Anxiety and depression in community-dwelling patients with schizophrenia in China during the COVID-19 pandemic

Shanshan Chen
Sir Run Run Shaw Hospital
Xiaohua Sun
Zhejiang University School of Medicine, Hangzhou Seventh People's Hospital
Qisha Zhu
Zhejiang University School of Medicine, Hangzhou Seventh People's Hospital
Yuan Zhao
Zhejiang University School of Medicine, Hangzhou Seventh People's Hospital
Jinsong Tang (tangjinsong@zju.edu.cn)
Sir Run Run Shaw Hospital
Haidong Song
Zhejiang University School of Medicine, Hangzhou Seventh People's Hospital

Research Article

Keywords: Anxiety, COVID-19, Depression, Schizophrenia

Posted Date: March 28th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1408832/v1

Abstract

Background

The 2019 Corona Virus Disease (COVID-19) poses a huge challenge to the global public health. People with schizophrenia living in communities urgently need effective interventions to help them adjust to life and work, but they have not received enough attention. This study aims to assess the prevalence of anxiety and depression symptoms in community-dwelling patients with schizophrenia in China during the epidemic, and to explore possible influencing factors.

Methods

Using a cross-sectional survey, we collected 15165 questionnaires. Assessments included subjects' demographic information, knowledge of COVID-19-related information, sleep status, anxiety symptoms, depressive symptoms, and other accompanying illnesses. The Chinese versions of the 7-item Generalized Anxiety Disorder (GAD-7) and the 9-item Patient Health Questionnaire (PHQ-9) were used to evaluate the depression and anxiety of patients.

Results

Moderate to severe anxiety accounted for 16.9%, and the percentage of moderate and above depression was 34.9%. T-test showed that females with schizophrenia had a significantly higher score of GAD-7 and PHQ-9 than males with schizophrenia ($t=-2.03$, $P = 0.042$; $t=-3.27$, $P = 0.001$), and patients without other accompanying long-standing diseases ($t = 4.18$, $P < 0.001$; $t = 6.86$, $P < 0.001$), not understanding COVID-19 ($t = 8.17$, $P<0.001$; $t = 2.29$, $P = 0.022$) had lower GAD-7 and PHQ-9 scores. ANOVA showed that participants aged from 30 to 39 ($F = 2.8$, ,$P = 0.014$), with higher educational levels ($F = 4.0$, P = 0.007) scored higher on GAD-, and patients with better sleep($F = 158.8$, P < 0.001; $F = 284.0$, P < 0.001), having a simple knowledge of COVID-19 ($F = 93.19$, $P<0.001$; $F = 95.30$, $P<0.001$) had lower GAD-7 and PHQ-9 scores. Bivariate regression analysis indicated that participants aged 30–39 and 40–49 positively predicted anxiety, whereas only patients aged 30–39 years were positively predictive of depression. Participants with poor sleep, other long-standing diseases, knowing the COVID-19 pandemic were more likely to experience anxiety and depression.

Conclusion

Patients aged from 30 to 39, with poor sleep, other accompanying long-standing diseases, knowing the COVID-19 pandemic were potential factors of depression and anxiety. We need to strengthen psychological intervention for patients with schizophrenia.

Introduction

The discovery and rapid progress of the coronavirus disease 2019 (COVID-19) brought huge challenges to the public health and medical communities around the world[1]. The health effects of this virus are worrisome: including death, a strained healthcare system, and economic uncertainty. Similarly, the epidemic may have a devastating effect on psychology and society[2]. Numerous studies assessed the mental health of the general population during the COVID-19 pandemic [3, 4], but there was insufficient research on the emotional impact of schizophrenia patients during the epidemic.

It was reported that patients with schizophrenia had a significantly increased risk of contracting COVID-19 compared to the normal population [5]. High-risk factors included failure to properly recognize self-protection and adherence to preventive behaviors due to impaired cognitive function [6], difficulties in evaluating health information, limitations in access to healthcare[7], and being easily influenced by the ongoing media coverage of the epidemic [8]. Therefore, it is necessary to assess the mental health burden of patients with schizophrenia during the COVID-19 pandemic.

Several studies in China in 2020 showed that hospitalized schizophrenia patients in isolation wards with suspected COVID-19 experienced sleep disturbances had significantly higher scores on depression and anxiety scales and had increased stress compared with general hospitalized schizophrenia patients [9, 10]. In addition, hospitalized patients with schizophrenia suspected of covid-19 were reassessed with significantly more anxiety symptoms than before isolation after 10–14 days of isolation. [10].

Although community-dwelling patients with schizophrenia did not have as narrow and limited social network connections as long-term hospitalized patients [11], they were relatively underreported during the epidemic. A study revealed that many community schizophrenia patients still had some psychiatric symptoms despite their stable condition, and these symptoms affected the life of the patients to a certain extent[11, 12]. Community-dwelling patients with schizophrenia urgently need to be provided with effective intervention methods to help them adapt to life and work during the epidemic. Thus, we intended to explore the psychological burden of community-dwelling patients with schizophrenia during the pandemic. A study indicated that community-dwelling patients with schizophrenia or bipolar disorder experienced more serious anxiety and depressive symptoms compared to community healthy controls during the city lockdown [13]. However, the report did not analyze anxiety and depressive symptoms separately in patients with schizophrenia during the outbreak. A Spanish study showed that compared to the control group, community-dwelling patients with schizophrenia (n = 42) experienced significantly higher scores in Hospital Anxiety and Depression Scale Anxiety (HADS-A) and Hospital Anxiety and Depression Scale Depression (HADS-D) during the COVID-19 pandemic [14]. Moreover, 40.8% of community-dwelling patients with schizophrenia (n = 76) reported depression and 32.9% reported anxiety[15]. In general, studies on depression and anxiety among community-dwelling patients with schizophrenia during the epidemic currently are not enough, and the insufficient sample size is also a deficiency.

Considering the evolving and unpredictable duration of COVID-19, using a web-based cross-sectional and large sample study, the first aim of this study was to examine the mental health burden of community-dwelling patients with schizophrenia during the COVID-19 outbreak, and the second objective was to analyze the potential influence factors. This study assessed the impact of the COVID-19 pandemic crisis on the mental health of community-dwelling patients with schizophrenia. We collected sociodemographic data, anxiety and depression assessments, and some other information, including sleep status, other accompanying long-standing diseases, knowledge about COVID-19. Research on community-dwelling patients with schizophrenia will help provide effective psychological screening and interventions. We hypothesized that community-dwelling patients with schizophrenia had different degrees of anxiety and depression symptoms during the COVID-19 pandemic and that the 30–39 age group, poor sleep, moderate knowledge of epidemic information, and other accompanying long-standing diseases would have an impact on depression and anxiety.

Methods

Subjects

This cross-sectional study was conducted from 7 April to 10 May 2020 in China. Inclusion criteria were: living in China, being able to read and write, and meeting the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) diagnosis of schizophrenia. Questionnaires were administered among community-dwelling patients with schizophrenia and collected by physicians, practicing mental illness prevention in respective districts, counties, and county-level cities, by means of telephone or face-to-face interviews. All participating psychiatrists underwent uniform training. All data were truthfully observed and recorded by the investigator. The investigator used a uniform evaluation standard to conduct a standardized evaluation of all subjects.

The study complied with the ethical standards of the Declaration of Helsinki and was approved by the Ethics Committee of Hangzhou Seventh People's Hospital. All participants provided written informed consent. Because the participants in this study included minors, informed consent was obtained from their parents and/or legal guardians. 15165 questionnaires were collected in total. There were 7010 male participants (46.2%) and 8155 female participants (53.8%). Age ranged from 10 to 96 years old, and mean age was 55.4 years ± 13.9 S.D.

Measures

All participants completed a detailed questionnaire, including demographic data, anxiety and depression assessments, and some other information (see supplementary material for details), including sleep status, other accompanying long-standing diseases, knowledge of COVID-19. The Generalized Anxiety Disorder-7 (GAD-7) was adopted to assess the severity of self-reported anxiety[16]. It is composed of 7 items to evaluate how often over the past two weeks the patient has suffered from various issues, such as "difficulty in relaxing" or "excessive worry". Response categories are "not at all", "several days", "more than one week", and "nearly every day", scored as 0, 1, 2, and 3, respectively. The total score of the GAD-7

is calculated by summing each item score. The total score ranges from 0 to 21, with a score of 5 indicating that the patient has anxiety. A score of 5, 10, and 15 represent the threshold for “mild”, “moderate”, and “severe” anxiety respectively. Studies showed that the scale has good internal consistency (Cronbach’α=0.92), and the test-retest reliability coefficient was 0.83. When the decomposition value was 10 points, the sensitivity was 89% and the specificity was 82%[17].

PHQ-9, also with good reliability and validity, was employed to screen depressive disorder and measure the severity of symptoms[18]. PHQ-9 is made up of 9 items to evaluate how often over the past two weeks the patient has suffered from nine issues, including depressed mood and anhedonia. Response categories are “not at all”, “several days”, “more than one week”, and “nearly every day”, scored as 0, 1, 2, and 3, respectively. The total score ranges from 0 to 27, with a score of 5 indicating that the patient has depression. A score of 5, 10, 15, and 20 represent the threshold for “mild”, “moderate”, “severe”, and “extremely severe” depression respectively. Nine items of PHQ-9 include anhedonia, depressed mood, sleep disturbance, fatigue, appetite changes, low self-esteem, concentration problems, psychomotor disturbances, and suicidal ideation.

Statistical analysis

Data analyses were conducted using IBM SPSS Statistics software version 19.0 (IBM Corporation, Armonk, NY, USA). Categorical data were described in the case number (percentage) and quantitative data in mean score ± S.D. Group comparison was conducted by t-test, ANOVA, or chi-square test wherever suitable, and pairwise comparison was conducted by Bonferroni test. Multivariate logistic regression models were performed to identify independent predictors for anxiety and depression respectively. Statistical significance was set at a two-sided P-value < 0.05.

Results

General distribution of patient’s anxiety or depression

Among 15165 cases of patients with schizophrenia, the mean score of GAD-7 and PHQ-9 were 8.1±2.1 and 10.4±2.7 respectively, and the incidence of anxiety and depression was 100%. The proportion of mild anxiety was 83.2%, moderate anxiety accounted for 15.7%, and 1.2% severe. Meanwhile, 65.1% of participants had minimal symptoms of depression, moderate depression rate was 25.7%, the proportion of severe depression was 8.2%, and 1.0% severe. See Table 1 for details.

Table 1 The severity of depression and anxiety in patients during COVID-19

Severity	GAD-7		Severity	PHQ-9	
	n	(%)		n	(%)
Mild	12612	83.2	Mild	9867	65.1
Moderate	2377	15.7	Moderate	3902	25.7
Severe	176	1.2	Severe	1249	8.2
-	-	-	Extremely serious	147	1.0
Total	15165	100		15165	100

n: number; SD, standard deviation; GAD-7: the 7-item Generalized Anxiety Disorder; PHQ-9: the 9-item Patient Health Questionnaire; COVID-19: 2019 Corona Virus Disease.

Subgroup analyses of questionnaire scores

In order to look for the score differences of PHQ-9 and GAD-7, patients with schizophrenia were sub-grouped into six groups by demographic and clinical status, namely sex, age, marital status, educational level, sleep status, and other accompanying long-standing diseases. Regarding the GAD-7 score, group comparison showed that female patients were more anxious than men (t=-2.03, P=0.042). Patients in the 30-39 age group were more anxious than other age groups (F=2.84, P=0.014). Patients receiving university degrees or above had the highest anxiety (F=4.08, P=0.007). Patients with other accompanying long-standing diseases were more anxious than those without other diseases (t=4.18, P<0.001). Patients with poor sleep (F=158.87, P<0.001) had high levels of anxiety. Similarly, PHQ-9 results showed that female patients were more depressed than men (t=-3.27, P=0.001). Patients with poor sleep (F=284.00, P<0.001) had higher levels of depression. Patients with other accompanying long-standing diseases were more depressed than those without other diseases (t=6.86, P<0.001). See Table 2 for details.

Table 2 Comparison of GAD-7 and PHQ-9 scores in patients with different characteristic

Characteristic	n(%)	GAD-7 (Mean ±SD)	*F/ t/ c2*	*P*	PHQ-9 (Mean ±SD)	*F/ t/ c2*	*P*
Sex			-2.03	0.042		-3.27	0.001
Male(%)	7010 (46.2)	8.1±2.1			10.3±2.5		
Female(%)	8155 (53.8)	8.2±2.2			10.5±2.8		
Age(years)			2.84	0.014		1.79	0.111
≤18	24(0.2)	8.1±1.9			10.2±2.3		
19~29	508 (3.3)	8.0±2.2			10.3±2.9		
30~39	1647 (10.9)	8.3±2.3			10.6±3.0		
40~49	2642 (17.4)	8.2±2.1			10.4±2.6		
50~59	4433 (29.2)	8.1±2.1			10.4±2.6		
≥60	5911 (39.0)	8.1±2.1			10.4±2.7		
Marital status			1.69	0.092		0.90	0.368
With partner	8607 (56.8)	8.2±2.2			10.4±2.7		
Without partner	6558 (43.2)	8.1±2.1			10.4±2.6		
Education(years)			4.08	0.007		0.38	0.769
Illiteracy	2528 (16.7)	8.1±2.2			10.4±2.8		
Primary school	4786 (31.6)	8.1±2.1			10.4±2.7		
Junior high school	7069 (46.6)	8.2±2.1			10.4±2.6		
University and above	782 (5.2)	8.3±2.2			10.4±2.5		
Sleep status			158.87	<0.001		284.00	<0.001
Better	4256 (28.1)	7.8±1.6			9.8±1.8		

Normal	10243 (67.5%)	8.2±2.2			10.6±2.7		
Poor	666 (4.4%)	9.1±3.2			12.0±4.4		
Accompanying other long-standing disease			4.18	<0.001		6.86	<0.001
Yes	2648 (17.5%)	8.3±2.3			10.7±3.0		
No	12517 (82.5%)	8.1±2.1			10.3±2.6		

n: number; SD, standard deviation; GAD-7: the 7-item Generalized Anxiety Disorder; PHQ-9: the 9-item Patient Health Questionnaire; COVID-19: 2019 Corona Virus Disease.

Knowledge of the COVID-19 pandemic

T-test showed that patients who understood COVID-19 scored higher on GAD-7 (t=8.17, P<0.001) and PHQ-9 (t=2.29, P=0.022) respectively, compared to those who do not understand COVID-19. ANOVA showed those with general knowledge of COVID-19 scored higher on GAD-7 (F=93.19, P<0.001) and PHQ-9 (F=95.30, P<0.001) respectively than those with simple or deep knowledge about COVID-19. Detailed data was seen in Table 3.

Table 3 Patient's knowledge of COVID-19 pandemic

	n (%)	GAD-7 (Mean ±SD)	*F*/*t*	*P*	PHQ-9 (Mean ±SD)	*F*/*t*	*P*
Understanding COVID-19			8.17	<0.001		2.29	0.022
Yes	12722(83.9%)	8.2±2.1			10.4±2.6		
No	2443(16.1%)	7.8±2.0			10.3±2.9		
Total	15165(100%)						
The degree of knowledge about COVID-19			93.19	<0.001		95.30	<0.001
Simply know	12055(79.5%)	8.0±2.0			10.2±2.5		
Generally know	2803(18.5%)	8.6±2.5			11.0±3.1		
Deeply know	307(2.0%)	8.4±2.8			10.5±3.2		
Total	15615(100%)						

n: number; SD, standard deviation; GAD-7: the 7-item Generalized Anxiety Disorder; PHQ-9: the 9-item Patient Health Questionnaire; COVID-19: 2019 Corona Virus Disease.

Multivariate logistic regression models for anxiety and depression among community-dwelling patients with schizophrenia

GAD-7 and PHQ-9 scores were first transformed into binary variables with the threshold of mild anxiety or depression and then served as dependent variables in the respective regression models. Sex, age, marital status, educational level, sleep status, other accompanying long-standing diseases, understanding COVID-19, and the degree of knowledge of COVID-19 served as independent variables. The details about the multivariate analyses of predictors with logistic regression models for anxiety and depression are shown in Table 4.Our study showed that people in the 30-39 (OR:1.14; 95%CI [0.39,3.4]，P=0.811) and 40-49 (OR:1.16 ; 95%CI [1.03,1.32] ; P=0.018)age groups, with other accompanying long-standing diseases (OR:1.15; 95%CI [1.03,1.29]，P=0.013) , knowing the COVID-19 pandemic (OR:1.44 ; 95%CI [1.26,1.65]，P<0.001) are more likely to experience anxiety. Good sleep (OR:0.23; 95%CI [0.19,0.28]; P<0.001) can reduce the risk of anxiety. Meanwhile, patients aged 30-39 (OR:1.23 ; 95%CI [1.09,1.38] ; P=0.001), with other accompanying long-standing diseases (OR:1.29; 95%CI [1.18,1.42]，P<0.001) , knowing the COVID-19 pandemic (OR:1.49 ; 95%CI [1.34,1.64]，P<0.001) are more likely to experience depression. Good sleep(OR:0.26 ; 95%CI [0.22,0.31]; P<0.001) can reduce the risk of depression. Other independent variables are the insignificant predictors in the logistic regression model for anxiety and depression (Table 4). Interestingly, we performed regression analysis separately for males and females and found that male patients with a partner(OR:0.88; 95%CI [0.79,0.97]; P=0.013) had a lower risk of depression (Table 5), and the remaining results did not change much. Detailed data was seen in Table 4-6.

Table 4 Logistic regression analysis of anxiety and depression in patients with schizophrenia in the community

		Anxiety[a]		Depression[b]	
		OR（95%*CI*）	*P*	OR（95%*CI*）	*P*
Age	≤18	1.14(0.39-3.4)	0.811	0.86(0.35-2.09)	0.734
	19~29	0.94(0.72-1.21)	0.620	0.92(0.75-1.12)	0.387
	30~39	1.26(1.09-1.46)	0.002	1.23(1.09-1.38)	0.001
	40~49	1.16(1.03-1.32)	0.018	1.04(0.94-1.15)	0.488
	50~59	1.03(0.92-1.15)	0.614	1.01(0.93-1.10)	0.786
	≥60	1.00		1.00	
Sleep status	Better	0.23(0.19-0.28)	<0.001	0.26(0.22-0.31)	<0.001
	Normal	0.47(0.40-0.56)	<0.001	0.54(0.46-0.63)	<0.001
	Poor	1.00		1.00	
Accompanying other long-standing disease	Yes	1.15(1.03-1.29)	0.013	1.29(1.18-1.42)	<0.001
	No	1.00		1.00	
Understanding COVID-19	Yes	1.44(1.26-1.65)	<0.001	1.49(1.34-1.64)	<0.001
	No	1.00		1.00	
The degree of knowledge about COVID-19	Simply know	0.78(0.57-1.05)	0.095	0.85(0.67-1.08)	0.188
	Generally know	1.38(1.01-1.87)	0.041	1.54(1.20-1.99)	0.001
	Deeply know	1.00		1.00	

OR: odds ratio; COVID-19: 2019 Corona Virus Disease.

[a] Anxiety was defined as a patient with a score of >5

[b] Depression was defined as a patient with a score of >5

Table 5 Logistic regression analysis of anxiety and depression in male patients with schizophrenia in the community (N=7010)

		Anxiety[a]		Depression[b]	
		OR（95%*CI*）	*P*	OR（95%*CI*）	*P*
Marital status	With partner	/	/	0.88(0.79-0.97)	0.013
	Without partner	/	/	1.00	
Sleep status	Better	0.30(0.22-0.41)	<0.001	0.31(0.23-0.40)	<0.001
	Normal	0.54(0.41-0.72)	<0.001	0.61(0.47-0.79)	<0.001
	Poor	1.00		1.00	
Accompanying other long-standing disease	Yes	/	/	1.37(1.20-1.57)	<0.001
	No	/	/	1.00	
Understanding COVID-19	Yes	1.36(1.12-1.65)	0.002	1.48(1.28-1.72)	<0.001
	No	1.00		1.00	
The degree of knowledge about COVID-19	Simply know	0.66(0.44-1.01)	0.055	0.69(0.49-0.97)	0.032
	Generally know	1.18(0.77-1.82)	0.443	1.33(0.94-1.90)	0.112
	Deeply know	1.00		1.00	

OR: odds ratio; COVID-19: 2019 Corona Virus Disease.

[a] Anxiety was defined as a patient with a score of >5

[b] Depression was defined as a patient with a score of >5

Table 6 Logistic regression analysis of anxiety and depression in female patients with schizophrenia in the community (N=8155)

		Anxiety[a]		Depression[b]	
		OR（95%*CI*）	*P*	OR（95%*CI*）	*P*
Sleep status	Better	0.20(0.16-0.26)	<0.001	0.24(0.19-0.30)	<0.001
	Normal	0.44(0.35-0.55)	<0.001	0.50(0.41-0.61)	<0.001
	Poor	1.00		1.00	
Accompanying other long-standing disease	Yes	1.16(1.00-1.34)	0.046	1.21(1.07-1.36)	0.002
	No	1.00		1.00	
Understanding COVID-19	Yes	1.55(1.29-1.86)	<0.001	1.53(1.33-1.75)	<0.001
	No	1.00		1.00	
The degree of knowledge about COVID-19	Simply know	0.85(0.55-1.30)	0.454	1.00(0.71-1.41)	0.997
	Generally know	1.55(1.00-2.40)	0.050	1.75(1.23-2.50)	0.002
	Deeply know	1.00		1.00	

OR: odds ratio; COVID-19: 2019 Corona Virus Disease.

[a] Anxiety was defined as a patient with a score of >5

[b] Depression was defined as a patient with a score of >5

Discussion

In the current study, all community-dwelling patients with schizophrenia had different degrees of anxiety and depression during the epidemic period. Moderate to severe anxiety accounted for 16.9%, and the percentage of moderate and above depression is 34.9%, which partly meets our first hypothesis. Regression analysis showed that people aged from 30 to 39, poor sleep, other accompanying long-standing diseases, knowing the COVID-19 pandemic are potential factors of depression and anxiety, which is consistent with our second hypothesis.

15165 cases of community-dwelling patients with schizophrenia in this survey all had mild to severe anxiety and depression, which is supported by previous research. Compared to the control group, community-dwelling patients with schizophrenia experienced significantly higher scores in HADS-A and

HADS-D during the covid-19 pandemic [14]. Moreover, 40.8% of community-dwelling patients with schizophrenia (n = 76) reported depression and 32.9% reported anxiety[15].

In this study, the GAD-7 and PHQ-9 scores of schizophrenia patients in the 40–49 age group were higher than those of other age groups. Compared with patients with schizophrenia who are older than 60 years, patients aged from 30 to 39 and from 40 to 49 were more likely to experience anxiety and compared with patients older than 60 years old, patients aged 30–39 scored higher in depression. Previous studies showed that during the COVID-19 pandemic, people aged 30–49 had higher scores on epidemic knowledge and will pay more attention to epidemic information, which may increase the risk of depression and anxiety [19]. As we know, the unemployment rate of schizophrenic patients is high, ranging from 80–90%, resulting in limited economic income [20]. Middle-aged patients undergo a period of shouldering societal and familial responsibility, although their physiological function is gradually declining. During the epidemic, due to limited social activities [21], the financial resources of patients may be greatly affected, which may lead to greater stress of community schizophrenic patients, resulting in more obvious symptoms of anxiety and depression.

We found that patients with a partner had less serious depression symptoms than those without any partner. Studies have shown that patients with schizophrenia are usually associated with severe damage in many areas of life, including intimacy and social adjustment. Patients with schizophrenia, especially men, are less likely to get married than others[22, 23]. Being single may increase the risk of schizophrenia[22, 24], and for patients with schizophrenia, being single itself may be a risk of adverse outcomes[25]. Previous studies showed that married patients with schizophrenia or schizoaffective disorder evaluate their quality of life higher than single subjects, and have fewer suicidal ideations than divorced, widowed, or separated subjects[26]. When the COVID-19 pandemic occurred, the situation changed. The epidemic posed a serious threat to patients' children and families. The consequences of these difficulties may be long-term, partly because environmental risks penetrate the structure and process of the family system[27], while the patient's partners can take more risks together, so as to reduce the pressure of the patient. Moreover, male schizophrenias who were currently in marital status had the least disease-related symptoms[28].

The results of this study revealed that schizophrenic patients with poor sleep had more severe anxiety and depression symptoms, which was similar to previous studies[29]. Approximately 90% of people diagnosed with depression[30] and approximately 70% of anxiety patients [31] self-reported lack of sleep. Substantial evidence suggested that sleep disturbance was a prodromal symptom of recurrent depressive episodes[32, 33]. In addition, depression, anxiety, fear, etc., are more likely to cause sleep problems [34].

We found patients with schizophrenia who accompanied other long-standing diseases were at higher risk of anxiety and depression. A Turkish study showed that the general population with chronic diseases will be more seriously affected by depression and anxiety symptoms, and other accompanying chronic diseases was a risk factor for anxiety. It may be that patients with schizophrenia are more sensitive and aware of how their body feels [35].

The GAD-7 and PHQ-9 scores of community-dwelling patients with schizophrenia who understood COVID-19 were higher than those who did not understand. Besides, the group comparison above showed that the anxiety and depression symptoms of patients with general knowledge of the epidemic were more serious than those with simple or deep knowledge. For the first result, this may be because patients who didn't know about the COVID-19 couldn't fully understand the severity of the epidemic, and were less worried about the health problems of the epidemic, which led to insignificant anxiety and depression symptoms. After understanding the COVID-19 deeply, knowing that the methods of controlling infectious diseases including risk communication, hygiene habits, social distancing, and vaccines were safe and effective [36] their anxiety and depression were naturally reduced. Patients with moderate knowledge of the outbreak had the most severe symptoms of depression and anxiety, probably because they were not ignorant, but overwhelmed by seeing more information on COVID-19 [21]. Some of the information or relevant knowledge they obtained may be superficial, especially in uncertain periods. Conspiracy theories and rumors are particularly popular during the pandemic. For example, they saw some rumors but did not further obtain rumor refutation information. Social media may be double-sided under the promotion of some people [36]. Since the information obtained by patients was not in-depth enough and the information cannot be distinguished from true and false, it was more likely to have a sense of uncontrollability and produce more serious anxiety and depression.

As our findings showed, patients with schizophrenia had obvious psychological stress responses such as anxiety and depression during the epidemic. Previous research has shown that pandemics can lead to unemployment and family poverty, separation of family members, and social isolation [36]. At the same time, the number of patients being screened for safety reasons decreases, and individuals with psychiatric symptoms may have difficulty accessing medical assistance[35]. Therefore, we need to focus on the mental health of patients in a timely and adequate manner. These patients are prevented from experiencing more severe consequences after stimulation, such as worsening of psychiatric symptoms and disease relapse [37]. Community grassroots medical staff and members of care and rescue groups need to focus on follow-up and emotional counseling for patients with the above characteristics. Of course, this mental health program should not increase the burden on healthcare providers and the risk of spreading the infection to other[36].

This survey also has certain limitations. First, due to the special period of epidemic prevention and control, the patient's mental health questionnaire survey was delivered by home visits, telephone calls, outpatient clinics, etc. Different delivering forms may cause misunderstandings and inaccuracy of the results. In this study, the means of telephone or face-to-face interviews were used. Face-to-face communication may help patients understand better than phone conversations, and the results obtained were relatively more accurate. Second, in order to obtain patient information conveniently, all results were derived from self-report scales, which may lead to biases of patients' recall. Third, this study was mainly based on the evaluation of patients by local physicians practicing mental illness prevention and the results may be affected by their subjective evaluation. Finally, we did not evaluate the depression or anxiety symptoms of these patients before the outbreak, which leads to a lack of longitudinal comparison.

Conclusion

This was the first study to investigate the psychological burden of community-dwelling patients with schizophrenia with a large sample during the COVID-19 epidemic. This study demonstrated that during the epidemic period, moderate and severe anxiety and depression symptoms were common in patients with schizophrenia. In addition, we found that in the current study, the 30–39 age group, sleeping poorly, with other accompanying long-standing diseases, and understanding the COVID-19 were risk factors of anxiety or depression. Besides, patients with general knowledge of COVID-19 had more severe symptoms of depression and anxiety. Living with a partner was a protective factor for depression in male patients. Our results indicated that community-dwelling patients with schizophrenia are prone to anxiety and depression, and we need to strengthen psychological intervention for patients with schizophrenia during the COVID-19 pandemic period.

Abbreviations

COVID-19
2019 Corona Virus Disease
DSM-IV
Diagnostic and Statistical Manual of Mental Disorders IV
GAD-7
The 7-item Generalized Anxiety Disorder
n
Number
OR
Odds ratio
PHQ-9
The 9-item Patient Health Questionnaire
SD
Standard deviation

Declarations

Availability of data and materials

The datasets used and/or analysed during the current study are available from thecorresponding author on reasonable request.

Acknowledgments

The authors wish to thank all the patients who participated in this study and thank the support of the Science and Technology Department of Zhejiang Province (LGF21H090006).

Funding

This work was supported by the Public Projects of Science and Technology Department of Zhejiang Province (LGF21H090006).

Author information

Affiliations

Department of Psychiatry, Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, Hangzhou, Zhejiang 310016, China.

Affiliated Mental Health Center, Zhejiang University School of Medicine, Hangzhou 310013, China.

Hangzhou Seventh People's Hospital, Hangzhou 310013, China.

The 4th Clinical College of Zhejiang Chinese Medical University, Hangzhou 310006, China.

Contributions

H.D Song and J.S Tang designed the study. X.H Sun, Q.S Zhu and Y. Zhao collected the clinical study. S.S Chen conducted the methodology and statistical analysis. S.S Chen, J.S Tang and H.D Song contributed to the writing and editing of the article. All authors have read and approved the published version of the manuscript.

Corresponding author

Correspondence to Jinsong Tanga and Haidong Song.

Ethics declarations

Ethics approval and consent to participate

This was a questionnaire survey of community-dwelling patients with schizophrenia during the COVID-19 pandemic. All participants provided written informed consent. The study complied with the ethical standards of the Declaration of Helsinki and was approved by the Ethics Committee of Hangzhou Seventh People’s Hospital. All data related to the study is saved in a password-protected computer. Subjects did not be paid and no rights was infringed.

Consent for publication

Not applicable.

Competing interests

The authors declare no potential competing interests.

References

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. N Engl J Med. 2020;382:1199–207.
2. Lebel C, MacKinnon A, Bagshawe M, Tomfohr-Madsen L, Giesbrecht G. Elevated depression and anxiety symptoms among pregnant individuals during the COVID-19 pandemic. J Affect Disord. 2020;277:5–13.
3. Odriozola-Gonzalez P, Planchuelo-Gomez A, Irurtia MJ, de Luis-Garcia R. Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. Psychiat Res. 2020;290.
4. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int J Environ Res Public Health. 2020;17.
5. QuanQiu Wang RX, Nora D Volkow. Increased risk of COVID-19 infection and mortality in people with mental disorders: analysis from electronic health records in the United States. World Psychiatry. 2021;20:124–30.
6. Hao Yao J-HC, Yi-Feng Xu. Patients with mental health disorders in the COVID-19 epidemic. Lancet Psychiatry. 2020;7:e21.
7. Shinn AK, Viron M. Perspectives on the COVID-19 Pandemic and Individuals With Serious Mental Illness. J Clin Psychiat. 2020;81.
8. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry. 2020;7:547–60.
9. Liu X, Lin H, Jiang H, Li R, Zhong N, Su H, et al. Clinical characteristics of hospitalised patients with schizophrenia who were suspected to have coronavirus disease (COVID-19) in Hubei Province, China. Gen Psychiatr. 2020;33:e100222.
10. Ma J, Hua T, Zeng K, Zhong B, Wang G, Liu X. Influence of social isolation caused by coronavirus disease 2019 (COVID-19) on the psychological characteristics of hospitalized schizophrenia patients: a case-control study. Transl Psychiatry. 2020;10:411.
11. Yamada AM, Lee KK, Dinh TQ, Barrio C, Brekke JS. Intrinsic Motivation as a Mediator of Relationships Between Symptoms and Functioning Among Individuals With Schizophrenia Spectrum Disorders in a Diverse Urban Community. J Nerv Ment Dis. 2010;198:28–34.
12. Tomotake M. Quality of life and its predictors in people with schizophrenia. J Med Invest. 2011;58:167–74.
13. Sole B, Verdolini N, Amoretti S, Montejo L, Rosa AR, Hogg B, et al. Effects of the COVID-19 pandemic and lockdown in Spain: comparison between community controls and patients with a psychiatric disorder. Preliminary results from the BRIS-MHC STUDY. J Affect Disord. 2021;281:13–23.

14. Rosa-Alcazar A, Parada-Navas JL, Garcia-Hernandez MD, Martinez-Murillo S, Olivares-Olivares PJ, Rosa-Alcazar AI. Coping Strategies, Anxiety and Depression in OCD and Schizophrenia: Changes during COVID-19. Brain Sci. 2021;11.
15. Hoşgelen EI, Alptekin K. Letter to the Editor: THE IMPACT OF THE COVID-19 PANDEMIC ON SCHIZOPHRENIA PATIENTS. Turk Psikiyatri Derg. 2021;32:219–21.
16. Plummer F, Manea L, Trepel D, McMillan D. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic metaanalysis. Gen Hosp Psychiat. 2016;39:24–31.
17. Spitzer RL, Kroenke K, Williams JBW, Lowe B. A brief measure for assessing generalized anxiety disorder - The GAD-7. Arch Intern Med. 2006;166:1092–7.
18. Wang WZ, Bian Q, Zhao Y, Li X, Wang WW, Du J, et al. Reliability and validity of the Chinese version of the Patient Health Questionnaire (PHQ-9) in the general population. Gen Hosp Psychiat. 2014;36:539–44.
19. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int J Biol Sci. 2020;16:1745–52.
20. Mueser KT, Deavers F, Penn DL, Cassisi JE. Psychosocial treatments for schizophrenia. Annu Rev Clin Psychol. 2013;9:465–97.
21. Fiorillo A, Gorwood P. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. Eur Psychiatry. 2020;63:e32.
22. Agerbo E, Byrne M, Eaton WW, Mortensen PB. Marital and labor market status in the long run in schizophrenia. Arch Gen Psychiatry. 2004;61:28–33.
23. Eaton WW. Marital status and schizophrenia. Acta Psychiatr Scand. 1975;52:320–9.
24. Tien AY, Eaton WW. Psychopathologic precursors and sociodemographic risk factors for the schizophrenia syndrome. Arch Gen Psychiatry. 1992;49:37–46.
25. Thara R, Srinivasan TN. Outcome of marriage in schizophrenia. Soc Psychiatry Psychiatr Epidemiol. 1997;32:416–20.
26. Nyer M, Kasckow J, Fellows I, Lawrence EC, Golshan S, Solorzano E, et al. The relationship of marital status and clinical characteristics in middle-aged and older patients with schizophrenia and depressive symptoms. Ann Clin Psychiatry. 2010;22:172–9.
27. Prime H, Wade M, Browne DT. Risk and resilience in family well-being during the COVID-19 pandemic. Am Psychol. 2020;75:631–43.
28. Walker E, Bettes BA, Kain EL, Harvey P. Relationship of gender and marital status with symptomatology in psychotic patients. J Abnorm Psychol. 1985;94:42–50.
29. Okun ML, Mancuso RA, Hobel CJ, Schetter CD, Coussons-Read M. Poor sleep quality increases symptoms of depression and anxiety in postpartum women. J Behav Med. 2018;41:703–10.
30. Tsuno N, Besset A, Ritchie K. Sleep and depression. J Clin Psychiatry. 2005;66:1254–69.

31. Alvaro PK, Roberts RM, Harris JK. A Systematic Review Assessing Bidirectionality between Sleep Disturbances, Anxiety, and Depression. Sleep. 2013;36:1059–68.
32. Ford DE, Cooper-Patrick L. Sleep disturbances and mood disorders: An epidemiologic perspective. Depress Anxiety. 2001;14:3–6.
33. Breslau N, Roth T, Rosenthal L, Andreski P. Sleep disturbance and psychiatric disorders: A longitudinal epidemiological study of young adults. Biol Psychiat. 1996;39:411–8.
34. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry Res. 2020;288:112954.
35. Ozdin S, Bayrak Ozdin S. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. Int J Soc Psychiatry. 2020;66:504–11.
36. Bakshi AJ, Deshmukh J, Kumar S. The psychology of pandemics: preparing for the next global outbreak of infectious disease. British Journal of Guidance & Counselling. 2021;49:633–6.
37. Seghi F, Barbini B, Franchini L, Colombo C. The challenge of mental health during Covid-19 outbreak: experience from metropolitan area of Milan. Eur Arch Psy Clin N. 2021;271:401–2.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Supplementarymaterial1.docx