

ONLINE FIRST

Emergency Treatment of Deliberate Self-harm

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Context: Although concern exists over the quality of emergency mental health services, little is known about the mental health care of adults who are admitted to emergency departments for deliberately harming themselves and then discharged to the community.

Objective: To describe the predictors of emergency department discharge, the emergency mental health assessments, and the follow-up outpatient mental health care of adult Medicaid beneficiaries treated for deliberate self-harm.

Design: A retrospective longitudinal cohort analysis.

Setting: National Medicaid claims data supplemented with county-level sociodemographic variables and Medicaid state policy survey data.

Participants: Adults aged 21 to 64 years who were treated in emergency departments for 7355 episodes of deliberate self-harm, focusing on those who were discharged to the community (4595 episodes).

Main Outcome Measures: Rates and adjusted risk ratios (ARRs) of discharge to the community, mental health assessments in the emergency department, and outpatient mental health visits during the 30 days following the emergency department visit.

Results: Most patients (62.5%) were discharged to the community. Emergency department discharge was directly related to younger patient age (21-31 years vs 45-64 years) (ARR, 1.18 [99% confidence interval {CI}, 1.10-1.25]) and self-harm by cutting (ARR, 1.18 [99% CI, 1.12-1.24]) and inversely related to poisoning (ARR, 0.84 [99% CI, 0.80-0.89]) and recent psychiatric hospitalization (ARR, 0.74 [99% CI, 0.67-0.81]). Approximately one-half of discharged patients (47.5%) received a mental health assessment in the emergency department, and a similar percentage of discharged patients (52.4%) received a follow-up outpatient mental health visit within 30 days. Follow-up mental health care was directly related to recent outpatient mental health care (ARR, 2.30 [99% CI, 2.11-2.50]) and treatment in a state with Medicaid coverage of mental health clinic services (ARR, 1.13 [99% CI, 1.05-1.22]) and inversely related to African American (ARR, 0.86 [99% CI, 0.75-0.96]) and Hispanic (ARR, 0.86 [99% CI, 0.75-0.99]) race/ethnicity.

Conclusion: Most adult Medicaid beneficiaries who present for emergency care for deliberate self-harm are discharged to the community, and many do not receive emergency mental health assessments or follow-up outpatient mental health care.

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DELIBERATE SELF-HARM, which may or may not involve suicidal intent, substantially increases the risk of future suicide death.¹⁻³

A single visit to an emergency department for deliberate self-harm increases the risk of suicide by nearly 6-fold.² The period immediately after an episode of deliberate self-harm poses the greatest risk of completed suicide and a repeated episode of deliberate self-harm.⁴⁻⁶ Because of the connection between deliberate self-harm and suicide risk, emergency departments are well positioned to provide frontline mental health assessments and potentially lifesaving referrals for follow-up mental health care. National trends suggest that emergency departments are increasingly important settings

for identifying, assessing, and treating adults who deliberately harm themselves.⁷

Mental disorders are highly prevalent among adults who deliberately harm themselves.⁸⁻¹⁰ More than 90% of adults who deliberately harm themselves meet current or lifetime criteria for 1 or more mental disorders at the time of deliberate self-harm.¹⁰ In view of this exceedingly high prevalence, the National Institute for Health and Clinical Excellence recommends that all persons admitted to emergency departments for deliberate self-harm should receive a mental health evaluation prior to emergency department discharge.¹¹

Mental health care in emergency departments varies in quality. According to 1 statewide survey,¹² more than one-half of emergency departments do not have a

mental health professional available for the evaluation and treatment of patients who deliberately harm themselves. Despite the nearly ubiquitous presence of mental disorders among patients who deliberately harm themselves, a national study¹³ revealed that mental disorders were not diagnosed in roughly one-half of emergency department visits for adults who deliberately harmed themselves. Beyond concerns related to underidentification of mental health problems, there is also apprehension over problems in the consistency with which patients who deliberately harm themselves are linked to outpatient mental health treatment.¹⁴ In a Finnish study,¹⁵ for example, nearly one-half of discharged patients (46.3%) who deliberately harmed themselves did not receive any outpatient care during the 30 days after their emergency department visit for their deliberate self-harm. In this study,¹⁵ diagnosis of a mood, psychotic, or personality disorder, but not a substance use disorder, predicted health care contact following the emergency department visit for self-harm. To the best of our knowledge, a comparable US study has not been previously performed.

Our study focuses on adult Medicaid beneficiaries who were admitted to the emergency department for deliberate self-harm. It evaluates the discharge disposition from the emergency department and 2 basic aspects of mental health care: (1) the mental health assessment in the emergency department and (2) the outpatient mental health treatment within 30 days of emergency department discharge. We describe patterns and predictors of these services. Medicaid beneficiaries represent a large population who may be at a particularly high risk for problems with continuity of mental health care.¹⁶

METHOD

DATA SOURCES

The primary source of data was the 2006 Medicaid Analytic Extract files from all 50 states and the District of Columbia that were obtained from the Center for Medicare and Medicaid Services. These files include data on the patient's eligibility, demographics, and medical service and on prescription claims data from the more than 40 million beneficiaries enrolled in Medicaid nationwide. Supplementary county-level information on poverty, income, and population density was derived from the Area Resource File, which is compiled by the US Health Resources and Services Administration.¹⁷ Information on state policies governing Medicaid coverage of mental health services in specialized clinics was derived from a Substance Abuse and Mental Health Services Administration–sponsored survey of state Medicaid directors from all 50 states and the District of Columbia.¹⁸ Our study was reviewed and determined to be exempt from human subjects review by the New York State Psychiatric Institute institutional review board.

SAMPLE SELECTION

In our study, we examined the Medicaid medical service and pharmacy claims of patients 21 to 64 years of age for a 60-day period before each emergency department visit and a 30-day period after emergency department discharge for deliberate self-harm (*International Classification of Diseases, Ninth Revision, Clinical Modification* [ICD-9-CM] codes E950-E959) in any position on the claim. A patient was included only if he or she

was continuously eligible for Medicaid services for the 60 days before emergency department visit and the 30 days after emergency department discharge. The earliest index emergency department visit was March 3, 2006, and the latest was December 1, 2006. E-coding is mandatory in about one-half of the states. In these states, completeness of E codes often surpasses 90%¹⁹ and exceeds the rate in states without reporting mandates.²⁰ Underreporting of E codes would pose interpretative challenges if it were correlated with diagnosis and coding of mental disorders in emergency departments or with diagnosis and coding of follow-up outpatient mental health care.

Because the analysis focuses on connections to outpatient care, patients were also excluded if they received services in an institutional residential setting. These settings included prisons and correctional facilities, assisted living facilities, group homes, nursing and custodial care facilities, hospices, and residential care facilities. Because patients who have frequent emergency department visits for deliberate self-harm may be well known to emergency department staff and therefore not fully evaluated at each visit, we excluded emergency department visits for deliberate self-harm that were preceded by another such visit in the prior 30 days. A total of 871 emergency department visits for deliberate self-harm (10.6%) were excluded from the primary analysis on this basis. Individual patients could contribute more than 1 deliberate self-harm–related emergency department visit (ie, treatment episode) to the analysis.

DEPENDENT VARIABLES

The 3 dependent variables were (1) discharge from the emergency department to the community, (2) mental health assessment within the emergency department, and (3) use of follow-up outpatient mental health care within 30 days of emergency department discharge. Mental health assessments were defined by the occurrence of 1 or more claims with *Current Procedural Terminology* codes for psychiatric evaluation and diagnostic interviewing (codes 90801, 90802, and 90885) and psychological and neuropsychological assessment and testing (codes 96101-96103 and codes 96118-6120) or with *ICD-9-CM* codes for the diagnosis of a mental disorder (codes 290-319) from the emergency department visit.²¹ Follow-up outpatient mental health care was defined as the use of any Medicaid-reimbursed outpatient mental health service (*ICD-9-CM* codes 290-319) during the 30 days following emergency department discharge. A combination of place of service, type of service, and diagnosis codes defined outpatient mental health services. By this means, services delivered by inpatient hospitals, emergency departments, surgery centers, transportation services, pharmacies, and a variety of other nonoutpatient settings as well as services that did not include a mental disorder diagnosis were excluded. Although no standards exist for outpatient care following emergency treatment, a 30-day period was selected based on the Health Plan Employer Data and Information Set quality measures for follow-up after hospitalization for mental illness.²²

INDEPENDENT VARIABLES

Independent variables included patients, local resources, and state policies. Patient-level variables from the Medicaid files included patient age at emergency department discharge (21-34, 35-44, and 45-64 years), sex, race/ethnicity, and Medicaid eligibility (poverty-related eligibility vs disability-related eligibility). On the basis of claims during the 60-day period prior to the index emergency department visit, treatment episodes were also classified with respect to the presence of 1 or more outpatient visits, inpatient episodes, emergency department visits, or any

DISCHARGE TO THE COMMUNITY

A total of 7355 treatment episodes met all eligibility criteria except emergency department discharge to the community. Among these episodes, 4595 episodes (62.5%) were from 4440 unique patients who were discharged to the community. The multivariate analyses revealed that discharged patients were significantly more likely than admitted patients to be young (21-34 years) adults and to have deliberately cut themselves. By contrast, discharged patients were significantly less likely than admitted patients to have been eligible for Medicaid through disability ($P = .01$), to have deliberately poisoned themselves or used some method of high lethality, and to have recently received outpatient and inpatient, but not emergency, mental health care (**Table 1**). In a post hoc analysis that included episodes of recent deliberate self-harm, recent self-harm (12.3% of hospital admissions and 13.4% of community discharges) was not significantly related to community discharge in unadjusted (RR, 1.04 [99% CI, 0.97-1.11]) or adjusted (adjusted RR [ARR], 1.06 [99% CI, 1.00-1.14]) analyses (data not shown).

MENTAL HEALTH ASSESSMENT

Among patients who were discharged to the community, slightly fewer than one-half of the treatment episodes (47.5%) included evidence of mental health assessment in the emergency department (**Table 2**). In the adjusted analyses, treatment episodes of individuals of Hispanic ancestry were significantly less likely than their white, non-Hispanic counterparts to include a mental health assessment. Emergency mental health assessments were significantly related to recent mental health care, including, specifically, emergency and outpatient mental health care. However, even among treatment episodes by patients who had received inpatient mental health care in the preceding 60 days, a substantial percentage of the episodes (43.5%) did not include a mental health assessment in the emergency department. Emergency department mental health assessments were not significantly related to patient age or sex. Lethality of the current deliberate self-harm method was also not significantly related to emergency department mental health assessment. In the post hoc analysis, emergency mental health assessments were provided to a similar proportion of episodes with and without deliberate self-harm claims in the past 60 days (48.9% vs 48.6%) (RR, 1.00 [95% CI, 0.90-1.13]; ARR, 0.95 [95% CI, 0.85-1.07]) (data not shown).

OUTPATIENT MENTAL HEALTH CARE

Approximately one-half of treatment episodes (52.4%) included outpatient mental health care within 30 days of the emergency department visit (**Table 3**). In the regressions, significantly greater rates of follow-up care were observed for female patients than males patients, for whites than Hispanics or African Americans, and for disabled beneficiaries than low-income Medicaid beneficiaries. Par-

health care contact in which a mental disorder (ICD-9-CM codes 290-319) was diagnosed. For the analysis of emergency mental health assessments, treatment episodes were further classified by 1 or more claims with a diagnosis of depressive (codes 296.2, 296.3, 298.0, 300.4, and 311), bipolar (codes 296.0, 296.4, 296.5, 296.6, 296.7, and 296.8), anxiety (codes 300.0, 300.2, 300.3, 293.84, 300.83, and 309.81), adjustment (codes 308.3, 309.0, 309.1, 309.2, 309.4, and 309.9), schizophrenia and related disorders (codes 295, 297, 298, and 299), substance use (codes 291, 292, 303, 304, and 305), personality (code 301), and other mental (codes 290-319 not otherwise classified) disorder during the 60-day period prior to the index emergency visit. For the analysis of follow-up outpatient mental health care, the mental disorder diagnostic algorithms were applied to the clinical diagnosis at the index emergency department visit.

On the basis of method of self-harm, the index deliberate self-harm event was classified into high, low, or unknown lethality.^{23,24} Methods of high lethality included the use of a firearm, drowning, suffocation, falling, the use of fire, and the use of a motor vehicle, whereas methods of low lethality included cutting and poisoning. Unspecified or poorly specified codes were classified as "other/unknown." Separate strata were also created for cutting compared with all other methods and poisoning compared with all other methods, the 2 most common methods of deliberate self-harm.

Area Resource File data were used to characterize counties in which patients resided on the basis of county per capita annual income from all sources (low, <\$25 000; medium, \$25 000-40,000; high, >\$40 000), percentage of county population in poverty (low, 0%-14%; medium, 15%-19%; high, $\geq 20\%$), and county population per square mile (low, ≤ 400 square miles; high, >400 square miles) (to convert to square kilometers, multiply by 2.6). Area Resource File data were available for 4550 of 4595 treatment episodes (99.0%). The state Medicaid policy report¹⁸ by the Substance Abuse and Mental Health Services Administration was used to distinguish patients treated in states that did or did not provide Medicaid coverage to services provided at specialized outpatient mental health clinics.

ANALYTIC PLAN

The percentages of patients with treatment episodes who were either admitted to the hospital or discharged to the community were determined overall and stratified by patient-level characteristics. For each of these characteristics, unadjusted risk ratios (RRs) were calculated using the GENMOD procedure in SAS (SAS Institute Inc, Cary, North Carolina) with the log-link function. In corresponding adjusted models, each variable of interest was first forced into each model, and all covariates were then stepped in with specified entry ($P < .05$) and retention ($P < .05$) criteria. Because approximately 2.6% of the patients contributed more than 1 treatment episode, the observations are non-independent. Accordingly, generalized estimating equations were used to adjust the confidence intervals (CIs) to accommodate clustering of observations within individual patients.

Similar sets of analyses were performed for patients with treatment episodes who were discharged to the community with a mental health assessment and use of outpatient mental health care within 30 days after the emergency department visit as the dependent variables. Outpatient mental health care within 30 days was also examined in relation to county characteristics and the state policy variable. In these analyses, generalized estimating equations were used to adjust the CIs to accommodate clustering of observations within counties.

To compensate for the large number of comparisons, results are presented as RRs with associated 99% CIs. We consider group differences with an RR of 1.10 or more or an RR of 0.90 or less to be potentially substantial from a policy perspective.

Table 1. Characteristics of 7355 Emergency Department Treatment Episodes of Deliberate Self-harm by Hospital Admission and Community Discharge Disposition

Characteristic	Treatment Episode, %		Risk Ratio (99% Confidence Interval)	
	Patient Admitted to Hospital (n=2760)	Patient Discharged to Community (n=4595)	Unadjusted	Adjusted
	Age range, y			
21-34	40.7	50.0	1.20 (1.13-1.28)	1.18 (1.10-1.25)
35-44	32.8	29.8	1.08 (1.00-1.16)	1.08 (1.00-1.15)
45-64	26.5	20.2	1 [Reference]	1 [Reference]
Sex				
Male	32.2	31.4	1 [Reference]	1 [Reference]
Female	67.8	68.6	1.01 (0.96-1.07)	1.00 (0.96-1.06)
Race/ethnicity				
White	75.9	74.5	1 [Reference]	1 [Reference]
African American	11.5	11.4	1.00 (0.93-1.08)	0.99 (0.92-1.06)
Hispanic	8.2	9.4	1.06 (0.98-1.15)	1.00 (0.92-1.08)
Other	4.4	4.7	1.03 (0.92-1.15)	1.00 (0.90-1.11)
Medicaid eligibility				
Poverty	29.1	35.0	1 [Reference]	1 [Reference]
Disability	70.9	65.0	0.91 (0.86-0.95)	0.95 (0.90-1.00)
Any mental health care ^a	61.0	54.4	0.90 (0.86-0.95)	0.94 (0.89-1.00)
Outpatient	54.0	48.4	0.92 (0.88-0.96)	0.92 (0.87-0.97)
Inpatient	16.7	9.7	0.76 (0.70-0.84)	0.74 (0.67-0.81)
Emergency	23.1	21.0	0.95 (0.90-1.01)	1.03 (0.97-1.09)
Any mental disorder ^{a,b}	64.6	58.6	0.91 (0.87-0.95)	0.96 (0.91-1.00)
Depression	36.3	29.4	0.89 (0.84-0.93)	0.95 (0.90-1.01)
Bipolar	18.6	16.4	0.94 (0.88-1.01)	1.01 (0.94-1.08)
Anxiety	24.0	23.2	0.98 (0.93-1.04)	1.07 (1.01-1.14)
Adjustment	4.3	3.2	0.88 (0.76-1.02)	0.95 (0.83-1.08)
Schizophrenia	15.9	13.7	0.93 (0.87-1.00)	0.98 (0.91-1.05)
Substance Use	24.1	20.0	0.91 (0.86-0.97)	1.02 (0.95-1.08)
Personality	6.4	5.2	0.92 (0.82-1.03)	0.99 (0.89-1.09)
Other	11.3	12.0	1.02 (0.95-1.10)	1.10 (1.03-1.17)
Lethality of current self-harm method ^c				
Low lethality	91.9	90.0	0.87 (0.80-0.94)	0.99 (0.91-1.08)
High lethality	3.2	2.7	0.82 (0.69-0.97)	0.83 (0.70-0.97)
Other/unknown	4.9	7.3	1 [Reference]	1 [Reference]
Current self-harm method				
Cutting	11.2	17.4	1.19 (1.12-1.26)	1.18 (1.12-1.24)
Poisoning	81.3	72.9	0.85 (0.81-0.89)	0.84 (0.80-0.89)

^aBased on 60-day period before each emergency department visit. Risk ratios were calculated using the GENMOD procedure in SAS (SAS Institute Inc, Cary, North Carolina) with the log-link function. Adjusted risk ratios involve stepwise selection among all listed variables as independent variables.

^bFor mental disorder variables, the reference group is the group of patients without the disorder.

^cHigh-lethality methods include use of a firearm, drowning, suffocation, falling, use of fire, and use of a motor vehicle; low-lethality methods include cutting and poisoning; and other/unknown includes unspecified or poorly specified methods.

ticularly high odds of follow-up care were also evident among emergency treatment episodes by patients who had received recent outpatient mental health care. A clinical depressive disorder diagnosis in the emergency department was also significantly and independently associated with follow-up outpatient mental health care, and a similar, though nonsignificant, trend was apparent for bipolar disorder. However, a method of self-harm of high lethality was not significantly related to follow-up care. Fewer than one-half of deliberate self-harm treatment episodes (39.8%) that involved a highly lethal method of injury (use of firearms, drowning, suffocation, falling, use of fire, or use of motor vehicles) included outpatient mental health care in the following 30 days. The post hoc analysis revealed that the likelihood of follow-up care did not significantly differ between visits with and without claims for recent deliberate self-harm in the 60 days prior to the in-

patient emergency department visit (52.1% vs 51.5%) (RR, 1.01 [95% CI, 0.91-1.13]; ARR, 0.93 [95% CI, 0.85-1.02]) (data not shown).

An independent and significant association was evident between state Medicaid coverage of outpatient specialty mental health clinics and successful linkage to outpatient mental care within 30 days of the emergency department visit (**Table 4**). Patient residence in a county with a low (compared with a high) poverty rate was related to higher rate of follow-up visits, although this association was not statistically significant.

COMMENT

Emergency departments have an opportunity to help ensure that patients who deliberately harm themselves

Table 2. Rates of Mental Health Assessment Among Emergency Department Treatment Episodes for Deliberate Self-harm of Patients Discharged to the Community, Stratified by Patient Characteristics

Characteristics	Mental Health Assessment, % of Episodes	Risk Ratio (99% Confidence Interval)	
		Unadjusted	Adjusted
Treatment episodes (n=4595)	47.5		
Age range, y			
21-34 (n=2298)	47.0	0.97 (0.87-1.08)	0.98 (0.88-1.09)
35-44 (n=1371)	47.8	0.99 (0.88-1.11)	0.99 (0.88-1.11)
45-64 (n=926)	48.5	1 [Reference]	1 [Reference]
Sex			
Male (n=1443)	47.8	1 [Reference]	1 [Reference]
Female (n=3152)	47.4	0.99 (0.91-1.08)	1.00 (0.92-1.09)
Race/ethnicity			
White (n=3282)	48.2	1 [Reference]	1 [Reference]
African American (n=504)	48.4	1.00 (0.88-1.14)	1.04 (0.92-1.18)
Hispanic (n=414)	39.4	0.82 (0.69-0.96)	0.85 (0.72-0.99)
Other (n=206)	44.7	0.93 (0.75-1.14)	0.95 (0.77-1.17)
Medicaid eligibility			
Poverty (n=1500)	45.3	1 [Reference]	1 [Reference]
Disability (n=2790)	49.1	1.08 (0.99-1.18)	1.04 (0.95-1.14)
Any mental health care ^a (n=2500)	51.3	1.19 (1.10-1.30)	1.19 (1.10-1.30)
Outpatient (n=2223)	51.2	1.16 (1.07-1.26)	1.12 (1.03-1.22)
Inpatient (n=444)	56.5	1.21 (1.08-1.36)	1.12 (0.99-1.27)
Emergency (n=964)	54.8	1.20 (1.10-1.31)	1.15 (1.05-1.26)
Any mental disorder ^{a,b} (n=2694)	50.8	1.18 (1.09-1.29)	1.18 (1.09-1.29)
Depression (n=1351)	50.9	1.10 (1.01-1.20)	0.99 (0.90-1.09)
Bipolar (n=753)	51.9	1.11 (1.01-1.23)	1.02 (0.91-1.13)
Anxiety (n=1067)	50.8	1.09 (1.00-1.19)	0.95 (0.85-1.06)
Adjustment (n=145)	51.0	1.08 (0.87-1.33)	0.98 (0.79-1.21)
Schizophrenia (n=630)	48.7	1.03 (0.92-1.15)	0.92 (0.82-1.04)
Substance use (n=919)	53.0	1.15 (1.05-1.26)	1.04 (0.93-1.15)
Personality (n=240)	51.2	0.97 (0.81-1.15)	0.97 (0.81-1.15)
Other (n=550)	53.1	1.14 (1.01-1.27)	1.05 (0.93-1.18)
Lethality of current self-harm method ^c			
Low lethality (n=4135)	47.4	0.95 (0.82-1.10)	0.94 (0.82-1.08)
High lethality (n=123)	43.1	0.86 (0.64-1.17)	0.87 (0.65-1.17)
Other/unknown (n=337)	49.8	1 [Reference]	1 [Reference]
Current self-harm method			
Cutting (n=799)	46.3	0.97 (0.87-1.08)	0.95 (0.85-1.06)
Poisoning (n=3351)	47.8	1.02 (0.93-1.12)	1.03 (0.94-1.13)

^aBased on 60-day period before each emergency department visit. Risk ratios were calculated using the GENMOD procedure in SAS (SAS Institute Inc, Cary, North Carolina) with the log-link function. Adjusted risk ratios involve stepwise selection among all listed variables as independent variables.

^bFor mental disorder variables, the reference group is the group of patients without the disorder.

^cHigh-lethality methods include use of a firearm, drowning, suffocation, falling, use of fire, and use of a motor vehicle; low-lethality methods include cutting and poisoning; and other/unknown includes unspecified or poorly specified methods.

receive prompt mental health treatment and that those who are discharged to the community receive timely follow-up care. In keeping with previous research from outside the United States,^{15,25,26} most adults in the Medicaid program who are admitted to emergency departments for deliberate self-harm are discharged to the community. Among those who are discharged, only about one-half receive an emergency mental health assessment, and a roughly similar percentage receive outpatient mental health care in the following month. Few known suicide risk factors substantially increased the likelihood of receiving an assessment or follow-up outpatient treatment. These findings highlight critical areas for quality-of-care improvement in the community mental health care of patients who deliberately harm themselves.

In our study, the proportion of emergency visits for self-harm by patients who were discharged to the community (62%) falls between comparable figures from British (52%

and 54%)^{25,26} and Finnish (72%)¹⁵ studies. In our study, the decision to admit patients to the hospital was related to some known suicide risk factors, including older age,²⁷ highly lethal self-harm method,²⁴ and previous mental health treatment.²⁸ However, hospital admission was not related to other known suicide risk factors such as male sex,^{27,29} a prior self-harm event,³⁰ depression,^{31,32} schizophrenia,³³ or substance use disorder.³⁴ Cutting, which is a common feature of nonsuicidal self-injury in young people,^{35,36} was linked to emergency department discharge to the community rather than hospital admission. As a cautionary note, however, a long-term follow-up study²⁸ of emergency department patients who deliberately harmed themselves reported that risk of a completed suicide tended to be higher among patients who presented to the emergency department with self-inflicted cuts rather than with another self-harm method ($P=.09$).

Mental health assessments were provided to roughly one-half of the patients who deliberately harmed themselves

Table 3. Rates of Outpatient Mental Health Care Within 30 Days of Emergency Department Visit for Deliberate Self-harm of Patients Discharged to the Community, Stratified by Patient Characteristics

Characteristics	Mental Health Outpatient Care, % of Episodes	Risk Ratio (99% Confidence Interval)	
		Unadjusted	Adjusted
Treatment episodes (n=4585)	52.4		
Age range, y			
21-34 (n=2289)	50.3	0.92 (0.84-1.02)	1.00 (0.92-1.08)
35-44 (n=1371)	54.6	1.00 (0.91-1.11)	1.03 (0.95-1.12)
45-64 (n=926)	54.4	1 [Reference]	1 [Reference]
Sex			
Male (n=1443)	49.8	1 [Reference]	1 [Reference]
Female (n=3152)	53.6	1.07 (0.99-1.17)	1.09 (1.02-1.16)
Race/ethnicity			
White (n=3282)	57.8	1 [Reference]	1 [Reference]
African American (n=504)	39.5	0.68 (0.59-0.79)	0.86 (0.76-0.97)
Hispanic (n=414)	37.2	0.64 (0.54-0.76)	0.86 (0.75-0.99)
Other (n=206)	39.3	0.68 (0.54-0.86)	0.91 (0.78-1.07)
Medicaid eligibility			
Poverty (n=1500)	45.2	1 [Reference]	1 [Reference]
Disability (n=2790)	57.1	1.26 (1.16-1.38)	1.09 (1.01-1.17)
Any mental health care ^a (n=2500)	70.1	2.24 (2.05-2.45)	2.13 (1.94-2.33)
Outpatient (n=2223)	74.6	2.36 (2.17-2.57)	2.30 (2.11-2.50)
Inpatient (n=444)	68.5	1.35 (1.23-1.48)	1.07 (0.99-1.15)
Emergency (n=964)	64.2	1.30 (1.21-1.41)	0.99 (0.92-1.05)
Emergency mental health assessment			
Present (n=2184)	55.6	1.13 (1.05-1.21)	1.03 (0.97-1.09)
Absent (n=2411)	49.4	1 [Reference]	1 [Reference]
Any mental disorder ^a (n=2178)	55.6	1.12 (1.04-1.21)	1.03 (0.97-1.09)
Depression (n=930)	57.9	1.13 (1.04-1.23)	1.09 (1.02-1.16)
Bipolar (n=241)	69.3	1.35 (1.20-1.51)	1.08 (0.98-1.20)
Anxiety (n=735)	58.8	1.15 (1.05-1.26)	1.02 (0.95-1.10)
Adjustment (n=86)	37.2	0.71 (0.49-1.02)	0.86 (0.63-1.16)
Schizophrenia (n=165)	70.3	1.36 (1.19-1.56)	1.08 (0.95-1.24)
Substance use (n=795)	50.4	0.96 (0.87-1.06)	0.94 (0.86-1.02)
Personality (n=71)	69.0	1.32 (1.08-1.63)	1.06 (0.90-1.26)
Other (n=106)	59.4	1.14 (0.92-1.40)	1.04 (0.88-1.22)
Lethality of current self-harm method ^b			
Low lethality (n=4135)	53.1	1.11 (0.96-1.29)	1.02 (0.91-1.13)
High lethality (n=123)	39.8	0.83 (0.60-1.15)	0.85 (0.64-1.13)
Other/unknown (n=337)	47.8	1 [Reference]	1 [Reference]
Current self-harm method			
Cutting (n=799)	54.8	1.06 (0.96-1.16)	1.02 (0.95-1.10)
Poisoning (n=3351)	52.7	1.02 (0.94-1.11)	1.00 (0.94-1.07)

^aBased on 60-day period before each emergency department visit. Risk ratios were calculated using the GENMOD procedure in SAS (SAS Institute Inc, Cary, North Carolina) with the log-link function. Adjusted risk ratios involve stepwise selection among all listed variables as independent variables.

^bHigh-lethality methods include use of a firearm, drowning, suffocation, falling, use of fire, and use of a motor vehicle; low-lethality methods include cutting and poisoning; and other/unknown includes unspecified or poorly specified methods.

(47.5%) and were subsequently discharged to the community. This compares with a psychosocial assessment rate of 59% in a British study²⁵ that included admitted as well as discharged emergency department patients who were treated for deliberately harming themselves. In that study,²⁵ more than one-half of patients who did not receive a psychosocial assessment (57%) left before the assessment could be performed, and approximately one-quarter of them (27%) specifically refused an assessment.²⁵ The 30-day outpatient follow-up rate of 52% of Medicaid patients who deliberately harmed themselves closely resembles the percentage of discharged patients from the Finnish study¹⁵ who received either outpatient psychiatric or health center care in 30 days (54%). The Finnish study¹⁵ further reported that, among all patients admitted for deliberate self-harm, approximately one-quarter had received psychiatric inpatient (25%) or outpatient (26%) care during the 12 months before the event, and only a slightly

larger percentage received psychiatric inpatient (30%) or outpatient (31%) care during the 12 months after the episode of deliberate self-harm.

Longitudinal research reveals that the risk of completed suicide following self-harm is especially great among adults who use highly lethal self-harm methods³⁷ and those with a history of self-harm.²⁸ Yet neither lethality of self-harm method nor recent self-harm was significantly associated with emergency department mental health evaluation or post-emergency department follow-up care. The reasons for this potentially troubling pattern are not clear. It is possible that, in some emergency departments, the acute physical health threat posed by self-injuries with high-lethality methods divert clinical attention from enduring mental health risks³⁸ and that patients who repeatedly harm themselves engender complacency in some emergency department clinicians.³⁹

Table 4. Rates of Outpatient Mental Health Care Within 30 Days of Adult Emergency Department Visit for Deliberate Self-harm of Patients Discharged to the Community, Stratified by County and State Medicaid Characteristics^a

Characteristic	Outpatient Mental Health Care, % of Episodes	Risk Ratio (99% Confidence Interval)	
		Unadjusted	Adjusted
Treatment episodes (n=4550)	52.3		
Annual income per capita, county, \$			
Low, <25 000 (n=1740)	51.3	1.09 (0.83-1.43)	1.07 (0.84-1.36)
Medium, 25 000-40 000 (n=2649)	53.3	1.13 (0.86-1.48)	1.04 (0.83-1.32)
High, >40 000 (n=161)	47.2	1 [Reference]	1 [Reference]
County population in poverty, %			
Low, 0-14 (n=2988)	55.4	1.27 (0.99-1.63)	1.11 (0.98-1.25)
Medium, 15-19 (n=1013)	48.1	1.10 (0.83-1.47)	1.07 (0.93-1.24)
High, ≥20 (n=549)	43.5	1 [Reference]	1 [Reference]
County population per square mile ^b			
Low, ≤400 (n=3097)	53.8	1.10 (0.94-1.28)	1.05 (0.97-1.15)
High (>400) (n=1453)	49.1	1 [Reference]	1 [Reference]
Mental health clinic coverage			
Present (n=2633)	57.5	1.27 (1.10-1.45)	1.13 (1.05-1.22)
Absent (n=1962)	45.5	1 [Reference]	1 [Reference]

^aFrom national Medicaid and Area Resource File data (45 treatment episodes were missing data). Risk ratios were calculated using the GENMOD procedure in SAS (SAS Institute Inc, Cary, North Carolina) with the log-link function.

^bTo convert to square kilometers, multiply by 2.6.

Recent mental health treatment in our study was associated with a modestly increased likelihood of receiving a mental health assessment in the emergency department. Because the likelihood of mental health assessments was not strongly tied to recent treatment of any specific mental disorder, an awareness of ongoing outpatient treatment may have a nonspecific effect of alerting emergency department clinicians of the need for a mental health assessment. Even among patients who have recently received inpatient mental health care, however, fewer than 6 in 10 discharged patients who deliberately harmed themselves received an emergency mental health assessment.

Hispanic patients who deliberately harmed themselves were significantly less likely than their white counterparts to receive an emergency mental health assessment. Without more detailed clinical information, it is not possible to determine the sources of this ethnic difference in service delivery. One possibility, however, is that language or cultural barriers play a role. Language interpreters in emergency department settings are often underutilized, untrained, or unavailable.^{40,41} In addition, few health care professionals are trained in culturally informed assessments of mental health problems.⁴²

Few other patient characteristics evaluated in our study were robustly related to an emergency department mental health assessment. A paucity of strong associations with individual patient characteristics raises the possibility that mental health assessments within emergency departments are governed less by clinical characteristics of individual patients than by staffing patterns or established emergency department evaluation protocols. In a British study⁴³ that evaluated the psychosocial assessment provision to patients who deliberately harmed themselves, there was wide variation among hospitals in the proportion of patients who received psychosocial assessments.

Recent mental health treatment emerged as the most powerful predictor of follow-up outpatient mental health care. This association, together with the lack of an inde-

pendent relationship between emergency mental health assessment and follow-up care, suggests that a portion of the follow-up mental health visits simply represent ongoing mental health care rather than emergency department-driven referrals for new outpatient mental health services. This pattern suggests that actively coordinated interagency efforts may be required to help ensure successful outpatient engagement of self-harming patients who are not currently receiving outpatient mental health treatment. Detailed clinical research is needed to define the extent to which emergency department referrals contribute to follow-up outpatient mental health care.

Following hospital discharge, Hispanics and African Americans were less likely than their white counterparts to receive follow-up outpatient mental health care. This observation extends prior research⁴⁴ on the broad tendency of African Americans and Hispanics to have relatively low rates of outpatient mental health care use. In a previous Medicaid claims analysis,⁴⁵ African Americans and Hispanics who were treated for mental health problems were less likely to use community-based services and more likely to use emergency department services than were their white counterparts.

A comparatively high rate of follow-up care was observed in states that offer Medicaid coverage of specialty outpatient mental health clinics. These treatment settings may facilitate service access for this patient population. In many communities, however, the availability of organized mental health services for Medicaid beneficiaries is limited. In one survey,⁴⁶ problems with access to mental health services were considerably more prevalent than were problems with access to other medical services. A shortage of providers, a lack of adequate coverage, and health plan barriers are all important obstacles to mental health service access.^{47,48} Residence in an impoverished area was also related to lower follow-up care, although this association did not achieve statistical significance. High-poverty areas tend to have fewer mental

health services,^{47,49} which may complicate transitions from emergency department to outpatient care.

Our study has several limitations. First, data were not available concerning many factors that may influence emergency department dispositions, mental health assessments, or follow-up outpatient mental health care. For example, no measures were available concerning staffing patterns of emergency departments, including the availability of mental health professionals or social workers, or concerning the extent to which patients were offered or accepted referrals for outpatient mental health care. Patients who deliberately harmed themselves sometimes leave before completing emergency treatment or deliberately refuse mental health services²⁵ and may not follow-up on outpatient appointments to which they have been referred. Second, concerns exist over the validity⁵⁰ and completeness⁵¹ of E codes to measure deliberate self-harm. In a medical record review⁵² of 30 depressed outpatients who had received E codes for deliberate self-harm, however, the records of each patient clearly documented intentional injury and suicidal intent. Another study⁵³ confirmed suicide attempts in inpatient records of 43 of 50 patients with an E code for deliberate self-harm. Third, diagnoses were based on clinician judgment and were not subject to expert validation through standardized assessments. Fourth, the mere presence of a mental disorder diagnosis in the billing record does not necessarily denote a thorough mental health assessment or provision of substantial mental health care. In a national study⁵⁴ of young self-harming patients who were discharged from an emergency department, 56.1% received a mental disorder diagnosis, and only 27.8% received a mental status examination. At the same time, however, the absence of mental disorder diagnoses or mental health service codes strongly suggests a missed opportunity to provide emergency mental health services to patients who deliberately harmed themselves. In emergency departments with limited availability of mental health specialists, mental health assessments may be channeled to more acutely ill patients who were subsequently hospitalized. Fifth, the mental health status of emergency department, self-harming patients who did not receive mental disorder diagnoses is not known. Sixth, analyses were limited to Medicaid recipients and may not generalize to privately insured patient populations. Seventh, the analyses do not capture services that are provided free, not reimbursed by Medicaid, or paid for out of pocket. However, out-of-pocket outpatient medical expenditures, which account for only about 1.3% of medical expenditures of Medicaid beneficiaries, are uncommon in the Medicaid population.⁵⁵ Finally, without more detailed information about the discharged patients, including specifically whether the deliberate self-harm occurred with or without suicidal intent, it is not possible to exclude the possibility that some of the discharged patients are at relatively low risk, despite the fact that deliberate self-harm is the main risk factor for completed suicide.^{6,37} In addition, the 2 groups had comparable rates of specific clinical mental disorders.

During the first year following emergency treatment of deliberate self-harm, the risk of suicide increases 30 to 130 times over that of the general population.^{27,28,37} Yet only about one-half of Medicaid beneficiaries who are dis-

charged from emergency departments following an episode of deliberate self-harm receive timely follow-up outpatient mental care. It is especially troubling that follow-up care was often not received by patients who are likely to be at especially high risk of suicide, such as those who have used dangerous self-harm methods. A greater focus is clearly needed on policies and procedures that promote emergency department mental health assessments and timely transitions to outpatient mental health care. Triage scales,⁵⁶ mental health screenings,⁵⁷ educational efforts to improve the attitudes of emergency department staff toward patients who deliberately harm themselves,⁵⁸ and systematic efforts to manage service transitions and coordinate care⁵⁹ represent promising approaches to help encourage mental health assessments and effective referrals of these high-risk patients. Providing specific outpatient appointments rather than only contact information, short waiting times between emergency department discharge and the outpatient appointments, and telephone reminders of the outpatient appointment may improve referral adherence.⁶⁰ Beyond these technical considerations, it may be important to include within the emergency department management of deliberate self-harm a clinical focus on underlying psychological factors and an orientation toward suicide prevention.

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