ORIGINAL RESEARCH

Mediating Effect of Self-Efficacy on the Relationship Between Perceived Social Support and Resilience in Patients with Recurrent Schizophrenia in China

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Purpose: To explore the mediating effect of self-efficacy on the relationship between perceived social support and resilience in patients with recurrent schizophrenia in China.

Patients and Methods: In this cross-sectional study, a total of 176 patients with recurrent schizophrenia who were hospitalized in a tertiary hospital in Hunan Province, China, completed a general data questionnaire, the Connor Davidson Resilience Scale (CD-RISC), the Perceived Social Support Scale (PSSS) and the General Self-Efficacy Energy Scale (GSES).

Results: Among the 176 patients, the mean GSES score was 2.02±0.61, the mean PSSS score was 56.77±14.61, and the mean CD-RISC score was 58.06±17.26. Self-efficacy played a partial mediating role between social support and resilience, and the mediating effect accounted for 42.56% of the total effect.

Conclusion: The resilience level of patients with recurrent schizophrenia in China is moderate and needs to be improved. This research revealed that self-efficacy played a part in mediating perceived social support and resilience in patients with recurrent schizophrenia in China. Perceived social support can indirectly affect resilience in patients with recurrent schizophrenia through self-efficacy. Comprehensive interventions in perceived social support and self-efficacy would help to improve the resilience of patients with recurrent schizophrenia.

Keywords: recurrent schizophrenia, perceived social support, self-efficacy, resilience, mediating effect

Introduction

The recurrence of schizophrenia in China is a serious concern. A study found that the recurrence rate of schizophrenia among patients in China was 41.3% one year after discharge, and the average recurrence time was 6.02 months.[1] The recurrence rate within six months after discharge was as high as 1/3.[2] Abroad, Nadeem[3] found that the vast majority of schizophrenic patients will relapse within two years, and only 16.6% will not relapse within 10–15 years. The recurrence rate in schizophrenia patients with a first attack in China was found to be more than 80% in five years, which is much higher than that in other countries.[4] Studies have shown that the economic burden of patients with recurrent schizophrenia is four times higher than that of patients without recurrent schizophrenia.[5] The high recurrence rate leads to irreversible brain damage in patients and causes an enormous economic burden to families and society. At present, research on factors related to schizophrenia recurrence in China is in the initial stage, and there are few studies performing in-depth analyses of the relationships between various factors. Factors related to recurrence have not been clarified thus far and recurrence may be affected by many factors, such as heredity, environment,

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society, psychology and physiology.[6] Many studies have shown that coping styles,[7] resilience,[8] self-efficacy,[9] social support and negative life events affect schizophrenia relapse, and domestic research[10,11] has shown lower efficacy, poor social support and lower resilience in persons with schizophrenia in China.

The American Psychological Association defines resilience as a process of adaptation to adversity, trauma, threats or major sources of stress.[12] Richardson[13] proposed the resilience process model theory, which states that after individuals experience the influence of risk factors, the physical system will carry out functional reorganization so that the biological psychological nervous system will reach a higher level and reshape the self-protection mechanism. Therefore, resilience is an important protective factor. Relevant studies have shown that paying attention to the development of resilience in patients with schizophrenia is conducive to exploring support resources in the process of rehabilitation and supporting the transformation from defect orientation to resource orientation from the perspective of mental illness.[14] Abroad, Gooding PA[15] proposed improving resilience, which could allow patients to resist negative ideas and impulses, such as self-injury or suicide, and highlighted external factors that supported resilience, including social support, reciprocity and religious coping. He[16] suggested that cognitive performance and a high level of resilience are positively correlated and that improving resilience can improve cognitive function. Cognitive impairment is a core feature of schizophrenia. Yeo[17] proposed that a higher level of resilience was associated with a lower severity of specific symptomatology, including positive symptoms, negative symptoms, depressive symptoms, suicidal ideation, cognitive deficits, and better insight. Therefore, positive psychological tolerance and coping ability can be obtained by improving the resilience of patients with recurrent schizophrenia. The determinants of resilience include biological, psychological, social and cultural factors that interact in complex ways.[18,19] Abroad, Sedić[20] found that low resilience levels in individuals at clinical high risk for psychosis and schizophrenia and a higher level of resilience were associated with better social functioning and less severe negative, anxiety and depressive symptoms. Evidence also suggests that the presence of resilience in individuals with schizophrenia-spectrum disorders is associated with improved psychosocial functioning.[21] Guo[22] and Izydorczyk[23] showed that schizophrenia patients with higher resilience and optimism show higher levels of happiness and self-efficacy, which in turn are associated with lower perceived stress and higher personal control. Therefore, improving the level of resilience has a positive effect on patients with recurrent schizophrenia.

Perceived social support is an individual's subjective perception and evaluation of external support.[24] Relevant evidence shows that the perceived social support of patients with recurrent schizophrenia in China has a positive protective effect on resilience, is significantly positively correlated with resilience and has a positive effect on the perception and prediction of an individual's mental health.[25] Perceived social support can effectively regulate an individual's psychological pressure and promote the development of their physical and mental health.

Self-efficacy is an individual's perception of and belief about his or her ability to take action and to cope with various environmental challenges; it refers to a relatively stable ability or self-confidence in general.[26] Self-efficacy was significantly positively correlated with optimism and resilience. Optimism was significantly positively correlated with resilience and its dimensions. The two dimensions of "social support" and "positive cognition" in resilience could significantly predict the self-efficacy of schizophrenic patients.[27] Therefore, resilience and self-efficacy influence each other in patients with schizophrenia. Domestic evidence shows that the level of self-efficacy in patients with recurrent schizophrenia is low, which needs to be improved.[28] Conner[29] found that the higher the perception and understanding of social support was, the higher an individual's self-efficacy. High level of social support helps to ensure good and positive psychological situation and physical and mental experience of patients with schizophrenia, and brings individual satisfaction, pleasure, self-confidence and comfortable living conditions.[30] Therefore, improving the level of perceived social support can effectively improve the level of self-efficacy.

Given the associations among self-efficacy, perceived social support and resilience found in separate studies among patients with recurrent schizophrenia, we hypothesized that self-efficacy might mediate the relationship between perceived social support and resilience. To the best of our knowledge, this hypothesis has not been empirically examined. At the same time, the resilience level of patients with recurrent schizophrenia in China have not been fully explored in existing studies. Therefore, this study aimed to explore (1) the level of resilience in patients with recurrent schizophrenia in China; (2) the correlation between perceived social support and resilience in patients with recurrent schizophrenia; and (3) the mediating effect of self-efficacy on the relationship between perceived social support and resilience in patients with recurrent schizophrenia. This study provides a theoretical basis for improving the resilience level of patients with recurrent schizophrenia.

Materials and Methods

Study Design and Participants

From July to December 2021, We conducted a cross-sectional survey of patients with recurrent schizophrenia from a tertiary hospital in Hunan Province, China, through cluster sampling. In this survey, the inclusion criteria included the following: (1) native Chinese speakers; (2) patients with schizophrenia diagnosed by the CCMD-3 or ICD-10;[28] (3) patients who met the clinical remission criteria according to the Positive and Negative Mental Symptom Scale (PANSS),[31] including scores of mild or below (≤3 points) for at least six months for delusions, conceptual disorganization, hallucinations, emotional withdrawal, passive/apathetic social withdrawal, a lack of spontaneity and flow of conversation, mannerisms and posturing, and stereotyped thinking; (4) Having patients with past history of recurrence of acute psychosis: the recurrence criteria were a PANSS total score that increased by >25%, a Clinical Global Impression (CGI)[32] score ≥6 (significantly deteriorated) and experiencing serious self-injury or destruction and obvious suicidal cognition for >1 week; (5) patients who were hospitalized ≥2 times; (6) patients with a stable state of mind; and (7) patients who were able to understand the survey's content. The exclusion criteria included (1) patients with severe physical diseases or organic brain lesions and (2) patients with intellectual disabilities who could not communicate normally. Complete and logical questionnaires were considered valid. Ultimately, 10 questionnaires were incomplete, 7 were not logical, 4 were vague and 3 were lost. A total of 176 patients who met the criteria completed valid questionnaires, resulting in an effective response rate of 88%.

Procedure

Each participant completed a questionnaire within 20 minutes; the questionnaire included a table collecting general information and evaluations of perceived social support, self-efficacy and resilience. The researchers developed unified questionnaire guidance and training for designated nursing staff in each department before issuing the questionnaire language. The integrity of each questionnaire was examined, and the questionnaires were immediately recovered after evaluation. Clinical disease information was obtained through accessing the medical records system. Participants voluntarily participated in the study and signed informed consent forms. This study was approved by the Hospital Ethics Committee (K2019011).

Measures

General Information

The table collecting general information included two dimensions: (1) demographic information of patients with recurrent schizophrenia, including age, sex (male, female), education level, monthly income, marital status, and occupation, and (2) disease information, including the disease course, onset age, number of hospitalizations, and medications.

General Self-Efficacy Scale (GSES)

Developed by Schwarzer, German scholar and revised by Wang Caikang.[33] It is used to measure the overall self-confidence of individuals when dealing with different environmental challenges or new things. It contains 10 items rated on a 4-point Likert scale, ranging from 1 (not at all true) to 4 (very true). The scores of all items are summed and divided by 10 to calculate the standardized score, with a higher standardized score indicating stronger self-efficacy. The Cronbach's alpha was 0.927 in the current sample, which indicates good reliability.

Perceived Social Support Scale (PSSS)

The Perceived Social Support Scale was compiled by Zimet[34] and translated by Xiao Shuiyuan.[34] It is used to emphasize an individual's self-understanding and self-feeling. It contains 12 items that address the three dimensions of family support, friend support and other support and uses 7 levels, ranging from 1 (strongly disagree)~7 (strongly agree). Total scores range from 12~84, with scores of 12~36 indicating low-level perceived social support, 37~60 indicating medium-level perceived social support, and 61~84 indicating high-level perceived social support. The Cronbach's α coefficient was 0.898.

Connor Davidson Resilience Scale (CD–RISC)

This scale was compiled by Connor and Davidson; it is used to evaluate an individual's resilience.[35] The Chinese version of the scale was translated and revised by Xiao Nan and Zhang Jianxin in 2007.[36] This study adopts the Chinese version of the

scale. It contains 25 items that address the three dimensions of strength, tenacity and optimism that are rated on a five-point Likert scale, ranging from 0 (never) ~4 (always). A score of 0~35 points represents a low level of resilience, 36~64 points represents a medium level, and 65~100 points represents a high level. The Cronbach's α coefficient was 0.89.

Data Analysis

All statistical analyses were performed using SPSS 22.0. Count data are expressed as relative numbers. Measurement data are expressed as ($\bar{x} \pm s$). Pearson's correlation was conducted to analyze the relationship among perceived social support, self-efficacy and resilience in patients with recurrent schizophrenia. The bootstrap program plug-in of the Process operation macro compiled by Preacher and Hayes[37] was used to test the mediating effect of self-efficacy in the relationship between social perceived support and resilience. The test level was α = 0.05.

Results

Demographic and Disease Information of Patients with Recurrent Schizophrenia

Among the 176 patients with recurrent schizophrenia, the age range was 14 to 62 years (mean=29.92 years, SD=11.22); ninety-five were male (54.1%), and eighty-one were female (45.9%). The majority of patients (75.6%) were without spouses; nearly two-thirds had an education level (61.3%) of high school and below. Eighty-four patients were unemployed (47.9%); nearly two-thirds of the patients (63.3%) were living in urban areas, and one-third (36.7%) were living in rural areas. The per capita monthly income was as follows: < 1000 yuan (12%), 1000 yuan~2999 yuan (43.8%), 3000 yuan~4999 yuan (30%), ≥5000 yuan (14.2%).

The median number of hospitalizations was 2.0, and the median disease duration was 5.0 years. Sixty-one patients had other diseases (34.7%), and nearly two-thirds (65.3%) had no complications; three-fourths of the patients received combined medications (88%).

Correlation Analysis of Self-Efficacy, Perceived Social Support and Resilience of Patients with Recurrent Schizophrenia

The correlations among the continuous variables are shown in Table 1. There were significant correlations between perceived social support, self-efficacy and resilience among patients with recurrent schizophrenia. Specifically, there was a strong and significant positive relationship between perceived social support and self-efficacy (r=0.273, p=0.01). There was a strong and significant positive relationship between self-efficacy and resilience (r=0.634, p=0.01). There was a positive relationship between perceived social support and resilience (r=0.470, p=0.05).

Table 1 Correlation Analysis of Self-Efficacy, Perceived Social Support and Resilience of Patients with Recurrent Schizophrenia (r)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1. Self-efficacy	2.02	0.61	1								
2. Perceived social support	56.77	14.61	0.273**	1							
3. Family support	20.07	5.95	0.164	0.848*	1						
4. Friend support	18.07	5.53	0.308**	0.872*	0.580*	1					
5. Other support	18.62	5.41	0.243*	0.876*	0.597*	0.693*	1				
6. Resilience	58.06	17.26	0.634**	0.470*	0.551	0.418*	0.404*	1			
7. Toughness	30.14	0.18	0.430**	0.379*	0.154	0.411*	0.435*	0.770*	1		
8. Strength	18.94	5.52	0.669**	0.331*	0.125	0.395*	0.353*	0.962*	0.644*	1	
9. Optimism	8.98	3.22	0.497**	0.324*	0.152	0.341*	0.358*	0.904*	0.636*	0.789*	1

Note: *Indicates that *P*<0.05 and **states that **P*<0.01".
Abbreviation: SD, standard deviation.

Table 2 Mediating Effect of Self-Efficacy on the Relationship Between Perceived Social Support and Resilience in Patients with Recurrent Schizophrenia

Project	Standardized Effect Value	SE	Bootstrap 95% CI		Relative Effect Value (%)
			Lower Limit	Superior Limit	
Direct effect	0.251	0.094	0.064	0.438	57.44 (0.251/0.437)
Indirect effect	0.186	0.088	0.009	0.357	42.56 (0.186/0.437)
Total effect	0.437	0.112	0.214	0.659	–

Mediating Effect of Self-Efficacy on the Relationship Between Perceived Social Support and Resilience in Patients with Recurrent Schizophrenia

The study examined the correlations among self-efficacy, perceived social support and resilience of patients with recurrent schizophrenia. The Process plug-in was selected to analyze the mediating effect of self-efficacy on the relationship between perceived social support and resilience in patients with recurrent schizophrenia. The perceived social support of patients with recurrent schizophrenia was taken as the independent variable, self-efficacy as the mediating variable, and resilience as the dependent variable; 5000 bootstrap samples and 95% confidence intervals (95% CIs) were selected.

The results showed that perceived social support had a positive predictive effect on resilience in patients with recurrent schizophrenia (β=0.438, P<0.001). Perceived social support positively predicted self-efficacy (β=0.115, P<0.001). Self-efficacy played a partial mediating role between perceived social support and resilience, suggesting that the partial effect of perceived social support on the resilience of schizophrenic patients was derived from the influence of self-efficacy. The value of the mediating effect was 0.186, accounting for 42.56% of the total effect, as shown in Table 2. The mediation model is shown in Figure 1.

Discussion

Analysis of Perceived Social Support, Self-Efficacy and Resilience in Patients with Recurrent Schizophrenia

The perceived social support score in this study (mean=56.77, SD=14.61) was moderate, similar to the results of Xia Pinzhen.[38] And the perceived social support score of rural patients with schizophrenia is lower than that of urban patients, which is consistent with the results of Yu.[39] The analysis is due to low income in rural areas, poverty, family members of patients pay more attention to family livelihoods, ignoring the care of patients. Among the three dimensions of perceived social support, family support scored the highest, followed by friend support and, finally, by other support. This shows that the majority of patients receive material and emotional support from their own families and that they received less psychological support from their friends, leaders, colleagues and medical staff. The reason for this is that the majority of patients experience multiple recurrences during the course of the disease, and recurrence is a serious event
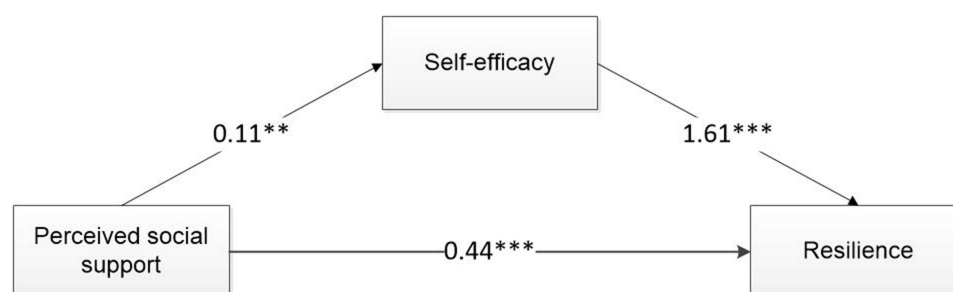
Figure 1 A mediation model of the role of self-efficacy in the relationship between perceived social support and resilience in patients with recurrent schizophrenia.
Note: **Indicates that P<0.01 and ***states that P<0.001".

that changes the trajectory of the disease. The quality of life of patients is significantly impaired, and social and work participation is reduced. At this time, patients are particularly dependent on material, spiritual and psychological support from their families. In addition, Fan[40] suggests the social support could reduce the severity of psychotic symptoms. Cheng[41] also proposed the peer co-delivered vocational rehabilitation services may enhance the social support received by persons with schizophrenia and improve their occupational outcomes. The peer co-delivered belongs to friend support in perceived social support. Therefore, it is suggested that family and friend participation in nursing care be increased and the utilization of social support for patients be improved so that close family and friend relationships can help patients recover, enable them to perceive effective emotional and social support, and improve their level of perceived social support.

The self-efficacy score in this study (mean=2.02, SD=0.61) was slightly lower than that of the relevant survey results.[42] The reason is that patients with recurrent hospitalization are influenced by various factors, such as a lack of entertainment, changes to their environment, greatly limited living space, and fear of communication with people; due to repeated recurrences, these factors not only seriously impact a patient's self-confidence in rehabilitation but also may cause them to stop treatment. In addition, fifty-one patients in this study were hospitalized ≥5 times (28%), indicating a high frequency of recurrence; four-fifths of the patients had a disease duration ≥2 years (80%), and the longer the duration was, the lower the patient's confidence in active rehabilitation and the poorer his or her treatment compliance. Previous studies have pointed out that the disease duration and number of hospitalizations are negatively correlated with self-efficacy; therefore, in this survey, the overall self-efficacy of the patients with recurrent schizophrenia was low. It is suggested that medical staff should frequently evaluate patients' general self-efficacy levels and its influencing factors and formulate individualized nursing interventions according to the specific situation of patients to improve their levels of self-efficacy.

The total score of resilience in this study (mean=50.06, SD=17.26), which was at a moderate level, was lower than that of the relevant research results[28] (mean=60.71, SD=16.52). It has been reported[42] that being married and being a parent/guardian are the influencing factors of the resilience scale, while sex, work and medication use are the influencing factors of the optimism score on the resilience scale. An analysis of the reasons for this revealed that nearly four-fifths of the hospitalized patients with recurrent schizophrenia did not have a spouse (75.6%), suggesting impaired resilience; in addition, nearly fifty percent (47.9%) of the patients were unemployed. One-fifth of the patients (12%) were treated with a single medication, while four-fifths (88%) were treated with combined medications, suggesting that their resilience and optimism were impaired. Resilience is the ability to physically rebound in the face of difficult experiences. Patients cannot participate in work normally and have substantial psychological responsibilities. In addition, confounding factors such as lack of family support, psychiatric history, living place and long-term effects of psychotropic medication lead to a decrease in the psychological endurance of patients with recurrence and failure to rebound from mental trauma. Therefore, it is suggested that not only should family support be strengthened and that there should be interventions for adverse medication reactions but also that the resilience level of patients with recurrence be frequently evaluated and that targeted intervention measures be taken.

Correlation Analysis of Perceived Social Support, Self-Efficacy and Psychological Resilience in Patients with Recurrent Schizophrenia

Correlation analysis showed that the total score of perceived social support was positively correlated with the total score of resilience in patients with recurrent schizophrenia (r= 0.470, P<0.01). Wang[43] also proposed some preliminary evidence of associations between perceived social support and outcomes in schizophrenia, bipolar disorder and anxiety disorders. Family support and friend support were highly correlated (r=0.551, r=0.418, P<0.01), indicating that the higher the family and friend support of patients with recurrent schizophrenia was, the higher the level of resilience. There was a significant positive correlation between the self-efficacy score and resilience score (r=0.634, P<0.01), which was consistent with the results of Liu Dongwei.[44] Kong[45] suggests that resilience played a partial mediating role in the relationship between perceived social support and health self-efficacy among migrant older adults, Compared with my research results, it is found that self-efficacy and resilience are significantly correlated, and

they are mutually causal, that is, the higher the level of self-efficacy is, the higher the level of resilience is, and high resilience will also improve the level of self-efficacy. Reasons analysed that schizophrenia patients with higher self-efficacy levels were more aware of their individual value in the face of negative events, and they were able to obtain a sense of control and autonomy of the external environment in a timely manner, which promoted their ability to transform difficulties from diseases into experience resources and enhanced their stress resistance and resilience. Therefore, the correlation among these factors suggests that mental hospitals and other medical and health institutions should improve resilience for patients with recurrent schizophrenia by actively intervening their perceived social support and self-efficacy.

Self-Efficacy Plays a Partial Mediating Role Between Perceived Social Support and Resilience

Self-efficacy[16] is an overall relatively stable sense of competence or self-confidence that individuals show in coping with challenges in various environments. Zhou[46] indicated that self-efficacy and motivation may act as mediators in the relationship between neurocognition and self-management in schizophrenia. It is consistent with our research results that self-efficacy plays a mediating role in schizophrenia. This study showed that after adding self-efficacy, the effect of perceived social support on the resilience of patients with recurrent schizophrenia was still significant, indicating that perceived social support can indirectly affect the resilience of patients with recurrent schizophrenia through self-efficacy. Self-efficacy was an intermediary variable between perceived social support and resilience, and the mediating effect was 42.56%. The reason for this is that, on the one hand, the social support of patients with recurrent schizophrenia is a favorable factor for improving their self-efficacy levels; that is, the more social support a patient receives, the higher their self-efficacy level. The lack of family warmth in patients with recurrent schizophrenia makes them vulnerable to helplessness, loneliness and loss of confidence in life. Perceived social support from peers, relatives and friends can buffer the adverse effects of negative factors.[42] The better a patient's self-efficacy is, the more active his or her social life and the wider his or her social support.

On the other hand, self-efficacy can affect resilience through positive coping, indicating that patients with recurrent schizophrenia with high self-efficacy tend to adopt positive coping and thus improve their resilience. A higher level of self-efficacy can make individuals more effectively perceive the positive components of self-personality and adopt a positive perspective in the face of disease to enhance their internalized stress resistance and resilience.[47] This is consistent with Lee[48] research results, indicating that emotional discomfort will reduce self-efficacy, and low self-efficacy will also lead to negative emotions, thereby reducing resilience. Therefore, it is suggested that strong continuous psychological support mechanisms be formed among hospitals, communities and families and that the self-efficacy levels of patients be continuously improved. Intervention measures such as the focus solution model, traditional Chinese material methods and stress management based on commitment therapy (ACT)[49–52] can effectively improve patients' perceived social support and self-efficacy, thereby improving the level of resilience and the quality of life of patients with recurrent schizophrenia.

In addition, this study found that self-efficacy was not a complete mediator between perceived social support and resilience in patients with recurrent schizophrenia and indicated that other influencing factors need to be further explored. Future research should include more mediating variables, explore the path of action between mediating variables, and more clearly reveal the multiple mediating mechanisms of perceived social support affecting resilience, so as to provide a theoretical basis for clinical intervention path.

However, there are several limitations in the current research. First, we only selected patients with recurrent schizophrenia who were hospitalized in a tertiary hospital in Hunan Province, China. Therefore, the extent to other groups need further research to confirm. Finally, the sample source was limited; in the future, researchers can increase the sample size and conduct research analysis in multiple centers and from multiple angles.

Conclusion

The resilience level of patients with recurrent schizophrenia in China is moderate and needs to be improved. This research revealed that self-efficacy played a part in mediating perceived social support and resilience in patients with recurrent schizophrenia in China. Perceived social support can indirectly affect resilience in patients with recurrent schizophrenia through self-efficacy. Comprehensive interventions in perceived social support and self-efficacy would help to improve the resilience of patients with recurrent schizophrenia.

Data Sharing Statement

We cannot disclose the data because of the particularity of the survey population. To obtain the data, please contact the corresponding author.

Ethics Statement

This study complies with the Declaration of Helsinki. All participants and their families fully understood the protocol of all questionnaires before registration, according to the principle of voluntary participation and anonymity, and signed written informed consent forms for this study. The research was reviewed by the Medical Ethics Committee of Hunan Provincial Brain Hospital, and the ethical number is K2019011.

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Disclosure

The authors report no conflicts of interest in this work.

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