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Original Research

Clinical and Sociodemographic Characteristics Associated With Suicidal Ideation in Depressed Outpatients

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Objective: To identify clinical and sociodemographic characteristics associated with suicidal ideation (SI) among patients seeking care for depression in routine primary and psychiatric care settings.

Methods: We examined data from 4041 treatment-seeking outpatients with major depressive disorder (MDD) to compare baseline sociodemographic and clinical characteristics of those with and without SI, and the presence or absence of baseline depressive symptoms and psychiatric comorbidities in those with SI.

Results: SI was significantly ($P < 0.01$) associated with numerous sociodemographic characteristics (that is, lower level of education, Caucasian or African American, male, unemployed, and treated in psychiatric care) and clinical features (that is, previous suicide attempt, younger age of MDD onset, greater baseline depressive symptom severity, greater number of depressive symptoms, and presence of agoraphobia and [or] generalized anxiety disorder). Elevated levels of SI at baseline were associated with decreased remission rates.

Conclusions: Consistent with past findings, increased rates of SI were associated with greater depressive symptom severity as well as other features suggestive of severity of illness. Our results confirm previous findings of associations between SI and panic and (or) phobic symptoms and anxiety, but did not confirm previous findings of an association between SI and alcohol or drug use and (or) dependence. While selective serotonin reuptake inhibitor monotherapy appeared significantly helpful in reducing SI during the course of treatment, the presence of SI at baseline was found to be a associated with decreased treatment response, with patients reporting SI at the start of treatment being less likely to achieve remission.

Clinical Trial Registration Number: Sequenced Treatment Alternatives to Relieve Depression, NCT00021528.

Caractéristiques cliniques et sociodémographiques associées à l'idéation suicidaire chez les patients externes déprimés

Objectif : Identifier les caractéristiques cliniques et sociodémographiques associées à l'idéation suicidaire (IS) chez les patients requérant des soins pour la dépression dans des contextes réguliers de soins de première ligne et psychiatriques.

Méthodes : Nous avons examiné les données de 4041 patients externes souffrant de trouble dépressif majeur (TDM) demandant un traitement afin de comparer les

caractéristiques cliniques et sociodémographiques de départ des patients avec et sans IS, et la présence ou l'absence de symptômes dépressifs de départ et de comorbidités psychiatriques chez les patients avec IS.

Résultats : L'IS était significativement ($P < 0,01$) associée à de nombreuses caractéristiques sociodémographiques (c'est-à-dire, faible niveau d'instruction, Blanc ou Afro-Américain, de sexe masculin, sans emploi, et traité en psychiatrie) et à des traits cliniques (c'est-à-dire, tentative de suicide antérieure, âge précoce d'apparition du TDM, gravité accrue des symptômes dépressifs de départ, plus grand nombre de symptômes dépressifs, et présence d'agoraphobie et [ou] de trouble anxieux généralisé). Des niveaux élevés d'IS au départ étaient associés à des taux de rémission moindres.

Conclusions : Conformément aux résultats précédents, les taux accrus d'IS étaient associés à la gravité accrue des symptômes dépressifs ainsi qu'à d'autres caractéristiques indiquant la gravité de la maladie. Nos résultats confirment les résultats précédents d'associations entre l'IS et les symptômes paniques et (ou) phobiques et l'anxiété, mais ne confirment pas les résultats précédents d'une association entre l'IS et l'utilisation d'alcool ou de drogue et (ou) la dépendance à ceux-ci. Bien que la monothérapie par inhibiteur spécifique du recaptage de la sérotonine semble significativement utile pour réduire l'IS durant le cours du traitement, la présence d'IS au départ a été observée être associée à une réponse réduite au traitement, et les patients qui déclaraient une IS au début du traitement étaient moins susceptibles d'obtenir une rémission.

Numéro d'enregistrement de l'essai clinique : Solutions de rechange séquencées pour soulager la dépression, NCT00021528.

Serious SI is not uncommon in the general population, with studies consistently noting lifetime prevalence rates of up to 16.5%.[1–5] The association between SI and suicide attempts is high. Fu et al[6] found that 91.4% of men who reported a lifetime history of suicide attempts also reported a lifetime history of SI. A 20-year prospective study of 6891 psychiatric outpatients determined that SI is a significant risk factor for suicide.[7] While nondepressed people in the general population experience SI,[8] patients with MDD are at a greater risk.[9,10] Bethell and Rhodes[11] demonstrated that even patients with subtheshold MDD were at increased risk for SI and behaviour. Farmer et al[12] found that 66% of people with MDD experienced SI in the previous week. In a population of psychiatric patients with MDD, Sokero et al[5] found that 58% experienced SI during the current MDE, and 95% of MDD patients who had attempted suicide had SI.

Several sociodemographic characteristics show promise in differentiating people with SI from those without. Caucasians have been found to be more likely to have SI than both African Americans[13] and Hispanics.[14] Studies attempting to identify gender differences in rates of SI have had mixed results, with some researchers finding higher prevalence rates in women,[3,13,15–17] some reports indicating higher rates of SI in men,[13] and others finding no gender distinctions.[4,18–20] Employment and marital status have been shown to be associated with SI, with unemployed and unmarried people being significantly more likely to have SI.[6,21] While the prevalence rates of completed suicides appear to indicate that younger adults are at greater risk of death by suicide, there are some inconsistencies in the data, with several trials finding younger people more likely to have SI,[19,22] and at least one study failing to find an association between age and SI.[13] Studies attempting to relate education level to SI have also been inconclusive.[6,19,21] Additionally, a low level of social and occupational functioning, and poor perceived social support, may also be independent risk factors for SI.[5,23]

SI and behaviour, collectively referred to as suicidality, is often measured along a continuum, ranging from passive thoughts that life is not worth living, to fleeting ideas of death or suicide with no intention of inflicting harm, to active SI and behaviour accompanied by a genuine intent to inflict harm.[24] Numerous clinical characteristics have been found to be associated with increased rates of SI. Studies have consistently identified an association between SI and hopelessness.[5,25–27] Patients with anxiety disorders have been shown to be at increased risk of SI.[17] In particular, studies have found SI to have a significant association with panic disorder.[19,28,29] Goodwin et al[30] found SI in 38.5%

Clinical Implications

- Among this sample of MDD outpatients, 48% had suicide spectrum thinking, of whom 14% had frank SI.
- Consistent with past findings, SI was associated with increased anxiety and mood symptoms. Inconsistent with previous studies, substance use was not independently related to SI.

Limitations

- The study was not specifically designed to study SI.
- SI was evaluated, along with other symptoms of depression, using a telephone-based interactive voice response system.

Abbreviations

AD	antidepressant
GAD	generalized anxiety disorder
HDRS	Hamilton Depression Rating Scale
IDS-C_{30}	Inventory of Depressive Symptomatology—Clinician-rated
MDD	major depressive disorder
MDE	major depressive episode
PTSD	posttraumatic stress disorder
SI	suicidal ideation
SSRI	selective serotonin reuptake inhibitor
STAR*D	Sequenced Treatment Alternatives to Relieve Depression
SUD	substance use disorder

of people with MDD and concurrent panic disorder, and 25.0% of those with MDD and panic attacks. Social phobia has also been found to be associated with SI,[31] as have other phobic disorders.[19] Researchers have found SI in 38.3% of civilians with PTSD[32] and 69% of male veteran inpatients with severe PTSD.[33] SUDs have been found to have be associated with increased rates of suicide in depressed patients.[34] A significant association between alcohol disorder or dependence and SI has also been identified.[5,19,35] Garlow et al[36] found that SI was reported by 24.3% of people with alcohol use disorder only, with 38.0% of those with alcohol and cocaine use disorder and 43.7% of those with cocaine use disorder only, as well as 17% of those with drug use disorders other than alcohol or cocaine.

The purpose of the STAR*D study was to analyze data from a large cohort of outpatients with nonpsychotic MDD who seek treatment in primary and psychiatric care settings, to determine the prevalence of SI in patients with MDD, and to determine which baseline sociodemographic and clinical characteristics are associated with the presence of SI. To this end, our study addresses the following questions:

1. What is the prevalence of SI in a cohort of treatment-seeking outpatients with MDD?
2. What baseline sociodemographic factors, clinical characteristics, and depressive symptom presentation differentiate depressed patients with SI from those without SI?

Method

Our study was conducted using data from the STAR*D study,[37,38] a prospective investigation designed to evaluate the relative effectiveness of different subsequent AD treatments for adults with nonpsychotic MDD who did not reach remission with an initial treatment with the SSRI citalopram. The STAR*D study offered the opportunity to examine a large cohort of adult outpatients with nonpsychotic MDD and determine whether associations exist between SI and any participant sociodemographic or clinical characteristics, including MDD symptom features and psychiatric comorbidities. The methods of the STAR*D study are described in detail elsewhere.[37,38] A brief summary of the STAR*D study methods is presented below.

*STAR*D Study Organization*

The study was overseen by 14 Regional Centers across the United States, each of which conducted the protocol at 2 to 4 clinical sites. The 41 clinical sites consisted of 18 primary care and 23 psychiatric care practice settings located across the United States. The study protocol was approved and monitored by the Institutional Review Boards of the National Coordinating Center (University of Texas Southwestern Medical Center, Dallas, TX), the Data Coordinating Center (University of Pittsburgh Epidemiology Data Center, Pittsburgh, PA), each Regional Center and relevant clinical site, and the Data Safety and Monitoring Board of the National Institutes of Health (Bethesda, MD).

*STAR*D Study Population*

The study enrolled 4041 outpatients, from 18 to 75 years of age, diagnosed with nonpsychotic MDD. Advertising for participants was not permitted, to ensure recruitment of a sample representative of MDD patients seen in typical clinical practice. Written informed consent was obtained prior to study entry.

*STAR*D Inclusion and Exclusion Criteria*

Broad inclusion and minimal exclusion criteria were used to ensure a representative sample. Inclusion criteria included a baseline score of 14 or more on the 17-item HDRS-17[39,40] and approval from the treating clinician indicating that outpatient AD treatment was safe and appropriate. Patients with SI were eligible if the treating clinician approved outpatient treatment. Exclusion criteria included a diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, anorexia nervosa, bulimia nervosa, obsessive–compulsive disorder, substance abuse or dependence requiring inpatient care, or a seizure disorder or other general medical condition that contraindicated medications used in the acute phase of the study. People were excluded if they had a well-documented history (during the current MDE) of nonresponse to, or clear intolerance of, adequate doses of any medication used in the acute phase of the study. Participants were also excluded if they were receiving a specific psychotherapy for depression. Other exclusions included severe, unstable concurrent psychiatric conditions that were likely to require hospitalization within 6 months (for example, severe alcohol dependence with recent detoxification admissions), and concurrent medical or psychiatric conditions that contraindicated the use of more than 1 treatment option within the protocol.[37,38] Concomitant use of nonpsychotropics, or anxiolytics and sedative-hypnotics, was not exclusionary, provided the participant's clinician determined that protocol-specified ADs still represented safe and appropriate treatments. Participants who were breastfeeding, pregnant, or intending to conceive in the 9 months subsequent to study entry were also excluded.

*STAR*D Data Collection*

Baseline participant data were collected by Clinical Research Coordinators at each clinical site, by telephone interviews conducted by a small team of trained Research Outcome Assessors masked to treatment, and by a telephone-based interactive voice response system.[41,42] Research Outcome Assessors received extensive training in the administration of efficacy measures, with interrater reliability assessed periodically.

At intake, the Clinical Research Coordinator reviewed the inclusion and exclusion criteria and gathered participant sociodemographic information. The Clinical Research Coordinator also gathered the HDRS-17 and the 16-item Quick Inventory of Depressive Symptomatology—Clinician-rated,[43,44] to assess depressive symptom severity, and the 14-item Cumulative Illness Rating Scale[45,46] to assess general medical conditions. Participants completed a modified version of the Psychiatric Diagnostic Screening

Questionnaire,[47] which assesses the types and degree of concurrent psychiatric symptoms.

The Research Outcome Assessors conducted a semi-structured telephone interview within 72 hours of the participant's baseline visit to assess depressive symptom severity using the HDRS-17 and the 30-item IDS-C_{30}.[44,48,49]

Statistical Analysis

For the purpose of this report, the presence of SI was defined using the SI question of the baseline IDS-C_{30}. SI was indicated by a score of 2 (thinks of suicide or death several times a week for several minutes) or 3 (thinks of suicide or death several times a day in depth, or has made specific plans, or attempted suicide) on this question. Additional analysis contrasting IDS-C_{30} SI scores of 0 (no SI) with 1 (life is not worth living), 2, and 3 on outcomes was also performed (cross tabulation, a bivariate logistic regression, and a multivariable logistic regression).

Descriptive statistics, means and standard deviations for continuous variables, and percentages for discrete variables, are presented to characterize the population. Bivariate logistic regression models were used to assess the associations of baseline sociodemographic and clinical characteristics with the presence of SI. To assess the association of sociodemographic and clinical characteristics with SI, independent of the effect of severity of depression, a series of logistic regression models were estimated, including main effects for the sociodemographic and clinical characteristic of interest and severity of depression as measured by the baseline HDRS-17 gathered by the Clinical Research Coordinator. For all statistical analyses, a P level of less than 0.01 indicated statistical significance.

Results

A total of 4041 participants were enrolled into the STAR*D study. Among these, 299 had missing data and could not be evaluated. Among the remaining 3742, 1939 (51.82%) had a score of 0 (does not think of suicide or death) on the baseline IDS-C_{30} SI question, 1267 (33.86%) had a score of 1 (feels life is empty and is not worth living), 507 (13.55%) had a score of 2 (thinks of suicide or death several times a week for several minutes), and 29 (0.77%) had a score of 3 (thinks of suicide or death several times a day in depth, or has made specific plans, or attempted suicide). For the purposes of our report, 536 of the available sample (14.32%) were considered to have SI at baseline presentation.

Numerous participant baseline sociodemographic and clinical characteristics were found to be associated with SI (Table 1). After adjustment for the baseline HDRS-17 scores, participants with SI were significantly ($P < 0.1$) more likely to be Caucasian, black or African American, male, or seeking treatment in psychiatric care settings. Unemployed participants were significantly more likely to have SI than those who were employed, while retired participants were the least likely of the employment groups to have SI. Participants who had attempted suicide were significantly more likely to have SI than those who had not attempted suicide. SI was significantly associated with less education, younger age of MDD onset, and greater depressive symptom severity.

After adjustment for the baseline HDRS-17 scores, SI was also associated with the presence of the following baseline depressive symptoms (by the IDS-C_{30}): sleep onset insomnia, mid-nocturnal insomnia, early morning insomnia, irritable mood, anxious mood, low mood reactivity, decreased appetite, poor self-outlook, reduced energy or fatigability, low pleasure or enjoyment, low sexual interest, psychomotor slowing, psychomotor agitation, somatic complaints, panic or phobic symptoms, interpersonal sensitivity, and leaden paralysis (Table 2). After adjustment for baseline HDRS-17 scores, SI was associated with the presence of the following Axis I comorbidities: agoraphobia and GAD (Table 3).

Neurovegetative, cognitive, and anxiety symptoms associated with significantly higher rates of SI are detailed in Table 4.

The results of the analysis evaluating the relation between severity of baseline SI and outcomes are listed in Table 5.

Discussion

Almost 15% of representative, treatment-seeking participants with nonpsychotic MDD had SI, a figure consistent with past studies. Interestingly, an additional 34% reported feeling that life was not worth living, a pattern of thinking considered to be subthreshold along the SI continuum, possibly occurring prior to the manifestation of overt SI.

Baseline Sociodemographic Characteristics

Our study found no significant difference between Caucasians and African Americans regarding SI prevalence, a finding that is in contrast to other studies that found a greater SI rate for Caucasians.[6,13] This contrast is likely due to our study's recruitment of participants from real-world practice sites, with broad inclusion and minimal exclusion criteria. Our finding of a lower rate of SI in Hispanics, compared with non-Hispanics, is in agreement with earlier findings.[14] Previous studies have shown mixed results for associations between sex and SI.[13,15,18,19,21] We found that men were more likely to have SI than women. Our finding that unemployed people have a higher rate of SI than employed people supports past conclusions.[6] Our findings also agree with past research that showed a greater likelihood of SI in people with less education.[21] In addition to the above sociodemographic findings, we found a greater likelihood of SI among people seeking treatment in psychiatric care clinics. One explanation for this may be that a person who is having thoughts of suicide may interpret such thoughts as a clear and serious indicator of psychological distress, and, as a result, may be more likely to seek treatment in a psychiatric care facility.

Baseline Clinical Characteristics

We found a strong association between previous suicide attempt(s) and SI, which is not unanticipated, given the greater risk of suicide found in people who have made prior attempts.[50,51] We found no significant association between the number of MDEs and the likelihood of having SI. This

Table 1 Baseline sociodemographic and clinical characteristics by SI

Characteristic	SI, %	OR	*P*	AOR[a]	*P*
Race			0.18		0.004
Caucasian	14.87				
Black or African American	14.40	0.96		0.69	
Other[b]	10.75	0.69		0.64	
Ethnicity, Hispanic			0.04		0.018
Yes	11.26	0.72		0.68	
No	14.96				
Sex			0.12		0.008
Male	15.70				
Female	13.81	0.86		0.76	
Employment status			<0.001		0.008
Employed	13.95				
Unemployed	16.42	1.21		0.85	
Retired	6.64	0.44		0.43	
Clinic type			<0.001		<0.001
Primary care	11.13				
Psychiatric care	16.56	1.58		1.68	
Marital status			0.005		0.08
Married	12.80				
Never married	14.00	1.11		1.26	
Divorced	17.93	1.49		1.33	
Widowed	12.96	1.01		0.94	
Family history of depression			0.06		0.12
Yes	15.32	1.20		1.17	
No	13.14				
Attempted suicide			<0.001		<0.001
Yes	23.04	2.06		1.53	
No	12.72				
	Mean (SD)				
Age (5)[c]	39.52 (12.57)	0.97	0.05	0.95	0.01
Education, years (5)[c]	13.38 (3.15)	0.94	0.40	1.30	0.001
Age at onset of 1st MDE (5)[c]	23.27 (13.28)	0.94	<0.001	0.94	0.001
Number of MDEs (3)[c]	6.60 (12.18)	1.02	0.11	1.02	0.20
Length of MDE, months (5)[c]	24.06 (53.13)	1.00	0.73	0.99	0.15
Length of illness, years (3)[c]	16.34 (13.02)	1.02	0.03	1.01	0.31
HDRS-17, ROA (5)[c]	24.81 (6.10)	2.11	<0.001		

[a] Adjusted for baseline HDRS-17

[b] Multiracial, Native-American, Alaskan-Pacific Islander, Asian-American

[c] Number in parentheses represents unit increase

ROA = Research Outcomes Assessor

Table 2 Baseline depressive symptoms present and absent in participants with SI

Depressive symptoms (IDS-C_{30})	Symptom		OR	*P*	AOR[a]	*P*
	Absent, %	Present, %				
Sleep onset insomnia	11.75	15.76	1.40	0.001	0.49	<0.001
Mid-nocturnal insomnia	13.01	14.84	1.17	0.22	0.47	<0.001
Early morning insomnia	12.82	15.96	1.29	0.007	0.49	<0.001
Hypersomnia	14.61	13.99	0.95	0.64	1.28	0.04
Mood—sad	2.00	14.82	8.51	0.003	2.05	0.32
Mood—irritable	13.38	14.73	1.12	0.37	0.62	<0.001
Mood—anxious	12.22	14.98	1.27	0.07	0.47	<0.001
Reactivity of mood	6.82	17.24	2.85	<0.001	1.64	<0.001
Mood variation	14.85	13.19	0.87	0.23	0.74	0.01
Quality of mood	13.34	14.86	1.13	0.26	0.94	0.57
Appetite—decreased	11.95	17.59	1.57	<0.001	0.72	0.002
Appetite—increased	14.92	12.94	0.85	0.16	1.03	0.80
Weight—decrease	12.68	18.54	1.57	<0.001	0.76	0.02
Weight—increase	14.75	13.59	0.91	0.40	1.03	0.83
Concentration–decision making	8.40	15.13	1.94	<0.001	0.80	0.28
Outlook—self	5.04	16.69	3.78	<0.001	1.87	<0.001
Outlook—future	9.21	16.08	1.89	<0.001	1.13	0.40
Involvement	5.00	16.11	3.65	<0.001	1.42	0.10
Energy–fatigability	10.00	14.97	1.59	0.01	0.51	<0.001
Pleasure–enjoyment	7.03	17.47	2.80	<0.001	1.46	0.006
Sexual interest	11.92	15.90	1.40	<0.001	0.63	<0.001
Psychomotor slowing	11.62	16.15	1.47	<0.001	0.73	0.006
Psychomotor agitation	11.97	15.98	1.40	<0.001	0.66	<0.001
Somatic (pain) complaints	12.62	15.04	1.23	0.08	0.64	<0.001
Sympathetic arousal	10.49	16.33	1.67	<0.001	0.77	0.04
Panic–phobic symptoms	12.60	17.59	1.48	<0.001	0.66	<0.001
Gastrointestinal	13.33	16.06	1.25	0.02	0.79	0.02
Interpersonal sensitivity	8.59	18.25	2.38	<0.001	1.54	<0.001
Leaden paralysis–physical energy	13.95	15.13	1.10	0.31	0.59	<0.001

[a] Adjusted for baseline HDRS-17

is in contrast to an earlier paper[12] that found a significant association between SI and recurrent MDD.

Baseline Depressive Symptom Features

After adjusting for baseline HDRS-17 scores, we found significant associations between the likelihood of SI and 17 of the 30 baseline depressive symptom features measured by the IDS-C_{30} (reported in Table 2). In an attempt to interpret the wide range of depressive symptoms associated with SI, the authors evaluated the symptom presentation of unique (nonoverlapping) neurovegetative, cognitive, and anxiety symptoms (Table 4). The participants in this baseline sample with SI reported higher rates of classic neurovegetative symptoms, such as decreased appetite, insomnia, psychomotor disturbances, decreased energy and (or) increased fatigability, as well as increased rates of leaden paralysis. Participants with SI also reported an increase in anxiety symptoms, including excessive fear, increased worrying and rumination, and elevated levels of irritability and anger. However, these participants did not show a consistent pattern of increased somatic anxiety, compared with those without SI, other than scoring higher in indices of physical distress and discomfort.

In addition to the neurovegetative symptoms discussed above, we also found a significant relative decrease in levels of libido in participants with SI. Before adjustment, we found an association between lower optimism and (or) greater pessimism and likelihood of SI, which is in accordance with previous studies that found hopelessness and (or) pessimism significantly associated with the presence of SI.[5,26,27] However, after adjustment, we found no significant association between lower optimism and (or) greater pessimism and SI. Participants who reported SI also indicated having several cognitive symptoms, such as

Table 3 Baseline psychiatric comorbidities present and absent in participants with SI

	Comorbidity					
Psychiatric comorbidities (PDSQ)	Absent, %	Present, %	OR	*P*	AOR[a]	*P*
OCD	14.11	16.63	1.215	0.14	0.742	0.04
Panic	13.47	22.09	1.821	<0.001	0.825	0.18
Social phobia	12.85	18.52	1.542	<0.001	1.080	0.47
PTSD	13.46	19.14	1.521	<0.001	0.819	0.11
Agoraphobia	14.29	15.76	1.122	0.44	0.531	<0.001
Alcohol abuse	14.42	14.87	1.037	0.80	0.915	0.56
Drug abuse	14.32	16.54	1.186	0.32	1.011	0.95
Somatoform	14.25	24.05	1.906	0.02	0.991	0.98
Hypochondriasis	14.24	20.27	1.531	0.04	0.868	0.53
Bulimia	14.10	17.16	1.262	0.09	1.157	0.31
GAD	13.67	17.49	1.339	0.008	0.652	<0.001

[a]Adjusted for baseline HDRS-17

OCD = obsessive–compulsive disorder; PDSQ = Psychiatric Diagnostic Screening Questionnaire

excessive and inappropriate feelings of guilt, as well as a significant decrease in interest and involvement in activities that were engaged during periods of euthymia. Additionally, participants did not report concentration deficits or impaired decision making relative to their non-SI cohorts.

Baseline Psychiatric Comorbidities

After adjusting for baseline HDRS-17 scores, we found significant associations between 2 psychiatric comorbidities and SI: agoraphobia and GAD. We found no significant association between panic disorder and SI, which is in contrast with previous findings.[30] Given the extreme rarity of agoraphobia in the absence of panic disorder, we suspect that panic disorder may possibly have been underreported in this sample at baseline. In contrast, our finding of an association between the presence of panic and (or) phobic symptoms, as measured by the IDS-C_{30}, and SI are consistent with prior work that found a significant association between panic attacks and SI.[19,28,30] We found no association between SI and social phobia, which contrasts with the Cox et al[31] finding that a large number of patients with social phobia also reported SI. Inconsistent with prior studies, we found no significant association between PTSD and SI.[32,33,52] Our finding of an association between GAD and SI is somewhat unique, in that while the presence of anxiety disorders in general has been associated with increased SI, past studies have not specifically identified GAD as being uniquely associated with increased rates of SI or the presence of SI. Finally, several previous studies found associations between the presence of SI and alcohol use disorder and (or) dependence,[19,34–36] and between SI and drug use disorder.[36] In our study, we found no such significant associations. While STAR*D provided a large representative outpatient sample, with no exclusion for substance dependence or abuse (other than the exclusion of patients that required inpatient detoxification), it is possible that other studies involving inpatients with more severe SUDs could lead to different results. It is also possible that SI-related outcomes may vary if the target population has been identified from substance use treatment facilities.

Baseline SI Severity

Patients with higher baseline SI scores achieved remission at a significantly lower rate than those with less severe or no SI. SI dropped dramatically (82%) from baseline, suggesting that, for the majority of patients, receiving SSRI monotherapy is associated with a significant decrease in SI.

Conclusions

Our study found an SI prevalence of almost 15% among treatment-seeking outpatients with nonpsychotic MDD, a point prevalence rate consistent with past studies. A further 34% reported feeling that life was not worth living, which is at subthreshold level on the SI continuum and may indicate the future onset of SI. We also found numerous sociodemographic and clinical characteristics, depressive symptom features, and psychiatric comorbidities to be associated with SI. Some of these findings confirm those of previous studies, while others are disparate. Further research will be required to clarify these issues. Notably, while patients with SI at baseline reported a significant reduction in SI by the end of acute phase treatment, they were less likely to achieve remission. Additional study is also needed to determine whether these characteristic differences will affect treatment outcomes, and to increase our understanding of the connection between SI, suicide attempts, and suicide, particularly whether SI is a risk factor for suicide.

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Table 4 Unique neurovegetative, cognitive, and anxiety symptoms that are associated with significantly higher rates of SI

Symptom	Relevant study symptom	SI associated with symptom[a]	
		Presence	Absence
Neurovegetative symptoms of depression			
Appetite disorder	Appetite—decreased	✓	X
	Appetite—increased	X	X
Energy deficit	Energy–fatigability	✓	X
	Leaden paralysis–physical energy	X	X
Psychomotor slowing or agitation	Psychomotor slowing	✓	X
	Psychomotor agitation	✓	X
Sleep disorder	Sleep onset insomnia	✓	X
	Mid-nocturnal insomnia	✓	X
	Early morning insomnia	✓	X
	Hypersomnia	X	X
Cognitive dymptoms of depression			
Concentration deficit	Concentration–decision making	X	X
Interest deficit	Pleasure–enjoyment	✓	X
Hopelessness	Outlook—future	X	X
Guilt, indecisiveness, or low self-esteem	Outlook—self	✓	X
Anxiety symptoms			
Excessive worry	Mood—anxious	✓	X
Fear	Panic or phobic symptoms	✓	X
Irritability or anger	Mood—irritable	✓	X
Somatic symptoms of anxiety			
Physical discomfort or distress	General somatic complaints	✓	X
Cardiovascular or respiratory	Sympathetic arousal	X	X
Diarrhea or constipation	Gastrointestinal	X	X

[a] Adjusted for baseline HDRS-17

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Table 5 Outcomes by SI

Outcome	Baseline SI: 0 *n* = 1939 *n* (%)	1 *n* = 1267 *n* (%)	2,3 *n* = 536 *n* (%)	OR1	OR2,3	*P*	AOR1[a]	AOR2,3[a]	*P*
Exit HDRS <8	672 (34.7)	332 (26.2)	112 (20.9)	0.669	0.498	<0.001	0.776	0.573	<0.001
Exit QIDS-SR <6	774 (40.1)	385 (30.5)	129 (24.2)	0.655	0.476	<0.001	0.754	0.542	<0.001
QIDS-SR reduction ≥50%	195 (16.9)	174 (19.8)	98 (24.3)	1.219	1.577	0.004	1.210	1.616	0.004
Exit QIDS-SR SI	45 (2.3)	92 (7.3)	97 (18.1)	3.295	9.296	<0.001	2.967	8.193	<0.001

QIDS-SR = Quick Inventory of Depressive Symptomatology—Self-Reported

[a] Adjusted for clinical setting, Hispanic ethnicity, employment status, marital status, age at first episode, years since first episode, ever attempted suicide, GAD, panic disorder, PTSD, and social phobia.

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