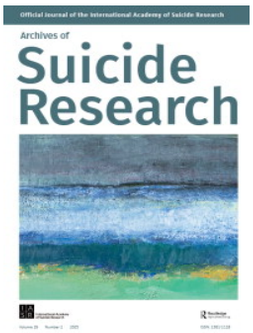

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ABSTRACT

Objective: The suicide crisis syndrome (SCS) is a suicide-specific acute cognitive-affective state that seeks to identify individuals at increased near-term risk of suicide. However, little is known about its correlates in psychiatric populations. We aimed to assess symptom severity and sociodemographic correlates of SCS in patients with major depressive disorder (MDD), compared to healthy controls.

Methods: Between November 2021 and August 2022, we cross-sectionally administered the revised Suicide Crisis Inventory (SCI-2) to patients with MDD and matched healthy controls across 24 centers in India. We compared SCS total and domain scores between groups using independent samples *t*-tests. Linear regressions were used to determine the sociodemographic characteristics uniquely associated with SCS, over and above clinical diagnosis.

Results: We obtained responses from 1196 patients with MDD (Mean age = 38.1 ± 12.2 years, 54.8% female) and 1067 controls (Mean age = 36.7 ± 11.4 years, 50.5% female). The MDD group had significantly greater severity of total SCS symptoms ($t[2063] = -58.57$, $p < 0.001$, Cohen's $d = 2.42$) and each of its five domains. In multivariate analyses, age ($B = -.37$, $SE = .11$, $p < 0.001$), female sex ($B = 3.61$, $SE = 1.62$, $p = 0.026$), and living in a nuclear family ($B = -3.97$, $SE = 1.73$, $p = 0.022$) were significantly associated with SCS symptoms. The relationship between age and SCS symptoms was significantly stronger among MDD patients ($B = -0.48$, $SE = 0.14$, $p < 0.001$).

Conclusion: Our findings are consistent with prior cross-national investigations of SCS correlates in community samples and overlap with correlates of suicidal behavior. These results point to the potential utility of the SCS construct in early identification of at-risk individuals and prevention of subsequent suicidal behavior.

KEYWORDS

Major depressive disorder; narrative crisis model of suicide; suicidal behavior; suicide; suicide crisis syndrome; suicide risk assessment

INTRODUCTION

Worldwide, more than 700,000 individuals take their own lives every year, leading to profound social, familial, and economic consequences (World Health Organization, 2023). In India, suicide-related deaths have been consistently increasing, from 9.9 per one lakh population in 2017 to 12.4 per one lakh population in 2022 (National Crime Records Bureau, 2023). A key element of suicide prevention at an individual level is suicide risk assessment, a process that informs stratification of the level of suicide risk, triaging, and clinical management (Menon, 2013).

Extant suicide risk assessment models have two main drawbacks. Firstly, they employ chronic risk factors such as past and family history of suicide to make inferences about acute risk. Secondly, they rely on self-expressed suicidal ideation (SI). The former approach has been shown to have unsatisfactory results (Large et al., 2011), and the latter is potentially problematic for several reasons; people who die by suicide may experience SI either in a transient, fluctuating manner (Kleiman et al., 2017), never experience it at all (LeMaster et al., 2004), experience it just before the act (Deisenhammer et al., 2009), or be motivated to conceal SI (Richards et al., 2019); any of these may contribute to non-detection of SI in routine clinical interviews and consequent erroneous downgrading of the level of risk. As a side note, concerns surrounding confidentiality (Anestis & Green, 2015), fear of unwanted consequences (e.g., hospitalization, negative career impact), experiencing negative emotions (e.g., shame, guilt), and specific attitudes to suicide (e.g., nobody can help or a preference for not sharing thoughts and feelings) (Blanchard & Farber, 2020), apart from personality variables (e.g., neuroticism vs extraversion, high vs low trait anxiety) (Bloch-Elkouby et al., 2023) have all been linked to non-disclosure of SI in clinical settings.

To address these issues, investigators have proposed the narrative crisis model (NCM) of suicide. The NCM is a dynamic, multi-stage model that tracks the progression of suicidal behavior, integrating both chronic and acute risk factors to identify individuals at high near-term risk of suicide (Bloch-Elkouby et al., 2024, 2021b; Rogers et al., 2024). Importantly, the NCM has shown both concurrent (Cohen et al., 2022) and short-term predictive validity (Bloch-Elkouby et al., 2020) for near-term suicidal behaviors. The model begins with an individual with trait vulnerability due to factors such as adverse childhood experiences. When these individuals experience a triggering life event, they are prone to develop a sub-acute, suicide-specific, cognitive-affective state called the suicidal narrative (SN) (Cohen et al., 2019). The SN is characterized by overly negative views of the self, difficulties in disengaging from non-viable life goals, as well as difficulties in redirecting oneself toward more realistic and achievable goals. This may result in feelings of frustration, social defeat, humiliation, isolation (thwarted belongingness), and perceived burdensomeness. Suicide now becomes a viable option for such an individual.

The development of SN heralds the next and most crucial phase of the NCM: the suicide crisis syndrome (SCS) (Galynker, 2023; Galynker et al., 2024; Schuck et al., 2019), formerly called the suicide trigger state (Melzer et al., 2024; Yaseen et al., 2012). This phase is the centerpiece of the NCM. It describes a more acute cognitive-affective state comprising symptoms from the following five domains in its latest iteration: entrapment (frantic cognitive state of hopelessness where the individual feels that they are stuck in

a crisis with no channels to mitigate or escape from the problem), affective dysregulation (emotional pain, extreme anxiety [including panic symptoms], and acute anhedonia), hyperarousal (agitation, insomnia), social withdrawal (avoiding social contact and feelings of loneliness), and cognitive dyscontrol (cognitive inflexibility, ruminative thoughts, and inability to control them). Importantly, individuals with SCS have a high near-term or imminent risk of suicide (within days to weeks).

The identification of SCS, therefore, has important clinical implications for management. The SCS is primarily assessed using the suicide crisis inventory (SCI)-2 (Bloch-Elkouby et al., 2021a). The tool has shown good psychometric properties and is validated for use in India and other Asian settings, both in general (Chistopolskaya et al., 2022; Menon et al., 2022; Park et al., 2023) and psychiatric populations (Menon et al., 2024a). Importantly, investigators have noted findings that support the predictive validity of SCI-2 for near-term suicidal thoughts and behaviors among high-risk psychiatric populations, regardless of SI disclosure (Bloch-Elkouby et al., 2021a).

To our knowledge, no study has examined the comparative severity and sociodemographic correlates of SCS in psychiatric populations. This is important for two reasons: first, the presence of unique associations between SCS and sociodemographic factors provides further support for its construct validity in this high-risk population, particularly if the SCS correlates approximate that of relevant suicide phenotypes such as suicide and suicide attempt. Second, it assists management by pointing to more easily identifiable factors as markers for underlying SCS in this group. The only previous study that assessed sociodemographic correlates of SCS was a cross-national investigation comprising ten countries, which was carried out in community-based adults, used a self-selected sample through online surveys, and did not include a control group for comparison (Rogers et al., 2023).

In the Indian context, the examination of SCS correlates in diagnostic subgroups may be particularly relevant for two reasons. First, India contributes to more than a quarter of global suicides (Arya, 2024) and evidence suggests that a significant proportion of those who attempt or die by suicide have concurrent psychiatric morbidity (Kattimani et al., 2015; Menon et al., 2020). This, combined with the considerable treatment gap for mental morbidity (Gautham et al., 2020), highlights the need to focus on this high-risk subpopulation to boost suicide prevention efforts. Second, the SCS is consistent with the scaffolding approach outlined in the national suicide prevention strategy of India which advocates for interventions at the 'right time, intensity, and duration' to help navigate a suicidal crisis (Vijayakumar et al., 2022). Specifically, the SCS represents an empirically supported, acute, high-risk state, warranting specific, intensive, multimodal interventions to mitigate accompanying suicide risk (Rogers et al., 2024). Finally, since the prevalence of suicidality differs by age, sex, employment, marital status, and locality of residence in India (Amudhan et al., 2020), it is also important to assess whether there are sociodemographic differences across these groups in an acute suicidal crisis indicator, the SCS (Amudhan et al., 2020).

Thus, the objectives of the present study were to compare SCS total and domain scores between participants with MDD and healthy controls, and to assess the sociodemographic correlates of SCS in MDD. Specifically, across 24 tertiary care hospitals across the country, we (1) compared SCI-2 total and subscale scores between MDD and

control participants; (2) assessed the relationship between each sociodemographic variable and total SCS symptom severity; and (3) assessed sociodemographic factors that correlated with SCS symptom severity over and above the diagnostic status (MDD vs no MDD). We also aimed to examine the moderating effects of participant type (i.e., diagnostic status) on each relationship by including an interaction term between participant type and the relevant sociodemographic variable.

MATERIALS AND METHODS

Setting and Design

The Research and Education Foundation subcommittee of the Indian Psychiatric Society supported this research. We used a cross-sectional design to collect data between November 2021 to August 2022. A total of 24 tertiary care hospitals, spread across the geographic length and breadth of the country, participated in the study. These included central government-funded institutions (n = 11), state government-funded institutions (n = 6), private medical schools (n = 5), and non-teaching hospitals (n = 2). The reasons for selecting these sites are explained elsewhere (Menon et al., 2024a).

Participants

We included adult patients aged 18-65 years with MDD (single/recurrent episode), diagnosed using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria (American Psychiatric Association, 2013). For controls, we recruited apparently healthy volunteers; consent was obtained from non-biologically related attenders of patients from the outpatient or inpatient psychiatry departments. We excluded patients with psychotic symptoms and those with documented intellectual disability; thus, our sampling was purposive. Previously, we reported the factor structure and psychometric properties of the SCI-2 (Menon et al., 2024a) and SNI-38 (Menon et al., 2024b) among the patient sample. This paper focuses on the presence and correlates of SCS in the full study sample.

Assessments

The *Suicide Crisis Inventory (SCI)-2* (Bloch-Elkouby et al., 2021a) is a revised 61-item self-report version of the original 49-item SCI (Galynker et al., 2017). It seeks to quantify the presence and intensity of SCS symptoms experienced at their worst point in the last several days. The SCI-2 comprises five sub-scales: entrapment (10 items; e.g., "Did you feel hopeless?"), affective disturbance (18 items; e.g., "Did you feel that your emotional pain was unbearable?"), loss of cognitive control (15 items; e.g., "Did you feel powerless to stop the thoughts that are upsetting you?"), hyperarousal (13 items; e.g., "Did you feel tensed or keyed up?"), and social withdrawal (5 items; e.g., "Did you interact less with people who care about you?"). Each item is rated on a 5-point scale, ranging from 0 ("not at all") to 4 ("extremely"), based on the intensity of the experience. The internal consistency of the subscales in our sample ranged from .89 for social withdrawal to .96 for entrapment and affective disturbances. The SCI-2 has previously

demonstrated strong reliability, good convergent and discriminant validity, and predictive validity across populations (Bloch-Elkouby et al., 2021a; Menon et al., 2024a) and settings (Wu et al., 2022). We used the SCI-2 total and subscale scores as continuous measures to examine associations between sociodemographic variables and SCS symptoms.

To enhance diversity in responses, we translated the SCI-2 into six local languages: Hindi, Marathi, Malayalam, Tamil, Bengali, and Odiya. These languages were chosen as they were the official languages of the participating states. We followed the World Health Organization (WHO) protocol for all translations (World Health Organization, 2016). This involved forward translation, expert panel scrutiny to assess semantic and conceptual equivalence, back translation, examination of the source and target versions for semantic, conceptual, and technical equivalence, and, finally, pre-testing in 5-10 participants to identify unacceptable words or expressions. We used the English or local language version of the SCI-2 as per participant preference.

Data Analytic Strategy

We used descriptive statistics (mean with standard deviations (*SD*) or frequencies and percentages) to depict the sample's sociodemographic characteristics and the severity of SCS symptoms (total scores and five domains). To assess differences in the severity of SCS symptoms among participants with MDD and those without MDD, a series of independent samples *t*-tests were conducted. Welch corrections were applied to each *t*-test to account for violations in the homogeneity of variance assumption, which was assessed using Levene's test.

General linear models were estimated to examine the relationship between each sociodemographic characteristic (age, sex, years of education, marital status, family type, locality, and employment status) and the SCS symptom severity, (1) controlling for participant type (MDD vs. non-MDD), and (2) including participant type as a moderator. In cases of significant interaction effects, simple slopes between each sociodemographic correlate and SCS symptom severity among participants with and without MDD were assessed and plotted. Initially, models were conducted with each sociodemographic characteristic separately. Significant sociodemographic correlates were then included into a final multivariate model to determine which characteristics were uniquely related to SCS, over and beyond MDD status. All analyses were conducted in R version 4.2.1 (R Core Team, 2022).

Ethical Aspects

The study protocol was approved by the institutional ethics committees of all participating sites. Written informed consent was obtained from every study volunteer. Access to relevant study data and materials can be requested by contacting the corresponding author.

RESULTS

Participant Characteristics

Detailed sociodemographic characteristics for the sample, stratified by participant type (i.e., MDD vs. control), are presented in Table 1. Among MDD patients, the average age was 38.1 years ($SD = 12.2$). The majority of the sample self-identified as female (54.8%), married (67.1%), had a mean of 11.4 years of education, were unemployed (48.5%), lived in a nuclear family (65.1%), and resided in an urban environment (48.2%). For control participants, the average age was 36.7 years ($SD = 11.4$), and participants predominantly self-identified as female (50.5%), married (67.5%), employed (71.8%), lived in a nuclear environment (67.9%), and resided in an urban environment (48.8%). MDD individuals were significantly older ($t[2246.2] = -2.87$, $p = .004$), more likely to be female ($\chi^2[1] = 3.99$, $p = .046$), had fewer years of education ($t[2201.2] = 7.82$, $p < .001$), more likely to be separated ($\chi^2[3] = 13.79$, $p = .003$), more likely to be unemployed ($\chi^2[6] = 130.35$, $p < .001$), and lived in a rural area ($\chi^2[2] = 29.19$, $p < .001$) compared to control participants. There were no differences between MDD and control participants in family type ($\chi^2[3] = 4.74$, $p = .192$). Comorbid mental disorders in the sample were: substance use disorder (n = 45), anxiety disorders (n = 43), dissociative disorder (n = 38), dysthymia (n = 17), and other conditions (n = 31). Prior suicide attempts were present in 189 patients (15.8%) and 10 control participants (0.9%). The proportion of those with mild (5-9), moderate (10-14), and severe depression (≥15) as per PHQ-9 were 135 (11.3%), 269 (22.5%), and 708 (59.2%),

Table 1. Sample characteristics.

Sociodemographic Characteristic	Full Sample ($n = 2263$)	MDD Participants ($n = 1196$)	Control Participants ($n = 1067$)
Sex			
Male	1063 (47.2)	535 (45.2)	528 (49.5)
Female	1188 (52.8)	649 (54.8)	539 (50.5)
Age (M/SD)	37.4 (11.8)	38.13 (12.2)	36.70 (11.4)
Marital Status			
Single	705 (31.3)	365 (30.8)	340 (31.9)
Married	1514 (67.3)	794 (67.1)	720 (67.5)
Separated	30 (1.3)	25 (2.1)	5 (0.5)
Other	2 (0.1)	0 (0.0)	2 (0.2)
Years of Education (M/SD)	12.2 (4.9)	11.4 (4.8)	13.0 (4.9)
Employment Status			
Unemployed	875 (38.9)	574 (48.5)	301 (28.2)
Unskilled Worker	150 (6.7)	69 (5.8)	81 (7.6)
Semi-Skilled Worker	211 (9.4)	110 (9.3)	101 (9.5)
Skilled Worker	205 (9.1)	80 (6.8)	125 (11.7)
Clerical/Shop-Owner/Farmer	273 (12.1)	144 (12.2)	129 (12.1)
Semi-Professional	199 (8.8)	95 (8.0)	104 (9.7)
Professional	338 (15.0)	112 (9.5)	226 (21.2)
Family Type			
Nuclear	1496 (66.5)	771 (65.1)	725 (67.9)
Joint	452 (20.1)	238 (20.1)	214 (20.1)
Extended	279 (12.4)	159 (13.4)	120 (11.2)
Living Alone	24 (1.1)	16 (1.4)	8 (0.7)
Locality			
Urban	1092 (48.5)	571 (48.2)	521 (48.8)
Semiurban	546 (24.3)	243 (20.5)	303 (28.4)
Rural	613 (27.2)	370 (31.3)	243 (22.8)

Values expressed as N(%); MDD, major depressive disorder; M/SD, Mean/Standard deviation.

respectively. The mean PHQ-9 score among patients was 15.6 ± 6.3 and among control participants was 2.4 ± 4.1.

Severity of the Suicide Crisis Syndrome and Its Domains across MDD and Control Participants

There were significant differences across MDD and control participants in the severity of SCS symptoms ($t[2063.0] = -58.57$, $p < .001$, $d = 2.42$) and across each of its five domains: entrapment ($t[1945.9] = -55.25$, $p < .001$, $d = 2.27$), affective disturbances ($t[1994.1] = -58.55$, $p < .001$, $d = 2.41$), loss of cognitive control ($t[2125.4] = -57.74$, $p < .001$, $d = 2.39$), hyperarousal ($t[2122.9] = -49.27$, $p < .001$, $d = 2.04$), and social withdrawal ($t[2000.6] = -49.25$, $p < .001$, $d = 2.03$). Means and standard deviations for these variables, stratified by participant group, are included in Table 2.

Sociodemographic Correlates of the Suicide Crisis Syndrome

Table 3 presents univariate associations between all sociodemographic characteristics and the SCS symptoms. Sociodemographic characteristics with significant associations were included in a multivariate model predicting SCS symptoms (Table 4).

Age

Age was significantly negatively associated with SCS symptoms after controlling for participant type (see Table 3). Moreover, participant type significantly moderated the relationship between age and SCS. Specifically, age was more strongly and negatively associated with SCS among MDD participants ($B = -.88$, $SE = .09$, $p < .001$) than among control participants ($B = -.36$, $SE = .10$, $p < .001$).

Sex

Female participants had more severe symptoms of SCS than male participants after accounting for participant type (see Table 3). Participant type did not moderate the relationship between sex and SCS symptoms.

Education

Controlling for participant type, years of education was not significantly associated with SCS symptoms; participant type did not moderate the relationship between years of education and SCS symptoms (see Table 3).

Table 2. Comparison of suicide crisis syndrome (SCS) total and subscale scores between groups.

SCS Symptom	MDD Participants	Control Participants
Total Score	114.76 (45.82)	19.92 (30.12)
Entrapment	21.01 (9.61)	2.86 (5.65)
Affective Disturbances	32.29 (13.56)	4.80 (8.34)
Loss of Cognitive Control	27.09 (10.41)	5.37 (7.31)
Hyperarousal	24.79 (10.90)	5.41 (7.63)
Social Withdrawal	9.57 (4.74)	1.48 (2.93)

Values expressed as mean (standard deviation); MDD, major depressive disorder.

Table 3. Regression models examining associations between sociodemographic characteristics, participant type, and suicide crisis syndrome symptoms.

Predictor	B	SE	*p*	95% CI
		Age		
Step 1				
Age	−.65	.07	<.001	−.78, −.52
Participant Type	95.78	1.62	<.001	92.59, 98.96
Step 2				
Age	−.36	.10	<.001	−.57, −.16
Participant Type	114.89	5.39	<.001	104.33, 125.45
Age × Type	−.51	.14	<.001	−.78, −.24
		Sex		
Step 1				
Female	3.44	1.65	.038	.19, 6.68
Participant Type	94.70	1.65	<.001	91.46, 97.94
Step 2				
Female	4.63	2.40	.054	−.07, 9.33
Participant Type	93.89	2.40	<.001	91.18, 100.60
Female × Type	−2.27	3.31	.493	−8.77, 4.22
		Years of Education		
Step 1				
Education	.004	.01	.639	−.01, .02
Participant Type	94.81	1.66	<.001	91.57, 98.06
Step 2				
Education	−.01	.02	.616	−.06, .03
Participant Type	94.48	1.71	<.001	91.13, 97.84
Education × Type	.02	.03	.447	−.03, .07
		Marital Status[a]		
Step 1				
Married	−8.31	1.78	<.001	−11.80, −4.83
Separated	6.08	7.29	.404	−8.20, 20.37
Participant Type	94.76	1.65	<.001	91.52, 97.99
Step 2				
Married	−8.21	2.57	.001	−13.24, −3.18
Separated	2.60	17.57	.882	−31.84, 37.05
Participant Type	94.86	2.94	<.001	89.10, 100.63
Married × Type	−.20	3.56	.955	−7.18, 6.78
Separated × Type	4.14	19.33	.831	−33.76, 42.04
		Family Type[b]		
Step 1				
Joint/Extended	−4.30	1.77	.015	−7.76, −.83
Living Alone	3.65	8.06	.650	−12.14, 19.45
Participant Type	94.92	1.65	<.001	91.68, 98.16
Step 2				
Joint/Extended	−1.52	2.59	.558	−6.59, 3.56
Living Alone	−12.61	13.90	.364	−39.87, 14.65
Participant Type	96.37	2.02	<.001	92.41, 100.34
Joint/Extended × Type	−5.20	3.54	.142	−12.14, 1.74
Living Alone × Type	24.06	17.05	.158	−9.38, 57.51
		Locality[c]		
Step 1				
Suburban	−2.43	2.06	.238	−6.46, 1.61
Rural	−2.23	1.98	.260	−6.12, 1.65
Participant Type	94.85	1.66	<.001	91.58, 98.11
Step 2				
Suburban	−1.69	2.83	.552	−7.24, 3.87
Rural	−.30	3.04	.920	−6.27, 5.66
Participant Type	96.09	2.37	<.001	91.43, 100.74
Suburban × Type	−1.45	4.13	.725	−9.54, 6.64
Rural × Type	−3.36	4.01	.403	−11.23, 4.51

(*continued*)

Table 3. Continued.

Predictor	B	SE	*p*	95% CI
		Employment		
Step 1				
Employed	.05	1.73	.976	−3.34, 3.45
Participant Type	94.86	1.69	<.001	91.54, 98.17
Step 2				
Employed	−1.85	2.67	.488	−7.07, 3.38
Participant Type	92.78	2.79	<.001	87.31, 98.25
Employed × Type	3.29	3.51	.348	−3.59, 10.16

[a]For marital status, single/widowed/divorced served as the reference group. Due to the small sample size of the "other" marital status, these individuals were removed from the analysis.
[b]For family type, "Nuclear" served as the reference group.
[c]For locality, "Urban" served as the reference group. For employment status, "Unemployed" served as the reference group.

Marital Status

Married participants had less severe SCS symptoms than single/widowed/divorced participants, controlling for participant type; however, participant type did not moderate the strength of these relations (see Table 3).

Family Type

Living with joint/extended family was associated with less severe SCS symptoms than living with a nuclear family, after controlling for participant type. Participant type was not a significant moderator of this relationship (see Table 3).

Locality

Locality (i.e., urban vs. suburban vs. rural) living was not related to the severity of SCS symptoms (see Table 3). The strength of this relationship was not moderated by participant type.

Employment Status

Employment status was not significantly associated with SCS symptoms after controlling for participant type (see Table 3). Participant type was not a moderator of this association.

Multivariate Analysis

In a model including all significant sociodemographic correlates of the SCS (see Table 4), age, sex, living in a joint/extended versus nuclear family, and the interaction between age and participant type remained significant correlates of SCS symptoms. Specifically, SCS symptoms were more severe among younger adults, female participants, and those living in a nuclear versus joint/extended family, and the relation between age and SCS symptoms was stronger among MDD participants than control participants.

Exploratory Models Examining Specific Suicide Crisis Syndrome Symptom Domains

A series of regressions were conducted to explore which sociodemographic characteristics were related to specific domains of the SCS: entrapment, affective disturbances, loss

Table 4. Multivariate regression model examining associations between sociodemographic characteristics, participant type, and suicide crisis syndrome symptoms.

Predictor	B	SE	*p*	95% CI
Age	−.37	.11	<.001	−.59, −.15
Female	3.61	1.62	.026	.42, 6.79
Married[a]	−.89	2.00	.658	−4.81, 3.04
Separated[a]	9.94	7.33	.176	−4.44, 24.31
Joint/Extended[b]	−3.97	1.73	.022	−7.37, −.57
Living Alone[b]	2.30	8.09	.776	−13.56, 18.17
Participant Type	95.52	1.62	<.001	92.33, 98.70
Age × Type	−.48	.14	<.001	−.75, −.21

[a]For marital status, single/widowed/divorced served as the reference group.
[b]For family type, "Nuclear" served as the reference group.

of cognitive control, hyperarousal, and social withdrawal. To correct for multiple comparisons, we interpreted $p < .01$ as statistically significant in these exploratory models. Participant type was included as a covariate in all models. See Table 5 for detailed statistics for each model. Age was significantly negatively associated with all five SCS symptom domains. Participant sex, marital status, and family type were not significantly related to entrapment, affective disturbances, loss of cognitive control, hyperarousal, or social withdrawal.

DISCUSSION

Main Findings

Our study aimed to investigate the symptom severity and sociodemographic correlates of the SCS in adults with MDD recruited from 24 tertiary care hospitals in India. Firstly, we found that MDD participants had significantly higher SCI-2 total and subscale scores compared to controls, indicating elevated SCS symptom severity in this group. Regarding sociodemographic correlates, individuals who were older, self-identified as men, were married, and were currently living in a joint/extended family were more likely to report a lower SCS symptom severity. In contrast, education, domicile (rural vs urban), and employment status did not significantly correlate with SCS severity. Age, sex, and living in a joint/extended family remained significant in the multivariate analysis. Overall, these findings support the importance of assessing the SCS construct and have practice and research implications.

Comparison with Extant Literature

Our findings closely align with data from prior multi-national investigations examining the correlates of SCS in community-based adult participants (Rogers et al., 2023). Specifically, older age, male sex, and being married correlated with lower intensity of SCS symptoms, compared to their counterparts, in this large 10-country study of community-based adults (n = 5528). Authors used cutoffs to define SCS categorically (yes/no) and found that other sociodemographic correlates did not distinguish between those with and without SCS. However, we chose not to use their cutoffs in our study due to concerns about cross-cultural validity.

Table 5. Exploratory regression models examining significant sociodemographic correlates as predictors of suicide crisis syndrome subscales.

Predictor	B	SE	*p*	99% CI
		Entrapment		
Age	−.12	.02	<.001	−.16, −.08
Female	.55	.33	.099	−.31, 1.41
Married[a]	.10	.41	.799	−.95, 1.16
Separated[a]	2.66	1.50	.077	−1.22, 6.53
Joint/Extended[b]	−.73	.36	.041	−1.64, .19
Living Alone[b]	.93	1.66	.576	−3.35, 5.21
Participant Type	18.28	.33	<.001	17.42, 19.14
		Affective Disturbances		
Age	−.18	.02	<.001	−.24, −.12
Female	1.14	.47	.016	−.07, 2.37
Married[a]	.07	.58	.900	−1.43, 1.58
Separated[a]	3.20	2.14	.135	−2.32, 8.71
Joint/Extended[b]	−1.38	.51	.007	−2.68, −.07
Living Alone[b]	.74	2.36	.754	−5.35, 6.83
Participant Type	27.70	.47	<.001	26.47, 28.92
		Loss of Cognitive Control		
Age	−.15	.02	<.001	−.19, −.10
Female	.92	.38	.015	−.06, 1.89
Married[a]	−.26	.46	.577	−1.46, .94
Separated[a]	1.84	1.70	.280	−2.55, 6.22
Joint/Extended[b]	−1.10	.40	.007	−2.13, −.06
Living Alone[b]	−.01	1.88	.997	−4.85, 4.84
Participant Type	21.90	.38	<.001	20.93, 22.88
		Hyperarousal		
Age	−.15	.02	<.001	−.20, −.10
Female	.84	.40	.033	−.18, 1.86
Married[a]	−.24	.49	.622	−1.49, 1.01
Separated[a]	2.49	1.78	.163	−2.11, 7.08
Joint/Extended[b]	−.91	.42	.032	−1.99, .18
Living Alone[b]	1.14	1.97	.562	−3.94, 6.22
Participant Type	19.54	.40	<.001	18.52, 20.56
		Social Withdrawal		
Age	−.05	.01	<.001	−.08, −.03
Female	.13	.17	.430	−.30, .56
Married[a]	−.09	.21	.647	−.62, .44
Separated[a]	1.16	.75	.122	−.78, 3.11
Joint/Extended[b]	−.14	.18	.448	−.59, .32
Living Alone[b]	−.20	.83	.810	−2.34, 1.94
Participant Type	8.15	.17	<.001	7.72, 8.58

[a]For marital status, single/widowed/divorced served as the reference group.
[b]For family type, "Nuclear" served as the reference group.

Our findings are consistent with the literature on sociodemographic correlates of suicide, particularly in the Southeast Asian region (SEAR). Regarding age, we found that older adults had lower SCS total and subscale scores indicating lower intensity of SCS, a trend also observed in previous investigations within the Indian dataset (Rogers et al., 2023). Further, we noted a significant interaction between age and participant type: the relationship between age and SCS symptoms was more strongly negative among MDD participants than controls. These findings align with the high rate of suicides among youth and young adults noted in Asia (Vijayakumar et al., 2020; Vijayakumar & Balaji, 2022). Data from the National Crime Records Bureau (NCRB) data, the nodal agency for collating suicide-related statistics from India, also show that young (18-30 years) and middle-aged adults (30-45 years) collectively accounted for two-thirds of suicide deaths in the country (National Crime Records Bureau, 2023).

In our study, female sex and staying in a joint/extended family were positively and negatively correlated, respectively, with SCS symptoms. Good social support is a well-documented protective factor against suicide across settings (Hu et al., 2023; Senapati et al., 2024; Silva et al., 2023), and those living in a joint/extended family may, conceivably, have access to and experience greater levels of support. These family systems are unique to the Indian context, as pointed out by Chadda and Deb (2013). Regarding sex, suicide patterns in India (Snowdon, 2019) and the Southeast Asian region (Ramesh et al., 2022) traditionally exhibit a lower male-to-female ratio compared to higher-income nations, indicating higher suicide rates among women in this region. Globally, women outnumber men in suicide attempts, a phenomenon observed across both high and low-and-middle-income countries (Bommersbach et al., 2022; Vijayakumar, 2015). Hence, our findings are consistent with self-identified sex correlates of both suicide and suicide attempts in Southeast Asia.

Implications

Our findings have key implications for practice and research. We observed that certain sociodemographic factors can effectively distinguish those with higher severity of SCS symptoms, consistent with established risk factors for suicides and suicide attempts in the literature. This finding is important because it supports the clinical utility of the SCS construct as a possible predictor of suicidal behavior. Practitioners can benefit from the individual-centric nature of SCS symptoms, as their presence in an individual reliably indicates a high near-term risk of suicide. This knowledge can inform the locus and intensity of clinical management.

This person-centric approach to suicide risk assessment also represents a significant advantage over traditional risk assessment models, which often rely on chronic, longer-term risk factors with limited predictive accuracy (Large et al., 2011; Menon, 2013). The stronger relationship between age and SCS severity in MDD suggests the potential for customizing risk assessment using SCS in this subgroup and possibly other high-risk suicide subgroups. Notably, the SCI-2, used to assess the SCS, is validated in the Indian context (Menon et al., 2024a) and has shown encouraging results in terms of predictive validity for near-term suicidal thoughts and behaviors in high-risk psychiatric samples (Bloch-Elkouby et al., 2021a; Rogers et al., 2022).

From a research standpoint, these results provide a basis for investigating sociodemographic and clinical correlates of SCS, its prevalence and severity, associated predisposing and precipitating factors, clinical trajectory, and outcomes among vulnerable high-risk subgroups. These include women and young girls, marginalized subgroups such as LGBTQIA+ and homeless individuals, those with medical co-morbidity, and those in justice and child welfare settings. Such investigations will enable a life course approach to understanding the origins and progression of SCS in populations that have been traditionally underrepresented in suicide research. It will also allow the development and testing of interventions at each stage of the NCM of suicide, enhancing suicide prevention efforts.

Notwithstanding the study's strengths, which included a large and linguistically diverse sample drawn from all regions of the country and the inclusion of a control group, there are several limitations worth noting. First, this was a purposive, convenient sample, limiting the generalizability of our findings to those who share similar characteristics to our

study sample. Next, the cross-sectional design used in our study precludes drawing any causal conclusions, both between the identified correlates and SCS and the link between SCS and future suicidal behavior. Addressing these questions would require longitudinal cohort designs to identify childhood factors such as early life adversities that may predict SCS, and to determine the predictive validity of SCS for suicidal thoughts and behaviors. Finally, our findings represent the first examination of the demographic correlates of SCS within an Asian setting. Though the SCS has well-defined dimensions, its expression may vary across cultures, mediated by social factors. Hence, our findings merit replication to ascertain the robustness and cultural relevance of our results.

Conclusions

Our study revealed that individuals with MDD had greater severity of SCS symptoms, indicated by higher total and subscale scores, than healthy control subjects. Additionally, age and sex significantly correlated with SCS symptoms: younger individuals and women were more likely to report a higher intensity of SCS symptoms. Furthermore, the relationship between age and SCS symptoms was more robust in the MDD group. Though our results merit replication, because they align more generally with risk factors for suicide attempts and related deaths, we propose that assessment of SCS as a milestone in suicide risk assessment may be a useful marker for identifying adults with MDD at high near-term risk of suicide. This step can potentially augment suicide management and prevention efforts directed at reducing subsequent suicidal thoughts and behaviors.

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AUTHOR NOTES

Vikas Menon, Department of Psychiatry, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry 605006, India. Ilambaridhi Balasubramanian, Department of Psychiatry, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry 605006, India. Megan L. Rogers, Department of Psychology, Texas State University, Texas 78666 4684, USA. Sandeep Grover, Department of Psychiatry, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh 160012, India. Bhavesh Lakdawala, Department of Psychiatry, Narendra Modi Medical College, Ahmedabad 380008, India. Rajeev Ranjan, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Patna 801507, India. Sujit Sarkhel, Department of Psychiatry, Institute of Psychiatry, Kolkata 700025, India. Naresh Nebhinani, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Jodhpur 342005, India. Roy Abraham Kallivayalil, Department of Psychiatry, Pushpagiri Institute of Medical Sciences and Research Center, Thiruvalla, Kerala 689101, India. Vijaya Raghavan, Department of Psychiatry, Schizophrenia Research Foundation (SCARF), Chennai 600101, India.

Kshirod Kumar Mishra, Department of Psychiatry, Mahatma Gandhi Institute of Medical Science (MGIMS), Sevagram, Maharashtra 442102, India. Jitender Aneja, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Bhatinda, Punjab 151001, India. Niteen Abhivant, Department of Psychiatry, Byramjee Jeejeebhoy Government Medical College and Sassoon General Hospitals, Pune 411011, India. Raman Deep, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Delhi 110029, India. Lokesh Kumar Singh, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Raipur, Chhattisgarh 492009, India. Avinash De Sousa, Department of Psychiatry, Lokmanya Tilak Municipal Medical College (LTMMC), Mumbai 400022, India. Arvind Nongpiur, Department of Psychiatry, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, Meghalaya 793018, India. Alka A. Subramanyam, Department of Psychiatry, Topiwala National Medical College (TNMC) and Bai Yamunabai Laxmanrao (BYL) Nair Charitable Hospital, Mumbai 400008, India. Debadatta Mohapatra, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha 751019, India. Sujita Kumar Kar, Department of Psychiatry, King George's Medical University (KGMU), Lucknow, Uttar Pradesh 226003, India. Vishal Dhiman, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Rishikesh, Uttarakhand 249203, India. P. N. Suresh Kumar, Department of Psychiatry, Iqraa International Hospital and Research Center, Calicut, Kerala 673009, India. Umesh Shreekantiah, Department of Psychiatry, Central Institute of Psychiatry (CIP), Ranchi, Jharkhand 834006, India. Samrat Singh Bhandari, Department of Psychiatry, Sikkim Manipal Institute of Medical Sciences (SMIMS), Sikkim Manipal University, Tadong, Gangtok, Sikkim 737102, India. Ramdas Ransing, Department of Psychiatry, All India Institute of Medical Sciences (AIIMS), Guwahati, Assam 781101, India. Vikhram Ramasubramanian, Department of Psychiatry, Ahana Hospitals, Madurai, Tamil Nadu 625020, India. Samir Kumar Praharaj, Department of Psychiatry, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka 576104, India.

Correspondence concerning this article should be addressed to Vikas Menon. Department of Psychiatry, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry 605006, India. Email: drvmenon@gmail.com.

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ORCID

Vikas Menon http://orcid.org/0000-0001-8035-4658
Megan L. Rogers http://orcid.org/0000-0002-4969-7035
Raman Deep http://orcid.org/0000-0003-1898-4186

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