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ORIGINAL CONTRIBUTION

Suicidal ideation is insensitive to suicide risk after emergency department discharge: Performance characteristics of the Columbia-Suicide Severity Rating Scale Screener

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Abstract

Objectives: We describe the Columbia-Suicide Severity Rating Scale (C-SSRS)–Clinical Practice Screener's ability to predict suicide and emergency department (ED) visits for self-harm in the year following an ED encounter.

Methods: Screening data from adult patients' first ED encounter during a 27-month study period were analyzed. Patients were excluded if they died during the encounter or left without being identified. The outcomes were suicide as reported by the state health department and a recurrent ED visit for suicide attempt or self-harm reported by the state hospital association. Multivariable regression examined the screener's correlation with these outcomes.

Results: Among 92,643 patients analyzed, eleven (0.01%) patients died by suicide within a month after ED visit. The screener's sensitivity and specificity for suicide by 30 days were 0.18 (95% confidence interval [CI] = 0.00 to 0.41) and 0.99 (95% CI = 0.99 to 0.99). Sensitivity and specificity were better for predicting self-harm by 30 days: 0.53 (95% CI = 0.42 to 0.64) and 0.97 (95% CI = 0.97 to 0.97), respectively. Multivariable regression demonstrated that screening risk remained associated with both suicide and self-harm outcomes in the presence of covariates. Suicide risk was not mitigated by hospitalization or psychiatric intervention in the ED.

Conclusions: The C-SSRS screener is insensitive to suicide risk after ED discharge. Most patients who died by suicide screened negative and did not receive psychiatric services in the ED. Moreover, most patients with suicidal ideation died by causes other than suicide. The screener was more sensitive for predicting nonfatal self-harm and may inform a comprehensive risk assessment. These results compel us to reimagine the provision of emergency psychiatric services.

INTRODUCTION

Emergency departments (EDs) are a critical location for identifying patients at risk of suicide. EDs are often the first point of care for patients with elevated suicide risk such as those with intentional self-injury[1,2] or substance use disorders.[3] Over 40% of individuals who die by suicide have an ED encounter in the year before death,[4] and patients treated in the ED are twice as likely to die by suicide in the following year than the general population.[5]

A related article appears on page 705.

Suicide deaths in the United States have increased by 35% from 1999 to 2018.[6]

In light of this epidemiology, health systems and regulatory bodies have sought to screen for and intervene upon suicide risk among ED patients. In 2019, The Joint Commission (TJC) mandated that ED patients treated for behavioral health conditions as their primary reason for care must be screened for suicidal ideation using a validated screening tool.[7] Screening is meant to guide delivery of additional assessment and evidence-based interventions to reduce risk such as behavioral safety planning[8] or comprehensive risk reduction approaches.[9]

The Columbia-Suicide Severity Rating Scale (C-SSRS)–Clinical Practice Screener is among TJC's recommended screening measures. The three- to seven-item C-SSRS screener has been published with triage criteria for recommended levels of mental health intervention.[10] The screener is derived from a longer suicide assessment instrument that quantifies the severity and intensity of suicidal ideation as well as the frequency and lethality of self-directed violence. In its initial validation the longer version of the C-SSRS demonstrated 99% to 100% sensitivity and 100% specificity retroactively identifying lifetime suicide attempts on the corresponding Columbia Suicide History Form.[11] Notable advantages of the screener include its brevity, the availability of online training, and its translation into multiple languages. Like similar tools, this instrument emphasizes the presence of suicidal ideation in scoring risk.

However, no study has validated the screener's ability to discern patients at high risk of suicide or self-harm. Prior studies of the longer C-SSRS have been confined to research studies or populations of emergency psychiatric patients rather than more generalized ED populations as envisioned by regulatory requirements and national suicide prevention strategies. In this study, our primary aim is to describe the testing characteristics of the C-SSRS screener for predicting suicide among all patients presenting to the ED. Secondarily, we describe the screener's performance for predicting self-harm. Finally, we describe the screener's predictive performance for these outcomes in the presence of other common clinical variables.

METHODS

Setting and participants

Denver Health is an academically affiliated integrated safety net health system. Emergency services include an adult Level 1 trauma center, urgent care for adults and children, and psychiatric emergency services. The urgent care service is colocated with the ED and treats lower-acuity presentation during extended daytime hours. There were about 108,000 adult ED and urgent care encounters annually during the study period. Mental health services are readily available through psychiatric consultation and a dedicated high-acuity psychiatric emergency service staffed by a psychiatrist and multidisciplinary team at all times.

We identified patients' first encounter in the ED or urgent care from April 2016 through June 2018 for which C-SSRS screening data were available. Included patients were aged ≥18 years with a response to the C-SSRS at least once during the study period. Encounters were excluded if the patient discharged without being identified, died during the encounter, or discharged to hospice. No patient contributed twice to the dataset. Data on demographics, diagnoses, disposition, and presence of a psychiatric evaluation were extracted electronically from the medical record. The study period began with the introduction of the health system's electronic medical record in April 2016 and ended with the most recent date for which 1-year follow-up data were available.

Screening procedure

During the study period, the C-SSRS screener was administered by nurses to all ED patients as part of routine care. The C-SSRS screener's first two questions inquire about the intensity of suicidal thoughts, and the third question asks about the patient's history of self-harm. Answering "yes" to any of those three questions prompts further screening questions. The screener has been developed with triage instructions for use in EDs that results in negative or low-, moderate-, or high-intensity risk scores based on the answer to these three questions.[10] As per the triage guidelines, local procedures directed patients with moderate to high risk to be referred for specialty mental health services; patients with low risk received further risk assessment by either an emergency medicine or a mental health clinician to determine the need for further psychiatric intervention. Patients answering "no" to any of the initial screening questions were included as negative screens in this study. The decision to use this broader definition of a negative screen was made a priori to capture all screened patients and to reflect clinical practice, in which a negative response to any question would be interpreted to mean that a patient does not require constant observation or specialized psychiatric intervention in the ED.

Primary and secondary outcomes

The primary outcome of interest was death by suicide within 30 and 365 days after ED discharge. Death and cause of death were ascertained by matching index encounters with the Colorado Department of Public Health and Environment, which records all deaths in the state. Patients without a reported death were considered alive. Mortality data were available for the entire study period. The secondary outcome was suicide attempt or intentional self-harm within 30 and 365 days as defined by the patient having an ED encounter with a relevant diagnosis code as defined by the Centers for Disease Control and Prevention.[12] Follow-up encounter data were obtained from the Colorado Hospital Association, which collects data from all hospital-associated EDs and urgent

care facilities in the state. ED and urgent care encounters were identified by the hospital association using hospital and revenue codes. The hospital association was only able to match data for encounters starting in January 2017. Patients without an ED encounter for self-harm were considered not to have self-harmed. Records were matched using an interactive deterministic matching algorithm utilizing multiple demographic identifiers in SAS v9.4 (SAS Institute) for mortality records and Alteryx (Alteryx Incorporated) for hospital association records.

Data analysis

Test statistics were calculated for death by suicide, all-cause death, and suicide attempts or self-harm. Multivariable logistic regression examined the performance of the screener in context of age; sex; homelessness; presence of a self-harm, mental health, or substance use diagnosis; receipt of psychiatric assessment by a mental health clinician; or hospitalization at the index encounter. The data extraction code was verified by an independent second programmer. Data cleaning and variable creation were performed using R v3.6.1 (R Foundation) and Python v3.8 (Python Software Foundation). Regression analyses were conducted using SAS Enterprise Guide v7.1 (SAS Institute). This study was authorized by the local institutional review board.

RESULTS

There were 117,691 adult ED patients with index ED encounters over the study period. Of these encounters, 92,643 (79%) were included in primary outcome analyses. Patient demographics and excluded encounters are described in Data Supplement S1, Table S1 and Figure S1, respectively (available as supporting information in the online version of this paper, which is available at http://onlinelibrary.wiley.com/doi/10.1111/acem.14198/full). There were 682 (0.73%) index encounters for a suicide attempt or intentional self-harm. There were 11 (0.01%) suicides within 30 days after discharge and 63 (0.07%) suicides within 365 days; the latter represents an incidence of 68.0 suicide deaths per 100,000 person-years. This incidence is far higher than the overall rates in Colorado (21.9 suicide deaths per 100,000 person-years)[13] or in the United States (14.2 suicide deaths per 100,000 person-years).[6]

Primary outcome: death by suicide

Among 3,348 (3.61%) encounters with a positive C-SSRS suicide risk screen, 825 (25%) were low risk, 718 (21%) were moderate risk, and 1,805 (54%) were high risk. Table 1 describes testing performance of a positive C-SSRS score for predicting suicide and all-cause death in the 30, 90, 180, and 365 days after ED discharge. Among 11 patients who died by suicide within 30 days of discharge, nine (82%) had a negative screen, and only one patient who screened negative received a psychiatric assessment. Figure 1 demonstrates the survival curves by binary screener risk for mortality by suicide (χ^2 [df = 1] 99.08, $p < 0.0001$) or by any cause (χ^2 [df = 1] 0.35, $p = 0.56$).

Multivariable logistic regression analyses of C-SSRS performance by binary positive/negative and intensity scores revealed that the screener achieved its maximum area under the receiver operating characteristic curve (AUC) for predicting suicide by 90 days and that the binary screener performed as well as the intensity-tiered interpretation. Thus, subsequent analyses were conducted using the clinically simpler binary interpretation of the screener for suicide by 90 days (AUC = 0.67, 95% confidence interval [CI] = 0.55 to 0.78). Data Supplement S1, Table S2, describes performance of the screener by risk rating level.

The adjusted odds ratios (ORs) from the multivariable model are presented in Table 2. The screener remained correlated with suicide in the presence of other relevant clinical descriptors and interventions (adjusted OR = 5.13, 95% CI = 13.33 to 19.87), and the overall model was statistically significant. Neither the provision of a psychiatric assessment in the ED nor hospital admission was correlated with suicide outcomes. Univariable correlations are described in Data Supplement S1, Table S3.

Secondary outcome: ED visit for suicide attempt or self-harm

Suicide attempt or self-harm data were available for 68,755 encounters. Of these encounters, there were 421 (0.61%) encounters with a subsequent ED encounter for intentional self-harm within 365 days representing an incidence of 612.3 self-harm visits per 100,000 person-years. This rate is lower than those in ED-based research studies in which rates exceed 20% of patients per year.[14] Table 3 describes C-SSRS testing performance characteristics for predicting self-harm after ED discharge. Regression analyses of C-SSRS screener performance for predicting self-harm revealed the test's largest AUC was for predicting self-harm by 30 days using a binary interpretation of the screener (AUC = 0.76, 95% CI = 0.69 to 0.81). Figure 2 demonstrates the survival curves by screener risk for subsequent self-harm (χ2 [df = 1] 1121.22, $p < 0.0001$). Data Supplement S1, Table S2, describes the screener's performance by risk rating level.

In multivariable logistic regression, the screener remained strongly correlated with self-harm by 30 days even after accounting for self-harm at the index encounter (adjusted OR = 10.48, 95% CI = 4.31 to 25.51; Table 2). The overall model was statistically significant. Hospital admission was correlated with a reduction in self-harm after ED discharge. Univariable correlations with self-harm outcomes are presented in Data Supplement S1, Table S3.

Self-harm analyses were repeated using a composite self-harm outcome composed of both subsequent ED visits for self-harm and also suicide. The findings were similar, and the data presented here are confined to outcomes from subsequent ED encounters.

TABLE 1 Mortality after ED encounter by C-SSRS screener risk score

	Death by suicide[a]				Death by any cause[a]			
	30 days	90 days	180 days	365 days	30 days	90 days	180 days	365 days
C-SSRS + (*n*)	2	10	10	17	4	25	40	67
C-SSRS– (*n*)	9	17	28	46	201	559	963	1662
Sensitivity	0.182 (0.000–0.410)	0.370 (0.188–0.553)	0.260 (0.120–0.400)	0.270 (0.160–0.380)	0.020 (0.001–0.038)	0.043 (0.026–0.059)	0.040 (0.028,–0.052)	0.039 (0.030–0.048)
Specificity	0.964 (0.962–0.965)	0.964 (0.963–0.965)	0.964 (0.963–0.965)	0.964 (0.963–0.965)	0.964 (0.962–0.965)	0.964 (0.962–0.965)	0.964 (0.963–0.965)	0.964 (0.963–0.965)
Positive predictive value	0.0006 (0.0000–0.0014)	0.003 (0.001–0.004)	0.003 (0.001–0.004)	0.005 (0.003–0.007)	0.001 (0.000–0.002)	0.008 (0.005–0.010)	0.012 (0.008–0.016)	0.020 (0.015–0.025)
Negative predictive value	0.9998 (0.9998–0.9997)	0.9998 (0.9997–0.9999)	0.9997 (0.9995–0.9998)	0.9995 (0.9993–0.9996)	0.998 (0.997–0.998)	0.994 (0.993–0.994)	0.989 (0.989–0.990)	0.981 (0.981–0.982)
Likelihood ratio	5.034 (1.436–17.640)	10.276 (6.277–16.823)	7.301 (4.281–12.442)	7.500 (4.989–11.273)	0.539 (0.205–1.428)	1.186 (0.807–1.743)	1.105 (0.814–1.500)	1.074 (0.847–1.361)
AUC	0.573 (0.397–0.749)	0.667 (0.555–0.780)	0.614 (0.519–0.710)	0.617 (0.543–0.691)	0.508 (0.468–0.548)	0.503 (0.480–0.527)	0.502 (0.484–0.520)	0.501 (0.487–0.515)

AUC, area under the receiver operating characteristic curve; C-SSRS, Columbia-Suicide Severity Rating Scale.

[a]92,643 encounters; 3,348 (3.6%) were positive C-SSRS risk and 89,295 (96.4%) were negative C-SSRS risk.

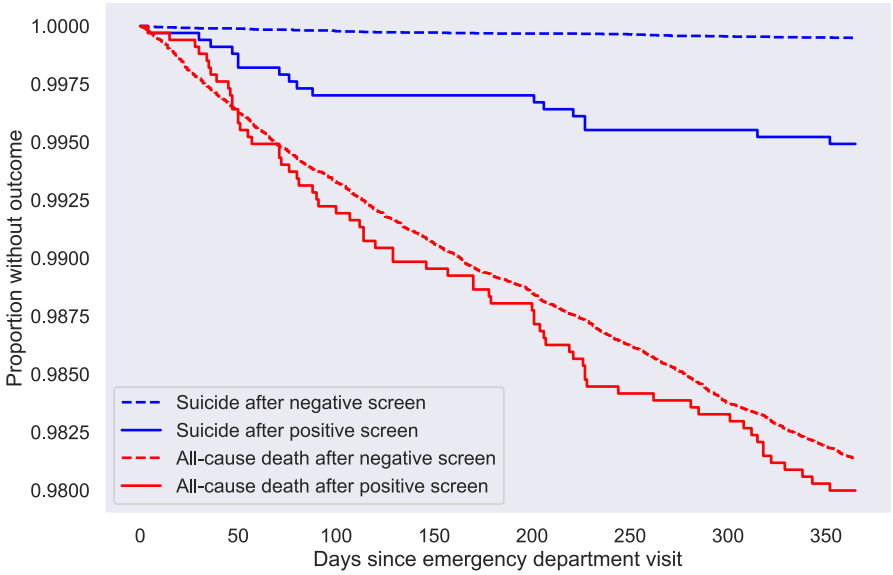

FIGURE 1 Survival curves for mortality after emergency department encounter by Columbia-Suicide Severity Rating Scale (C-SSRS) screener risk score (*N* = 92,643)

TABLE 2 Multivariable logistic model of positive screening risk for suicide and ED visits for self-harm

	Suicide death by 90 days[a]		ED visit for self-harm/ suicide attempt by 30 days[b]	
Variable	***N* (%)**	**OR (95% CI)**	***N* (%)**	**OR (95% CI)**
Positive C-SSRS screener risk	10 (0.011%)	5.131 (1.325–19.870)	37 (0.054%)	10.483 (4.308–25.511)
Self-harm at index encounter	4 (0.004%)	3.857 (1.056–14.084)	9 (0.013%)	1.864 (0.870–3.994)
Male sex	21 (0.023%)	2.749 (1.089–6.940)	31 (0.045%)	2.046 (1.096–3.819)
Age (years)[c]	39.0 ± 19.5	1.011 (0.986–1.037)	31.0 ± 12.5	0.982 (0.964–1.000)
Homelessness	4 (0.004%)	1.241 (0.412–3.741)	14 (0.020%)	2.046 (1.096–3.819)
Mental health diagnosis at index encounter	13 (0.014%)	4.361 (1.495–12.722)	35 (0.051%)	1.345 (0.692–2.613)
Substance use diagnosis at index encounter	12 (0.013%)	1.786 (0.748–4.262)	33 (0.048%)	1.544 (0.914–2.609)
Psychiatric assessment during index encounter	8 (0.009%)	0.591 (0.153–2.281)	37 (0.054%)	2.155 (0.841–5.524)
Hospital admission at index encounter	5 (0.005)	0.541 (0.172–1.707)	3 (0.0044%)	0.270 (0.082–0.890)

C-SSRS, Columbia-Suicide Severity Rating Scale.

[a]92,643 encounters, model Wald χ^2 (df = 9) 72.269, $p < 0.0001$.

[b]68,755 encounters, model Wald χ^2 (df = 9) 282.377, $p < 0.0001$.

[c]Age reported as median ± interquartile range.

Missing data

From the identified encounters, 24,278 (21%) encounters were excluded solely due to lack of C-SSRS screening data (Data Supplement S1, Figure S1). Among encounters missing C-SSRS data, there was one suicide within 30 days of discharge and 19 (0.00078%) suicides within 365 days of discharge, or 78.3 suicide deaths per 100,000 person-years. Only three (16%) of these patients who died by suicide within 1 year received a psychiatric assessment in the ED. Psychiatric assessments were provided in 641 (2.64%) of encounters missing screening data.

Patients missing screening data were generally similar to those with screening data. Missing screens were more common earlier in the study period, decreasing from 42% in 2016 of all encounters to 11% of encounters by 2018 (χ^2 [df = 2] 17245.33, $p < 0.0001$). Patients missing screeners were more likely to have private insurance than those with screening data (29% vs. 20%) and less likely to have Medicaid (36% vs. 45%; χ^2 [df = 4] 1756.01, $p < 0.0001$).

Our a priori methods considered any screen with a "no" response to any of the three triage questions to be negative; while most negative screens included a "no" to all three screening questions, 15,307 (17%) responses were included despite missing a response to one of these triage questions. Reanalysis excluding these partial responses and retaining only negative screens on which the patient answered "no" to all three questions did not significantly change performance of the screener.

TABLE 3 Recurrent ED visit for self-harm after ED discharge by C-SSRS screener risk score

	ED visit for suicide attempt or self-harm[a]			
	30 days	90 days	180 days	365 days
C-SSRS+ (*n*)	42	73	104	135
C-SSRS− (*n*)	37	86	165	286
Sensitivity	0.532 (0.422–0.642)	0.459 (0.382–0.537)	0.387 (0.328–0.445)	0.321 (0.276–0.365)
Specificity	0.967 (0.966–0.969)	0.968 (0.966–0.969)	0.968, (0.967–0.969)	0.968 (0.967–0.969)
Positive predictive value	0.018 (0.013–0.024)	0.032 (0.025–0.039)	0.045 (0.037–0.054)	0.059 (0.049–0.068)
Negative predictive value	0.9994, (0.9992–0.9996)	0.9987 (0.9984–0.9999)	0.9975 (0.9971–0.9979)	0.9957 (0.9952–0.9962)
Likelihood ratio	16.213 (13.130–20.020)	14.180 (11.920–16.868)	12.090 (10.343–14.132)	10.149 (8.779–11.734)
AUC	0.749 (0.686–0.812)	0.713 (0.668–0.758)	0.677 (0.642–0.713)	0.645 (0.616–0.674)

AUC, area under the receiver operating characteristic curve; C-SSRS, Columbia-Suicide Severity Rating Scale.
[a]68,755 encounters; 2,291 (3.3%) were positive C-SSRS risk and 66,481 (96.7%) were negative C-SSRS risk.

FIGURE 2 Survival curves for recurrent ED visit for self-harm after ED discharge by Columbia-Suicide Severity Rating Scale (C-SSRS) screener risk score (*N* = 68,755)

DISCUSSION

The poor sensitivity of this screener and, by extension, patient-reported suicidality for predicting suicide has profound implications for psychiatric practice in emergency settings. Much emergency psychiatric care is triaged by the presence of suicidal ideation. However, this approach misses most patients who die by suicide after an ED visit. A fundamental reassessment of emergency psychiatry is needed that recognizes the limitations of current suicide screening in this setting, deemphasizes a focus on suicidal ideation, and broadens the indications and aims for mental health care in emergency settings.

The shortcomings of the C-SSRS screener seen here raise concern for the performance of other screening instruments for detecting suicide risk in the ED. TJC recommends use of the C-SSRS screener among other tools including the Ask Suicide-Screening Questions[15] and the Patient Safety Screener.[16] Like the C-SSRS screener, these other recommended instruments have not been previously studied to predict clinical outcomes among a general ED population. In these smaller research studies, screeners are often tested among a study sample that likely differs from a broader general ED population. Suicide outcomes are rare in these studies, while nonsuicidal self-harm may be more frequent (perhaps reflecting the process by which subjects are identified for recruitment).[8] Our findings suggest the need to prove screening instruments' performance in real-world clinical settings. In addition, other suicide screening tools also rely on patients to self-report suicidal ideation and self-harm history in the same manner as does the C-SSRS. Our finding that most patients deny suicidality prior to suicide death echoes smaller studies in other settings.[17,18] Thus, these questions appear to be insensitive markers of suicide risk among ED patients.

This study questions the utility of universal suicide screening in the ED with currently available screening instruments. Despite this

hospital's commitment to universal suicide screening, screening data were unavailable for 21% of potentially eligible patient encounters. This completion rate is similar to that purported by a multisite research study to represent the feasibility of universal screening,[19] yet suicide mortality remained significant among patients who were not screened at all. Challenges to universal screening include the patient's inability or unwillingness to answer questions, fatigue among administering staff that leads them to skip questions, or a sense by staff and patients that the questions are perfunctory and therefore unimportant. Other patients may leave prior to completing the full medical screening examination. Suicide's rare incidence complicates study of preventive interventions, but prior research has also likely failed to capture many high-risk patients who do not report suicidal ideation or screen positive for suicide risk. Universal screening does not appear to have adequately directed psychiatric care in this general ED population: most patients who died by suicide received no psychiatric assessment in the ED.

New strategies are needed to screen for suicide risk among ED patients. Improving the pretest probability for suicide may enhance the value of screening, but a patient's ED visit alone already confers suicide risk similar to more comprehensive models.[4,20] A sophisticated screen would incorporate multiple factors into a calculated risk assessment that is communicated to the clinician via the electronic health record during the ED encounter. Screeners might consider active psychiatric symptoms, prior history, and reasons for presentation in addition to the presence of suicidal ideation.[21] Risk stratification could further benefit from the advancing science of suicide risk assessment, for example, by applying machine learning and artificial intelligence to build predictive models[22] and by understanding suicide risk correlated with cognitive testing,[23] biomarkers,[24] personal digital profiles (e.g., data from health monitoring applications),[25] and psychological characteristics.[26] New proposed instruments should be validated in real-world clinical populations rather than in smaller research samples. All of these approaches would ameliorate challenges posed by relying solely on patient-reported suicidal ideation to triage further psychiatric assessment.

Better suicide prevention is only part of the treatment challenge: emergency psychiatric care must intervene upon other causes of mortality in addition to suicide. Among patients who endorsed suicidal ideation on the C-SSRS screener in this study, 75% died of causes other than suicide. Patients with mental disorders have significantly shorter life expectancies—15 years shorter for men and 5 years shorter for women.[27] This high mortality reflects worse outcomes from medical illness as well as higher rates of trauma and violent death.[5] Psychiatric interventions in the ED to reduce these outcomes might include addressing psychosocial barriers to treatment adherence, treating substance use disorders, identifying patients with somatization at risk of iatrogenic harm,[28] or counseling on behavioral modification for patients after trauma. By moving away from a focus on patient-reported suicidal ideation toward broader indications for mental health care, emergency psychiatry might prevent more deaths—including by suicide among patients who deny suicidal ideation. In the real-world use of the C-SSRS screener studied here, it may be that treatment in the ED occurring as a result of the screener score affected clinical outcomes. Multivariable analyses suggest that neither a formal psychiatric assessment nor hospitalization modified patients' suicide risk in the context of screening. However, we cannot account for all indications for a mental health referral, and these patients receiving more intensive treatment are likely at higher risk of self-harm and suicide nor could we capture other risk-reducing interventions, for instance, an emergency medicine physician providing lethal means counseling. Regardless of interventions that may have been provided based on the screener, there remains a need to identify the risk of death following ED discharge, because few patients die of suicide in hospital settings compared to the period after discharge.[29]

These results suggest a valuable if more limited role for this instrument in EDs than envisioned by TJC. The tool may be an insensitive screener but does inform risk assessment. The C-SSRS screener still correlated with suicide and self-harm in multivariable analyses, and suicide constituted a greater proportion of all-cause mortality among patients screening positive than among those screening negative. The C-SSRS screener was most sensitive for detecting risk of recurrent self-harm in a shorter time frame after the ED visit. This performance is consistent with the scale's provenance from a longer instrument designed to ascertain prior nonlethal self-harm. The lower risk of ED return among patients being hospitalized may reflect that patients were prevented from returning to the ED because they were hospitalized. Another explanation may be that hospitalization alleviated immediate stressors that drove self-harming behavior, such as among patients with borderline personality disorder experiencing crisis. Better understanding of the relationship of hospitalization with subsequent self-harm may elucidate effective crisis interventions. Ultimately, suicide screening tools may be more effective for addressing self-harm morbidity than suicide mortality. For all these uses, the screener may be shortened given that the designed low-/moderate-/high-intensity scale did not outperform a positive/negative interpretation. These statistical correlations were calculated using a traditional receiver operating characteristic curve that may overstate the screener's performance in light of the unbalanced cohorts observed here.[30]

LIMITATIONS

There are limitations to this study. Index encounters were only obtained from one public hospital—an approach that limits geographic heterogeneity but captures greater standardization in screening processes and more clinical detail of the index encounter and all patients regardless of payer source. Administration of the screener was unlikely as strict and reliable as in research studies, and there are no additional data against that we can validate screening scores entering by the triage nurses. We were able to account for the provision of a psychiatric assessment but cannot account for more specific interventions shown to reduce risk such as safety planning. Not ascertaining psychiatric care

provided outside the ED such as in an outpatient clinic or jail after discharge may understate receipt of mental health care in this population. Outcomes reflect all deaths and ED visits occurring in a single state, and the self-harm measure only reflects ED and urgent care visits. It is unlikely that patients who left the state would have died by suicide shortly thereafter, but such occurrences would bias findings toward the null. Presumption of survivorship among patients who lacked a death or self-harm outcome is consistent with prior large studies of suicide.[5] Our methodology is constrained by the general limitations in the use of diagnostic codes for research.[31] Finally, our use of a single encounter per patient limits our ability to discern risk particular to high-utilizing patients or the dynamic nature of risk over time for a particular patient.

CONCLUSIONS

Reducing suicide is an urgent public health priority and one to which our available treatments have proven inadequate thus far. We found that a key recommended suicide screener based on the presence of suicidal ideation is insensitive to suicide risk among general ED patients; among patients who screen positive, most die by causes other than suicide. Taken together, these findings lead us to reconsider how suicide risk is identified and mitigated in emergency and urgent care settings. Suicidal ideation should not be the sole symptom for triaging psychiatric care in the high-risk patient population seen in EDs, and there is a need for emergency psychiatric interventions that address other causes of mortality among patients with mental illness.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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