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Medication adherence among community-dwelling schizophrenia patients during the COVID-19 pandemic: A cross-sectional study

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ABSTRACT

Objectives: This study aims to investigate medication adherence during the COVID-19 pandemic among community-dwelling schizophrenia patients, and to explore the role of social support in improving medication adherence in a rural community sample in China.

Methods: A cross-sectional sample of 800 patients was recruited using a cluster random sampling method in Yingshan County, Sichuan Province. Information on participant demographic characteristics, social support and medication adherence was collected through face-to-face interviews. The data analysis was performed using SAS9.4. Two binary logistic regression models were employed to identify the association between regular medication use and social support.

Results: The rate of regular medication adherence among community-dwelling patients with schizophrenia was 41.5%, which was lower than that indicated by recent research (Li et al., 2020) before COVID-19 in western rural China. The mean scores and standard deviation of the patient's objective support, subjective support, and support utilization were 4.94 ± 1.57 , 17.03 ± 5.24 , and 5.25 ± 2.75 , respectively. The social support standard deviation was 27.22 ± 6.32 . The crude odds ratio of objective support, subjective support, and support utilization were 0.790 (95%CI:0.713–0.876), 0.999 (95%CI:0.971–1.027), and 1.049 (95%CI:0.995–1.105) respectively. After adjusting for potential factors, the adjusted odds ratio of objective support, subjective support, and support utilization were 0.758 (95%CI:0.673–0.853), 1.030 (95%CI:0.994–1.068), and 1.043 (95%CI:0.985–1.105), respectively.

Conclusions: During the COVID-19 pandemic, community-dwelling schizophrenia patients had a low rate of regular medication adherence. This was particularly true of those who were older adults, less educated and living in rural areas. The results of this study suggest that strengthening social support may effectively improve medication adherence for those patients.

1. Introduction

Schizophrenia is, a persistent, chronic, and severe brain disorder (Owen et al., 2016; van Os and Kapur, 2009; Perkovic et al., 2017). It is well-known for its morbidity and disability rates (Subotnik et al., 2011), with a lifetime prevalence of 1% globally (~21 million) (Owen et al., 2016; Yu et al., 2020a). According to Huang et al., 2019; Li et al., 2020, the lifetime prevalence of schizophrenia in China is 0.6% (~8 million). Given the advances in primary health care services, there has been a considerable improvement in managing patients with schizophrenia (Owen et al., 2016). About 90% of schizophrenia patients now live in

communities due to de-institutionalization. Hence, a supportive community and family environment are essential to these patients in the absence of a physician's direct management (Chen et al., 2012). Additionally, patients with schizophrenia could enjoy subsidised medication in China (Sichuan Center for Disease Control Prevention, 2020). Social support for schizophrenia patients is a critical protective factor and has been the focus of numerous studies (Subotnik et al., 2011; Fan et al., 2021).

Medication adherence is critical in helping community-dwelling schizophrenia patients maintain disease stability. As a result, it is a core assessment indicator in providing information, treatment, and

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quality management in the community (Subotnik et al., 2011). Previous systematic reviews have reported increased medication non-adherence among patients with schizophrenia—from 56% to over 90% in the third year-in each of the first five years of treatment (Hsieh et al., 2019; Xiao et al., 2015). According to Li et al. (2020), the rate of medication adherence was 63.6% in southwest China. Many factors affect medication adherence, and there is general agreement that it is mediated best by patients, their social environment, and other treatment-related factors. Surveys conducted by Scheurer et al. (2012) showed that social support effectively promoted medication adherence. Social support systems combined with efforts by primary mental health workers, community staff, and families help to maintain patients' stability (Yu et al., 2020a). These include regular follow-up visits, medication guidance and monitoring, and rehabilitation training (Yang et al., 2022). These factors help to facilitate rehabilitation activities and increase medication adherence in schizophrenia patients (Huang et al., 2019). Rehabilitation activities were given to schizophrenia patients in the community by mental health staff and primary health care workers on four follow-up visits per year to improve the quality of medication adherence (National Health Commission of the People's Republic of China, 2017).

The coronavirus epidemic, known as Corona Virus Disease 2019 (COVID-19), has spread rapidly, resulting in a substantial number of deaths worldwide (Chen et al., 2020; Asanjarani et al., 2021). It has also posed a new challenge for managing schizophrenia patients (Chen et al., 2020; Khatibi et al., 2021). During the pandemic, Chinese authorities have implemented social distancing policies, including home-quarantine and regulations to reduce social connection and proximity. These measures may also interfere with the management of community-dwelling schizophrenia patients during the pandemic (Brown et al., 2020; Bao et al., 2020). As for individuals with schizophrenia, changes in social interactions have some limitations. These include routine home visits, medication delivery, home-care management and other similar support mechanisms (Zhang et al., 2022; Zhu et al., 2020). Patients with schizophrenia are more likely to be ostracised by the community due to the disease symptoms are highly affected by external stimulation (Kozloff et al., 2020). Besides strict social control, the Chinese government also implemented a series of prevention and control measures, including limitations for patients in hospitals, medicine management and delivery, and closing rehabilitation programs (Yu et al., 2020c). Hence, schizophrenia patients' stricter medication adherence may be more susceptible to extrinsic factors. Consequently, their poor medication adherence was only worsened by the pandemic (Chutiyami et al., 2021; Kim et al., 2021). Schizophrenia patients who received community-based management services at home during the COVID-19 pandemic had a lower regular medication rate and significantly declined levels of social support (Kozloff et al., 2020).

Due to a considerable lack of social support for people with schizophrenia in underdeveloped areas, we chose Yingshan County as the sampling area for this research. Our study aimed to (a) investigate medication adherence in community-dwelling schizophrenia patients in terms of the medication adherence specification and (b) confirm the impact of social support on medication adherence. We hypothesize that schizophrenia patients with better social support were more likely to achieve medication adherence during the COVID-19 pandemic.

2. Methods

2.1. Study setting and participants

This cross-sectional study was conducted in Yingshan County, Northeast of Nanchong city, Sichuan Province, China. The present study was conducted from May to July 2021. A total of 2297 people diagnosed with schizophrenia were registered on the Sichuan Province Comprehensive Management Information Platform for Severe Mental Disorders as of December 31, 2020 (Sichuan Province Center for Mental Health,

2019). This amounts to a prevalence rate of 0.37%, (given the registered population of Yingshan County at the end of 2020 as the denominator). Inclusion criteria for schizophrenia patients were as follows: (1) meet the definitions of the International Classification of Diseases ICD-10 criteria-(World Health Organization WHO, 2019)-and the Chinese Classification of Mental Disorders Scheme and Diagnostic Criteria, 3rd edition (CCMD-3); (2) had a minimum of 1-year disease duration since diagnosis; (3) is aged between 16–85 years, and (4) are schizophrenia participants who received community management at home for ≥ 6 months and required consistent, regular, medication adherence during the COVID-19 pandemic. (5) Regular medication was defined as being used and taken as prescribed by the schizophrenia patient's doctor according to the CCMD-3. Exclusion criteria were as follows: 1) Incapacitated or unable to complete the survey, 2) comorbid with other mental illness or serious physical illness, 3) no clear guardian.

Regular use of medication was used as an indicator to obtain the required sample. The sample size was calculated based on the following formula: $n = \left(\frac{Z_{1-\alpha/2}}{\delta}\right)^2 \times p \times (1 - p)$. Using $\alpha = 0.05$, per the literature, a regular medication rate of $p=40\%$, and a tolerance error $\delta=4\%$ (10% of the regular medication rate), the sample size required for the calculation was 514 people. Taking into consideration a 30% missed visit rate, the final (minimum) sample size was determined to be 789 people.

The community mental health service centres in Yingshan County were divided into 10 zones by the Serious Mental Disorder Management Office of Yingshan County (County, Serious Mental Disorder Management Office). Based on the pre-survey results, four zones (one urban and three rural regions, defined by administrative classification in China (National Bureau of Statistics (P.R. China) 2008) were selected through a cluster random sampling method with the mental health service management section as a sampling unit. Ultimately, 947 patients who met the study definition criteria within the management ward were included as survey participants.

2.2. Ethical considerations

Written informed consent was obtained from each eligible participant before the commencement of the interview. The interviewed participants or their guardians were informed verbally and in writing of the study's purpose, their right to refuse to participate, and the voluntary nature of their participation. The study content and all procedures were reviewed and approved by the Institutional Ethics Review Board (IERB) of the Psychosomatic Hospital Affiliated with the North Sichuan Medical College in June 2021.

2.3. Data collection

The field survey was conducted by one physician and four nurses from the Nanchong Psychosomatic Hospital psychiatry department, affiliated with the North Sichuan Medical College. Before commencement, they received a one-day training session run by the research team. This covered the work plan, core indicators definitions, data collection standards, and the ethical consideration requirement. All participants and their guardians were invited to a designated office in the selected zones by the general practitioner responsible for their routine management. The interviewers approached participants and assessed their eligibility for the study before a face-to-face interview was conducted to collect their information after receiving consent. Interviews were conducted from the patients' homes for those who could not come to the designated location (about 10% of the total participants). The interview took about 10 minutes, and a payment of 20 CNY (equivalent to \$2.6, Jun.10th 2022) was made.

2.4. Sociodemographic and related factors

Information on sociodemographic characteristics (age, gender, marital status, education level, occupation, place of residence, monthly family income per person) was collected. The subject-related variables-including family income, burden, duration, and caregivers' information-were gathered through direct consultation with the patient or their caregivers by the same interviewers. Family income in this study was divided into three levels: good, average and poor. The response option for family incomes was dependent on participants' self-assessment criteria. Patients and their respective caregivers were interviewed individually to ensure their privacy and confidentiality during the data collection process.

2.5. Social support rating scale (SSRS)

The Social support rating scale (SSRS), designed by Xiao (1994) in 1988, is a widely used assessment tool to evaluate social support. This revised version of the tool has been proven reliable and valid in diverse Chinese populations with a Cronbach's alpha of 0.784 ((WHO), 2019). In this study, there were 10 variables. Each variable was divided into four levels, from low (without support) to high (full support), for a total score of 40. It contained three dimensions: subjective support (items 1, 3, 4, and 5), objective support (items 2, 6, and 7), and support utilization (items 8, 9, and 10). The total score was calculated as the sum of all the items. The higher the total score, the higher the levels of social support are expected.

2.6. Data analysis

Both database creation and basic statistical analyses were performed using the SAS9.4 software version (SAS Inc., NCSU, USA). Continuous variables were represented by their means and standard deviations. T-test analyses were conducted for group comparisons. For categorical variables, frequencies were used for basic descriptions and chi-squared tests were used for group comparison. Regular medication use was defined as taking medicine regularly during the COVID-19 pandemic. The medication adherence criteria were assessed according to the National Basic Public Health Service Standards of the P.R.China (3rd edition) (National Health Commission of the People's Republic of China, 2017), and were divided into four categories. These were regular, intermittent, not taking medication at all, and no medication prescribed (National Health Commission of the People's Republic of China, 2017). Using the advice from experts in this field (Velligan et al., 2010) and published No.46 documents of the Health Bureau of Yingshan County, 2021), a regular standard was established for the medication adherence category. Intermittent and not taking medication at all was defined as nonadherent. Also, we defaulted to medication nonadherent if the participants were interviewed at a level that qualified as non-adherence.

The regular medication rate was equivalent to the number of regular medication-adherent patients divided by the total number of respondents. Two binary logistic regression analyses were further developed to examine the crude and adjusted associations between regular medication use and social support. With regular medication use set as the dependent variable (regular medication use = 1, irregular medication use = 0), model 1 showed the crude odds ratio of objective support, subjective support, and support utilization. Model 2 showed the adjusted odds ratio of Model 1, factoring in demographic and socio-economic characteristics such as types of guardianship, with the social support level as independent variables.

The model was not filtered for variables considering the large sample size. Of the independent variables, unordered multi-categorical variables (place of residence, marriage, guardian-patient relationship, etc.) were included in the model in the form of dummy variables, and covariates were tested before inclusion. Statistical significance was set at $P < 0.05$.

3. Results

3.1. Descriptive analyses

Of the 947 eligible participants, 800 actually participated in the study, indicating a response rate of 84.5%. The demographic characteristics are presented in Table 1. Of the 800 patients enrolled, 312 (39.0%) were male, and 488 (61.0%) were female- the ratio of men to women was 0.64:1. One hundred seventy-three (21.6%) were unmarried, 548 (68.5%) were married, and 79 (9.9%) were categorised as other. In addition, 254 (31.8%) were illiterate or semi-illiterate, 319 (39.9%) had primary school education, and 227 (28.4%) had junior school education and above. The majority, 665 (83.1%) came from rural areas. Guardians were primarily couples-426 (53.3%)-223 (27.9%)

Table 1
Demographic characteristics and regular medication use of community-dwelling schizophrenia patients in Yingshan County during the COVID-19 pandemic, 2021.

Variables	Respondents (N)		Regular Medication Use (N)		χ^2 value	P value
	Total	Percentage	Total	Rate (%)		
Sex						
Male	312	39.0	153	49.0	11.973	0.001
Female	488	61.0	179	36.7		
Residence					6.828	0.033
Urban area	44	5.5	26	59.1		
Town	91	11.4	41	45.1		
Rural area	665	83.1	265	39.8		
Age					46.681	0.001
≤40	181	22.6	106	58.6		
41-60	399	49.9	171	42.9		
>60	220	27.5	55	25.0		
Educational level					53.825	0.001
Semi-illiterate & illiterate	254	31.8	65	25.6		
Primary school	319	39.9	134	42.0		
Junior and above	227	28.4	133	58.6		
Marital status					11.993	0.002
Unmarried	173	21.6	91	52.6		
Married	548	68.5	207	37.8		
Other*	79	9.9	34	43.0		
Family income					0.082	0.960
Good	58	7.3	25	43.1		
Average	479	59.9	199	41.5		
Poor	263	32.9	108	41.1		
Relationship with guardian					10.732	0.013
Parents	264	33.0	131	49.6		
Couple	426	53.3	160	37.6		
Children/Relative	66	8.3	25	37.9		
Group	44	5.5	16	36.4		
Education of guardian					2.990	0.224
Semi-illiterate & illiterate	197	24.6	86	43.7		
Primary school	402	50.3	155	38.6		
Junior and above	201	25.1	91	45.3		
Free medication					4.387	0.036
Yes	735	91.9	313	42.6		
No	65	8.1	19	29.2		
Rehabilitation activity					22.219	0.001
治疗活动						
Yes	223	27.9	122	54.7		
No	577	72.1	210	36.4		

Note: *Other, including divorced, widowed and unspecified categories. Bold P-value represents statistics with statistical significance; Percentage means respondents / Total numbers; Rate means regular medication use patients/ total respondents.

participated in rehabilitation activities.

3.2. Analyses of patients' medication use during the pandemic

Of the 800 respondents, regular medication use was shown in 332 patients, a rate of 41.5%, which was lower than that indicated by a recent study in rural China (Li et al., 2020). Patient characteristics whose medication use was irregular, were: female (36.7%), age >60 (25.0%), living in rural areas (39.8%), low education level of semi-illiterate to illiterate (25.6%), and could not participate in rehabilitation activities (36.4%). Conversely, those who took free medication (42.6%) and participated in social rehabilitation activities (54.7%) had a significantly higher rate of regular medication use. Moreover, there were no significant associations between marital status, family income, relationship with guardians, guardians' educational level, and regular medication use.

3.3. Social support factors during the pandemic

The social support scores collected during the pandemic are shown in Table 2. Our results revealed the scores for patients' objective support, subjective support and support utilization were 4.94 ± 1.57 , 17.03 ± 5.24 and 5.25 ± 2.75 , respectively. Social support was 27.22 ± 6.32 . Patients with regular medication adherence had significantly higher scores in objective and subjective support, and higher total scores, than those with irregular medication adherence. However, there was no significant difference in support utilization.

3.4. Logistic regression analysis of factors associated with regular medication use

As seen in Table 3, Model 1 examined the crude odds ratio of objective support, which was 0.790 (95%CI:0.713–0.876). Model 2 shows the objective support adjusted odds ratio was 0.758 (95% CI:0.673–0.853)-Model 1 plus potential factors such as demographic characteristics and family incomes. Both models show that the higher the objective support, the more regular medication use becomes.

Those patients who lived in rural areas (OR = 2.13, 95%CI: 1.05–4.29) and were >60 years old (OR = 2.44, 95%CI: 1.42–4.18) had a lower regular medication adherence rate. Regarding influencing factors such as education level, those with primary school education (OR = 0.59, 95%CI: 0.39–0.89) and junior and above levels of education (OR = 0.38, 95%CI: 0.24–0.61) had a higher regular medication rate than those who were illiterate. Moreover, patients with high scores in objective support (OR = 0.75, 95%CI = 0.67–0.85) also had a higher regular medication rate. We also found that schizophrenia patients who had participated in rehabilitation activities had a higher regular medication adherence rate than those who did not participate in rehabilitation activities (OR = 2.50, 95%CI = 1.72–3.63).

4. Discussion

The accessibility of service resources for severe schizophrenia patients has gradually increased with the development of community

Table 2

Social support score by regular medication adherence indicator (whether or not regular medication use is adhered to).

Variables	Regular Medication Use		t value	P value
	Yes	No		
Objective Support	4.94 ± 1.57	4.44 ± 1.44	4.681	0.001
Subjective Support	17.03 ± 5.24	16.36 ± 5.35	1.748	0.081
Support Utilization	5.25 ± 2.75	5.45 ± 2.80	-0.969	0.333
Total score	27.22 ± 6.32	26.24 ± 6.78	2.062	0.040

Note: Bold P-value represents statistics with statistical significance;

Table 3

The logistic regression analysis of influencing factors on regular medication use among community-dwelling schizophrenia patients in Yingshan County during the COVID-19 pandemic.

Variables	β value	OR (95%CI)	P value
Model 1			
Objective support	-0.236	0.790(0.713–0.876)	0.001
Subjective support	-0.001	0.999(0.971–1.027)	0.929
Support	0.047	1.049(0.995–1.105)	0.079
Model 2			
Objective support	-0.278	0.758(0.673–0.853)	0.001
Subjective support	0.029	1.030(0.994–1.068)	0.107
Support	0.042	1.043(0.985–1.105)	0.149
Sex			
Male		1	
Female	0.241	1.273(0.867–1.868)	0.218
Residents			
Urban area		1	
Town	0.416	1.516(0.666–3.453)	0.322
Rural area	0.756	2.130(1.057–4.294)	0.035
Age			
<40		1	
40~	0.265	1.303(0.854–1.988)	0.220
>60	0.893	2.443(1.427–4.183)	0.001
Educational level			
Illiterate		1	
Primary school	-0.519	0.595(0.398–0.890)	0.011
Junior and above	-0.957	0.384(0.242–0.610)	0.001
Marital status			
Unmarried		1	
Married	-0.130	0.878(0.489–1.576)	0.663
Other	-0.149	0.861(0.451–1.643)	0.650
Family income			
Good		1	
Average	-0.073	0.930(0.491–1.760)	0.823
Poor	-0.222	0.801(0.400–1.601)	0.801
Relationship with guardian			
Parents		1	
Couple	-0.009	0.991(0.624–1.574)	0.970
Children/Relative	0.001	1.001(0.516–1.942)	0.998
Group	0.155	1.167(0.534–2.554)	0.699
Education of guardian			
Semi-illiterate & illiterate		1	
Primary school	0.163	1.177(0.789–1.754)	0.425
Junior and above	0.085	1.089(0.673–1.761)	0.729
Free medication use			
Yes		1	
No	0.510	1.665(0.895–3.096)	0.107
Rehabilitation activity			
治疗活动			
Yes		1	
No	0.917	2.502(1.721–3.636)	0.001

Note: *1 represents the reference group. Bold P-value represents statistics with statistical significance; Model 1: Crude OR; Model 2: Adjusted OR

primary mental illness care and management in China. However, due to the COVID-19 outbreak, regular social and medication services and basic management strategies for schizophrenia had been limited and restricted. By understanding these problems, the findings of this study are more likely to help improve schizophrenia services and enhance primary health care policies.

Previous studies have demonstrated that the differences in regular medication adherence rates among community-dwelling schizophrenia patients range from 35.8 to 71% across regions (Velligan et al., 2010; Wang et al., 2016). According to Li et al. (2020), the rate of medication adherence was 63.6% before COVID-19 in western rural China. Findings from the present studies indicated that the medication adherence rate of schizophrenia patients in Yingshan County during the COVID-19 pandemic was 41.5%, which was lower than that indicated by recent research (Yu et al., 2021). There is relative consistency in demographic characteristics, indicator definitions, and survey methods between the current study and previous studies. Considering this, the differences between the previous findings and the current study illustrate that the

impact of the COVID-19 pandemic may be a reasonable explanation for schizophrenia patients' irregular medication adherence. This finding is in line with previous pandemic findings that indicated that schizophrenia patients' medication adherence becomes irregular during home quarantine or restrictions of rehabilitation services. The pandemic caused a situation with limited to no social contact over several months (Meyer et al., 2021). Patients' rehabilitation and health education activities had decreased significantly in the community during the pandemic, and so did their medication adherence. Additionally, the readmission and recurrence rates of patients had increased. Hence, giving special attention and social support to those schizophrenia patients during pandemics is important to prevent adverse outcomes.

It has been found that high levels of social support are a basic requirement for a schizophrenia patient's rehabilitation and integration into normal life. Previous studies have shown that severe schizophrenia patients have lower social support levels due to social prejudice and bias (Hou et al., 2008; Huang et al., 2009). This places the burden of long-term health care on the family. The total score of social support for schizophrenia patients was much less than the Chinese domestic standard score (38.78 ± 7.60), and the three dimensions scores were lower than the scores before the pandemic (Shields-Zeeman et al., 2020). During the pandemic, lockdowns led to the forced isolation of entire societies (Chen et al., 2020), and the social support level declined significantly in patients with schizophrenia. Lockdowns also reduced or completely stopped interpersonal communication and social interaction. Accordingly, schizophrenia patients' cognitive functions were incomplete. This meant they perceived danger-related safety problems, crisis management, and social communication as significantly more burdensome during the pandemic. This could lead to outbreaks of severe schizophrenic behavior in some populations. These results of this study indicate that community residents and the public gradually declined social support for schizophrenic populations due to this potential severe behavior (Yu et al., 2020c; Yu et al., 2020b). This study also found schizophrenia patients with lower objective and subjective support scores tended to have lower regular medication adherence rates, consistent with previous studies (Yu et al., 2020b). It can be concluded that during a crisis such as a global pandemic, there is an important connection between social support level, medication adherence, and further rehabilitation of schizophrenia patients (Huang et al., 2019).

The two logistic regression models illustrated the relationship between regular medication use and social support. Model 1 showed the crude odds ratio, considering that social support was related to various potential factors such as demographic characteristics and economic levels. Model 2 was the adjusted odds ratio of Model 1 plus potential factors. We found that the higher the objective support, the more regular medication use. This indicated the association between regular medication use and social support. Our result also showed that schizophrenia patients, who were female, lived in rural areas, and were over 60 years old had a low regular medication adherence rate. This often correlated with lower socioeconomic status, limited mobility, and poor willingness and initiative to accept health services. Moreover, due to the impact of the pandemic, schizophrenia patients had greater difficulty finding rehabilitation services. Clearly, those patients' regular medication use rates would be lower due to the lack of rehabilitation services and objective support in communities during that time.

Online visits had already become an important alternative for chronic management during the pandemic. This included follow-up medication guidance, rehabilitation counselling, and patient health education (Shang et al., 2017; Maguire et al., 2019). However, lower patient literacy levels were associated with more difficulties mastering and utilizing modern web-based techniques (Huang et al., 2019; Zhang et al., 2022; Wang et al., 2016). Enhancing online social support could be helpful for patients' daily management. The demographic variables showed that patients with higher educational backgrounds had better regular medication adherence rates and rehabilitation outcomes, better education can be identified as contributors to new ideas for future

community management. Broadly, our findings were consistent with previous evidence showing that, compared to those patients on free medication, the self-pay patients usually had lower regular medication adherence rates (Jääskeläinen et al., 2013). This might be explained by economic elements, and the special management measures during the COVID-19 pandemic. Expanding the scope of free medication, improving access to medication, and enabling ease of medication purchasing for self-pay patients are measures that could help schizophrenia patients receive more medical social support. During the pandemic, pharmacies had to close due to community management regulations (Chutiyaami et al., 2021), and the self-pay patients or their caregivers needed to go to hospitals to purchase medications. These patients often faced greater difficulties and required more social support than the schizophrenia patients on free medication who relied on organised distribution by primary health care workers (Biswas et al., 2021). As noted by our investigators, those who participated in community-based rehabilitation activities had a higher regular medication adherence rate than those who did not participate in any activities. It should also be noted that in previous studies (Meyer et al., 2021), schizophrenia patients may have had more communication opportunities for increased social support from peers (Chutiyaami et al., 2021), as well as received more care through organised community rehabilitation activities (Yu et al., 2020c). In our findings, almost 75% of patients had not taken part in community-based rehabilitation activities through primary care social support. This ongoing dilemma could be addressed after the pandemic.

5. Limitations

There are some limitations to the current study. As participants were selected using county-based nonrandom sampling in China, they might not be representative of all counties, and thus the findings cannot be generalised. Being cross-sectional by design and during the late stage of a pandemic, the causal inferences of this study might be misleading. In addition, due to the prevalence of the pandemic, outcomes based on the conditions in primary health care and community-based rehabilitation services offered to patients with schizophrenia may vary significantly. Despite these limitations, this study adds to the limited knowledge base on medication adherence among community-dwelling schizophrenia patients in China and the importance of social support during the COVID-19 pandemic.

6. Conclusion

In summary, during the COVID-19 pandemic, community-dwelling schizophrenia patients had a low rate of regular medication adherence, particular among those who were older adults, less educated, and living in rural areas. Patients with a high level of social support have a higher level of medication adherence. Therefore, it is suggested that social support is provided to community-dwelling schizophrenia patients to maintain medication adherence.

CRediT authorship contribution statement

Lansicheng Yao: Visualization, Software, Writing – original draft, Writing – review & editing. **Hongying Liu:** Conceptualization, Methodology, Supervision. **Xiaobing Tian:** Data curation.

Declaration of Competing Interest

The authors report no conflict of interest in this work.

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