Diagnosis of the Suicide Crisis Syndrome in the Emergency Department Associated With Significant Reduction in 3-Month Readmission Rates

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Abstract

Objective: The suicide crisis syndrome (SCS), an acute negative affect state predictive of near-term suicidal behavior, is currently under review for inclusion as a suicide-specific diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*). While the SCS has ample psychometric validation, it is critical to test its utility as a clinical tool within a real-world clinical setting. The present study investigates patterns of emergency department (ED) readmissions following implementation of an SCS-based risk assessment tool into the ED of a large, urban hospital system.

Methods: Patterns of readmission rates to the ED in the 3 months following initial ED visit were evaluated for patients diagnosed with the SCS, after controlling for suicidal ideation (SI), self-harm behavior (SHB), and psychosis in the initial ED visit. All diagnoses were extracted from the electronic medical record. SCS diagnosis was based on the Abbreviated SCS Checklist (A-SCS-C), a clinician-administered rating scale.

Results: Analysis of the SCS was performed on 213 patients consecutively admitted to the ED 9 months post-implementation of the A-SCS-C. Over one third (79; 37%) of patients were diagnosed with the SCS, over half 111 (52.1%) presented with SI

and 8 (3.8%) with suicide attempt. After controlling for covariates, SCS diagnosis reduced readmission risk by approximately 72% (AOR = 0.281) for any reason and almost 75% (AOR = 0.257) for suicidal presentations, while SI and SHB upon initial ED visit either increased readmission risk or were noncontributory. The protective effect of the SCS was consistent across levels of severity of both SI and SHB.

Conclusion: Use of the SCS appears to improve clinical outcome with suicidal patients presenting to the ED.

J Clin Psychiatry 2024;85(4):24m15320

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Despite decades of suicide research, the ability to identify those individuals at imminent risk of suicide is still woefully inadequate.[1–3] Both nationally and globally, suicide remains one of the most common forms of death[4,5] and suicidal thoughts and behavior a major mental health problem.[6,7] In response to the pressing need to improve suicide prevention by identifying those at high suicidal risk, researchers have proposed the notion of a suicidal mental state that might precede and precipitate near-term suicidal behavior (SB).[8–10] Such syndromes can offer markers of acute risk as well as opportunities for clinical intervention.[11,12] Specifically, the suicide crisis syndrome (SCS), an acute, hyperaroused, negative affect state, characterized by an intense sense of entrapment, has demonstrated robust psychometric validity as such a suicidal state.[11,13] While

numerous studies have validated the construct of the SCS as well as the instruments used to measure it,[14–17] it is critical to test its efficacy and utility as a clinical tool within a real-world clinical setting.

The construct of the SCS developed in an iterative manner across over a decade of research.[18,19] In the current version, the SCS has 2 overarching criteria, A and B. Criterion A consists of frantic hopelessness/entrapment, an overwhelming and persistent feeling of being trapped in an intolerable situation with no possibility of escape. Criterion B has 4 component criteria, affective disturbance (B1), loss of cognitive control (B2), hyperarousal (B3), and social withdrawal (B4), each of which includes several symptoms, for a total of 14 possible symptoms for Criterion B. To meet criteria for the SCS, the individual must meet Criterion A plus 1 symptom each from Criteria B1 to B4

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(see Table 1). The SCS is currently under review for inclusion in the *Diagnostic and Statistical Manual for Mental Disorders* (*DSM*) as a suicide-specific diagnosis.[11] Of note, suicidal ideation (SI) is not necessary for the diagnosis.

The fact that SI is not required differentiates the SCS from other proposed suicide-specific syndromes.[20] For example, acute suicidal affective disturbance (ASAD) is characterized by a drastic increase in SI over the course of hours to days. Additional criteria include marked social and/or self-alienation; perceptions that one's SI, social, and self-alienation are hopelessly unchangeable; and overarousal.[20,21] Thus, despite some overlap in symptoms, the SCS differs from the ASAD with regard to the central role of entrapment, the absence of SI, and the focus on cognitive process (ie, B2 loss of cognitive control) rather than content (eg, social and self-alienation).

While queries of SI have traditionally served as the cornerstone of risk assessment,[22,23] there are significant disadvantages to this approach. For one, SI is highly variable and transient[24] and frequently occurs in the absence of imminent suicidal risk.[25] Further, many suicide attempters do not experience SI until immediately before the attempt. In a study by Deisenhammer and colleagues,[26] almost half of the sample (N = 39, 47.6%) reported an interval of 10 minutes or less between onset of ideation and attempt. Finally, assessment of SI depends on self-report which is often compromised by either reluctance to self-disclose[22] or over-reporting, frequently for secondary gain, such as a brief respite from homelessness or a tense home situation.[27] Likewise, in our initial study of a suicide-risk assessment tool based on the SCS,[28] clinicians' disposition decisions were far more tightly tied to SCS status than to SI or even SB. In this light, it will be important to investigate how SCS status compares with SI and SB in their ability to predict readmissions. Consequently, the present study investigates patterns of emergency department (ED) readmissions following

implementation of an SCS-based risk assessment tool in a large, urban hospital system.

The psychometric validity of the construct of the SCS as well as the instruments developed to measure it have been well documented. Confirmatory factor analyses have provided construct validity for the SCS as a unitary construct[15,17,29,30] as well as for its 5 distinct but related components.[15,17] Additionally, concurrent validity of questionnaires assessing the severity of SCS symptoms has been demonstrated for SI,[17,30,31] suicide attempts,[31–33] and suicidal thoughts and behavior.[34] Most importantly, predictive validity has been shown for near-term (1–2 months after initial assessment) suicidal attempts,[13] and suicidal thoughts and behavior[14,16] in psychiatric inpatients and outpatients. The SCS has also demonstrated incremental predictive validity for suicidal attempts over prior SI, attempts, and/or depressive symptoms.[13,17,31]

CLINICAL UTILITY

Nonetheless, for a diagnostic construct such as the SCS, psychometric validity is a necessary but insufficient measure of its value in the real world. In this regard, it is also critical to evaluate the *clinical utility* of the SCS. Indeed, across the mental health field, there has been growing recognition of the importance of establishing the clinical utility of novel clinical constructs and treatments.[35,36] As defined by the American Psychological Association, clinical utility reflects the extent to which the intervention will be effective in the practice setting where it is to be applied, regardless of the efficacy that may have been demonstrated in the clinical research setting.[37] Likewise, for the WHO, clinically useful constructs must contribute to clinical decision making in the real world setting.[36] Similarly, improvement of clinical utility was prioritized in the development of *DSM-5*.[35]

In order to establish the clinical utility of the SCS, however, it is first necessary to integrate SCS measurements into routine suicide risk assessments within clinical settings. To date, this has occurred in 3 settings, a psychiatric hospital in Trondheim, Norway; an inpatient psychiatric service in Pecs, Hungary; and the psychiatric EDs of a hospital system in Chicago, Illinois. Initial studies of the clinical utility of these endeavors have investigated clinicians' perceived utility of the SCS as a clinical tool[38] as well as the relationship between positive scores on a novel screening tool, the Abbreviated Suicide Crisis Syndrome Checklist (A-SCS-C), and admission/discharge decisions in the emergency room.[28] Indeed, clinicians endorsed positive views of the feasibility, appropriateness, acceptability, incremental helpfulness, and overall clinical utility of the SCS as a clinical construct.[38] Further, SCS diagnosis on the

Table 1.

Diagnostic Criteria for the Suicide Crisis Syndrome (SCS)

To meet SCS criteria, patients must meet criteria for Criterion A and at least one symptom from Criteria B1 to B4

Criterion A: Frantic Hopelessness/Entrapment:

A persistent or recurring overwhelming feeling of urgency to escape or avoid an unacceptable life situation that is perceived to be impossible to escape, avoid, or endure

Criteria B1–B4

Criterion B1: Affective Disturbance
- Emotional pain
- Rapid spikes of negative emotions or extreme mood swings
- Extreme anxiety that may be accompanied by dissociation or sensory disturbances
- Acute anhedonia (ie, a new or increased inability to experience or anticipate interest or pleasure)

Criterion B2: Loss of Cognitive Control
- Ruminations—an intense or persistent rumination about one's own distress and the life events that brought on distress
- Cognitive rigidity—an inability to deviate from a repetitive negative pattern of thought
- Ruminative flooding—an experience of overwhelming profusion of negative thoughts, impairing ability to process information or make a decision
- Failed thought suppression—repeated unsuccessful attempts to suppress negative or disturbing thoughts

Criterion B3: Hyperarousal
- Agitation
- Hypervigilance
- Irritability
- Insomnia

Criterion B4: Acute Social Withdrawal
- Withdrawal from or reduction in scope of social activity
- Evasive communication with close others

A-SCS-C powerfully predicted admission/discharge decision in the NorthShore Hospital systems' EDs (now Endeavor Health), such that 92.9% of nonpsychotic patients with the SCS were admitted and 81.9% of nonpsychotic patients without the SCS were discharged. This far outstripped the contribution of SI, as only 6.5% of patients with SI but without SCS were admitted whereas 83.3% of patients with SCS but not suicide ideation were admitted (see Karsen et al,[28] data reanalyzed). Notably, the largest impact of the A-SCS-C on admission/discharge decisions was on nonpsychotic patients, as a psychotic presentation to the ED was strongly associated with admission independent of SCS status.

Nonetheless, while this study demonstrated the effect of implementation of the A-SCS-C on clinical decision making, it did not address clinical outcome. Therefore, the current study expands on the initial NorthShore study by examining readmissions to the ED in the 3 months following the initial visit after implementation of the A-SCS-C screening tool. EDs provide an excellent setting to test the clinical utility of a suicide risk assessment tool as they represent the most common triage area for severe suicidal risk and require fast, high-stakes decisions based on relatively little information.

Likewise, in the US in 2019, more than 490,000 patients presented to EDs following deliberate self-harm.[39]

Specifically, we hypothesize the following:

1. There will be a reduction in both general readmissions and readmissions for SI or behavior among patients diagnosed with the SCS upon initial presentation to the ED.
2. The protective effect will be stronger for SCS diagnosis than for SI and self-harm behavior (SHB).

To the extent that this study supports the efficacy of SCS assessment on reducing readmissions, it will provide meaningful evidence of the clinical utility of the SCS as a suicide-specific diagnosis and support its inclusion into the *DSM*.

METHODS

Subjects

Subjects included 213 patients admitted to the ED in December 2020, approximately 9 months after implementation of the new risk assessment tool. As the dataset used for analysis was extracted from a preexisting database (ie, the electronic medical record) and entirely de-identified, the study was given exempt status from institutional review board approval with no need for informed consent forms. This dataset is an expanded version of the same dataset used for our 2023 paper.[28] The sample for both papers includes all patients seen in the NorthShore EDs in the month of December 2020, but the current paper includes newly extracted data on ED readmission rates.

Measures

NorthShore suicide risk assessment tool. In April 2020, NorthShore introduced a new suicide risk assessment procedure into their EDs, based at 4 separate hospitals. The development and implementation of this procedure was described previously.[28] Briefly, the procedure involved a new risk assessment tool embedded into the electronic medical record. After completing a day-long training on the SCS with author IG, the NorthShore psychiatry department created the tool strictly for clinical purposes, based on their assessment of their clinical needs. Empirical evaluation of the clinical utility of A-SCS-C implementation occurred independently of and more than 1 year after tool design and implementation. The tool includes questions both from the Abbreviated SCS Checklist (A-SCS-C), adapted from the longer SCS Checklist,[40] and from the Columbia Suicide Severity Rating Scale (C-SSRS)—Screening Version.[41] Patients were screened with 2 questions from the A-SCS-C and 3 from the C-SSRS related to recent SI or behavior (see Supplementary Figure 1). If the patient answered yes to any screening question, the full version of both

instruments was administered. The 2 screening questions for the A-SCS-C are "Do you feel trapped with no good options left? Are you overwhelmed or have you lost control by negative thoughts filling your head?" The first A-SCS-C diagnostic criterion in the full suicide risk assessment is a clinician rating (no, yes, or extreme) of entrapment (SCS Criterion A). The second item assesses the 4 domains of SCS Criteria B: affective disturbance, loss of cognitive control, hyperarousal, and social withdrawal. Patients are rated yes if 1 or 2 domains are rated positive and extreme if 3 or more are. Patients are marked positive for the SCS if they scored positively for both Criteria A and B. Note that this diagnostic threshold is less stringent than the original SCS checklist, in which the diagnosis requires patients to meet both Criterion A and all 4 Criteria B. An additional 21 risk factors are grouped into recent activating events (eg, legal problems and recent loss) and clinical status (eg, agitation and severe anxiety). Admission/discharge decisions are made jointly by the ED physician and the on-call psychiatrist, in consultation with the master's level crisis worker who administers the assessment tool. Note that disposition decisions are individualized and not algorithmic.

Variables in this study included the SCS score (positive or extreme vs negative) and 2 C-SSRS-derived ratings. C-SSRS SI was rated on a 6-point scale from 0 = none to 5 = SI with plan and intent. The current study condensed these scores into a 4-point scale, such that 0 = no SI; 1 = SI with no method, plan, or intent; 2 = SI with method, plan, or intent; and 3 = SI with plan and intent and/or SHB. This was done due to low cell sizes in the intermediate severity levels. Of note, all patients with suicidal SHB received a code of 3 on the SI scale. SHB without accompanying SI was coded as 0. Additionally, a separate code for SHB was calculated with 0 = none, 1 = suicidal attempt (any SHB with SI and/or intent), and 2 = nonsuicidal self-injury (SHB without SI or intent).

Information from the medical record. Additional information from the electronic medical record included demographic (age, sex, and race/ethnicity) and clinical variables, specifically chief complaint, admission vs discharge from the ED, and readmission to the ED within 3 months from the original visit. Based on prior analyses in which psychotic presentation strongly predicted admission independent of SCS status,[28] chief complaint of psychosis was entered as a covariate in subsequent analyses.

Statistical Analyses

Given the above-mentioned limitations of self-reported SI as an indicator of acute suicidal risk,[24–26] we chose to investigate risk of both suicide-specific and overall ED readmission in order to capture any patients who may fail to report either SI or SB but still be at high albeit undetected risk. To test whether diagnosis of SCS was associated with reduced risk of

Table 2.

Demographic and Clinical Characteristics

Characteristic	N (%)
Age, mean ± SD, y	33.10 ± 18.2
Sex, female	113 (53.1)
Race/ethnicity	
Asian	11 (5.2)
Black or African American	39 (18.4)
Caucasian	117 (55.2)
Hispanic or Latinx	19 (9.0)
Other non-Hispanic	26 (12.3)
Chief complaint	
Psychosis	55 (25.8)
SCS positive plus extreme	79 (37.1)
SCS extreme only	4 (1.9)
SCS positive only	75 (35.2)
SCS negative only	134 (62.9)
C-SSRS suicidal ideation	
None	102 (47.9)
Ideation only	49 (23.0)
Ideation with plan or intent	31 (14.6)
Ideation with plan and intent[a]	31 (14.6)
C-SSRS suicidal behavior	
None	203 (95.3)
Suicidal self-harm	8 (3.8)
Nonsuicidal self-harm	2 (0.9)
Initial admission vs discharge	
Admission	122 (57.3)
Discharge	91 (42.7)
All readmissions (ED + inpatient)	45 (21.1)
Readmit to ED in 90 d	45 (21.1)
Readmit to inpatient in 90 d	27 (12.7)

[a]Includes suicidal behavior but not nonsuicidal self-harm.
Abbreviations: C-SSRS = Columbia Suicide Severity Rating Scale, ED = emergency department, SCS = suicide crisis syndrome.

readmission overall, we conducted multivariable logistic regression. Readmission to the ED within 3 months of the initial visit was the dependent variable and SCS status the independent variable. C-SSRS SI, C-SSRS SHB, and chief complaint of psychosis upon initial ED visit were covariates. Due to powerful overlap with SCS status, disposition from the initial ED visit was left out of the analysis (unadjusted odds ratio of SCS in relation to admission vs discharge = 17.1; 95% CI, 7.29–40.01).

To test whether SCS status predicted to reduced risk of readmission specifically for suicidal complaints, this analysis was repeated with readmission for SI or suicidal SHB as the dependent variable. Because of the overlap between the predictors SI and SHB on initial admit, both regression analyses were repeated without SHB.

RESULTS

Descriptives

Demographic and clinical characteristics of the sample are presented in Table 2. Over one third (79;

Table 3.

Predictors of Readmission to the Emergency Department Within 90 d of Initial Emergency Department Visit (N = 213)

	Readmission Yes	Readmission No	AOR	95% CI	P value[a]
SCS positive	10 (12.7)	69 (87.3)	0.281	0.096–0.827	**.021**
Negative (ref)	35 (26.1)	99 (73.9)	—	—	—
Psychosis	19 (34.5)	36 (65.5)	3.03	1.38–6.65	**.006**
No psychosis (ref)	26 (16.5)	132 (83.5)	—	—	
C-SSRS suicidal ideation					
None (ref)	21 (20.6)	81 (79.4)	—	—	—
Ideation only	15 (30.6)	34 (69.4)	3.59	1.45–8.90	**.006**
Ideation with plan or intent	3 (9.7)	28 (90.3)	1.62	0.35–7.52	.539
Ideation with plan and intent[b]	6 (19.4)	25 (80.6)	3.64	0.73–17.34	.105
C-SSRS self-harm behavior					
None (ref)	42 (20.7)	161 (79.3)	—	—	—
Suicide attempt	2 (25.0)	6 (75.0)	1.45	0.18–11.62	.726
Nonsuicidal self-injury	1 (50.0)	1 (50.0)	6.57	0.38–113.7	.196

[a]Boldface indicates statistical significance.
[b]Suicidal behavior but not nonsuicidal self-harm.
Abbreviations: AOR = adjusted odds ratio, C-SSRS = Columbia Suicide Severity Rating Scale, ref = reference category, SCS = suicide crisis syndrome.

37.1%) of the patients screened positive for the SCS. Over half of the sample (111; 52.1%) initially presented to the ER with SI. Eight (3.8%) patients presented with suicidal self-harm, and 2 (0.9%) presented with nonsuicidal self-harm. Regarding readmissions, 45 (21.1%) patients were readmitted within the following 3 months.

Multivariable Analysis Assessing Effect of SCS Status on Readmissions

SCS status was associated with a markedly reduced risk of readmission for any reason, even after controlling for C-SSRS SI, C-SSRS SHB, and psychotic chief complaint. Psychosis was a risk factor for readmission as was SI without intent or plan (see Table 3). Because of the overlap between SI and SHB, the analyses were repeated with SHB removed. The results were not substantially changed. SI without intent or plan (AOR = 3.36, 95% CI, 1.37–8.21, $P = .008$) and psychosis (AOR = 2.85, 95% CI, 1.32–6.17, $P = .008$) remained risk factors for readmission. SI with intent and plan was a marginally significant risk factor (AOR = 3.78, 95% CI, 0.92–15.51, $P = .065$). SCS diagnosis remained protective against readmission (AOR = 0.279, 95% CI, 0.10–0.82, $P = .020$).

Multivariable Analysis Assessing Effect of SCS Status on Readmissions for SI or Behavior

When examining predictors to readmission specifically for SI or behavior, a diagnosis of SCS was again a protective factor while psychosis, SI, and nonsuicidal self-injury were associated with greater risk of readmission. The adjusted odds ratios were highest for SI without plan or intent and for nonsuicidal self-injury (see Table 4). Because of the overlap between SI and SHB, analyses were repeated with SHB removed. All levels of SI remained significant risk factors (AORs: 5.9–9.9). Psychosis was a marginally significant risk factor (AOR = 2.72, 95% CI, 0.93–7.94, $P = .068$). SCS diagnosis remained protective (AOR = 0.256, 95% CI, 0.08–0.84, $P = .025$).

Relationship Between SI, SHB, SCS Status, and Readmission Rates

To better understand the above results, as a secondary analysis, the relationship between SCS status and the different levels of both C-SSRS SI and SHB were evaluated (see Table 5). Unsurprisingly, there was significant overlap between SI and positive SCS rating. Moreover, there was a clear dose-response relationship. While 90.3% of the patients rated to have the most severe level of SI were also rated to have SCS, only 40.8% of those with the most mild form of SI were rated to have SCS. Importantly, this mild level of SI was common, recorded in 23% of the sample. Likewise, 7 (87.5%) of the 8 people admitted with suicide attempts were rated to have SCS but neither of the 2 patients with nonsuicidal self-injury were SCS positive. Thus, ratings of SCS closely aligned with severity of suicidal risk, such that SI without plan or intent and nonsuicidal self-injury were less likely to be comorbid with the SCS.

Table 5 also shows the proportion of patients readmitted to the ED who are either SCS positive or negative at each level of severity of SI and self-harm. Across all but one level of severity, patients rated as SCS positive on initial admission were less likely to be

Table 4.

Predictors of Readmission to the Emergency Department for SI or Behavior Within 90 d of Initial Emergency Department Admission

	Readmission for SI/SB Yes	Readmission for SI/SB No	AOR	95% CI	P value[a]
SCS positive	7 (9.2)	69 (90.8)	0.257	0.08–0.86	**.028**
Negative (ref)	18 (14.5)	106 (85.5)	—	—	—
Psychosis	8 (17.8)	37 (82.2)	3.16	1.04–9.65	**.043**
No psychosis (ref)	17 (11.0)	138 (89.0)	—	—	—
C-SSRS SI					
None (ref)	6 (6.5)	87 (93.5)	—	—	—
Ideation only	12 (25.5)	35 (74.5)	12.66	3.56–45.00	**<.001**
Ideation with plan or intent	3 (9.7)	28 (90.3)	7.56	1.26–45.34	**.027**
Ideation with plan and intent[b]	4 (13.8)	25 (86.2)	8.31	1.07–64.71	**.043**
C-SSRS self-harm behavior					
None (ref)	22 (11.6)	168 (88.4)	—	—	—
Suicide attempt	2 (25.0)	6 (75.0)	3.01	0.29–31.20	.356
Nonsuicidal self-injury	1 (50)	1 (50)	29.05	1.45–582.16	**.028**

[a]Boldface indicates statistical significance.
[b]Includes suicidal behavior but not non-suicidal self-harm.
Abbreviations: AOR = adjusted odds ratio, C-SSRS = Columbia Suicide Severity Rating Scale, ref = reference category, SCS = suicide crisis syndrome, SB = suicidal behavior, SI = suicidal ideation.

readmitted than those rated as SCS negative. In sum, even though patients with the most severe form of SI and SHB were most likely to be diagnosed with SCS, at any level of severity those who received a diagnosis of SCS appeared to benefit clinically.

DISCUSSION

The purpose of this paper was to investigate the impact of a novel suicide risk-assessment tool, based on the SCS, on readmission rates in the ED of a large, urban hospital system. Our hypotheses were that SCS diagnosis upon admission would be associated with fewer

readmissions, both overall and related to SI or behavior, and that this effect would be stronger than initial presentations of SI or SHB. Indeed, these hypotheses were supported. Diagnosis of SCS at initial ED visit was associated with a notably reduced rate of both general and suicidal readmissions while SI and SHB were either noncontributory or significant risk factors.

Although the associations between SCS diagnosis and reduced risk of readmission are robust, there are several possible explanations for these findings.

1. Patients with SCS may be less likely to return to the ED because they are at base healthier than are other patients. There are 2 arguments against

Table 5.

Proportion of SCS Positive Patients at Each Level of Severity of Suicidal Ideation and Self-Harm Behavior With Associated Readmission Rates

	SCS+	SCS−	Readmitted N (% SCS+)	Readmitted N (% SCS−)
C-SSRS suicidal ideation				
None	5 (4.9)	97 (95.1)	0 (0.0)	21 (21.6)
Ideation only	20 (40.8)	29 (59.2)	3 (15.0)	12 (41.4)
Ideation with plan or intent	26 (83.9)	5 (16.1)	3 (11.5)	0 (0.0)
Ideation with plan and intent[a]	28 (90.3)	3 (9.7)	4 (14.3)	2 (66.7)
C-SSRS self-harm behavior				
None	72 (35.5)	131 (64.5)	9 (12.5)	33 (25.2)
Suicide attempt	7 (87.5)	1 (12.5)	1 (14.3)	1 (100.0)
Nonsuicidal self-injury	0 (0.0)	2 (100.0)	0 (0.0)	1 (50.0)

[a]Includes suicidal behavior but not nonsuicidal self-harm.
Abbreviations: C-SSRS = Columbia Suicide Severity Rating Scale, SCS = suicide crisis syndrome.

this. First, while 57% of the entire sample were admitted to the inpatient service from the ED, 91% of the SCS positive patients were[28] an unlikely phenomenon if the SCS patients were healthier. Second, as shown in Table 5, SCS diagnosis was associated with reduced readmissions at all levels of SI severity.

2. Because SCS patients were overwhelmingly likely to receive inpatient treatment, the improved clinical outcome is attributable to inpatient care. This indeed seems likely, such that patients who were flagged by their SCS diagnosis for more intensive treatment had improved outcome. Likewise, a previous study showed a marked decrease in SCS symptoms across inpatient stays, even in the absence of targeted treatment protocols.[29] Of note, this suggests a general, nonspecific effect of inpatient care on clinical outcome in SCS patients.

3. Inpatient clinicians adjusted their treatment of SCS patients. Perhaps, inpatient clinicians' awareness of the SCS diagnosis impacted clinical decision making, such that clinicians targeted easily treatable SCS symptoms, such as hyperarousal, as well as more traditional correlates of suicide risk, such as depression and SI. This would reflect a more specific effect of inpatient care on clinical outcome. While this was not testable in our dataset, future research is needed to assess the efficacy of different interventions and ultimately to develop a treatment protocol.

In sum, our findings suggest that diagnosis of the SCS may not only be useful for risk assessment but may also identify a highly treatable acute syndrome.[42]

It is also worthwhile to consider the high concordance between SCS diagnosis and SI (80.3%). This raises the possibility that the effect of SCS diagnosis masked the effect of SI on ED readmits through collinearity. Yet there is evidence that this is not the case and that SCS and SI had truly independent relations with ED readmissions. For one, as shown in Table 5, the overlap was not consistent across the level of severity of SI, being highest (90.3%) at the most severe level of the spectrum and dropping to 40.8% for the mildest level, SI with no method, plan, or intent. Further, it was rare for patients to have SCS and not SI (5 out of 79 SCS+ patients = 6.3%), but it was relatively common for patients to have SI but not SCS (37 out of 134 SCS− patients = 27.6%). Importantly, there were no readmissions in patients with SCS but not SI, whereas there were 14 readmissions (37.8%) among the patients with SI but no SCS. These data underlie the divergent adjusted odds ratios found in Table 3.

Remarkably, despite the above-noted high concordance between the SCS and SI, the data suggest that SI was a risk factor for readmission while SCS was protective. These findings suggest that patients presenting with SI are notably heterogeneous, present at different levels of risk, and may require diverse treatment approaches. This is consistent with our first study,[28] which found that nonpsychotic patients with SCS with or without SI were typically admitted but those with SI without SCS were typically discharged. It is possible that ED patients with low levels of SI suffer from chronic difficulties that acute inpatient psychiatric treatment is unlikely to resolve, such as severe personality disorders.[43] Likewise, some of these patients may present to the ED for secondary gain, for example, in the context of homelessness or severe substance abuse.[27] Alternatively, those at higher levels of SI may present in a more acute suicidal crisis,[8] potentially more amenable to acute inpatient interventions.

Nonetheless, it is not surprising that people who initially present for suicidality (ie, SI or SHB) will be more likely to return for the same problem than those who present for other reasons. That SCS diagnosis is a protective factor against such readmissions, however, suggests it is successful in mitigating the considerable risk of suicidality-related readmissions in this population.

The findings of this study should be considered within the context of its limitations. For one, only 1 month of admissions was studied, generating a relatively small sample size. Second, this study was restricted to one hospital system and therefore requires replication in different hospital systems as well as different clinical settings. The role of the SCS diagnosis in clinical decision making will necessarily be different in these different settings and require different outcome measures. Third, as the A-SCS-C was generated in a clinical context, it was not validated against the SCS-C or other SCS measures prior to implementation. Efforts to establish criterion validity of the A-SCS-C are currently underway. Fourth, it is possible that some patients who were classified as not readmitted were actually readmitted to another hospital. That this study included 4 separate hospitals in the NorthShore system, however, partially mitigates this risk. That this is a retrospective rather than a truly prospective study is an additional limitation, as data extraction was restricted to available data rather than a planned research design. Finally, it is also critical to investigate whether clinical use of the SCS can reduce suicide deaths.

Nonetheless, this is the first study to date that evaluated suicide-related clinical outcome following implementation of the SCS into the clinical workflow and, as such, represents a critical contribution to the developing evidence base supporting its clinical utility. Indeed, our findings suggest that use of the SCS in suicidal risk assessment had a markedly beneficial effect on clinical outcome, specifically reducing readmissions to the ED, both for any reason and for suicide-related presentations.

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