause of death information were derived from linkage to data purchased from the National Death Index (NDI) (https://www.cdc.gov/nchs/data/factsheets/factsheet_ndi.htm), which provides a complete accounting of state-recorded deaths in the US and is the most complete resource available for tracing mortality in national samples.[19]

Cohort Assembly and Suicide Outcome

We identified all ED visits including mental disorder diagnoses (*ICD-9-CM*: 290–319) for adults aged 18–64 years. Three hierarchical visit groups were defined by (1) codes for suicide and self-inflicted injury (E950.0–E959.8), hereafter, suicide attempt or self-harm visits; (2) suicidal ideation (V62.84); or (3) other mental health visits. Study visits were also required to have Medicaid eligibility for ≥ 180 days preceding the ED visit and, if admitted for inpatient care following the index ED visit, to have an inpatient stay of < 30 days and to be alive at hospital discharge. The outcome variable was suicide defined as *ICD-10*-CM X60–X84, Y87.0, or U03 as the underlying cause of death.

Sociodemographic and Clinical Characteristics

The 3 study groups were classified by age (18–34, 35–44, 45–64 years), sex, and race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; and other, non-Hispanic including American Indian/Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, more than one race, and unknown). Claims within 180 days preceding the index ED visit were used to characterize visits by codes with diagnoses for depressive, bipolar, anxiety, psychotic, personality including borderline as a subgroup, developmental, disruptive behavior, adjustment-related, substance use including alcohol and drug use, and other mental disorders (*ICD* codes in Supplementary Table 1). Visits were characterized by the presence of ≥ 1 inpatient mental health admissions within 180 days preceding the index ED visit. The visits were also hierarchically classified by ED visits in the prior 180 days with (1) a suicide attempt or self-harm code, (2) a suicidal ideation code, or (3) a mental disorder diagnosis code.

Analysis

The analysis was performed in 4 stages. The first 3 were performed at the visit level and the fourth at the patient level. First, distributions of background clinical and demographic characteristics were derived for the 3 ED visit groups, and the 2 suicidal symptom groups were compared to the other mental health visit group using risk ratios. Second, the 3 groups were followed forward until date of death or 365 days following ED discharge, whichever occurred first. Rates of suicide per 100,000 person-years were calculated. For each demographic and clinical group, age, sex, and race/ethnicity adjusted Poisson regression models estimated adjusted risk ratios with 95% confidence intervals with suicide as the dependent variable. Suicide attempt or self-harm visits and suicidal ideation visits were each compared to other mental health visits as the independent variable of interest. Third, survival curves of cumulative suicide risk over the first year were plotted separately for males and females, and log rank tests compared the 3 study groups. Finally, person-level age, sex, and race/ethnicity stratified suicide standardized mortality ratios (SMRs) were calculated using observed suicide deaths in the year following each patient's first ED discharge. Expected annual suicide rates were derived from the US 2008–2012 general population using WONDER data.[20] Separate suicide SMRs were derived for the 3 study groups overall and stratified by age, sex, and race/ethnicity.

In all visit-level analyses, generalized estimating equations adjusted for autocorrelations among visits from patients contributing multiple ED visits. All statistical analyses were performed with SAS 9.4 (SAS, Cary, North Carolina). The University of Pennsylvania Institutional Review Board approved this study with a waiver of informed consent.

RESULTS

Background Characteristics

Most ED visits in each group were by women, adults ≤ 45 years, and white people (Table 1). The proportion of ED visits resulting in hospital admission was highest for visits presenting with suicide attempts or self-harm (46.6%), followed by suicidal ideation (27.6%) and other mental health visits (16.4%).

Based on non-overlapping confidence intervals, the groups differed with respect to clinical diagnoses during the 180 days preceding the index ED visits. Depressive, bipolar, anxiety, psychotic, and especially personality disorders were diagnosed more commonly among suicide attempt or self-harm visits and suicidal ideation visits than among other mental health visits. During this 180-day period, substance use disorders were diagnosed in approximately half of

Table 1. Characteristics of Emergency Department Visits With Mental Disorder Diagnoses (N = 9,635,594)[a]

Characteristic	Suicide attempt[b] (N = 55,323) %	Suicidal ideation (N = 435,464) %	No attempt or ideation (N = 9,144,807) %	Risk ratio of attempt (95% CI) (no attempt or ideation reference)	Risk ratio of ideation (95% CI) (no attempt or ideation reference)
Sex					
Male	32.9	46.8	38.3	–	–
Female	67.1	53.2	61.7	1.09 (1.08–1.10)	0.862 (0.86–0.87)
Age					
18–34 y	54.8	44.4	43.7	–	–
35–44 y	21.8	22.9	20.4	0.89 (0.88–0.91)	1.07 (1.06–1.08)
45–64 y	23.4	32.7	35.9	0.66 (0.65–0.67)	0.94 (0.93–0.95)
Race/ethnicity					
White, non-Hispanic	64.7	56.5	55.9	–	–
Black, non-Hispanic	14.3	24.1	25.2	0.58 (0.57–060)	0.96 (0.95–0.97)
Other, non-Hispanic[c]	12.1	10.6	10.0	1.05 (1.02–1.08)	1.05 (1.03–1.06)
Hispanic	8.9	8.8	8.9	0.88 (0.85–0.91)	0.98 (0.97–1.00)
Admitted to hospital	46.6	27.6	16.4	2.85 (2.82–2.88)	1.69 (1.68–1.70)
Any mental disorder diagnosis[d]	78.4	86.3	76.2	1.03 (1.02–1.03)	1.13 (1.129–1.13)
Depressive disorders	50.5	60.6	34.5	1.46 (1.45–1.48)	1.76 (1.75–1.76)
Bipolar disorders	30.6	39.7	19.3	1.59 (1.56–1.61)	2.06 (2.05–2.08)
Anxiety disorders	34.1	34.1	25.3	1.35 (1.33–1.37)	1.35 (1.34–1.36)
Psychotic disorders	23.1	39.3	19.4	1.19 (1.16–1.21)	2.03 (2.01–2.04)
Personality disorders	11.5	14.5	4.6	2.51 (2.42–2.60)	3.15 (3.10–3.20)
Borderline personality disorder	7.2	6.5	1.9	3.87 (3.69–4.06)	3.49 (3.42–3.56)
Developmental disorders	5.3	8.2	7.3	0.73 (0.70–0.77)	1.13 (1.10–1.15)
Disruptive behavior disorders	10.3	11.0	6.5	1.58 (1.52–1.63)	1.70 (1.67–1.72)
Adjustment-related disorders	7.0	8.2	4.6	1.51 (1.46–1.57)	1.77 (1.74–1.80)
Substance use disorder	42.8	51.3	42.9	1.00 (0.99–1.01)	1.20 (1.19–1.20)
Alcohol use disorder	38.0	46.4	37.2	1.02 (1.01–1.04)	1.25 (1.24–1.25)
Drug use disorder	18.0	25.2	16.7	1.08 (1.06–1.10)	1.51 (1.49–1.52)
Other mental disorders	16.9	22.1	9.3	1.82 (1.77–1.87)	2.38 (2.35–2.40)
Comorbid substance and other mental disorder[d]	24.5	35.4	16.4	1.50 (1.47–1.53)	2.16 (2.14–2.18)
Any inpatient mental health care[d]	29.6	43.0	24.3	1.22 (1.20–1.24)	1.77 (1.76–1.78)
Recent mental health emergency department visits[d,e]					
Suicide attempt	10.3	2.8	0.8	13.45 (12.9–13.9)	3.64 (3.53–3.74)
Suicidal ideation	10.9	30.0	5.5	2.01 (1.96–2.06)	5.49 (5.45–5.54)
Mental disorder diagnosis	31.0	31.8	47.7	0.65 (0.64–0.66)	0.67 (0.66–0.67)

[a]Data from 2008 to 2012 Medicaid Analytic Extract.
[b]Includes suicide attempts and self-harm events.
[c]Includes American Indian/Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, unknown, and more than one race.
[d]During 180 days prior to the index emergency department visit.
[e]Subgroups defined hierarchically.

suicidal ideation visits (51.3%) and in lower percentages of suicide attempt or self-harm (42.8%) and other mental health (42.9%) visits. In this period, a larger percentage of suicide attempt or self-harm visits (10.3%) than suicidal ideation visits (2.8%) or other mental health visits (0.8%) had ≥ 1 recent prior ED visits with a suicide attempt. Also in this period, a larger proportion of suicidal ideation visits (30.0%) than attempt or self-harm visits (10.9%) or other mental health visits (5.5%) had recent prior ED visits with suicidal ideation.

Risk of Suicide

The suicide rate per 100,000 person-years during the first year following discharge was highest for suicide attempt or self-harm visits (325.4), intermediate for suicidal ideation visits (156.6), and lowest for other mental health visits (57.0) (Table 2). As compared to the other mental health mental health visits, the age, sex, race/ethnicity adjusted suicide risk ratio was higher for suicide attempt or self-harm visits (5.51; 95% CI, 4.64–6.55) than for suicidal ideation visits (2.59; 95% CI, 2.34–2.87). A similar pattern was found across most sex, age, and race/ethnicity groups. Suicide risk was consistently higher among visits by males than females and among visits by white and Hispanic adults than by black adults. Among suicide attempt or self-harm visits, the suicide rate per 100,000 person-years was higher for visits by patients aged 45–64 years than 18–34 years.

Within each group, the highest suicide rates occurred among visits with ≥ 1 prior suicide attempt or self-harm ED visits in the preceding 180 days. For these groups, suicide rates per 100,000 person-years were 687.2 for suicide attempt or self-harm visits, 397.4 for suicidal ideation visits, and 328.4 for other mental health visits. Among groups defined by recent clinical mental health diagnoses, the highest suicide rates per 100,000 person-years in the suicide attempt or self-harm visits group were with drug use disorders (601.0), the highest in the suicidal ideation group were with anxiety disorders (207.2), and the highest in the other mental health group were with borderline personality disorder (187.2).

For most clinical characteristics, the adjusted suicide risk ratios were significantly higher for suicide attempt or self-harm and suicidal ideation visits than other mental health

Table 2. Annualized Rates of Suicide per 100,000 Person-Years for Emergency Department Visits During the First Year Following Hospital Discharge (N = 9,635,594)[a]

Characteristic	Suicide rate per 100,000 person-years[b]			Adjusted risk ratio of attempt (95% CI) (no attempt or ideation reference)	Adjusted risk ratio of ideation (95% CI) (no attempt or ideation reference)
	Suicide attempt[c] (N = 55,323)	Suicidal ideation (N = 435,464)	No attempt or ideation (N = 9,144,807)		
Overall	325.4 (269.0–381.7)	156.6 (139.8–173.5)	57.0 (53.4–60.0)	5.51 (4.64–6.55)	2.59 (2.34–2.87)
Sex					
Male	516.1 (395.6–636.5)	183.9 (156.3–211.5)	79.9 (73.1–86.7)	5.79 (4.58–7.32)	2.29 (1.99–2.63)
Female	231.8 (172.1–291.4)	132.6 (112.3–152.8)	42.8 (38.6–47.0)	5.19 (4.02–6.70)	3.06 (2.64–3.55)
Age					
18–34 y	211.1 (155.5–266.7)	134.3 (112.1–156.6)	46.8 (41.7–51.8)	4.36 (3.35–5.68)	2.61 (2.22–3.07)
35–44 y	405.5 (258.1–552.9)	162.5 (127.7–197.2)	61.8 (53.7–69.8)	5.98 (4.21–8.51)	2.55 (2.06–3.16)
45–64 y	518.5 (369.6–667.5)	182.8 (149.2–216.5)	66.9 (60.1–73.6)	6.72 (5.03–8.97)	2.59 (2.19–3.06)
Race/ethnicity					
White, non-Hispanic	388.6 (315.4–461.8)	200.8 (176.3–225.4)	75.1 (69.6–80.5)	5.45 (4.52–6.58)	2.54 (2.27–2.85)
Black, non-Hispanic	88.4 (0–177.6)	49.6 (29.1–70.1)	20.9 (15.7–26.1)	4.58 (1.63–12.87)	2.16 (1.42–3.27)
Other, non-Hispanic[d]	267.7 (119.3–416.2)	181.5 (120.7–242.2)	60.5 (49.2–71.9)	4.68 (2.67–8.17)	2.96 (2.12–4.13)
Hispanic	325.8 (87.0–564.6)	135.3 (79.5–191.1)	42.1 (29.0–55.1)	8.50 (4.07–17.73)	3.18 (2.13–4.73)
Admitted to hospital	399.2 (309.8–488.5)	166.2 (135.6–196.7)	61.4 (55.4–67.3)	5.88 (4.63–7.47)	2.61 (2.15–3.17)
Any mental disorder diagnosis[e]	373.4 (305.3–441.5)	165.3 (146.3–184.4)	67.0 (62.3–71.7)	5.30 (4.42–6.36)	2.36 (2.11–2.63)
Depressive disorders	407.9 (317.2–498.7)	176.1 (151.9–200.3)	93.7 (85.4–102.1)	4.19 (3.36–5.22)	1.80 (1.58–2.04)
Bipolar disorder	443.2 (328.1–558.2)	184.4 (152.3–216.4)	101.3 (89.3–113.3)	4.20 (3.25–5.43)	1.79 (1.52–2.10)
Anxiety disorders	429.4 (315.4–543.5)	207.2 (172.3–242.1)	92.0 (82.6–101.5)	4.54 (3.49–5.91)	2.13 (1.82–2.49)
Psychotic disorders	430.9 (292.8–568.9)	151.9 (123.5–180.3)	95.3 (83.9–106.7)	3.80 (2.77–5.23)	1.51 (1.27–1.80)
Personality disorders	313.5 (151.0–476.0)	193.4 (143.9–243.0)	162.4 (129.9–194.9)	1.87 (1.12–3.11)	1.21 (0.95–1.56)
Borderline personality disorder	324.3 (100.3–548.3)	186.3 (121.2–251.3)	187.5 (128.2–246.7)	1.70 (0.87–3.33)	1.00 (0.68–1.47)
Developmental disorders	203.9 (15.6–392.2)	115.3 (59.9–170.7)	30.8 (20.2–41.4)	6.47 (2.44–17.17)	3.73 (2.24–6.24)
Disruptive behavior disorders	317.4 (155.4–479.4)	104.2 (70.0–138.4)	64.1 (50.8–77.4)	4.86 (3.03–7.81)	1.60 (1.17–2.18)
Adjustment-related disorders	491.7 (248.8–734.6)	140.3 (92.3–188.3)	88.3 (67.2–109.3)	5.45 (3.21–9.24)	1.52 (1.08–2.15)
Substance use disorder	443.4 (338.6–548.1)	175.8 (149.8–201.8)	81.2 (74.0–88.3)	5.05 (4.00–6.39)	2.17 (1.83–2.42)
Alcohol use disorder	442.0 (330.1–553.9)	166.8(140.2–193.4)	81.7 (73.9–89.4)	5.02 (3.90–6.45)	1.99 (1.72–2.32)
Drug use disorder	601.0 (419.5–782.5)	199.4 (159.6–239.2)	98.5 (85.8–111.2)	5.42 (4.04–7.26)	2.03 (1.69–2.42)
Other mental disorders	555.3 (352.9–757.8)	182.6 (139.7–225.4)	118.4 (101.0–135.8)	4.32 (3.05–6.13)	1.55 (1.25–1.91)
Comorbid substance and other mental disorder[e]	530.7 (371.6–689.9)	186.4 (153.4–219.3)	127.4 (112.6–142.1)	3.78 (2.81–5.10)	1.48 (1.25–1.75)
Inpatient mental health care[e]	513.4 (384.6–642.1)	183.6 (153.6–213.6)	100.8 (90.9–111.6)	4.51 (3.49–5.82)	1.79 (1.52–2.09)
Recent ED visits[e,f]					
Suicide attempt ED visits	687.2 (396.5–978.0)	397.4 (230.6–564.3)	328.4 (241.5–415.4)	2.10 (1.47–3.00)	1.22 (0.86–1.73)
No suicide attempt ED visits	284.0 (236.5–331.5)	149.7 (133.6–165.9)	55.0 (51.4–58.5)	5.04 (4.24–5.99)	2.58 (2.32–2.86)
Suicidal ideation	429.3 (264.6–594.0)	167.1 (131.8–202.5)	153.0 (127.5–178.5)	2.57 (1.75–3.79)	1.14 (0.94–1.37)
No suicide ideation ED visits	312.6 (253.9–371.2)	152.1 (137.0–167.2)	51.5 (28.1–54.9)	5.93 (4.91–7.16)	2.81 (2.53–3.12)
Mental disorder ED visits	361.7 (271.8–451.6)	170.5 (148.3–192.7)	62.0 (56.2–67.8)	5.52 (4.25–7.15)	2.62 (2.27–3.03)
No mental disorder ED visits	309.0 (242.2–375.9)	150.1 (129.8–170.5)	52.5 (48.9–56.1)	5.69 (4.62–7.00)	2.65 (2.35–2.98)

[a]Data from 2008 to 2012 Medicaid Analytic Extract and National Death Index. Results from a series of Poisson regressions adjusted for age, sex, and race/ethnicity.
[b]The analysis includes 47 suicide deaths in the suicide attempt group, 171 in the suicidal ideation group, and 1,275 in the no attempt or ideation group.
[c]Includes suicide attempts and self-harm events.
[d]Includes American Indian/Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, unknown, and more than one race.
[e]During 180 days prior to the index emergency department visit.
[f]Subgroups defined hierarchically.
Abbreviation: ED = emergency department.

visits (reference group). Among visits with recent personality disorder diagnoses, however, the suicide risk ratios were not significantly higher for suicidal ideation than other mental health visits. Among suicidal ideation and other mental health visits, a similar pattern was also observed for ED visits with recent suicide attempt or self-harm and suicidal ideation.

Timing of Suicide Risk

For males (Figure 1) and females (Figure 2), the cumulative 1-year suicide risks were highest for suicide attempt or self-harm visits, intermediate for suicide ideation visits, and lowest for the other mental health visits. All 6 pairwise comparisons between the 3 study groups were significant ($P < .0001$). Across all groups, 20.4% of the suicide deaths occurred within 30 days, 33.5% within 60 days, 42.2% within 90 days, and 73.3% within 180 days of discharge. The percentage of suicide deaths that occurred within 180 days of discharge was 89.4% among suicide attempt or self-harm visits, 78.9% for suicide ideation visits, and 71.9% for other mental health visits.

Suicide Risk in Relation to General Population

In relation to the general population, the demographically standardized suicide SMR for the first year following discharge was 18.2 (95% CI, 13.0–23.4) for suicide attempt or self-harm patients, 10.6 (95% CI, 9.0–12.2) for suicidal ideation patients, and 3.2 (95% CI, 3.1–3.4) for other mental health patients (Table 3). Among ED patients without attempts or ideation, the suicide SMR was 3.9 (95% CI, 3.6–4.2) for females and 2.9 (95% CI, 2.7–3.1) for males.

Figure 1. Cumulative Suicide Risk of Male Patients During the 365 Days Following Discharge From a Mental Health Emergency Department Visit

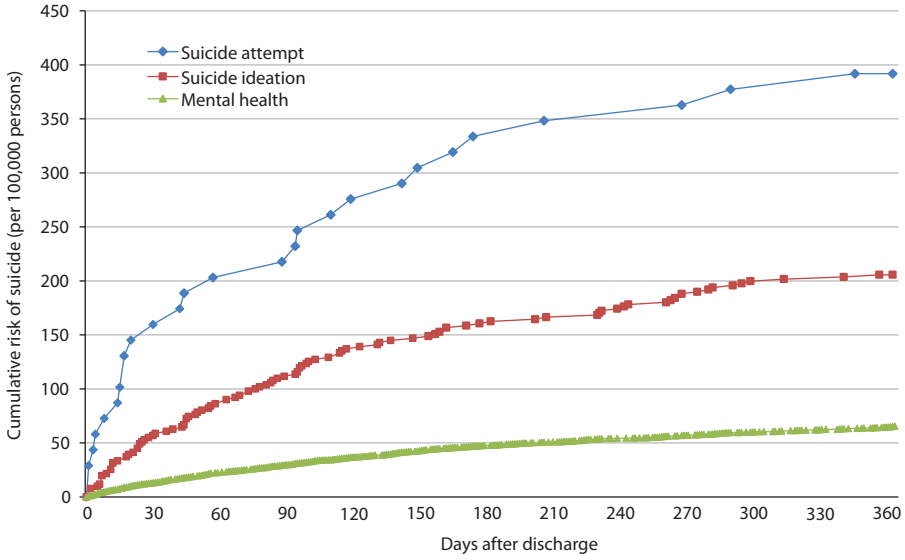
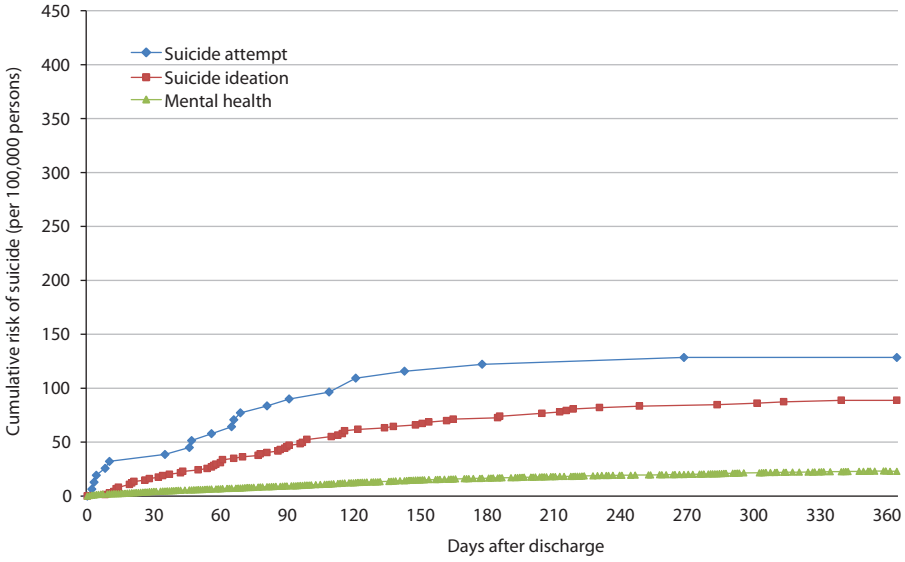


Figure 2. Cumulative Suicide Risk of Female Patients During the 365 Days Following Discharge From a Mental Health Emergency Department Visit



DISCUSSION

Mental health ED patients were at significantly greater suicide risk than the general population. This risk, which was concentrated during the first months following discharge, was highest for patients with suicide attempts or self-harm, intermediate for suicidal ideation, and lowest, though still elevated, for other mental health problems. Within each group, attempt or self-harm visits in the past 6 months emerged as the strongest suicide risk factor. Recent suicide attempt or self-harm history was associated with more than doubling suicide risk following suicide attempt or self-harm visits and suicidal ideation visits and increasing by nearly 6-fold suicide risk following other mental health visits. These patterns underscore the critical importance of evaluating all emergency department mental health patients for a recent history of suicide attempts or self-harm.

History of Suicidal Behavior

A lifetime history of multiple attempts has been reported to increase suicide over long-term follow-up.[21–23] The present findings extend this research by documenting increased suicide risk associated with a recent prior suicide attempt or self-harm including among current visits for

Table 3. Suicide Rates per 100,000 Person-Years and Suicide Standardized Mortality Ratios in a Cohort of Emergency Department Patients With Mental Disorder Diagnoses in the First Year Following Discharge[a]

	Suicide attempt or self-harm event		Suicide ideation		Other mental health patients	
	Observed suicide rate[b]	SMR (95% CI)	Observed suicide rate[b]	SMR (95% CI)	Observed suicide rate[b]	SMR (95% CI)
Total	209.3	18.2 (13.0–23.4)	136.3	10.6 (9.0–12.2)	38.4	3.2 (3.1–3.4)
Sex						
Male	391.8	16.5 (10.3–22.7)	205.6	8.9 (7.2–10.6)	65.3	2.9 (2.7–3.1)
Female	128.5	21.2 (11.9–30.4)	88.7	14.8 (11.2–18.4)	23.3	3.9 (3.6–4.2)
Age group						
18–34 y	114.1	11.4 (5.8–17.0)	111.7	9.8 (7.6–12.0)	29.1	2.9 (2.6–3.1)
35–44 y	343.3	26.0 (12.8–39.1)	190.8	13.6 (9.8–17.5)	47.4	3.7 (3.3–4.1)
45–64 y	393.7	26.6 (13.6–39.7)	145.9	9.4 (6.7–12.1)	48.0	3.4 (3.1–3.7)
Race						
White	280.8	18.8 (12.8–24.8)	175.4	10.3 (8.5–12.0)	52.6	3.3 (3.1–3.5)
Black	0	0 (0.0–0.0)	40.4	5.9 (2.4–9.4)	12.0	1.9 (1.5–2.3)
Hispanic	233.9	44.3 (8.8–79.7)	114.6	18.3 (9.1–27.6)	19.4	3.2 (2.4–3.9)
Others	112.7	13.5 (0–28.7)	142.7	15.4 (8.5–22.3)	42.7	4.8 (4.0–5.6)

[a]Data from 2008 to 2012 Medicaid Analytic Extract, National Death Index, and the National Vital Statistics System Mortality multiple cause-of-death files. SMRs standardized by age, sex, and race/ethnicity.
[b]Suicide rates reported in 100,000 person-years.
Abbreviation: SMR = standardized mortality ratio.

attempts or self-harm. This finding contradicts clinical lore that people presenting with repeated self-harm are not at increased risk for suicide.

A recent history of ED visits with suicidal ideation was also associated with increased suicide risk. Among mental health ED patients without current suicidal or self-harm symptoms, having had a recent suicidal ideation visit was associated with a nearly 3-fold greater suicide risk. However, a recent suicidal ideation visit did not appear to significantly increase risk among patients presenting with suicide ideation. This suggests that a recent history of suicidal ideation operates differently on risk in the presence and absence of current suicidal ideation and highlights the importance of evaluating mental health ED patients without current suicidal symptoms for recent prior suicidal ideation visits.

Borderline Personality Disorder and Drug Use Disorders

Among other mental health visits, a history of borderline personality diagnosis was associated with suicide risk over 3 times higher than overall mental health visits without suicidal symptoms. Even in the absence of overt suicidal symptoms, ED patients with a history of borderline personality diagnoses should be evaluated carefully for suicide risk. In the context of persistently elevated risk, some ED clinicians[24] and mental health clinicians[25] may develop negative views of patients with borderline personality disorder that may lead to inadequate safety assessments or compromise efforts to contact outpatient providers or social supports.[26] However, brief training workshops have improved mental health clinicians' attitudes and perceived competence in treating patients with borderline personality disorder.[27,28]

Healthcare professionals also tend to hold negative views of patients with drug use disorders that can result in lower personal engagement.[29] Although drug use disorders are established risk factors for suicide,[30] less is known about the effects of drug use disorders on suicide risk among suicidal patients. Among patients presenting with suicide attempts or self-harm, we found that patients with recent drug use disorder diagnoses had nearly twice the suicide risk. Prior research has provided inconsistent support for substance use disorders as a risk factor for suicide among acute care patients with suicidal symptoms.[9,11,21] In evaluating this issue, it may be important to consider whether substance use disorder is diagnosed in the ED by symptoms of intoxication or withdrawal that may identify different patients than those who are diagnosed with substance use disorders in other settings. Drug intoxication can also complicate ED suicide risk assessment by impairing the patient's responses to clinical questions.[31] As a result, drug use disorder diagnoses derived from an ED visit might be less strongly related to future suicide risk than diagnoses from clinical evaluations preceding ED visits as in the present study.

Anxiety Disorders and Suicidal Ideation

Among suicidal ideation visits, anxiety disorders were the diagnostic group with the highest suicide risk. Retrospective epidemiologic research reveals significant associations of panic disorder and social anxiety disorder with nonfatal suicide attempts.[32] Detailed clinical studies are needed to examine whether and how anxiety disorders contribute to transitions from suicidal ideation to suicidal behavior. Anxiety sensitivity is common in panic disorder and other anxiety disorders[33,34] and may contribute to suicide risk.[35] Longitudinal psychological research is needed to evaluate associations between anxiety disorders, anxiety sensitivity, suicidal ideation, and suicide.

Clinical Implications

Although the current study focused on patients presenting to emergency departments, patients with suicidal symptoms

in all clinical settings should receive careful mental health evaluations with a focus on modifiable intervention targets. According to a recent meta-analysis, annual suicide rates did not significantly differ between patients with suicidal thoughts or behaviors discharged from EDs or general hospital inpatient units.[36]

The concentration of suicide risk during the first few months following ED discharge has important clinical implications for short-term management. A thorough assessment should be provided of risk and protective factors of ED mental health patients including evaluation of suicidal intent.[37] Some single-encounter suicide prevention interventions significantly improve linkage to follow-up care and reduce subsequent suicide attempts.[38] Common components include brief contacts involving telephone calls, postcards, letters, or text messages reminders urging follow-up care[39]; care coordination involving scheduling of outpatient appointments and reducing barriers to appointment attendance; and safety planning including helping patients identify personal warning signs of an impending suicidal crisis, internal coping strategies, social supports, and available mental health professionals, as well as providing patients with lethal means counseling.[40] A variety of brief therapeutic interventions have also demonstrated promise including problem solving therapy for patients with repeated self-harm,[41] follow-up telephone calls providing case management and supportive counseling,[42] and follow-up text messages expressing care and concern.[43]

Limitations

This study has several limitations. First, the suicidal ideation codes[44] and mental disorder diagnoses are based on routine clinical assessments and were not subjected to independent expert validation. Because suicidal symptoms are sometimes not detected in EDs, they are not consistently captured in the ED claims record.[45] Second, different results might have been obtained if the analysis included more recent data, a wider age range, and uninsured or privately insured ED patients. Among ED patients with suicide attempts or self-harm, for example, Medicaid patients are significantly more likely than privately insured patients to have recently received inpatient psychiatric care and diagnosed with depression, schizophrenia, or bipolar disorder.[46] Third, no information was available concerning several suicide risk factors such as a family history of suicide, lifetime personal history of attempted suicide, proximal stressful life events, or access to firearms or other lethal means.[47] Fourth, stigma,[48] low autopsy rates,[49] and forensic uncertainty[50] may result in underreporting or misclassification of suicide in the NDI data. Fifth, some visits classified as suicide attempts or self-harm events may have been for nonsuicidal self-harm, though prior research has revealed accurate documentation of suicidal intent.[51] Finally, person-level comparisons to population norms tend to underweight visits by people with more ED visits, who may be a higher risk group.

CONCLUSIONS

ED physicians commonly face clinical uncertainties in evaluating suicidal risk and in determining which mental health patients can be safely discharged to the community. In making these clinical judgments, ED physicians should bear in mind that suicide risk following ED discharge is substantially higher for mental health patients with current or recent ED visits for suicide attempts or self-harm events. Even among ED mental health patients without current suicidal symptoms, a recent suicide attempt or self-harm event markedly increased suicide risk. Learning which ED mental health patients pose high short-term suicide risk will hopefully improve clinical judgments concerning the appropriate level of follow-up care.

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Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Suicide section. Please contact Philippe Courtet, MD, PhD, at pcourtet@psychiatrist.com.

See supplementary material for this article at PSYCHIATRIST.COM.

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Supplementary Material

Article Title: Suicide Risk Among Adults With Mental Health Emergency Department Visits With and Without Suicidal Symptoms

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List of Supplementary Material for the article

1. Table 1 Diagnostic groups and ICD-9-CM codes

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This Supplementary Material has been provided by the author(s) as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

SUPPLEMENTARY TABLE 1. Diagnostic groups and ICD-9-CM codes	
Diagnostic Group	**ICD-9-CM codes**
Depression	296.2x, 296.3x, 296.9x, 298.0x, 300.4x, 311.xx
Bipolar disorder	296.0x, 296.4x, 296.5x, 296.6x, 296.7x, 296.8x
Anxiety disorder	300, 300.0x, 300.2x, 300.3x, 293.84, 300.83, 309.81
Psychosis	295.xx, 297.xx, 298.xx
Personality disorder	301.xx (301.83 borderline personality disorder)
Developmental disorders	294.8, 299, 299.0, 299.00, 299.01, 299.80, 299.90, 307.0, 307.9, 315, 315.00, 315.01, 315.02, 315.09, 315.1, 315.2, 315.31, 315.32, 315.34, 315.35, 315.39, 315.4, 315.5, 315.8, 315.9, 317.00, 317, 318, 318.0, 318.1, 318.2, 319, V400, V401
Disruptive behavior disorders	312.00, 312.01, 312.02, 312.03, 312.10, 312.11, 312.12, 312.13, 312.20, 312.21, 312.22, 312.23, 312.30, 312.34, 312.4, 312.8, 312.81, 312.82, 312.89, 312.9, 313.81, 314, 314.00, 314.01, 314.1, 314.2, 314.8, 314.9
Adjustment-related disorders	308.0x, 308.1x, 308.2x, 308.4x, 308.9x, 309.0x, 309.2x, 309.3x, 309.4x, 309.9x
Alcohol use disorder	291.xx, 303.xx, 305.xx
Drug use disorder	292.xx, 304.xx
Other mental disorder	Diagnosis codes from 290.xx to 319.xx, except those listed in diagnostic groups above.