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Factors associated with stigma in community-dwelling stroke survivors in China: A cross-sectional study

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ABSTRACT

Background: Although stigma is considered to be present in stroke patients, the factors that influence its level are ambiguous. The aim of this study was to investigate whether certain demographic, clinical, and psychosocial characteristics are related to higher levels of stigma among stroke patients in China.

Methods: A total of 200 stroke patients in the community were investigated using the Stigma Scale for Chronic Illness (SSCI), Barthel Index, Self-Rating Depression Scale, Medical Moping Questionnaire, and Social Support Rating Scale. Potential determinants were evaluated with univariate statistical analyses for their contributions to total, felt and enacted stigma. Important findings were further evaluated with multiple regression models.

Results: The mean total stigma, felt stigma, and enacted stigma scores were 45.21 ± 16.68, 27.93 ± 10.95, and 17.27 ± 6.93, respectively. Most participants reported experiencing felt stigma (90%), while 72.5% reported experiencing enacted stigma. Multiple regression analysis showed that stroke patients' depression, functional status, an avoiding coping strategy, subjective support and recurrence of stroke were factors impacting the SSCI score.

Conclusion: The stigma level among stroke patients in China was of a mild-moderate degree. Among stroke patients, a higher level of stigma was influenced by a higher degree of depression, a higher degree of an avoiding coping strategy, lower functional ability, lower subjective support and recurrence of stroke. Further work should focus on developing intervention strategies to decrease the amount of stigma and promote quality of life as well as psychosocial rehabilitation among stroke patients.

1. Background

Stroke is one of the most common neurological disorders in China and is also a major cause of long-term disability worldwide [1,2]. The World Health Organization (WHO) predicted that by 2020, stroke will be second only to ischemic heart disease as the leading cause of disability in the world [3]. With advances in medical technology, the stroke survival rate increases, and the number of disabled persons who have experienced a stroke is also gradually increasing [4]. Over 85% of people survive a stroke, and of these, over 80% are discharged to the community [5]. In the community, stroke survivors often live with different degrees of physical, psychosocial and cognitive challenges such as hemiplegia, aphasia, depression or low self-esteem [6]. Those symptoms are visible to the public and are likely to lead to a situation in which the individual is disqualified from full social acceptance, which was defined as stigma by Goffman in 1963 [7].

Stigma is an established construct in the social sciences that describes an attribute that discredits individuals and elicits prejudice, discrimination, and loss of status [8]. Stigma can be categorized into "enacted" stigma, which refers to actual experiencing of discrimination on the basis of individuals' social unacceptability, whereas "felt" stigma refers to the shame of being deviant and the feeling that discrimination or exclusion will happen [9–11]. Stigmatized patients tend to disguise their symptoms and seek isolation, which results in the decreased use of

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healthcare services, the disruption of social relationships and poor quality of life [12–14]. Recently, many studies have reported the negative influence of stigma on quality of life among patients with neurological disorders, such as epilepsy [15], Parkinson's disease [16], migraine [8], neuromuscular diseases [9] and multiple sclerosis [17]. However, little attention has been paid to stigma in stroke patients. Furthermore, there has been no study on stigma in community-dwelling stroke survivors.

Fred at el [18]. reported that four out of five stroke survivors in a Ghanaian cohort experienced some form of stigma. The people in that cohort tended to be depressed and had a lower level of quality of life [18]. Hyman [19] and Sjogren [20] demonstrated that the feelings of stigma impair the patient's motivation and functional improvement and reduce the poststroke frequency of outdoor leisure activities during and after rehabilitation. Although stigma has a great impact on the quality of life and rehabilitation of stroke patients, there has been no research on stigma in stroke patients in the community. In addition, whether certain demographic, clinical, or psychosocial variables are associated with stigma among individuals who had a stroke remains unanswered. Therefore, the aim of this cross-sectional study was to assess the prevalence and seriousness of stigma among a cohort of stroke survivors in two community centers in China and to investigate the factors that are associated with stigma.

2. Methods

This cross-sectional study was conducted in two community centers in Tianjin, China. This study was approved by the Research Ethics Committees of Tianjin Medical University (TmuhME(2015023)). All participants were informed about the purpose of this study and signed informed consent before any study procedures were performed.

A convenience sample of 200 Chinese stroke survivors was recruited from March 2016 to July 2016. The inclusion criteria are as follows: (1) 18 years or older; (2) clinically diagnosed with stroke (confirmed by computed tomography or magnetic resonance imaging); (3) had a period of 1 month or longer since discharge from the hospital was considered necessary for adaptation; (4) had a stable disease condition; and (5) had a clear consciousness and was able to answer questions correctly. Participants were excluded from this study if they (1) were unable to finish the questions due to serious dysphasia or aphasia and (2) had cognitive impairment or mental illnesses. A research assistant approached the stroke survivors or their family members while they were attending the community centers and explained in detail the study purposes and procedures, the right to confidentiality and the voluntary participation of potential participants. The questionnaires were completed at a time and location convenient to the participant, usually in their own home.

3. Measurements

A questionnaire was conducted, and it included general information, the Stigma Scale of Chronic Illness and questions about activities of daily living, self-rated depression, social support and medical coping modes.

1. *Questionnaire for general information*: This questionnaire included demographical information (age, sex, marital status, educational level, current employment status, and monthly income) and disease-related characteristics (type of stroke, duration of disease in months, needing a caregiver or not, and whether this was the stroke event or recurrent).
2. *Chinese version of the Stigma Scale for Chronic Illness-24 (Chinese SSCI-24)*: The Stigma Scale for Chronic Illness-24 (SSCI-T) was developed by Rao et al. [21] to measure stigma among patients with chronic neurological diseases. Deng et al. [22] translated the SSCI-24 into Chinese and tested the psychometric properties of it among a sample of 204 Chinese patients with stroke, resulting in a Chinese version of the SSCI-24, which demonstrated good reliability and validity. The scale contains 24 items and two subscales: felt stigma and enacted stigma. The felt stigma (SSCI-F) scale measures shame and fear of discrimination or exclusion and consists of 13 items. The enacted stigma (SSCI-E) scale measures the actual experience of discrimination or exclusion and consists of 11 items. Each item is rated as 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always. The total score ranges from 0 to 120, with a higher score indicating a higher frequency of experiencing stigma. To estimate the prevalence of health-related stigma, we assumed that a patient should report at least one symptom of felt stigma or enacted stigma.
3. *The Modified Barthel Index (MBI)*: The BI consists of 10 common activities of daily living (ADL) and was used to assess physical functional status and performance of daily living activities. The total scores range from 0 to 100, with higher scores indicating a greater degree of functional independence.
4. *Zung Self-Rating Depression Scale (ZSDS)*: The ZSDS is a 20-item self-reported screening tool used to measure the state of depression in stroke survivors. The ZSDS is a commonly used, 20-item, self-reported tool for measuring depressive symptoms [23]. It includes ten positive items and ten negative items. The ZSDS score on a 4-point Likert scale ranges from 20 to 80, with higher scores indicating more severe depressive symptoms.
5. *Medical Coping Modes Questionnaire (MCMQ)*: This scale was designed by Feifel et al. [24] to evaluate patients' cognitive-behavioral and illness-related coping strategies. It contains 3 subscales and 19 items: confrontation (8 items), avoidance (7 items), and acceptance-resignation (4 items). The scale is scored on a 4-point Likert scale ranging from 1 (never) to 4 (very much). The Chinese version was introduced by Shen and Jiang [25], and an extra item was added.
6. *The Social Support Self-Rating Scale (SSRS)*: The SSRS was developed by Xiao and is one of most commonly used instruments for measuring social support in China [26]. It consists of 10 items measuring three dimensions: subjective support (4 items), objective support (3 items), and support-seeking behavior (3 items). The SSRS scale can be used in two ways. First, raw scores within each of the three domains are summed, giving subjective (range: 8–32) and objective (range: 1–22) support scores and a support-seeking behavior score (range: 3–12). Second, item scores are simply added up, generating a total support score ranging from 12 to 66.

4. Statistical analysis

Descriptive statistics such as the means, standard deviations (SDs), and frequencies were used to examine the main characteristics of our sample. Each characteristic was evaluated for its contribution to stigma (SSCI-T, SSCI-F, and SSCI-E) by performing a univariate analysis (*t*-test or ANOVA). For interval data, we used Pearson's r correlation. Each characteristic showing significant correlation with stigma was deemed as a potential predictor of stigma in the subsequent multiple linear regression models. Multiple linear regression was performed on significant variables identified by the univariate analysis ($P < .05$) to determine which variables were independently associated with higher stigma scores (SSCI-T, SSCI-F, SSCI-E). These models were created using a stepwise method. The level of significance was set at 0.05. Statistical analyses were performed using SPSS 19.0 software (SPSS Inc., Chicago, IL, USA).

5. Results

Table 1 shows the mean characteristics of our sample. Eventually, 200 stroke patients completed the survey and were enrolled in this study. The mean age of the patients was 67.59 ± 8.21 (34–83). More than one half of the participants were male (59%). Most patients were married (84%), currently not working (96%) and had not graduated

Table 1
Mean characteristics of the study's sample (N = 200).

	N (%)
Age in years, mean(SD)	67.59 ± 8.21 (34–83)
Gender	
Male	118(59%)
Female	82(41%)
Marital status	
Married	168(84%)
Unmarried/divorced/bereaved	32(16%)
Education	
Have not graduated high school	109(54.5%)
High school or above	91(45.5%)
Employment	
Working	8(4%)
Retired	154(77%)
Unemployment	38(19%)
Income (every month)	
< 3000 RMB	126(63%)
≥3000 RMB	74(37%)
Type of stroke	
Ischemic	144(72%)
Hemorrhagic	44(22%)
Both ischemic and hemorrhagic stroke	13(6.5%)
Number of stroke events	
First	124(62%)
Recurrent	76(38%)
Duration of disease	
< 1 year	49(24.5%)
1–3 years	52(26%)
3–5 years	49(24.5%)
> 5 years	50(25%)
Caregiver	
Yes	136(68%)
No	64(32%)
Modified rankin score	1.8 ± 1.24
Barthel index	79.80 ± 23.99
Self-rating depression	40.22 ± 10.05
Medical coping modes questionnaire	
Facing	16.44 ± 4.10
Yielding	8.57 ± 4.10
Avoiding	13.24 ± 3.45
Social support rate scale	
Objective support	8.91 ± 2.29
Subjective support	19.25 ± 3.85
Utilization of support	5.58 ± 2.21

from high school (54.5%). More than half of the patients (63%) had an income of < 300 RMB (per month). Most patients had ischemic (72%) and first-ever (62%) strokes and had a care giver for their daily life (68%). The modified Rankin score was 1.8 ± 1.24 (0–5). The Barthel Index score was 79.80 ± 23.99. The Self-Rating Depression score was 40.22 ± 10.05. The scores of the facing, yielding, and avoiding dimensions of the Medical Coping Modes Questionnaire were 16.44 ± 4.10, 8.57 ± 4.10, and 13.24 ± 3.45, respectively. The scores for the objective support, subjective support, and utilization of support dimensions of the Social Support Self-Rating scale were 8.91 ± 2.29, 19.25 ± 3.85, and 5.58 ± 2.21, respectively.

Table 2 shows the level of stigma and frequency of responses to each item of the SSCI-24 among our participants. The mean total stigma, felt stigma, and enacted stigma scores were 45.21 ± 16.68, 27.93 ± 10.95, and 17.27 ± 6.93, respectively. The score of felt stigma was higher than that of enacted stigma (t = 19.85, $P < .001$). Most participants reported experiencing felt stigma (90%), while 72.5% reported experiencing enacted stigma (Table 2).

Tables 3 and 4 present the results of the univariate analyses of the relationships between the demographic, clinical, and psychosocial variables and the total and subscale scores. The results revealed that being unmarried and absent from work were associated with significantly higher stigma scores in all three areas ($P < .05$). The Barthel Index, stroke event, caregiver, and duration of disease were also significantly associated with all three stigma scores. All stigma scores were found to increase in patients with lower ADL, lower duration of disease, recurrence of disease, and needing a caregiver ($P < .05$). Similarly, with more severe types of stroke, the scores for the SSCI-T and SSCI-F were higher ($P < .05$) than those of patients with less severe types of stroke. Table 4 shows the Pearson's correlation between psychosocial characteristics and stigma. It was evident that with increasing depression scores, all three stigma scores increased ($P < .001$). Participants with avoiding and yielding copy strategies reported experiencing more stigma ($P < .001$). In addition, all three stigma scores were correlated with all domains of social support ($P < .001$).

Table 5 shows the results of the multiple regression models for the three stigma scores. Those factors that were significantly correlated with the total stigma and subscale were deemed potential factors in the multiple regression models. Higher depression scores, an avoiding cope strategy, lower ADL scores and lower subjective support scores were significantly associated with increased total stigma scores. These four factors explained 58.3% of the overall stigma variance. Regarding felt stigma, the results were similar as total stigma. These four factors explained 57.9% of the felt-stigma variance. Higher depression scores, an avoiding cope strategy, lower subjective support scores and recurrence of stroke were associated with higher enacted stigma scores. These four factors explained 43.4% of the overall stigma variance. Depression was the most potent predictor for all three stigma scores.

6. Discussion

Our study results indicated that higher levels of stigma among stroke patients were significantly associated with a higher degree of depression, lower functional ability, a higher degree of an avoiding coping strategy, lower subjective support and recurrence of stroke. Depression was the most significant predictor of all three stigma scores.

In this study, we found that the majority of stroke patients had mild-to-moderate stigma severity, which was the same as that of the West African stroke patients found in Fred et al. ‘s study [18]. The average stigma level among these 200 patients was 45.21 ± 16.68, with felt stigma being 27.93 ± 10.95 and enacted stigma being 17.27 ± 6.93. Most participants reported experiencing felt stigma (90%), while 72.5% reported experiencing enacted stigma. Rao et al. [21] examined stigma in 511 patients with chronic neurological disorders (including stroke patients (38%)), and the total stigma score was 42.7 ± 19.7, which was similar to our results. Not surprisingly, the prevalence and severity of felt stigma was higher than that of enacted stigma (t = 19.85, $P < .001$). The reason why the felt stigma score was higher may be that, influenced by the social-oriented culture in China, stroke patients were prone to being worried about the potential consequences of stroke, such as physical disability, being dependent on others, being a burden, and not being able to socialize. The negative self-perception of oneself may be a source of felt stigma.

Depression was revealed as the most powerful predictor of stigma among stroke patients in this study. This result can be explained by the mutual relationship between stigma and depression. Stroke patients with depression may tend to feel more socially isolated by others and accept the devaluating characteristics of their impairment, which leads to a high level of stigma. Conversely, stigma may accelerate the emergence of depression and act as a barrier to care among those most in need of mental health treatment [27]. The association between stigma and depression may set up a vicious cycle that results in more severe depression and a greater stigma level.

The association between physical function status and stigma has already been reported by other authors [12,28]. Previous literature reported that older Chinese adults with chronic illness worried about losing their ability to maintain independence. The belief that one's ability to walk, eat, and exercise normally without relying on others is one of the priorities the adults in the study had for managing their social life [29]. The mean age of the patients in this study was

Table 2
Stigma among Chinese stroke patients in community.

Total-stigma mean (SD): 45.21 ± 16.68	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	Always(%)
Felt-stigma prevalence (> 1) n(%): 180(90%) Mean(SD): 27.93 ± 10.95					
Because of my illness, I felt emotionally distant from other people	36.5	23.5	26	13	1
Because of my illness, I felt left out of things	26.5	22	23.5	24.5	4.5
Because of my illness, I felt embarrassed in social situations	41.5	18	23.5	15	2
Because of my illness, I worried about other people's attitudes toward me	45.5	20	24	10.5	0
I was unhappy about how my illness affected my appearance	39.5	20.5	27.5	12	5
Because of my illness, it was hard for me to stay neat and clean	39	19.5	20	20.5	1
Because of my illness, I worried that I was a burden to others	28.5	20.5	26.5	23.5	1
I felt embarrassed about my illness	47	22	22	8.5	5
I felt embarrassed because of my physical limitations	41	22	23	12.5	1.5
I felt embarrassed about my speech	42	22	25.5	8.5	2
Because of my illness, I felt different from others	36	24.5	24	11.5	4
I tended to blame myself for my problems	45	24	23.5	7	5
I avoided making new friends to avoid telling others about my illness	49.5	27	13.5	10	0
Enacted stigma prevalence (> 1)n(%): 145(72.5%) Mean(SD): 17.27 ± 6.93					
Because of my illness, some people seemed uncomfortable with me	50	23.5	22	4.5	0
Because of my illness, some people avoided me	61	19.5	18.5	1	0
Because of my illness, people were unkind to me	62	24.5	10	3.5	0
Because of my illness, people made fun of me	66.5	22	9	2.5	0
Because of my illness, people avoided looking at me	67.5	19.5	11	2	0
Because of my illness, strangers tended to stare at me	66	21	11.5	1.5	0
Because of my illness, I was treated unfairly by others	68	21.5	9.5	1	0
Because of my illness, people tended to ignore my good points	62.5	21.5	12.5	2.5	1
Some people acted as though it was my fault I have this illness	63.5	24	11	1.5	0
People with my illness lost their jobs when their employers found out about it	55	18	15.5	7	4.5
I lost friends by telling them that I have this illness	73	13	7.5	5.5	1

67.59 ± 8.21, and they still had an intense desire to be independent. In traditional Chinese social culture, severe functional status and reliance on daily care may facilitate thoughts of useless and being a burden of the whole family. In addition, patients with stroke may lose their job or need a caregiver, which also causes financial burden. It is likely that this is the reason why employment and caregiver status remained significant in the univariate analysis.

Young et al. [8] also demonstrated that the ability to work was the strongest predictor of stigma in migraine patients. On the other hand, more severe physical function means worse disability status, and the symptoms of stroke may be more visible to the public. Visible symptoms can incur more discrimination from others. The recurrence of stroke makes the patient's physical function worsen, which is why it is a significant predictor of enacted stigma.

As a negative coping strategy, a higher level of "avoiding" was correlated with a higher level of stigma among stroke patients. This finding was consistent with results from a stigma investigation among patients with epilepsy [30]. Lazarus claimed that coping is capable of mediating emotional and behavioral responses provoked by stressful events [31]. Our study reveals that stigma is more common in stroke patients who have problems dealing with stress. Negative coping strategies are an attempt to distance the individual from the source of stress. An "avoiding" coping mode may regulate patients' emotions and behaviors after a stroke event. It may decrease social participation and

Table 3
Univariate analyses examining candidate predictors of Stigma in stroke (N = 200).

	SSCI-T	SSCI-F	SSCI-E		SSCI-T	SSCI-F	SSCI-E
Pearson's r with age	−0.076	−0.105	−0.017	Pearson's r with BI	−0.465	−0.493	−0.340
P value	0.282	0.137	0.807		< **0.001**	< **0.001**	< **0.001**
Gender				Type of stroke			
Male	47.08 ± 17.18	29.03 ± 11.31	18.04 ± 7.24	Ischemic	44.02 ± 16.33	27.15 ± 10.72	16.87 ± 6.82
Female	42.51 ± 15.63	26.34 ± 10.25	16.17 ± 6.35	Hemorrhagic	45.40 ± 17.08	28.04 ± 11.33	17.36 ± 7.05
P value	0.057	0.087	0.060	Both	57.54 ± 15.10	36.15 ± 9.24	21.38 ± 6.84
Marital status				*P* value	**0.019**	**0.017**	0.079
Married	43.95 ± 15.78	27.20 ± 10.53	16.74 ± 6.48	Stroke event			
Unmarried/divorced/bereaved	51.78 ± 19.76	31.71 ± 12.42	20.06 ± 8.55	First	43.00 ± 16.11	26.56 ± 10.80	16.43 ± 6.36
P value	**0.041**	**0.032**	**0.044**	Recurrence	48.82 ± 17.05	30.16 ± 10.88	18.66 ± 7.62
Education				*P* value	**0.016**	**0.024**	**0.034**
Have not graduated high school	45.99 ± 17.02	28.43 ± 11.08	17.56 ± 7.30	Duration of disease			
High school or above	44.26 ± 16.30	27.33 ± 10.82	16.93 ± 6.49	< 1 year	51.63 ± 16.50	32.53 ± 11.02	19.10 ± 7.03
P value	0.467	0.480	0.527	1–3 years	44.51 ± 15.69	27.04 ± 9.84	17.48 ± 6.81
Employment				3–5 years	44.14 ± 18.07	26.65 ± 11.07	17.48 ± 7.92
Working	40.25 ± 9.74	24.88 ± 8.70	15.37 ± 5.60	> 5 years	40.66 ± 14.93	25.60 ± 10.84	15.06 ± 5.34
Retired	43.25 ± 16.29	26.75 ± 10.86	16.50 ± 6.50	*P* value	**0.009**	**0.007**	**0.034**
Unemployment	54.16 ± 16.66	33.34 ± 10.23	20.2 ± 7.83	Caregiver			
P value	**0.01**	**0.03**	**0.02**	Yes	48.99 ± 16.52	30.46 ± 10.54	18.53 ± 7.30
Income				No	37.17 ± 14.06	22.56 ± 9.87	14.61 ± 5.20
< 3000 RMB	46.42 ± 17.43	28.61 ± 11.15	17.81 ± 7.41	*P* value	< **0.001**	< **0.001**	< **0.001**
≥3000 RMB	43.16 ± 15.21	26.77 ± 10.56	16.36 ± 5.98				
P value	0.179	0.252	0.155				

SSCI-T,I,E: The Stigma Scale for Chronic Illness total, felt, enacted.

Table 4
Relationships between psychosocial variables and SSCI.

Variables	SSCI-T		SSCI-F		SSCI-E	
	r value	P value	r value	P value	r value	P value
Self-Rating depression	0.625	< **0.001**	0.665	< **0.001**	0.454	< **0.001**
Medical coping modes						
Facing	−0.045	0.527	−0.082	0.249	−0.020	0.777
Yielding	0.244	< **0.001**	0.173	**0.015**	0.314	< **0.001**
Avoiding	0.400	< **0.001**	0.428	< **0.001**	0.290	< **0.001**
Social support						
Objective support	−0.266	< **0.001**	−0.231	**0.001**	−0.278	< **0.001**
Subjective support	−0.322	< **0.001**	−0.282	< **0.001**	−0.322	< **0.001**
Utilization of support	−0.224	**0.002**	−0.248	< **0.001**	−0.151	**0.034**

SSCI-T,I,E: The Stigma Scale for Chronic Illness total, felt, enacted

change the patient's attitude toward daily life. Therefore, it is necessary to carry out coping skills training and a psychological intervention for stroke patients with stigma. Reconstructing the recognition of the disease and building optimistic beliefs about adjusting to the disease may help stroke patients adopt positive coping strategies and decrease the degree of stigma [32]. On the other hand, a train of problem solving and a confrontational coping strategy could be strengthened.

In our study, the dimension “subjective support” had a positive effect on all three stigma scales. Subjective support refers to the degree of emotional experience and satisfaction that individuals feel about being respected, supported, and understood in society, and it is closely related to their emotional feelings [26]. For numerous possible reasons, social support may buffer stroke patients from experiencing stress by enhancing their resilience to stigma by helping them regulate their emotions and problem solve [33]. On the other hand, subjective support may mitigate some of the negative consequences of stigma, such as the impact on coping and depression [34]. Thus, these findings may inform and guide future interventions to help patients cope with feeling stigmatized by developing the role of subjective support. In China's traditional culture, family members always provide care for patients, and individuals always manage personal affairs with the aid of support networks formed by family ties. Family emotional support plays an important role in promoting subjective support and requires further research.

Our study has several limitations. First, it was a cross-sectional study, so we can only show associations between the variables under study, and causal inference cannot be made among these variables. Second, restricted factors were included in our study. We cannot exclude the contributions of other study variables, such as self-esteem and self-efficacy. Finally, the results in this study may be closely related to traditional Chinese culture, and any thoughts of generalization in other populations should be performed with extreme caution. Our study is just an initial description of the social life of stroke patients, and larger, longitudinal studies should be conducted to provide more information in the future. Despite these limitations, to our knowledge, this is the first study to explore factors associated with stroke patients in the community in China, and the study showed compelling evidence of higher stigma levels among Chinese stroke patients.

7. Conclusion

The stigma level among stroke patients in China was of a mild-moderate degree according to the total stigma score. Felt stigma was more prevalent than enacted stigma. Among stroke patients, a higher level of stigma was influenced by a higher degree of depression, lower functional ability, a higher degree of an avoiding coping strategy, lower subjective support and recurrence of stroke. In clinical practice, health care staff should identify patients with a high level of stigma and develop strategies to handle the consequences of stigma on stroke patients. The results of this study should be verified with a larger population and with longitudinal studies. Further work is needed to develop intervention procedures related to stroke stigma and to promote quality of life and psychosocial rehabilitation among stroke patients.

Contributors

All authors contributed equally.

Ethics approval

The study was approved by the Ethics Committee of Tianjin Medical University.

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Table 5
Multivariate regression models predictors of stigma in stroke patients.

	B(SE)	Standardized beta	*P* value	Model summary
SSCI-T				
Constant	17.608(9.214)			F(3,991) = 34.215
Depression	0.907(0.089)	0.539	< 0.001	P < .001
Avoiding	1.510(0.239)	0.312	< 0.001	Adjusted R^2 = 58.2%
Subjective support	−0.939(0.215)	−0.215	< 0.001	
ADL	−0.134(0.037)	−0.189	< 0.001	
SSCI-F				
Constant	10.098(6.001)			F(1,673) = 33.820
Depression	0.618(0.058)	0.566	< 0.001	P < .001
Avoiding	0.773(0.156)	0.247	< 0.001	Adjusted R^2 = 57.9%
ADL	−0.098(0.024)	−0.213	< 0.001	
Subjective support	−0.479(0.140)	−0.166	0.001	
SSCI-E				
Constant	3.941(4.033)			F(536) = 19.332
Depression	0.318(0.041)	0.451	< 0.001	P < .001
Avoiding	0.713(0.117)	0.352	< 0.001	Adjusted R^2 = 43.4%
Subjective support	−0.503(0.104)	−0.274	< 0.001	
Recurrence of stroke	1.940(0.821)	0.134	0.019	

SSCI-T,I,E: The Stigma Scale for Chronic Illness total, felt, enacted, SE standard error.

Declaration of Competing Interest

The authors declare no conflicts of interest.

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