High Scores on the Montgomery-Åsberg Depression Rating Scale and Psychotic Symptoms Predict Suicide:

A Prospective Cohort Study of Psychiatric Acute Ward Patients

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ABSTRACT

Objective: To investigate the role of depression severity in suicide risk by studying the predictive value of psychotic symptoms and depression scale scores, controlled for suicidal behavior and gender.

Methods: We conducted a prospective cohort study of consecutive psychiatric acute ward admissions between 2005 and 2014 from a Norwegian catchment area. Inclusion criteria were an *ICD-10* diagnosis of unipolar or bipolar depression with a current depressive episode (n = 1,846); depression severity was measured by the Montgomery-Åsberg Depression Rating Scale (MADRS). Patients were assessed for suicidal ideation/planning, self-harm, and recent suicide attempts on admission. Mean follow-up time was 5.5 years (minimum/maximum: 0/10.6 years). We used Cox regression analyses and Kaplan-Meier analyses to explore potential predictors and time to suicide.

Results: During the follow-up period, 46 patients died by suicide, 30 (65%) of these within the year following admission. Psychotic depression ($P = .014$), admission MADRS score ($P = .006$), suicide attempts ($P = .021$), and male sex ($P = .043$) significantly predicted suicide. Suicidal ideation and self-harm did not predict suicide. The cumulative suicide risk in psychotic depression was 1.7% after 12 weeks and 3.0% after 52 weeks.

Conclusions: Depression severity as measured with the MADRS or a diagnosis of psychotic depression independently predicted suicide. More suicides may be prevented by implementing intensive treatment and post-discharge follow-up for patients who present to psychiatric acute wards with severe depressive episodes and recent suicide attempts, regardless of self-reported suicidal ideation, suicide plans, and self-harm.

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According to the World Health Organization, nearly 800,000 people die every year from suicide.[1] Despite decades of research and clinical efforts in developing treatment and general security measures, suicide rates for inpatients and for those post-discharge remain very high.[2,3] At present, our ability to predict suicide in emergency departments is close to chance, due to lack of studies with representative samples with short-term follow up.[4,5]

A recent review[6] found that 18.3% of persons who died by suicide had made contact with inpatient mental health services the year before suicide. This fact motivates research on high-risk inpatient groups, as we desperately need more knowledge on how to prioritize inpatient admissions, and on post-discharge follow-up in order to save lives. Suicidal behavior (patients' self-report of suicidal ideation/plans, self-harm, and previous suicide attempt) is a common reason for acute admittance to hospital.[7,8] Previous suicide attempt is identified as a crucial risk factor for suicide.[3,4,9–11] However, although there is evidence for suicidal ideation as a valid predictor for suicide in non-psychiatric populations and well as for those with schizophrenia and for mixed psychiatric patients,[4,12] evidence from acutely admitted inpatients[13] and those with affective disorders[12,14] is scarce. Depression is the strongest diagnostic predictor of suicide,[15,16] while prior psychiatric hospitalization is the strongest general predictor of suicide.[4] Inpatients with a depressive episode as part of a unipolar or bipolar disorder are particularly at risk, especially during the first week of admission and after discharge.[3,6,8,17,18] Clinical cohort and case-control studies[9,10,19] indicate that suicide risk increases alongside the severity of a depressive episode as measured by diagnosis of depression severity. However, depression severity as assessed by depression rating scales is understudied as a suicide predictor.[20,21] The Montgomery-Åsberg Depression Rating Scale (MADRS)[22] is used extensively worldwide to assess severity of depression in both research and clinical

Clinical Points

- Suicide was predicted by both depression severity as assessed by a rating scale and the presence of psychosis. However, self-reported suicidal ideation, suicide plans, and self-harm failed to predict suicide.
- Male sex and suicide attempts predicted suicide.
- Acutely admitted patients with depression remain at high risk of suicide both during hospitalization and post-discharge.

settings, yet any relationship between MADRS scores and suicide risk remains unexplored.[20]

The *ICD-10* classification of mental and behavioral disorders[23] defines psychotic symptoms as both a subtype and a marker of severity in depressive episodes. Episodes of psychotic depression include the presence of delusions or hallucinations, often with mood-congruent content such as guilt and worthlessness.[24,25] Researchers have hypothesized that psychotic processes may transform suicidal thoughts to suicidal acts in depressed patients.[26–28] However, the impact of psychotic symptoms on suicide risk in the first year after a depressive episode as part of a unipolar or bipolar disorder remains poorly understood. Systematic studies of depression with psychotic features are limited, as these patients are often excluded from clinical studies,[29,30] and psychotic depression is challenging to diagnose correctly.[28] A recent review of unipolar psychotic depression[31] reports only 3 dated studies of small study populations with less than 1-year follow-up, of which 2 reported inconclusive findings.[32,33] The third cross-sectional study, from 1983,[27] retrospectively reviewed all inpatient suicides (n = 14) associated with unipolar endogenous depression at the New York State Psychiatric Institute over a period of 25 years. The authors retrospectively assigned diagnoses and included 42 participants, 19 with delusions and 23 without delusions. Patients with delusions were 5.3 times more likely to die by suicide during their hospital stay than those without psychosis.[27] Comparable short-term risk estimates of bipolar psychotic depression do not exist, to our knowledge. The majority of studies have looked at suicide risk in unipolar depression over longer time intervals up to 40 years, with results ranging from insignificant to elevated suicide risk associated with psychotic symptoms.[9,11,31,34,35] Through our own qualitative studies of inpatients with severe unipolar or bipolar depressive episodes and psychotic symptoms,[26,36] we found that suicidal behavior was underreported and impulsive in patients with psychotic depression. Acute psychotic episodes are associated with poorer daily functioning, neuropsychological deficits, and increased levels of stress hormones,[37–39] which strengthens our hypothesis that increased suffering and impulsive behavior exacerbate acutely increased suicide risk. However, it is difficult to disentangle the effect of psychotic symptoms per se from the effect of more severe overall depressive symptoms.[11]

In the present study, our aim was to investigate whether depression severity assessed by MADRS sum score in combination with diagnoses of psychotic depression predicts suicide. We added recent suicide attempts and male sex into the model, as both are well-established risk factors for suicide.[3,4,9–11] Suicidal behavior is a risk factor for completed suicide, and suicidal ideation and self-harm were also included in our model in addition to actual attempts. We investigated whether there was an association between time from assessment to suicide according to depression severity, as this possible association is highly clinically relevant for improving suicide risk assessments.

METHODS

Setting

This study was part of the prospective cohort study Suicidality in Psychiatric Emergency Admissions run by the Department of Psychiatry, Haukeland University Hospital, Norway.[40] The Norwegian psychiatric health care system is catchment area–based and publicly funded. There are no privately run acute inpatient facilities. Haukeland University Hospital covers a population of approximately 400,000.

Participants

The cohort consisted of 7,000 patients consecutively admitted to the Psychiatric Emergency Department at Haukeland University Hospital from May 2005 to June 2014. Patients were included in the study if they had been acutely admitted and fulfilled the *ICD-10* criteria for a depressive episode as part of unipolar or bipolar disorder as a primary or secondary diagnosis (*ICD-10* codes: F31.3, F31.4, F31.5, F32.0, F32.1, F32.2, F32.3, F33.0, F33.1, F33.2, and F33.3). In cases with several admissions during the study period, we used data from the most recent admission. Patients with a primary or secondary diagnosis of F20–F29 (schizophrenia, schizotypal, and delusional disorders), and patients with a diagnosis of F31.8 (other bipolar disorders), which does not include a psychosis subspecifier, were excluded from the study. In total, 1,846 patients were included in the study.

Assessments

Clinicians and trained research assistants collected and coded demographic and clinical data. Clinical diagnoses were assessed according to *ICD-10* criteria[23] at admission.

Clinicians made qualitative assessments of current suicidal behavior over the past 7 days using a standardized rating form in which only 1 of the following items (the most severe) could be rated positive: no suicidal ideation, passive death wishes, suicidal ideation, suicide plans made, self-harm without suicidal intent, and suicide attempt. Suicide attempt would be considered the most severe, and no suicidal ideation would be considered the least severe.

All available information was used to complete this, including the patient's self-report, information from referring physicians, and information from any known somatic hospital admissions for suicide attempts or self-harm.

Intake clinicians rated symptom severity using the MADRS, which consists of 10 items rated for severity on an ordinal scale ranging from 0 to 6.[22] The total score may be seen as indicating mild (12–20), moderate (21–29), or severe depression (≥ 30). The observation time for the MADRS was the previous 72 hours. The MADRS is used extensively worldwide in clinical research to assess severity of depression, with sound reliability and validity.[41–43] Clinicians who were involved in the assessment of patients at admission underwent training in the MADRS and rating of suicidal behavior.

Suicide as Primary Outcome

We obtained suicide data by linking each patient's 11-digit birth number to the Norwegian Cause of Death Registry (CDR) up to December 31, 2015, representing a mean and maximum follow-up time of 5.5 and 10.6 years, respectively. The CDR contains information about Norwegian residents regardless of geographic location of death and has a completeness rate of > 98%.[44]

Statistical Analyses

Descriptive analyses were used to explore clinical and demographic features at admission and group differences. We used Cox regression analyses to investigate 6 predictor variables (depression with psychosis vs non-psychotic depression, reporting suicide ideation/plan, non-suicidal self-harm, suicide attempt, men vs women, and MADRS sum score), included in the first step based on a priori hypotheses. The variable measuring passive death wishes was entered in a second step. The inclusion of this variable failed to statistically significantly improve the model; thus, we report only the results from the first step. Correlation analyses of predictor variables indicated that multicollinearity was not present. Figure 1 was based on the Cox regression.

We linked patient's birth number to the CDR regarding death by suicide. Follow-up time from first admission to censor date when the last suicide in the study occurred in the mortality registry was 553 weeks (10.6 years).

Time to suicide was analyzed using the Kaplan-Meier method to compare the number of suicides in non-psychotic depression versus psychotic depression. In a subanalysis including only patients diagnosed with a severe depressive episode as part of a unipolar or bipolar disorder, we used the Kaplan-Meier Wilcoxon test to compare those with psychosis to those without.

All tests were 2-tailed, and a P value < .05 was considered statistically significant. We used SPSS software (v. 24; IBM SPSS; Armonk, New York) for all analyses.

Table 1. Demographic and Clinical Characteristics of the Patient Sample (N = 1,846)[a]

Characteristic	Value
Demographic	
Age at most recent episode in the inclusion period, mean (SD), y	43.7 (17.4)
Male	849 (46.0)
Paid employment/student loans/pension[b]	725 (40.5)
Private housing[c]	1,528 (83.1)
Education level	
Not completed 12 years	10 (0.6)
Completed 12 years of school	1,306 (75.6)
Completed higher education (3 years or more)	412 (23.8)
Clinical	
MADRS sum score, mean (SD)	30.7 (8.8)
Length of stay, days, mean (SD)	33.0 (74.4)
Suicidal ideation/behavior at admission[d]	
No suicidal ideation/behavior	245 (13.3)
Passive death wishes	251 (13.7)
Suicidal ideation	473 (25.8)
Made a suicide plan	411 (22.5)
Non-suicidal self-harm	204 (11.1)
Suicide attempt	222 (12.1)
Unknown suicidal ideation/behavior	24 (1.3)
Diagnosis according to *ICD-10*	
Bipolar disorder	
Current episode depressed, mild or moderate severity (F31.3)	121 (6.6)
Current episode depressed, severe without psychotic features (F31.4)	60 (3.3)
Current episode depressed, severe with psychotic features (F31.5)	45 (2.4)
Major depressive disorder	
Single episode, mild (F32.0)	113 (6.1)
Single episode, moderate (F32.1)	540 (29.3)
Single episode, severe without psychotic features (F32.2)	216 (11.7)
Single episode, severe with psychotic features (F32.3)	126 (6.8)
Recurrent, mild (F33.0)	94 (5.1)
Recurrent, moderate (F33.1)	295 (16.0)
Recurrent, severe without psychotic features (F33.2)	175 (9.5)
Recurrent, severe with psychotic symptoms (F33.3)	61 (3.3)

[a]Data are n (%) values unless specified otherwise. The following variables had missing data: paid employment/student loans/pension (n = 56, 3%), private housing (n = 7, 0.4%), education level (n = 118, 6.4%).
[b]Others: social benefits including unemployment benefits, sickness benefits.
[c]Others: institution/supervision, temporary housing (hospice/asylum centers/prison/custody/homeless).
[d]Information on suicide ideation/behavior is missing for 16 admissions in addition to the 24 admissions scored unknown. Thus, the total number of depressed patients with valid suicide scores is 1,830.
Abbreviation: MADRS = Montgomery-Åsberg Depression Rating Scale.

Ethics

The Regional Committee for Medical Research Ethics (REK 2009/1057) and the Norwegian Social Science Data Service (NSD 11237) approved the study. The Norwegian Directorate of Health Care (SHDIR 07/2558) authorized the use of patient information.

RESULTS

Demographic and clinical characteristics of the study population are described in Table 1. There were 46 deaths by suicide in the total study sample of 1,846 included patients during the follow-up time. Significant predictors of suicide during the follow up time were psychosis, male sex, recent suicide attempt, and 5-point sum score increase in MADRS (Table 2).

As the Cox regression analysis indicated the MADRS sum score to be a significant predictor of suicide, we compared MADRS sum scores between patients who died by suicide (mean [SD] = 34.10 [8.5]) to the scores of those who did not (mean [SD] = 30.44 [8.2]). Group level sum scores differed significantly (P = .003).

Table 2. Potential Risk Factors for Suicide Among Inpatients (N = 1,846) Diagnosed With a Depressive Episode After a Mean Follow-Up Time of 5.5 Years[a]

Potential Risk Factor	Hazard Ratio	95% CI	*P* Value
Depressive episode with psychosis	2.39	1.19–4.81	.014
Suicidal thoughts/plans	1.36	0.58–3.16	.480
Non-suicidal self-harm	2.10	0.73–6.07	.172
Suicide attempt	3.00	1.18–7.62	.021
Male	1.84	1.02–3.32	.043
MADRS score (5-point sum increase)[b]	1.31	1.08–1.58	.006

[a]Analysis of association between potential risk factors and completed suicides (n = 46): Cox regression with risk expressed as hazard ratio.
[b]5-Point sum increase on the MADRS; overall score range, 0–60 points.
Abbreviation: MADRS = Montgomery-Åsberg Depression Rating Scale.

Table 3. Death by Suicide (n = 46)[a] in Patients With Non-Psychotic Depression Versus Psychotic Depression (Kaplan-Meier Results)

	Depressive Episode Without Psychosis (n = 1,614)		Depressive Episode With Psychosis (n = 232)	
Weeks After Admission	Suicide (cumulative n)	Suicide Rate (cumulative %)	Suicide (cumulative n)	Suicide Rate (cumulative %)
1	1	0.06	1	0.4
4	6	0.4	1	0.4
12	11	0.6	4	1.7
26	12	0.7	6	2.6
52	23	1.4	7	3.0
104	28	1.7	7	3.0
553	35	2.2	11	4.7

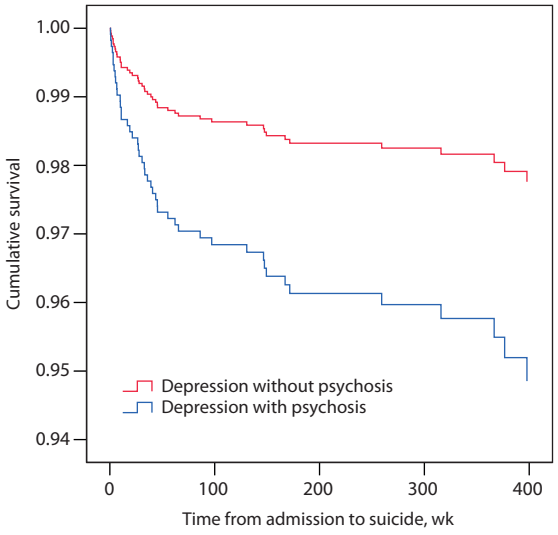
[a]Includes inpatient and post-discharge suicides.

Depression severity and risk of suicide were examined further by grouping participants according to severity of *ICD-10* diagnoses. Patients diagnosed with a mild/moderate depressive episode (n = 1,163, 63% of patients) had a suicide risk of 1.7%, while patients with a severe depressive episode (n = 451, 24.4% of patients) without psychosis had a suicide rate of 3.3% compared to 4.7% for those with psychosis (n = 232, 12.6% of patients). However, Wilcoxon test including only patients diagnosed with a severe depressive episode found no significant difference in suicide risk between those with psychosis and those without ($P = .356$). We found no significant differences in suicide risk between unipolar and bipolar groups ($P = .77$).

A higher proportion of patients with psychotic depression died by suicide than those without psychotic symptoms at every follow-up point except after 4 weeks (Table 3 and Figure 1). The 1-year suicide risk rate in psychotic depression was 3%. Suicide rates were especially high the first year following admission in the total study population, constituting 65% (n = 30) of all completed suicides. Although the curve stabilized somewhat after this, the continuing fall represents a long-term stable number of suicides.

Of patients diagnosed with psychotic depression, 30.8% reported no suicidal ideation (vs 11.0% without psychotic symptoms), 14.7% reported passive death wishes (vs 13.6%), 22.3% reported suicidal ideation (vs 26.3%), 9.8% reported suicide plan (vs 24.2%), 10.3% reported self-harm (vs 11.3%), and 9.8% (vs 12.5%) reported suicide attempt. We found that on a group level, patients with psychosis were

Figure 1. Cox Regression Curve of Survival Function of Suicide After Admission According to Type of Depressive Episode at Hospitalization[a]



[a]Figure 1 was based on the Cox regression analysis.

significantly less likely to report suicidal behavior (including suicidal thoughts, suicide plans, self-harm, and suicide attempts) at the time of admission compared with those without psychotic symptoms ($P < .001$), and they also had a significantly longer mean (SD) length of stay ($P < .001$; (65.5 [110.53] days vs 28.3 [66.46] days).

DISCUSSION

The main finding of this study was that severity of depression as measured by MADRS sum score and a diagnosis of psychotic depression at admission both independently predicted suicide in a sample of 1,846 consecutively admitted patients with a depressive episode. We also found that a higher proportion of patients with psychotic depression died by suicide as compared to the group without psychotic symptoms at every follow-up point.

Our finding that MADRS-assessed depression severity is a predictor of suicide is not easily compared to existing findings on depression scales and suicide risk.[21,45,46] This is because no studies have previously assessed the predictive validity of either the MADRS suicidality item or the MADRS sum score in suicide risk evaluation.[20] Also, existing studies of depression rating scales have investigated samples unrepresentative of psychiatric inpatients.[21,46] However, two studies of the Beck Depression Inventory (BDI) have found the pessimism item to predict suicide in samples including inpatients: Beck et al[47] included 207 inpatients in a mixed diagnostic sample with 14 suicide deaths at up to 10 years follow-up, and Oquendo et al[48] studied 308 patients, of whom 80% were inpatients, with major depressive disorder or bipolar disorder with 4 suicides at 2-year follow-up. Results from these BDI studies,[47,48] alongside our own MADRS-related findings, highlight the need for future studies to

examine depression scales as clinical tools for suicide risk assessment.

However, the extent to which the MADRS sum score provides predictive suicide risk information beyond simply providing an accurate assessment of depression severity is still uncertain. In our study, we also found a dose-response effect of baseline *ICD-10* severity criteria for depression on risk of suicide. These results are in accordance with those of other studies tracking hospitalized patients with a depressive episode.[9,11,49] More research is needed to elucidate any distinction between these two indicators of depression severity. However, we believe that a MADRS score gives a more detailed description of the symptomatic load than do the *ICD-10* severity criteria, given that each symptom is rated separately. This information may be valuable when planning an individual treatment plan.

Interestingly, we found no difference in death by suicide when comparing those with and without psychosis from within the group with severe depression. This finding is contrary to those of a recent review and meta-analysis,[31] which found increased risk of suicide in unipolar psychotic depression. Our finding may be due to type 2 error given the small size of the sample. However, results are in line with those of a registry-based Danish prospective cohort study of unipolar severely depressed patients in which psychotic depression was not found to be an independent risk factor.[15] Also in our study, diagnoses were not mutually exclusive, and the same person may have received both diagnoses during the follow-up, thus potentially disguising potential between-group differences. Diagnostic instability is a common weakness in longitudinal studies, including ours, as we used the diagnoses at last admission in the inclusion period. Such instability makes it difficult to examine the specific ways in which psychotic symptoms induce suicidal behavior, as the symptoms are subtle and intermittent.[28] This is especially pertinent given that we do not have access to information about each participant's clinical state at the time of suicide.

We found independent effects of suicide risk both for depression severity as assessed by MADRS sum score and for psychotic symptoms. Previous findings in this area are equivocal, with some authors[10,11] arguing that psychotic symptoms are associated with more severe depressive symptoms while several other studies[50–53] have found weak or missing correlations between depression severity and occurrence of psychotic symptoms. These differing findings suggest individual variation in susceptibility to psychotic symptoms rather than depression severity as the sole determinant.

Our results, including data showing that duration of stay increases when psychotic symptoms are present, may indirectly support findings that severe depressive episodes predict longer episode duration and recurrence of future episodes,[54–56] which in turn result in more time spent across the lifespan in a state of clinically elevated suicide risk. High levels of residual symptoms at discharge may also be one reason for post-discharge suicide and increased short-term risk.[26,36] One review[34] also suggests that more persistent symptoms may play a role in elevating the risk of suicidal behavior after a psychotic episode. Our results regarding suicide risk in psychotic depression after 1, 4, 12, and 26 weeks are again not comparable to those of other studies. Although 3 somewhat similar studies exist, they are quite dated and look at unipolar psychotic depression report measuring points after 1-year follow-up or less,[34] ie, study a different timeframe. However, our results do indicate elevated risk across short-time follow-up for inpatients with psychosis as compared to patients without psychosis, similar to the sole existing study by Roose et al[27] with conclusive findings.

We found that the rate of suicide at mean 5.5-year follow-up (minimum/maximum: 0/10.6 years) was more than twice as high in inpatients diagnosed with psychotic symptoms during their depressive episode as compared to the rate in patients without psychosis. Because our sample included both bipolar and unipolar patients, suicide rates in this study are not directly comparable to those of other studies. Results are, however, in line with those of a systematic review and meta-analysis[31] reporting that patients with unipolar psychotic depression have increased risk of suicide, both during lifetime and in the acute phase, as compared to patients with non-psychotic depression. We found no significant differences in suicide risk between unipolar and bipolar groups. Our findings regarding suicide rates for psychotic depression may add knowledge to bipolar research, in which suicide remains severely underexplored.[57]

Consistent with existing findings,[6,10,11,35,58] we found male sex and suicide attempts directly preceding admission to predict suicide. When asked routine questions to assess suicidal intent, 884 (48.2%) of the participants reported suicidal ideation/plans, but these self-reports did not predict suicide. Systematic assessment of suicidal behavior at admission (including suicidal ideation/plans, passive death wishes, self-harm, and suicide attempt) in all consecutively admitted acute ward patients has, to our knowledge, never previously been conducted in a prospective study. Suicidal ideation is one main suicide predictor in prospective studies,[4] but many clinical studies lack a control group presenting self-reports of suicide survivors,[8] and we do not know which factors predict the transition from suicidal thoughts to completed suicide.[59] Several other studies of mixed diagnostic samples have described that patients may not disclose their suicidal ideation to clinicians.[60–63] Despite reporting less suicidal ideation/planning on admission, patients with psychotic depression were at increased risk of suicide. This is interesting given our previous qualitative findings of patients with psychotic depression indicating that they may underreport suicidal behavior due to hindrances such as shame, paranoid ideas, and impulsivity,[26,36] which may obstruct appropriate interventions. It is possible based on these findings combined that the nature of psychosis, which often entails sudden and unpredictable changes in affective state or behavioral intent, as well as paranoia is motivating a higher level of underreporting than in other patient groups.

Strengths and Limitations

Notable strengths of this study are the inclusion of a broad and clinically representative high-risk population of acutely admitted patients who were not selected by the presence of suicidal ideation or behavior, its prospective design, and the more accurate measurement of depression severity at baseline by MADRS sum score. The completeness of the Norwegian CDR made it possible to identify and follow every patient after discharge. In Norway, contact rates with mental health services have been found to be above 40% in the year before suicide.[6] We thus ostensibly have clinical data on a relatively large proportion of suicide victims in our catchment area. Our follow-up points of the effect of psychotic symptoms on suicide risk in the first year after a depressive episode as part of a unipolar or bipolar disorder is a strength, and to our knowledge this has not been studied before.

One limitation is that the absolute number of suicides (46) in our sample prevented us from completing interaction analyses between significant predictors. The cohort is smaller and number of events fewer than in register-based studies,[9,15] which may result in incidental findings. This also meant we were unable to explore several potential risk factors or protective factors for suicide that may be pertinent, including age, socioeconomic status measured by educational level, paid employment, and being married/cohabiting. A larger study sample may have allowed us to combine identified predictors of suicide in this study to identify and study a potentially ultrahigh-risk group. It should be noted that our study evaluated and coded suicidal behavior only during patients' stay in the acute unit, and patients may have reported more suicidal thoughts/behaviors at a later stage during their admission. Our findings should thus be generalized to those from other non-acute, longer-term settings with caution.

Diagnoses in this study were made by practicing clinicians in an acute ward, making diagnostic imprecision more likely. Clinicians may also fail to identify psychotic symptoms in major depression due to the psychosis's being subtle, intermittent, or concealed.[28] Interrater reliability for diagnostics and the MADRS was not assessed due to the practical limitations of a naturalistic setting.

Clinical Implications

Patients with depression are repeatedly shown to be the largest diagnostic group associated with suicide risk. High MADRS scores and/or psychotic symptoms during hospital treatment may indicate an ultrahigh risk group. This may especially be the case in patients who are male and have previously attempted suicide.

However, patients with psychotic symptoms were significantly less likely to report suicidal behavior (including suicidal thoughts, suicide plans, self-harm, and suicide attempts), despite being at elevated risk of suicide both short-term and long-term.

Contrary to common clinical beliefs, suicidal ideation, self-harm, and suicidal plans did not significantly predict suicide. Denial of suicidal ideation, which in the case of some patients may be motivated or exacerbated by psychotic symptoms or exceptionally high symptom load, may mislead clinicians to wrongly assess suicide risk as low. Clinicians therefore cannot and should not rely solely on patients' self-report of suicidal ideation in the presence of psychotic symptoms.

It is in our opinion thus unviable that any universal, structured suicidal risk assessment tool would successfully identify suicide risk across clinical settings. Suicide risk assessment, especially in high-risk groups as those reported in this article, should mainly be based on regular clinical evaluations both during hospital treatment and after discharge. Depressive symptoms and psychotic symptoms may, however, be modifiable during admission and after discharge and as such be relevant target points for both interventions and future risk assessment tools. On the basis of our findings that 65% of completed suicides occurred the first year following admission, we suggest applying symptom-focused treatment approaches both during hospitalization and after discharge.

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Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Suicide section. Please contact Philippe Courtet, MD, PhD, at pcourtet@psychiatrist.com.