WHAT ARE THE ATTRIBUTES THAT PSYCHIATRISTS CONSIDER IN THE DECISION TO DISCHARGE ADULTS WITH MAJOR DEPRESSIVE DISORDER WHO HAVE BEEN HOSPITALIZED WITH ACTIVE SUICIDAL IDEATION WITH INTENT?

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INTRODUCTION

- Major depressive disorder (MDD) is one of the most common mental health disorders; in 2018, 7.2% of adults in the US experienced a major depressive episode in the past year [1]
- Some patients with particularly severe symptoms (e.g. suicidal ideation or behavior) may present to the hospital and may receive inpatient mental health services
- The decision to admit patients presenting with MDD to an inpatient unit is complex. Factors associated with higher probability of inpatient admission include history of suicide attempt, suicidal ideation, clinical severity of illness, and availability of social support, as well as diagnosis [2-5]
- However, there is a paucity of information on the decision-making process of psychiatrists when considering when to discharge these patients from an inpatient stay. Understanding this process is critical as, following discharge, patients are at heightened risk of readmission, suicide attempt or even suicide death [6, 7]
- The aim of this study was to ascertain the relative importance of various attributes that US-based psychiatrists consider when deciding to discharge adult patients hospitalized with major depressive disorder and active suicidal ideation with intent (MDSI)

METHODS

- A choice-based conjoint (CBC) analysis was conducted via online survey among psychiatrists actively managing patients with MDSI using a mixed-methods design

Survey development

- Potential attributes related to the decision to discharge and associated levels to be included in the conjoint exercise were identified through literature search and expert consultation, and explored during qualitative, semi-structured interviews with 10 practicing psychiatrists to identify all relevant attributes and attribute levels
- The use of the Montgomery-Asberg Depression Rating Scale (MADRS) ensured that all respondents used consistent definitions of MDD severity of illness
- The survey design was based on the qualitative interviews and pre-testing with three psychiatrists to ensure survey clarity and content validity
- Seven attributes, each with two to four levels, were included in the final survey (Table 1)

Table 1: Definitions of attributes and attribute levels used in survey

Attribute	Definition	Levels	Level description
Clinician assessment of suicidal ideation at admission	Frequency of suicidal ideation and presence of a plan and preparations when the patient was admitted to inpatient care At admission, all patient scenarios shown have active suicidal ideation with suicidal intent	**Moderate**	Intermittent/regular ideation with intent. May or may not have a plan
		Severe	Frequent/constant ideation with intent. Plan and/or preparation underway
Clinician assessment of current suicidal ideation	The current (as an inpatient, following treatment) frequency of suicidal ideation and presence of a plan	**No suicidal ideation**	For at least 24 hours
		Mild	Minimal/occasional ideation
		Moderate	Intermittent/regular ideation with intent. May or may not have a plan
Previous history of suicide attempts	If, and when, previous suicide attempts were made by the patients. Please assume equivalent lethality of attempts across all scenarios shown	**No** previous attempts	
		Attempt **more than one month** ago	
		Attempt within **last month**	
		Current admission **due to attempt**	
Current MDD severity	The current (as an inpatient, following treatment) severity of MDD At admission, all patient scenarios shown have moderate to severe MDD	**Remission**	0 to 10 MADRS score
		Mild MDD	11 to 20 MADRS score
		Moderate MDD	21 to 34 MADRS score
		Severe MDD	≥35 MADRS score
Psychosocial support at discharge	Defined across two metrics: • Level of support available at home (e.g. living with family vs living alone) • Engagement in the community (e.g.Volunteering, (part of a church group etc.)	**Family/friends** at home. Engaged in the community	
		Family/friends at home. **No** community engagement	
		Living **alone.** Engaged in the community	
		Living **alone. No** community engagement	
Post-discharge outpatient follow up plan	The immediacy and frequency of outpatient appointments scheduled for the patient upon discharge	Outpatient program: **2 visits per week for 3 weeks**	
		1 appointment in the 3 weeks following discharge	
Current length of hospital stay	The number of days the patient has been treated as an inpatient at the hospital (admitted due to moderate to severe MDD with active suicidal ideation with intent)	3 days	
		5 days	
		7 days	
		9 days	

Abbreviations: MDD, major depressive disorder; MADRS, Montgomery-Asberg depression rating scale.

Survey sample

- Respondents were recruited from an online panel of board certified, registered, and verified psychiatrists practicing in the US with 2–40 years of practice experience
- Psychiatrists were included if they spent ≥50% of their time devoted to direct patient care in a hospital or institutional setting, currently managed at least five patients with MDSI per month, and had active involvement in determination of inpatient treatment plans and discharge planning
- Quotas were used to ensure that a geographical balance was maintained among respondents (based on Census data) and the views of respondents from teaching as well as non-teaching hospitals were captured

Survey structure

- Screening questions ensured that respondents met the eligibility criteria and also captured sociodemographic data
- Training questions were included to provide definitions of the attributes and levels and to introduce respondents to how to complete the choice task
- The first phase of the CBC exercise consisted of a choice between three randomly generated profiles to determine the patient profile that the respondent considered the most appropriate candidate for discharge. Respondents were each shown 10 pages, each containing three patient profiles and asked to choose the most appropriate profile for discharge. The impact of attribute importance in the clinician discharge decision was then assessed
- In the second phase of the CBC, respondents were asked when a specific patient admitted with MDSI would be ready for discharge (today, within the next 24, 48, or 72 hours, or unlikely within the next 72 hours) based on the attribute levels provided in randomly generated patient profiles. Respondents were each shown 10 pages, each containing one patient profile and asked to choose one of the five timeframes for discharge. The impact of changes in attribute levels on discharge timeframe was then assessed

Statistical analysis

- The relative importance of each attribute was calculated using a multinomial logit model. Percentages were calculated from relative ranges, thereby obtaining a set of attribute importance values that, when scaled, sum to 100 percent
- Attribute importance was calculated for respondents individually and averaged across the group and ratio-scaled, thereby allowing a direct comparison of the importance of the attributes
- In order to analyze the data, utilities were scaled to sum to zero within each attribute. This allowed a negative (less preferred) utility to decrease, and a positive (more preferred) utility to increase the total utility of each individual attribute
- Internal validity was assessed by a goodness of fit statistic for the choice data of each individual respondent

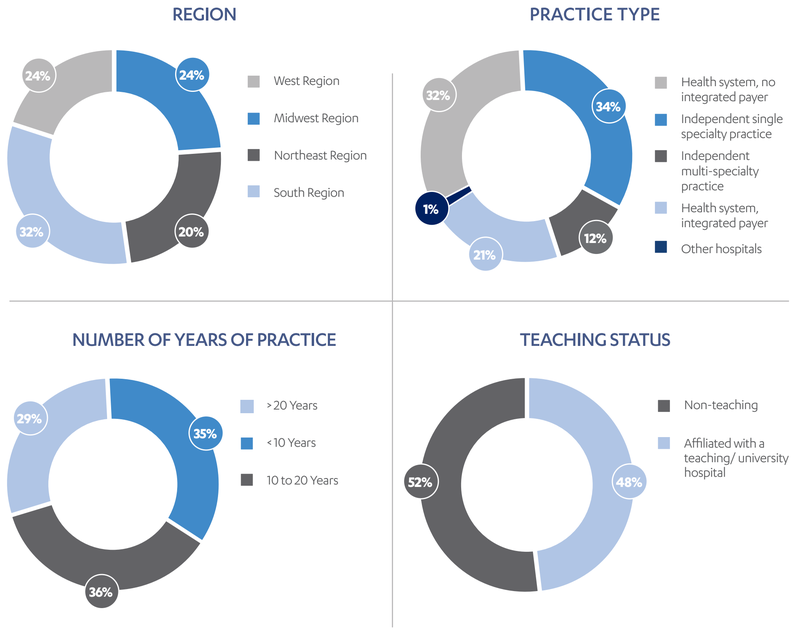
RESULTS

- A sample of 100 psychiatrists, who were actively managing inpatients admitted for suicidal ideation with intent, from a pool of 659 who responded to an electronic mail invitation to participate in the survey was used

Respondent demographics

- Respondents represented all four Census regions (Northeast, Midwest, South, and West) with comparable proportions (Figure 1)
- Approximately half of the sample worked in a teaching/university hospital and mean (standard deviation) practice experience was 14.5 (8.5) years

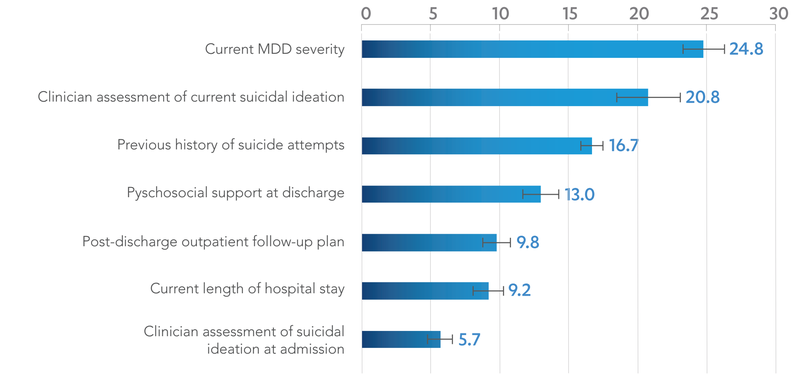
Figure 1: Baseline characteristics of psychiatrists who completed the survey



Relative importance of attributes in discharge decision-making process

- No single attribute exceeded 25% in relative importance, indicating that no single attribute was overwhelmingly contributary (Figure 2)
- The three most important attributes were: current MDD severity (24.8%), current suicidal ideation (20.8%), and previous history of suicide attempts (16.7%). Combined, these three attributes accounted for nearly two-thirds (62.3%) of the decision
- The degree of suicidal ideation at admission had the smallest impact (5.7%) of all tested attributes

Figure 2: Relative importance of the seven attributes included in the conjoint analysis

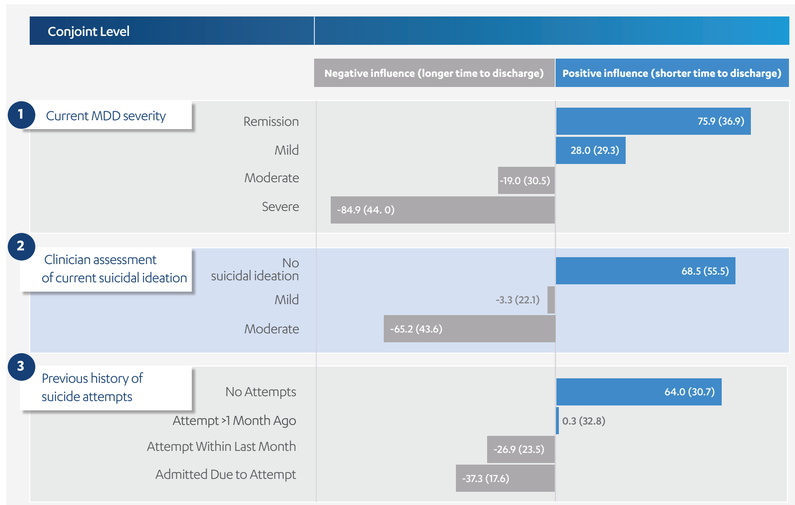


Abbreviations: MDD, major depressive disorder.Error bars indicate 95% confidence interval. Attribute importance scores total 100%. Attribute and factor level definitions displayed in Table 1.

Utility scores

- The respective utility scores for each attribute level are summarized in Figure 3, with positive scores indicating a shorter time to discharge and negative scores indicating a longer time to discharge

Figure 3: Utility scores†



Abbreviations: Appt., appointment; MDD, major depressive disorder. Ranked utility scores are presented as mean (standard deviation). Within any given category, they sum to zero but, as presented here, may not sum to zero due to rounding.

- Factors with a strong positive influence (utility score ≥20) corresponding to a shorter time to discharge were: remission (75.9) or mild (28.0) MDD severity, no current suicidal ideation (68.5), no previous history of suicide attempt (64.0), home and community psychosocial support (31.8), and frequent outpatient follow-up post discharge (28.3)
- Factors with a substantial negative influence (utility score ≤−20) corresponding to a longer time to discharge were: severe MDD (−84.9), moderate current suicidal ideation (−65.2), no community or home support (−42.4), admitted due to suicide attempt (−37.3), and limited outpatient follow-up post discharge (−28.3)

Internal validity of willingness to discharge model

- The actual choices made by respondents were compared with the estimated choices based on the mathematical model in order to determine the goodness of fit of the model as a method of testing the internal validity of the model and were in good agreement with a pseudo R^2 value of 0.7221

Projected time to discharge

- The impact of changes in specific attribute levels on psychiatrist-reported time to discharge was explored using three example patient scenarios shown in Table 2
- All three patient profiles shown had the same poor prognostic factors for discharge (severe suicidal ideation at admission and admitted due to a suicide attempt) and positive prognostic factors (supportive psychosocial support, a comprehensive follow-up plan, and completely resolved suicidal ideation); the remaining attributes (current MDD severity and LOS) varied between the three profiles
- Results show that improvement in MDD severity substantially reduces projected time to discharge:
  - In scenario 1, the patient achieves MDD remission at day 3 of the current hospital stay whereas, in scenario 2, the patient has severe MDD at day 3, resulting in an increased projected time to discharge of 1.36 days compared with scenario 1
  - In scenario 3, the patient does not reach MDD remission until day 9, compared with day 3 in scenario 1. This results in a reduction of 0.46 days in the projected time to discharge following achievement of MDD remission but, in total, an increase of 5.54 days in time to discharge

Table 2: The impact of changes in specific attribute levels on discharge timeframe

Attribute	Scenario 1	Scenario 2	Scenario 3
Clinician assessment of suicidal ideation at admission	Severe suicidal ideation	Severe suicidal ideation	Severe suicidal ideation
Clinician assessment of current suicidal ideation	No suicidal ideation	No suicidal ideation	No suicidal ideation
Previous history of suicide attempts	Admitted due to attempt	Admitted due to attempt	Admitted due to attempt
Current MDD severity	**Remission**	**Severe MDD**	**Remission**
Psychosocial support at discharge	Home and community support	Home and community support	Home and community support
Post-discharge outpatient follow up plan	2 visits per week for 3 weeks	2 visits per week for 3 weeks	2 visits per week for 3 weeks
Current length of hospital stay	**3 days**	**3 days**	**9 days**
Average discharge time	**2.28 days**	**3.64 days**	**1.82 days**

Abbreviations: MDD, major depressive disorder.

DISCUSSION

- To our knowledge, this is the first study analyzing the discharge decision-making process of psychiatrists with respect to patients with MDSI
- The results reveal that the most important modifiable attributes considered by psychiatrists when making the decision to discharge a patient are the current severity of symptoms of MDD and clinician-assessed presence of suicidal ideation
- In the time to discharge analysis, reductions in current MDD severity from severe MDD to remission of MDD substantially reduced projected time to discharge
- Encouragingly, the factors which psychiatrists cited as most likely to influence discharge decision making (depression severity and suicidal ideation) do have predictive value for suicide in the immediate post-hospital period [8, 9]

LIMITATIONS

- In order to focus on the clinical aspects of the discharge decision, the list of attributes included in the current study did not include financial or budgetary considerations, which likely may also contribute to the decision-making process in real-world clinical practice. The current analysis may be considered to represent decisions made in an environment in which psychiatrists can assess the clinical and support needs of patients without the confounding influence of financial considerations
- Self-selection of psychiatrists willing to respond to this survey may be a potential source of inherent bias and may limit the generalizability of the study respondents to the wider group of practicing psychiatrists

CONCLUSION

- **Current level of symptoms of MDD, including overall depression severity and clinician-assessed presence of suicidal ideation, were the most important attributes that psychiatrists reported considering when discharging patients hospitalized with MDSI**
- **To our knowledge, this is the first study using CBC analysis to explore discharge decisions for patients hospitalized with MDSI. Further research should be conducted to determine whether treatment approaches targeting modifiable attributes (e.g. MDD symptom severity and suicidal ideation) could optimize the care of these patients thereby allowing them to successfully return to their everyday lives with improved function, reduced risk of relapse and readmission, and decreased healthcare costs for the health system involved in and with the treatment of depression**

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