Preplanned Studies

Suicide Risk and Its Associations with Psychiatric Symptoms and Sleep Disturbances in Schizophrenia Inpatients — Henan, Hebei, and Shandong Provinces and Beijing Municipality, China, 2019–2022

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Summary

What is already known about this topic?

Suicide behaviors are prevalent among inpatients with schizophrenia. However, the relationships between psychiatric symptoms, sleep disturbances, and suicide risk remain poorly understood in these high-risk populations.

What is added by this report?

In a study of 672 schizophrenia inpatients across 9 hospitals in 4 Chinese provinces, the prevalence of suicide risk was 22.3% [95% confidence interval (*CI*): 19.3%, 25.6%]. The study identified significant associations between suicide risk and multiple clinical factors, including poor sleep quality, depressive symptoms, anxiety symptoms, and other psychiatric manifestations such as thinking disorder and activation.

What are the implications for public health practice?

Understanding the common sleep-related and psychiatric factors associated with suicide risk in hospitalized schizophrenia patients will enable clinicians and policymakers to better identify clinical risk indicators and enhance the quality of suicide prevention and treatment programs.

Schizophrenia represents a severe mental disorder with substantial global disease burden. According to the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019, more than 20 million people worldwide live with schizophrenia, with the condition accounting for 12.2% of disability-adjusted life years across all mental disorders (*1*). The disorder exhibits a strong association with suicide (*2*), with lifetime prevalence rates of 26.8% for suicide attempts and approximately 5% for suicide deaths among individuals with schizophrenia (*3*). Identifying patients at risk of suicide to enable targeted interventions remains a significant clinical challenge. While extensive research has examined suicide risk factors in schizophrenia patients, the relationships between psychiatric symptoms, sleep disturbances, and suicide risk remain poorly understood in hospitalized populations. Notably, hospitalized patients face particularly high suicide risk, with approximately one-third of suicide behaviors in schizophrenia patients occurring during hospitalization or within one week of discharge, and elevated risk persisting throughout the first post-discharge year (*2*). This underscores the critical importance of suicide risk assessment at admission. This study investigated suicide risk patterns in hospitalized schizophrenia patients and identified associated factors across comprehensive psychopathological dimensions, including multiple psychiatric symptom domains and sleep disturbances. The findings indicate higher suicide risk prevalence among schizophrenia inpatients experiencing psychiatric symptoms and sleep disturbances. These results suggest that systematic evaluation and intervention targeting these symptoms may help guide clinical practice and improve suicide risk management in this population.

This cross-sectional study employed convenience sampling to recruit schizophrenia inpatients from nine hospitals across Beijing Municipality and Henan, Hebei, and Shandong provinces in China from August 2019 to July 2022. The Ethics Committee of Peking University Sixth Hospital approved the protocol (No. 2019-18), and all participants provided written informed consent. Eligible participants met the International Classification of Diseases (tenth edition) diagnostic criteria for schizophrenia, confirmed by the Mini-International Neuropsychiatric Interview (M.I.N.I.). Inclusion criteria required participants to be 18 years or older, have at least primary education, and score 20 or higher on the Mini-Mental State

Examination (MMSE). Exclusion criteria encompassed severe cardiac, hepatic, nephritic, or respiratory dysfunction and other serious diseases. This study collected general demographic data and clinical characteristics. Psychiatric symptoms were evaluated using the Brief Psychiatric Rating Scale (BPRS), an 18-item scale ranging from 18 to 126 points, with higher scores indicating greater symptom severity. The BPRS comprises 5 factors: withdrawal-retardation, thinking disorder, anxious-depression, hostile-suspiciousness, and activation. Depressive and anxiety symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) self-rated scales, respectively. Sleep disturbances were evaluated using the Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS), while cognitive performance was assessed using the Montreal Cognitive Assessment (MoCA). Suicide risk was categorized as none, mild, or moderate to severe based on scores from the M.I.N.I. (version 6.0) suicide module, administered by uniformly trained psychiatrists. The primary outcome was current suicide risk, defined as mild, moderate, or severe risk. Secondary outcomes included current suicidal ideation, suicide plan, and suicide attempt in the past month, as determined by specific questions in the M.I.N.I. suicide module. Of 714 invited inpatients, 672 participants (94.1% response rate) provided valid data and were included in the final analysis.

Measurement data of normal distribution were expressed as $\bar{x}\pm s$, and an independent sample *t*-test was used to compare the two groups. Non-normally distributed data were represented by M (Q_1, Q_3), and the Mann-Whitney *U* test was used to compare groups. Count data were expressed as *n* (%), and the χ^2 test was used for comparisons. A multivariable logistic regression was applied to obtain independent associated factors of suicide risk. All statistical methods used a two-tailed test, and differences where $P<0.05$ were considered statistically significant. All statistical analyses were performed using SPSS software (version 25.0. IBM Corp., Armonk, NY, USA).

Among the hospitalized patients with schizophrenia, the median age was 38 years, with females comprising 33.0% (222/672) of the cohort. All patients were receiving antipsychotic medication. The prevalence of PHQ-9-defined depressive symptoms and GAD-7-defined anxiety symptoms was 12.4% (83/672) and 7.9% (53/672), respectively. Sleep disturbances were common, with 56.8% (382/672) of patients experiencing poor sleep quality (PSQI score >5) and 19.2% (129/672) reporting daytime sleepiness (ESS score >10). Mild cognitive impairment (MCI) was present in 77.8% (523/672) of patients, as defined by a MoCA score below 26.

The overall prevalence of suicide risk in hospitalized patients with schizophrenia was 22.3% [95% confidence interval (*CI*): 19.3%, 25.6%], with 14.6% (98/672) classified as mild risk and 7.8% (52/672) as moderate to severe risk. Current suicidal ideation was present in 10.9% (73/672) of patients, while 2.5% (17/672) reported suicide plans and 3.3% (22/672) had attempted suicide.

Analysis of demographic and clinical characteristics revealed that patients with suicide risk were significantly younger than those without risk (median age 35 years *vs.* 39 years, $P=0.004$). Age stratification showed a higher proportion of younger patients (18–35 years) in the suicide risk group (53.3% *vs.* 41.4%, $P=0.010$). Additionally, patients with suicide risk had a higher rate of previous modified electroconvulsive therapy (35.3% *vs.* 23.8%, $P=0.005$). No significant differences were observed between groups regarding sex distribution, education level, body mass index (BMI), or marital status (Table 1).

Regarding psychiatric symptoms and sleep disturbances, patients with suicide risk exhibited significantly higher rates of poor sleep quality (73.3% *vs.* 52.1%, $P<0.001$), daytime sleepiness (25.3% *vs.* 17.4%, $P=0.030$), depressive symptoms (32.7% *vs.* 6.5%, $P<0.001$), and anxiety symptoms (26.0% *vs.* 2.7%, $P<0.001$) compared to those without suicide risk. Total BPRS scores, factor scores (anxious-depression and activation), PHQ-9, GAD-7, PSQI, and ESS scores were also significantly elevated (all $P<0.01$), while the thinking disorder factor score was lower ($P=0.036$) (Table 1). Among patients with varying levels of suicide risk, BPRS total scores, PHQ-9, GAD-7, and PSQI scores showed positive correlations (Figure 1A), and the prevalence of depressive symptoms, anxiety symptoms, and poor sleep quality increased proportionally with suicide risk level (Figure 1B). Neither the level nor the prevalence of daytime sleepiness showed significant increases with elevated suicide risk.

In the multivariable logistic regression analysis, multiple potential contributors to suicide risk were considered including: sex, age group, marital status, education, BMI, disease duration, family history of mental disorders, history of drug allergy, histories of smoking and alcohol consumption, modified electroconvulsive therapy history, MCI, anxiety

TABLE 1. Demographic characteristics, clinical characteristics, sleep parameters and psychiatric symptoms of schizophrenia inpatients with and without suicide risk.

Variable	Total (*N*=672)	Schizophrenia with suicide risk (*N*=150)	Schizophrenia without suicide risk (*N*=522)	χ^2/Z-value	*P*
Demographic characteristics					
Sex [*n* (%)]				0.253	0.615
Male	450 (67.0)	103 (68.7)	347 (66.5)		
Female	222 (33.0)	47 (31.3)	175 (33.5)		
Age [years, M (Q1, Q3)]	38.00 (30.00, 49.00)	35.00 (27.00, 45.00)	39.00 (30.00, 49.00)	−2.899	0.004
Age group (years)				9.184	0.010
18–35 [*n* (%)]	296 (44.0)	80 (53.3)	216 (41.4)		
36–60 [*n* (%)]	340 (50.6)	67 (44.7)	273 (52.3)		
>60 [*n* (%)]	36 (5.4)	3 (2.0)	33 (6.3)		
Marital status [*n* (%)]				1.112	0.292
Married	192 (28.6)	48 (32.0)	144 (27.6)		
Not married	480 (71.4)	102 (68.0)	378 (72.4)		
Education [*n* (%)]				0.934	0.334
College or above	121 (18.0)	23 (15.3)	98 (18.8)		
Lower than college	551 (82.0)	127 (84.7)	424 (81.2)		
BMI [kg/m^2, M (Q1, Q3)]	24.77 (22.08, 27.69)	24.60 (21.88, 27.69)	24.82 (22.18, 27.70)	−0.229	0.819
Clinical characteristics					
Disease duration [years, M (Q1, Q3)]	11.00 (5.00, 20.00)	10.00 (5.00, 16.00)	11.00 (5.00, 20.00)	−1.698	0.089
Family history of mental disorders [*n* (%)]				0.489	0.485
Yes	97 (14.4)	19 (12.7)	78 (14.9)		
No	575 (85.6)	131 (87.3)	444 (85.1)		
History of drug allergy [*n* (%)]				0.195	0.659
Yes	23 (3.4)	6 (4.0)	17 (3.3)		
No	649 (96.6)	144 (96.0)	505 (96.7)		
History of alcohol consumption [*n* (%)]				2.541	0.111
Yes	40 (6.0)	13 (8.7)	27 (5.2)		
No	632 (94.0)	137 (91.3)	495 (94.8)		
History of smoking [*n* (%)]				2.350	0.125
Yes	161 (24.0)	43 (28.7)	118 (22.6)		
No	511 (76.0)	107 (71.3)	404 (77.4)		
MECT history [*n* (%)]				8.051	0.005
Yes	177 (26.3)	53 (35.3)	124 (23.8)		
No	495 (73.7)	97 (64.7)	398 (76.2)		
Current medication					
Antipsychotics [*n* (%)]	672 (100)	150 (100)	522 (100)	NA	NA
Antidepressants [*n* (%)]	54 (8.0)	15 (10.0)	39 (7.5)	1.008	0.315
Sedative-hypnotics [*n* (%)]	195 (29.0)	42 (28.0)	153 (29.3)	0.097	0.755
Mood stabilizers [*n* (%)]	109 (16.2)	22 (14.7)	87 (16.7)	0.343	0.558
Sleep parameters					
PSQI [M (Q1, Q3)]					
Subjective sleep quality	1.00 (0, 1.00)	1.00 (1.00, 2.00)	1.00 (0, 1.00)	−5.329	<0.001

Continued

Variable	Total (*N*=672)	Schizophrenia with suicide risk (*N*=150)	Schizophrenia without suicide risk (*N*=522)	χ^2/Z-value	*P*
Sleep latency	1.00 (1.00, 2.00)	1.00 (1.00, 2.00)	1.00 (0, 2.00)	−2.071	0.038
Sleep duration	0 (0, 1.00)	0 (0, 1.00)	0 (0, 1.00)	−3.224	0.001
Habitual sleep efficiency	0 (0, 1.00)	0 (0, 2.00)	0 (0, 1.00)	−2.395	0.017
Sleep disturbances	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)	1.00 (0, 1.00)	−4.513	<0.001
Use of sleeping medication	1.00 (0, 3.00)	2.00 (0, 3.00)	1.00 (0, 3.00)	−2.618	0.009
Daytime dysfunction	1.00 (0, 2.00)	2.00 (1.00, 3.00)	1.00 (0, 2.00)	−6.243	<0.001
Total score	6.00 (3.00, 10.00)	8.50 (5.00, 11.00)	6.00 (3.00, 9.00)	−5.656	<0.001
Poor sleep quality [*n* (%)]				21.400	<0.001
Yes	382 (56.8)	110 (73.3)	272 (52.1)		
No	290 (43.2)	40 (26.7)	250 (47.9)		
ESS total score [M (Q1, Q3)]	5.00 (1.00, 9.00)	6.00 (2.00, 11.00)	5.00 (0, 9.00)	−3.094	0.002
Daytime sleepiness [*n* (%)]				4.689	0.030
Yes	129 (19.2)	38 (25.3)	91 (17.4)		
No	543 (80.8)	112 (74.7)	431 (82.6)		
Psychiatric symptoms					
MoCA total score [M (Q1, Q3)]	22.00 (18.00, 25.00)	22.00 (18.00, 25.00)	22.00 (18.00, 25.00)	−0.847	0.397
Mild cognitive impairment [*n* (%)]				1.375	0.241
Yes	523 (77.8)	122 (81.3)	401 (76.8)		
No	149 (22.2)	28 (18.7)	121 (23.2)		
PHQ-9 total score [M (Q1, Q3)]	3.00 (0, 7.00)	8.00 (4.00, 12.00)	2.00 (0, 4.00)	−11.399	<0.001
Depressive symptom [*n* (%)]				73.619	<0.001
Yes	83 (12.4)	49 (32.7)	34 (6.5)		
No	589 (87.6)	101 (67.3)	488 (93.5)		
GAD-7 total score [M (Q1, Q3)]	1.00 (0, 4.75)	5.50 (1.00, 10.00)	0.50 (0, 3.00)	−9.951	<0.001
Anxiety symptom [n (%)]				87.206	<0.001
Yes	53 (7.9)	39 (26.0)	14 (2.7)		
No	619 (92.1)	111 (74.0)	508 (97.3)		
BPRS [M (Q1, Q3)]					
Withdrawal-retardation	2.00 (1.50, 2.50)	2.00 (1.50, 2.50)	2.25 (1.50, 2.50)	−0.457	0.648
Thinking disorder	1.50 (1.00, 2.25)	1.50 (1.00, 2.25)	1.75 (1.00, 2.50)	−2.093	0.036
Anxious-depression	1.75 (1.00, 2.50)	2.50 (2.00, 3.00)	1.50 (1.00, 2.06)	−9.502	<0.001
Hostile-suspiciousness	2.00 (1.00, 2.67)	2.33 (1.00, 2.67)	2.00 (1.00, 2.67)	−1.010	0.313
Activation	1.00 (1.00, 1.67)	1.67 (1.00, 1.67)	1.00 (1.00, 1.67)	−5.155	<0.001
Total score	33.00 (27.00, 38.00)	35.00 (30.00, 40.00)	32.00 (27.00, 38.00)	−3.824	<0.001

Note: Poor sleep quality is defined as PSQI >5. Daytime sleepiness is defined as ESS >10. MCI is defined as MoCA <26. Depressive symptom is defined as PHQ-9 ≥10. Anxiety symptom is defined as GAD-7 ≥10. Continuous variables not conforming to the normal distribution were expressed as M (Q1, Q3); categorical variables were expressed as *n* (%).

Abbreviation: M=median; Q1=lower quartile; Q3=upper quartile; BMI=body mass index; MECT=modified electroconvulsive therapy; PSQI=Pittsburgh Sleep Quality Index; ESS=Epworth Sleepiness Scale; MoCA=Montreal Cognitive Assessment; BPRS=Brief Psychiatric Rating Scale; PHQ-9=Patient Health Questionnaire-9; GAD-7=Generalized Anxiety Disorder-7.

symptoms, depressive symptoms, poor sleep quality, daytime sleepiness, and BPRS factor scores (withdrawal-retardation, thinking disorder, hostile-suspiciousness, and activation). The anxious-depression factor of BPRS was excluded due to the presence of PHQ-9-defined depressive symptoms and GAD-7-defined anxiety symptoms. The analysis revealed that suicide risk in schizophrenia was independently

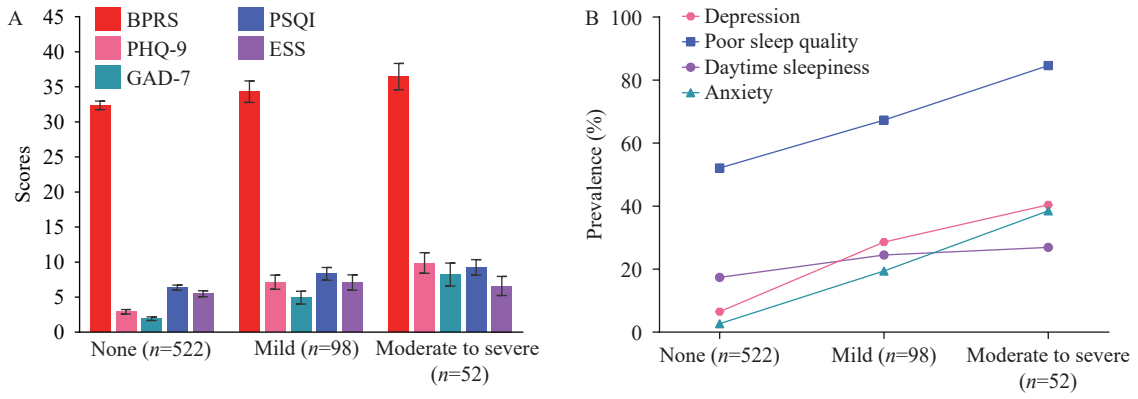

FIGURE 1. Psychiatric symptoms and sleep disturbances in schizophrenia inpatients with different suicide risk levels. (A) Scores; (B) Prevalence.
Note: Error bars indicate 95% *CI*s. Suicide risk was categorized as none, mild, or moderate to severe according to the Mini-International Neuropsychiatric Interview suicide module assessment by trained psychiatrists. Anxiety is defined as GAD-7≥ 10. Depression is defined as PHQ-9≥10. Poor sleep quality is defined as PSQI>5. Daytime sleepiness is defined as ESS>10.
Abbreviation: BPRS=Brief Psychiatric Rating Scale; PHQ-9=Patient Health Questionnaire-9; GAD-7=Generalized Anxiety Disorder-7; PSQI=Pittsburgh Sleep Quality Index; ESS=Epworth Sleepiness Scale; *CI*=confidence interval.

associated with poor sleep quality [adjusted odds ratio (*aOR*)=2.09, 95% *CI*: 1.31, 3.36, *P*=0.002], depressive symptoms (*aOR*=2.24, 95% *CI*: 1.19, 4.23, *P*=0.013), anxiety symptoms (*aOR*=6.91, 95% *CI*: 3.10, 15.41, *P*<0.001), thinking disorder (*aOR*=0.55, 95% *CI*: 0.39, 0.80, *P*=0.002), and activation (*aOR*=1.85, 95% *CI*: 1.13, 3.04, *P*=0.014) (Table 2).

DISCUSSION

These findings demonstrate a high prevalence of suicide risk among hospitalized patients with schizophrenia, with significant associations between suicide risk and both psychiatric symptoms and sleep disturbances. The results indicate that schizophrenia inpatients with suicide risk are characterized by younger age, lower levels of thinking disorder, and higher levels of activation, coupled with anxiety symptoms, depressive symptoms, and poor sleep quality compared to those without suicide risk. These findings suggest that systematic evaluation and targeted intervention for these symptoms may help reduce suicide risk in clinical settings and improve both clinical practice and health management strategies.

Previous studies of schizophrenia patients in China have reported suicidal ideation prevalence rates ranging from 7.4% to 57.6% (*4*). Meta-analytic evidence indicates lifetime and point prevalence rates of suicidal ideation among schizophrenia patients of 34.5% and 29.9%, respectively, while lifetime and point prevalence rates of suicide plans were 44.3% and 6.4%–13%, respectively (*5*). The 1-month prevalence of suicide attempts in patients with schizophrenia was reported at 2.7% across studies (*6*). In this study, the prevalence of suicide risk (22.3%, 95% *CI*: 19.3%, 25.6%) was lower than anticipated, potentially due to the sample characteristics. Since this cohort consisted of hospitalized patients with extended disease duration, their psychiatric symptoms and sleep disorders were relatively mild post-treatment compared to those in acute episodes.

The relationship between psychiatric symptoms and suicide risk in schizophrenia patients has been extensively investigated. While some studies suggest that increased positive symptoms, such as hallucinations and delusions, are associated with suicide (*7*–*8*), evidence indicates that command auditory hallucinations specifically, rather than auditory hallucinations in general, correlate with suicidal behavior (*8*). The nature of psychotic symptoms is highly complex and variable, with marked individual differences. The elevated suicide risk may stem not from the psychotic symptoms themselves but from the accompanying distress, depression, and hopelessness (*9*). Suicide rates were notably higher among schizophrenia patients experiencing depression and anxiety, particularly depressed mood and hopelessness (*2*). This study reveals that suicide risk in schizophrenia inpatients is associated with multiple psychiatric symptoms: anxiety, depression, thinking disorder, and activation. These results underscore the critical importance of comprehensive assessment of

TABLE 2. Unadjusted and adjusted *OR*s of associated factors of suicide risk in schizophrenia inpatients.

Variable	Unadjusted *OR* (95% *CI*)	*P*	Adjusted *OR* (95% *CI*)*	*P*
Sex				
Male	1	–	1	–
Female	0.91 (0.61, 1.34)	0.615	0.90 (0.54, 1.51)	0.680
Age group (years)				
18–35	1	–	1	–
36–60	0.66 (0.46, 0.96)	0.029	0.80 (0.48, 1.33)	0.386
>60	0.25 (0.07, 0.82)	0.023	0.36 (0.09, 1.55)	0.171
Marital status				
Not married	1	–	1	–
Married	1.24 (0.83, 1.83)	0.292	1.44 (0.89, 2.35)	0.141
Education				
Lower than college	1	–	1	–
College or above	0.78 (0.48, 1.29)	0.335	1.02 (0.57, 1.80)	0.954
BMI (kg/m^2)	1.00 (0.96, 1.04)	0.922	0.99 (0.94, 1.03)	0.518
Disease duration (years)	0.98 (0.96, 1.00)	0.030	1.00 (0.97, 1.02)	0.725
Family history of mental disorders				
No	1	–	1	–
Yes	0.83 (0.48, 1.41)	0.485	1.05 (0.56, 1.98)	0.873
History of drug allergy				
No	1	–	1	–
Yes	1.24 (0.48, 3.20)	0.660	0.63 (0.18, 2.22)	0.472
History of alcohol consumption				
No	1	–	1	–
Yes	1.74 (0.87, 3.46)	0.115	1.18 (0.49, 2.89)	0.712
History of smoking				
No	1	–	1	–
Yes	1.38 (0.91, 2.07)	0.126	1.22 (0.71, 2.10)	0.481
MECT history				
No	1	–	1	–
Yes	1.75 (1.19, 2.59)	0.005	1.36 (0.84, 2.20)	0.209
Poor sleep quality				
No	1	–	1	–
Yes	2.53 (1.69, 3.77)	<0.001	2.09 (1.31, 3.36)	0.002
Daytime sleepiness				
No	1	–	1	–
Yes	1.61 (1.04, 2.48)	0.031	1.02 (0.60, 1.72)	0.950
Mild cognitive impairment				
No	1	–	1	–
Yes	1.32 (0.83, 2.08)	0.242	1.23 (0.72, 2.10)	0.454
Depressive symptom				
No	1	–	1	–
Yes	6.96 (4.28, 11.33)	<0.001	2.24 (1.19, 4.23)	0.013

Continued

Variable	Unadjusted *OR* (95% *CI*)	*P*	Adjusted *OR* (95% *CI*)*	*P*
Anxiety symptom				
No	1	–	1	–
Yes	12.75 (6.69, 24.28)	<0.001	6.91 (3.10, 15.41)	<0.001
Withdrawal-retardation	0.94 (0.72, 1.22)	0.637	0.73 (0.52, 1.03)	0.070
Thinking disorder	0.73 (0.56, 0.94)	0.013	0.55 (0.39, 0.80)	0.002
Hostile-suspiciousness	1.06 (0.88, 1.29)	0.524	1.09 (0.82, 1.45)	0.537
Activation	2.46 (1.67, 3.63)	<0.001	1.85 (1.13, 3.04)	0.014

Abbreviation: *OR*=odds ratio; *CI*=confidence interval; BMI=body mass index; MECT=modified electroconvulsive therapy.
* *OR* was adjusted for the variables listed above in a multivariable logistic regression model.

both affective and positive symptoms in schizophrenia patients for timely identification of suicide risk.

Sleep disturbances are highly prevalent in schizophrenia, affecting up to 80% of patients, with manifestations including difficulties in initiating or maintaining sleep and excessive daytime sleepiness (*10*). Among these disturbances, insomnia represents the predominant sleep disorder in schizophrenia patients, occurring at significantly higher rates compared to the general population (*11*). This study demonstrates that both the prevalence and severity of poor sleep quality increased proportionally with suicide risk level, providing further evidence for the robust association between sleep disturbances and suicide risk in schizophrenia.

This investigation has three primary limitations. First, the cross-sectional study design only allows for the identification of correlative factors associated with suicide risk and cannot establish causality; additionally, recall bias remains an inherent challenge. Second, while the M.I.N.I. effectively assesses current suicide risk, it cannot predict progression to death by suicide. Third, the relatively small sample size constrains the study's statistical power and generalizability, necessitating larger-scale investigations to validate these findings.

In conclusion, this study emphasizes the critical importance of suicide risk assessment in schizophrenia inpatients. Comprehensive monitoring of psychiatric symptoms and sleep disturbances can facilitate early identification of patients at elevated suicide risk, and timely intervention targeting these symptoms may help reduce suicide risk. When clinicians identify these symptoms in hospitalized schizophrenia patients, they should alert family members and community healthcare providers to maintain vigilant suicide prevention measures following discharge.

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REFERENCES

1. GBD 2019 Mental Disorders Collaborators. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Psychiatry 2022;9(2):137 – 50. https://doi.org/10.1016/S2215-0366(21)00395-3.
2. Popovic D, Benabarre A, Crespo JM, Goikolea JM, González-Pinto A, Gutiérrez-Rojas L, et al. Risk factors for suicide in schizophrenia: systematic review and clinical recommendations. Acta Psychiatr Scand

2014;130(6):418 – 26. https://doi.org/10.1111/acps.12332.
3. Hor K, Taylor M. Suicide and schizophrenia: a systematic review of rates and risk factors. J Psychopharmacol 2010;24(S4):81 – 90. https://doi.org/10.1177/1359786810385490.
4. Dong M, Wang SB, Wang F, Zhang L, Ungvari GS, Ng CH, et al. Suicide-related behaviours in schizophrenia in China: a comprehensive meta-analysis. Epidemiol Psychiatr Sci 2019;28(3):290 – 9. https://doi.org/10.1017/S2045796017000476.
5. Bai W, Liu ZH, Jiang YY, Zhang QE, Rao WW, Cheung T, et al. Worldwide prevalence of suicidal ideation and suicide plan among people with schizophrenia: a meta-analysis and systematic review of epidemiological surveys. Transl Psychiatry 2021;11(1):552. https://doi.org/10.1038/s41398-021-01671-6.
6. Lu L, Dong M, Zhang L, Zhu XM, Ungvari GS, Ng CH, et al. Prevalence of suicide attempts in individuals with schizophrenia: a meta-analysis of observational studies. Epidemiol Psychiatr Sci 2019;29:e39. https://doi.org/10.1017/S2045796019000313.
7. Fenton WS. Depression, suicide, and suicide prevention in schizophrenia. Suicide Life Threat Behav 2000;30(1):34 – 49. https://doi.org/10.1111/j.1943-278X.2000.tb01063.x.
8. Wong Z, Öngür D, Cohen B, Ravichandran C, Noam G, Murphy B. Command hallucinations and clinical characteristics of suicidality in patients with psychotic spectrum disorders. Compr Psychiatry 2013;54(6):611 – 7. https://doi.org/10.1016/j.comppsych.2012.12.022.
9. Hettige NC, Bani-Fatemi A, Sakinofsky I, De Luca V. A biopsychosocial evaluation of the risk for suicide in schizophrenia. CNS Spectr 2018;23(4):253 – 63. https://doi.org/10.1017/S1092852917000128.
10. Cohrs S. Sleep disturbances in patients with schizophrenia: impact and effect of antipsychotics. CNS Drugs 2008;22(11):939 – 62. https://doi.org/10.2165/00023210-200822110-00004.
11. Laskemoen JF, Simonsen C, Büchmann C, Barrett EA, Bjella T, Lagerberg TV, et al. Sleep disturbances in schizophrenia spectrum and bipolar disorders - a transdiagnostic perspective. Compr Psychiatry 2019;91:6 – 12. https://doi.org/10.1016/j.comppsych.2019.02.006.