





# Prevalence of Suicidality and its Association with Quality of Life in Older Patients with Clinically Stable Psychiatric Disorders in China During the COVID-19 Pandemic

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## Abstract

**Aims:** The pattern of suicidality in older patients with psychiatric disorders during the COVID-19 pandemic is not clear. This study examined the prevalence of suicidality and its association with quality of life (QOL) among older clinically stable patients with psychiatric disorders during the COVID-19 pandemic. **Methods:** A multicenter, cross-sectional study was conducted from May 22 to July 15, 2020, among four major tertiary psychiatric hospitals in China. Suicidality was assessed by asking 3 standardized questions. Depressive symptoms, pain, and QOL were assessed with the 9-item Patient Health Questionnaire (PHQ-9), the numeric pain rating scale (NPRS), and the World Health Organization Quality of Life Questionnaire-brief version, respectively. **Results:** A total of 1063 clinically stable patients participated and completed the assessment. The prevalence of suicidality was 11.8% (95% CI: 9.9%–13.7%) during the COVID-19 pandemic. Multiple logistic regression analysis revealed that poor treatment adherence ( $P = .009$ , OR = 1.86, 95% CI: 1.17–2.96) and perceived illness worsening during the COVID-19 outbreak ( $P = .02$ , OR = 2.07, 95% CI: 1.15–3.73), being diagnosed with major depressive disorder ( $P < .001$ , OR = 2.79, 95% CI: 1.68–4.64), PHQ-9 total score ( $P < .001$ , OR = 1.20, 95% CI: 1.15–1.24) and NPRS total score ( $P = .002$ , OR = 1.17, 95% CI: 1.06–1.29) were associated with higher risk of suicidality. After controlling for covariates, older psychiatric patients with suicidality had lower QOL compared to those without ( $F_{(1, 1063)} = 16.5$ ,  $P < .001$ ). **Conclusions:** Suicidality was common in older patients with clinically stable psychiatric disorders during the COVID-19 pandemic. Considering its negative impact on QOL and personal suffering, routine screening and preventive suicide measures should be implemented for older psychiatric patients.

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## Keywords

COVID-19, older patients, psychiatric disorder, quality of life, suicidality

## Introduction

Since the Coronavirus disease 2019 (COVID-19) was first reported in China at the end of 2019, it has been found in more than 200 countries and territories, with more than 15.78 million confirmed cases,<sup>1</sup> and has been declared as a pandemic by the WHO.<sup>2</sup> To reduce the COVID-19 transmission, a range of preventive measures have been implemented in many countries such as lockdown of cities, mass quarantine, and school closure, all of which are associated with increased risk of mental health problems. Vulnerable populations can be affected disproportionately, such as increased suicidality among older adults.<sup>3-5</sup> Previous studies have noted increased suicide risk among older adults during the 2003 outbreak of severe acute respiratory syndrome (SARS).<sup>6-8</sup> To date, however, little is known about suicide risk in older adults during the COVID-19 pandemic.

Suicidality is a major public health problem worldwide, associated with heavy healthcare burden.<sup>9,10</sup> Suicidality consists of several subtypes, including suicidal ideation, suicide plan, and suicide attempt.<sup>11</sup> Older adults, especially older patients with psychiatric disorders, are usually more prone to suicidality.<sup>12,13</sup> Compared to their younger counterparts, older psychiatric patients are more vulnerable to the effects of the COVID-19 pandemic due to more severe cognitive impairment, poorer self-care, and lack of risk awareness.<sup>14,15</sup> In China, older patients with stable psychiatric disorders usually visit psychiatric outpatient clinics and receive maintenance treatment.<sup>16</sup> However, during the COVID-19 pandemic, they inevitably experience poorer access to mental health services due to mass quarantine and suspended public transportation in many areas.<sup>5,16</sup> Although online mental health services and education are provided, many older adults do not use smart phones or benefit from online services/educations as these are not specifically developed for older adults.<sup>16,17</sup> Further, due to the fear of higher mortality rate of COVID-19 among older population, older patients with psychiatric disorders may be more likely to develop stress, depressive and anxiety symptoms associated with COVID-19, all of which could trigger pre-existing psychiatric disorders and increase the risk of suicidality.<sup>5,18,19</sup>

As an important measure of health outcome, quality of life (QOL) has been widely used in clinical practice and research.<sup>20,21</sup> Some studies found that due to lack of social connection, loneliness, and increased psychological problems, older adults had lower QOL during COVID-19.<sup>22,23</sup> To date, however, no data of suicidality among older patients with psychiatric disorders have been published.

Therefore, we conducted this study to examine the prevalence of suicidality and its association with clinical factors and QOL among older patients with clinically stable psychiatric disorders during the COVID-19 pandemic.

## Methods

### *Patients and Study Sites*

This was a multicenter, cross-sectional study conducted from May 22 to July 15, 2020. Participants were recruited from 4 major tertiary psychiatric hospitals in northern (Beijing), southern (Fujian province), eastern (Jiangsu province), and western parts (Gansu province) of China, which could represent a wide range of clinical settings. All outpatients who received maintenance therapy for psychiatric disorders diagnosed according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)<sup>24</sup> were consecutively invited from the outpatient departments of the participating hospitals during the study period if they were (1) aged 50 years and older; (2) judged to be clinically stable by their treating psychiatrists. In this study, patients with changes in doses of psychotropic medications less than 50% during the past three months were defined as “clinically stable”; (3) able to understand the purpose and contents of the assessments and provide written informed consent. Due to the COVID-19 pandemic, face-to-face interviews were not conducted in clinical settings. Instead, data were collected with the WeChat-based Question-Star application (Changsha Renxing Science and Technology, Shanghai, China), which was widely used in China during the COVID-19 pandemic.<sup>25,26</sup> The WeChat is a mainstream social communication program in China with over 1 billion users. All patients and/or their guardians invited were WeChat users. All patients who agreed to participate in this study were required to complete the assessments with their smartphone. For patients who had difficulties with using smartphone, they could seek help from a research psychiatrist. This study was approved by the -ethics committee of the respective hospitals.

### *Measurements*

A pre-prepared data collection sheet was used to collect patients' basic socio-demographic and clinical characteristics, including age, gender, education years, marital status, household registration (urban/rural residence), severe physical diseases, principal psychiatric diagnosis

**Table 1.** Socio-Demographical and Clinical Characteristics of Patients.

Variable	Total		No Suicidality		Suicidality		Univariate Analyses		
	(N=1063)		(N=938)		(N=125)		$\chi^2$	Df	P
	N	%	N	%	N	%			
Male gender	347	32.6	305	32.5	42	33.6	.06	1	.81
Married	961	90.4	850	90.6	111	88.8	.42	1	.52
Rural area	373	35.1	315	33.6	58	46.4	7.96	1	<b>.005</b>
Having severe physical diseases	190	17.9	161	17.2	29	23.2	2.74	1	.10
Concern about COVID-19	744	70.0	662	70.6	82	65.6	1.30	1	.25
Frequent use of mass media during COVID-19 outbreak	215	20.2	187	19.9	28	22.4	.42	1	.52
Limited access to psychiatric services during COVID-19 outbreak	367	34.5	316	33.7	51	40.8	2.47	1	.12
Poor treatment adherence during COVID-19 outbreak	365	34.3	295	31.4	70	56.0	29.49	1	<b>&lt;.001</b>
Perceived illness worsening during COVID-19 outbreak	564	53.1	461	49.1	103	82.4	48.97	1	<b>&lt;.001</b>
Primary psychiatric diagnoses							44.69	1	<b>&lt;.001</b>
MDD	485	45.6	393	41.9	92	73.6			
Other psychiatric diagnoses	578	54.4	545	58.1	33	26.4			
	Mean	SD	Mean	SD	Mean	SD	t/Z	Df	P
Age (years)	62.80	9.44	63.03	9.51	61.02	8.71	2.24	1061	<b>.03</b>
Education (years)	7.96	4.03	8.01	3.97	7.64	4.48	-1.35	- <sup>a</sup>	.18
PHQ-9 total score	7.76	6.73	6.56	5.85	16.72	6.18	-13.85	- <sup>a</sup>	<b>&lt;.001</b>
NPRS total score	1.53	2.20	1.33	2.03	3.06	2.79	-7.23	- <sup>a</sup>	<b>&lt;.001</b>
Quality of life	6.26	1.56	6.45	1.46	4.84	1.56	11.49	1061	<b>&lt;.001</b>

<sup>a</sup>Mann–Whitney U test.

Bolded values: <.05.

COVID-19: Coronavirus disease 2019; MDD: major depressive disorder; PHQ-9: 9-item Patient Health Questionnaire; NPRS: numeric pain rating scale; SD: standard deviation.

(major depressive disorder (MDD)/other diagnoses), concern about COVID-19, and frequent use of mass media, limited access to psychiatric services, poor treatment adherence, and perceived illness worsening during the COVID-19 pandemic.

Following previous studies,<sup>27,28</sup> suicidality during the COVID-19 outbreak was evaluated by 3 “yes” or “no” standardized questions, including (1) suicidal ideation (“whether you had any suicidal ideation during the COVID-19 outbreak”), (2) suicide plan (“whether you had any suicide plan during the COVID-19 outbreak”), and (3) suicide attempt (“whether you had any suicide attempt during the COVID-19 outbreak”). Patients who responded “yes” to any of the 3 questions were considered “having suicidality.”

The Chinese version of the 9-item Patient Health Questionnaire (PHQ-9) was used to assess the severity of depression.<sup>29,30</sup> Each item of PHQ-9 ranges from 0 to 3, and the total score ranges from 0 to 27, with a higher score indicating more severe depression.<sup>29</sup> This scale has been validated and widely used in Chinese populations.<sup>31</sup>

The 0–10 numeric pain rating scale (NPRS) was used to assess the level of pain,<sup>32,33</sup> with “0” indicating “no pain” and ten indicating “worst pain imaginable.” The Chinese

version of NPRS had satisfactory psychometric properties in the elderly.<sup>34–36</sup> The total score of the first 2 items on overall QOL of the World Health Organization Quality of Life Questionnaire-brief version (WHOQOL-BREF)<sup>37,38</sup> was used to measure QOL. A higher score means higher QOL.<sup>37</sup>

### Data Analysis

Data analyses were performed using SPSS statistical software version 24.0. To compare the socio-demographical and clinical variables between patients with suicidality and those without, chi-square tests, 2 independent sample t-tests, or Mann–Whitney U tests were used, as appropriate. To explore the independent associated factors of suicidality, multiple logistic regression analysis with “enter” method was performed, with the suicidality as dependent variable, and the variables with significant group differences in univariate analyses as independent variables. Analysis of covariance was conducted to compare QOL between patients with and without suicidality after controlling for variables with significant group difference in univariate analyses. The level of significance was set at  $P < .05$  for all tests (2-sided).

**Table 2.** Distribution of Clinical Diagnoses among Older Patients with Clinically Stable Psychiatric Disorders.

Diagnosis	Total		No Suicidality		Suicidality	
	N	%	N	%	N	%
MDD	485	45.6	393	41.9	92	73.6
Bipolar disorder	43	4	40	4.3	3	2.4
Schizophrenia	73	6.9	71	7.6	2	1.6
Mental disorder associated with physical diseases	63	5.9	53	5.7	10	8
Others	399	37.5	381	40.6	18	14.4

MDD: major depressive disorder.

**Table 3.** Independent Correlates of Suicide by Multiple Logistic Regression Analysis.

Variables	Multiple Logistic Regression Analysis			
	P Value	OR	95% CI	
			Lower	Upper
Rural area	.40	1.24	.75	2.06
Poor treatment adherence during COVID-19 outbreak	<b>.009</b>	1.86	1.17	2.96
Perceived illness worsening during COVID-19 outbreak	<b>.02</b>	2.07	1.15	3.73
Primary psychiatric diagnoses				
Other psychiatric diagnoses	—	1.0	—	—
MDD	<b>&lt;.001</b>	2.79	1.68	4.64
Age (years)	.25	.98	.96	1.01
PHQ-9 total score	<b>&lt;.001</b>	1.20	1.15	1.24
NPRS total score	<b>.002</b>	1.17	1.06	1.29

Bolded values: <.05.

CI: confidential interval; OR: odds ratio; MDD: major depressive disorder; PHQ-9: 9-item Patient Health Questionnaire; NPRS: numeric pain rating scale. Residence was controlled for study sites.

## Results

Of a total of 1068 patients invited, 1063 met the study entry criteria and completed the assessment. The prevalence of overall suicidality was 11.8% (95% CI: 9.9%–13.7%), with prevalence of suicidal ideation of 11.3% (95% CI: 9.4%–13.2%), suicide plan of 2.8% (95% CI: 1.8%–3.8%), and suicide attempt of 2.6% (95% CI: 1.6%–3.6%). The socio-demographical and clinical characteristics of patients are summarized in [Table 1](#). Of the patients with suicidality, MDD was the most common psychiatric diagnosis (73.6%; [Table 2](#)).

Univariate analyses found that age, living in rural area, having limited access to psychiatric services, poor treatment adherence, and perceived illness worsening during the COVID-19 outbreak, PHQ-9 total score and NPRS total score were significantly associated with suicidality (all *P* values <.05). After controlling for covariates, older psychiatric patients with suicidality had lower QOL compared to those without ( $F_{(1, 1063)} = 16.5, P < .001$ ).

Multiple logistic regression analysis found that poor treatment adherence (*P* = .009, OR = 1.86, 95% CI: 1.17–

2.96) and perceived illness worsening during the COVID-19 outbreak (*P* = .02, OR = 2.07, 95% CI: 1.15–3.73), being diagnosed with MDD (*P* < .001, OR = 2.79, 95% CI: 1.68–4.64), PHQ-9 total score (*P* < .001, OR = 1.20, 95% CI: 1.15–1.24), and the NPRS total score (*P* = .002, OR = 1.17, 95% CI: 1.06–1.29) were significantly associated with higher risk of suicidality ([Table 3](#)).

## Discussion

To the best of our knowledge, this was the first study that examined the prevalence of suicidality in older patients with clinically stable psychiatric disorders and its association with QOL during the COVID-19 outbreak. The prevalence of suicidality (11.8%; 95% CI: 9.9%–13.7%) in this study was substantially higher than previous reports (ie, the 1-year prevalence of suicidality of .009%–.031% in 2018; .009%–.025% in 2017; and .011%–.037% in 2016) among rural older adults in China.<sup>39–41</sup> Of the older psychiatric patients with suicidality, most reported suicidal ideation, which is a major predictor of future suicide.<sup>42,43</sup> The prevalence of suicidal ideation among older patients

with clinically stable psychiatric disorders in this study (11.3%, 95% CI: 9.4%–13.2%) was even higher than the 1-year prevalence of suicidal ideation (8.8%) among the older adults living in rural areas,<sup>43</sup> the pooled prevalence of suicidal ideation (9.9%) among older adults in China,<sup>44</sup> and the 1-week prevalence of suicidal ideation (3.1%) among the hospitalized older patients with medical conditions in Taiwan.<sup>45</sup>

The high prevalence of suicidality in older patients with clinically stable psychiatric disorders could be due to several reasons. First, due to the high risk of mortality and morbidity among older patients infected with COVID-19, many older adults suffered from anxiety and fear of contagion during the COVID-19 pandemic, which may lead to suicidality.<sup>46,47</sup> Second, mass social isolation and quarantine although being essential public health measures may lead to psychosocial and physical problems, including stress, depression, anxiety, helplessness, and loneliness, which could increase risk for suicidality among older adults.<sup>5,18,48,49</sup> Third, older patients with psychiatric disorders are more vulnerable to poor access to outpatient psychiatric services during the pandemic due to cancellation of appointments, restriction of services, and suspension of public transport, which could increase the risk of relapse of their psychiatric disorders.<sup>16,18</sup> Fourth, many older patients with psychiatric disorders have major physical co-morbidities<sup>50</sup> which could worsen due to inaccessible medical treatments and in turn may increase the likelihood of suicidality during the COVID-19 pandemic.

We found that older psychiatric patients with poor adherence treatment were more likely to experience suicidality during the COVID-19 outbreak, which is consistent with previous findings.<sup>51-53</sup> Most patients with clinically stable psychiatric disorders need long-term maintenance pharmacotherapy. Poor treatment adherence could lead to exacerbation of psychiatric symptoms, which in turn increases the risk of suicidality.<sup>52,54</sup> Due to mass lockdowns and quarantine during the pandemic, community mental health services, social supports, and communications with others were severely restricted; therefore, many patients with psychiatric disorders may feel highly stressed and helpless, thereby decreasing their adherence treatment.<sup>55,56</sup> As expected, patients who experienced illness worsening were at a higher risk of suicidality during the COVID-19 pandemic.<sup>57</sup> Certain psychiatric symptoms, such as depression and anxiety, are closely linked to suicidality. Furthermore, the associated stigma and discrimination of unstable mental illness could lead to severe psychological distress and hence increase the risk of suicidality.<sup>58,59</sup>

Similar to previous findings,<sup>60-62</sup> we found that patients with a primary diagnosis of MDD and those suffering from severe depressive symptoms had a higher risk of suicidality. Patients with more severe pain symptoms were also at an increased risk of suicidality during the COVID-19.

Pain has been considered as a risk factor of suicidality in older adults.<sup>63</sup> Some patients may consider suicide as a means of escape from personal suffering due to intolerable and unbearable pain.<sup>64-66</sup>

We found that older psychiatric patients with suicidality had lower QOL compared to those without, which is partly consistent with previous findings.<sup>62,67</sup> According to the distress/protection QOL model,<sup>68,69</sup> QOL is determined by the interaction of distress and protective factors. Suicidality is related to a range of negative health outcomes, for example, worsened psychiatric symptoms, functional impairments, and poor physical health, all of which could lower QOL.

The strengths of this study include the large sample size, multicenter design, and the use of standardized instruments. However, several limitations should be noted. First, clinically stable patients were included in this study, limiting the generalizability of the findings to patients in other illness phases. Second, for logistical reasons, some factors associated with suicidality, such as social support, were not examined. Third, the causal relationship between suicidality and other variables could not be examined due to the cross-sectional study design. Finally, suicidality is a spectrum of suicidal behaviors which include suicidal ideation, suicide plan, suicide attempt, and completed suicide. As this study only focused on patients who attended outpatient departments, those who died by suicide were excluded.

In conclusion, suicidality was common in older patients with clinically stable psychiatric disorders during the COVID-19 pandemic. Considering the negative impact on QOL and other health outcomes, routine screening and preventive measures of suicide should be implemented for older patients attending outpatient services with pre-existing psychiatric disorders during the COVID-19 pandemic. Specific suicide prevention measures for older psychiatric outpatients may include enhancing adherence to maintenance treatment during the COVID-19 pandemic, and telemedicine which has been widely implemented during the COVID-19 pandemic in China.<sup>5</sup> In addition, community-based mental health services which have been well developed in many areas of China should be integrated into the existing maintenance treatments for psychiatric outpatients in need, especially those with high risk of suicide.<sup>3,5,15</sup>

## Author Contributions

Study design: Qinge Zhang, Yu-Tao Xiang.

Data collection, analysis, and interpretation: Rui Liu, Xiuying Xu, Siyun Zou, Yulong Li, Huan Wang, Xiaona Yan, Xiang-Dong Du, Lan Zhang, Qinge Zhang, Wen Li.

Drafting of the manuscript: Rui Liu, Teris Cheung, Yu-Tao Xiang. Critical revision of the manuscript: Gabor S. Ungvari, Chee H. Ng. Approval of the final version for publication: all co-authors.

## Declaration of Conflicting Interests

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## Ethical Approval

This study was approved by the ethics committees of the respective hospitals in northern (Beijing), southern (Fujian province), eastern (Jiangsu province), and western parts (Gansu province) of China. All the participants required to be able to understand the purpose and contents of the assessments and provide written informed consent.

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