Relationship between the anxiety/depression and care burden of the major caregiver of stroke patients

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Abstract

To investigate the anxiety/depression of caregivers of stroke patients.

This study used a cross-sectional survey design and convenience sampling.

Totally, 117 caregivers of stroke patients were enrolled. Data were collected from questionnaires. Hamilton anxiety scale, Hamilton depression scale, and Zarit caregiver burden interview were performed. Multiple linear regression and correlation analysis were used.

The anxiety score, depression score and total burden score of 117 stroke caregivers were 16.56 ± 8.02, 18.63 ± 9.39, and 25.88 ± 10.35, respectively. Anxiety symptoms, mild to moderate depressive symptoms, and severe depressive symptoms were found in 43.9%, 26.5%, and 27.4% of the caregivers, respectively. Daily care time and medical payment method were influencing factors for anxiety and depression ($P < .05$). Both anxiety and depression were positively correlated with total care burden score ($P < .01$).

Anxiety and depression are common in the caregivers of stroke patients and are closely related to care burdens. In this regard, appropriate home care guidance, psychological counseling and social support should be provided to the caregivers to reduce their physical and mental burden.

Abbreviations: HARS = Hamilton anxiety rating scale, HDRS = Hamilton depression rating scale, ZBI = Zarit caregiver burden interview.

Keywords: anxiety, care burden, caregiver, depression, stroke

1. Introduction

Stroke is a common chronic disease with high morbidity, mortality and disability rate, and seriously threatens human health.[1] Medical advances have produced an increasing number of stroke survivors, but many survivors will experience varying degrees of disability.[2] Most patients are often accompanied by language disability, limb hemiplegia and other dysfunctions when discharge and the rehabilitation of these functions need 6 months or even longer. This makes the patients and their families to fall into the troubles of "adaptation" and "care",[3] causes huge impact on the mental health of caregivers and brings a heavy burden.[1]

It is reported that the main caregivers of stroke patients have an equal to or greater incidence of mental illness than stroke patients,[4,5] and bear high burden at the same time.[6] The prevalence of depressive symptoms was 40.2% and that of anxiety symptoms was 21.4% in the main caregivers of stroke patients.[7] Studies[8–11] have shown that the mental states of caregivers have a negative impact on their social function, economy, body health, and quality of life, and are also associated with the psychological state and prognosis of stroke patients.[12]

In this study, the anxiety and depression status of caregivers for stroke patients and their influencing factors were evaluated, and the relationship between emotional problems and caregiver burden was discussed. The results may provide evidence to better guide the caregivers of stroke patients.

2. Materials and methods

2.1. Subjects

The main caregivers of the stroke patients between March 2015 and June 2016 were enrolled in this study. Inclusion criteria:

(1) The patients met the diagnostic criteria of the 4th National Cerebrovascular Disease (The 4th National Symposium on Cardiovascular Disease of the Chinese Medical Association, 1996), and diagnosed as stroke by brain computed tomography (CT) or magnetic resonance imaging (MRI);
(2) caregivers were 18 years old and above;
(3) the main caregiver was a family member of the patient;
(4) unpaid care;
(5) the care time was 2 months or more.

Exclusion criteria:

(1) any paid caregivers;
(2) caregivers with major diseases or mental disorders;

(3) incomplete investigation due to communication or reading and writing obstacles.

Prior written and informed consent was obtained from every participant and the study was approved by the ethics review board of Chongqing Medical University (IRB number: 2017-078).

2.2. Data collection

Four scales were used to collect the data.

General Information Questionnaire. It included age, gender, race, education level, care time, medical payment method, etc.

Hamilton anxiety rating scale (HARS).[13] It was established by Hamilton in 1959 and contains 14 entries. It uses the 5-level rating method of 0 to 4 points. The total score is 0~56, and the anxiety level can be divided as follows: < 7 means no anxiety, 7~14 means possible anxiety, 15~21 means certain anxiety, 21~29 means obvious anxiety and >29 means severe anxiety. Score 14 is generally the critical value. The reliability coefficient (Cronbach's a) of HARS is 0.93 after localization in China, and the correlation coefficient to the total score of HAMA was 0.36 ($P < .05$).

Hamilton depression rating scale (HDRS).[13] It was established by Hamilton in 1960. It uses the 5-level rating method of 0 to 4 points. The total score is 0~78, and the depression level can be divided as follows: < 8 means no depression, 8~17 means possible depression, 18~24 means mild to moderate depression and >24 means severe depression. Score 17 is generally the critical value. The reliability coefficient (Cronbach's a) of HDRS is 0.88~0.99 after localization in China, and the correlation coefficient to GAS is r >0.84.

Zarit caregiver burden interview (ZBI)[14] was designed by Zarit in 1980s and was translated into Chinese by Lie Wang in 2006.[15] ZBI includes 2 dimensions (personal burden and responsibility burden) of 22 entries. It uses the 5-level rating method, and the total score is 0~88. The burden level can be divided as follows: <21 means mild or no care burden, 21~39 means moderate care burden and >40 means severe care burden. The reliability coefficient (Cronbach's a) of ZBI (Chinese version) is 0.87.

2.3. Statistical analysis

The collected data were analyzed using SPSS 22.0 software (IBM, Armonk, NY). Count data were expressed as absolute numbers and percentages (%). Measurement data were expressed as mean ±standard deviation and analyzed with t test, variance analysis, multiple linear regression and correlation analysis. Statistical significance was defined as $P < .05$.

3. Results

3.1. The basic information of the main caregivers of stroke patients

There were 117 subjects included in the study. The basic information of the main caregivers of stroke patients was shown in Table 1.

3.2. The anxiety/depression levels of the caregivers of stroke patients

To learn about the conditions of anxiety and depression of stroke caregivers, HARS and HDRS were used. The average anxiety score of the 117 caregivers was 16.56±8.02, and 43.9% of them

Table 1

The sociodemographic characterisics of the caregivers (n=117).

Items	
Age (mean±SD, years old)	56.66±9.62
Gender, n (%)	
Male	45 (38.5)
Female	72 (61.5)
Education, n (%)	
Primary school and below	23 (19.7)
Junior high school	30 (25.6)
High school/technical secondary school	57 (48.7)
College and above	7 (6.0)
Care time, n (%)	
≤ 4h/d	23 (19.7)
5~8h/d	37 (31.6)
9~12h/d	32 (27.4)
≥ 13h/d	25 (21.4)
Relationship to the patient, n (%)	
Spouse	76 (65.0)
Child	35 (29.9)
Other relatives	6 (5.1)
Financial sources, n (%)	
Self-paid	34 (29.1)
Health insurance	83 (70.9)

SD = standard deviation.

certainly had anxiety symptoms using 14 points as the critical value.

The average depression score of the 117 caregivers was 18.36 ±9.39. Among the caregivers, 26.5% of them had mild to moderate depression symptoms and 27.4% had severe depression symptoms, using 17 points as the critical value.

3.3. Univariate analysis of the influencing factors of caregivers' anxiety

To determine the factors that influence the anxiety of stroke caregivers, univariate analysis was performed. The results showed that gender, education, care time per day and medical payment methods had effects on the anxiety of caregivers, and the difference among different groups was statistically significant ($P < .05$, Table 2). Female anxiety score was significantly higher than that of male ($P < .01$), and the anxiety level of caregivers of medical insurance group was lower than that of self-financed group ($P < .01$). Post hoc test showed that the anxiety levels of caregivers with primary school education were significantly lower than those of other groups ($P < .05$), and the anxiety score in the caregivers with care time of more than 13 hours/day was the highest ($P < .05$).

3.4. Multiple linear regression analysis of the factors affecting the anxiety of caregivers

To further analyze the influencing factors of the anxiety of caregivers, multiple linear regression analysis was performed. The anxiety score of caregivers was used as the dependent variable and the 4 influencing factors of anxiety symptoms of the caregivers in the Univariate analysis were used as the independent variables (Table 3). The results showed that 3 variables appeared in the regression equation, and the 3 variables could explain 29.5% of the total anxiety variation of the main caregivers of the stroke patients. The main contributors of the anxiety scores of main caregivers of stroke patients in descending order were the

Table 2

Single factor analysis of the anxiety score of caregivers (n=117).

Influencing factors	Groups	No. of Cases (%)	Anxiety	F	P
Age	≤ 50	27 (23.1)	17.56±6.45	0.566	.638
	51~60	42 (35.9)	16.86±9.29		
	61~70	40 (34.2)	16.20±8.13		
	≥ 71	8 (6.8)	13.50±4.81		
Gender	Male	45 (38.5)	13.87±5.85	2.970	.004
	Female	72 (61.5)	18.25±8.74		
Education	Primary school and below	23 (19.7)	21.22±13.06	3.666	.014
	Junior high school	30 (25.6)	15.87±8.03		
	High school / technical secondary school	57 (48.7)	15.47±4.46		
	College and above	7 (6.0)	13.14±3.18		
Care time	≤ 4h/d	23 (19.7)	11.74±5.6	5.942	.001
	5~8h/d	37 (31.6)	15.46±5.82		
	9~12h/d	32 (27.4)	18.56±10.56		
	≥ 13h/d	25 (21.4)	20.08±6.70		
Relationship to the patient	Spouse	76 (65.0)	16.33±7.34	0.273	.761
	Child	35 (29.9)	17.31±9.80		
	Other relatives	6 (5.1)	15.17±4.92		
Financial sources	Self-paid	34 (29.1)	21.29±10.08	3.597	.001
	Health insurance	83 (70.9)	14.63±6.09		

Table 3

Multiple linear regression analysis performed with the anxiety score as the dependent variable (n=117).

Dependent variable	Independent variable	Partial regression coefficient				Standardized partial regression coefficient	R^2	R^2_{adj}
		Coeffieient (β/Coef)	Standard error (SE)	t	P			
Anxiety	Financial source	−5.023	1.447	−3.471	.001	−0.285	0.313	0.295
	Care time	2.985	0.613	−4.868	.000	0.387		
	Education	−2.232	0.765	−2.918	.004	−0.243		

SE = standard error.

Table 4

Univariate analysis of the depressive scores of caregivers (n=117).

Influencing factor	Group	Case (%)	Depression	F	P
Age	≤ 50	27 (23.1)	18.11±9.02	0.266	.849
	51~60	42 (35.9)	19.02±10.19		
	61~70	40 (34.2)	19.08±9.40		
	≥ 71	8 (6.8)	16.13±7.04		
Gender	Male	45 (38.5)	15.36±7.91	3.091	.003
	Female	72 (61.5)	20.68±9.71		
Education	Primary school and below	23 (19.7)	22.00±12.42	1.471	.226
	Junior high school	30 (25.6)	16.97±11.02		
	High school / technical secondary school	57 (48.7)	18.44±6.96		
	College and above	7 (6.0)	16.28±6.10		
Care time	≤ 4h/d	23 (19.7)	15.61±10.16	3.098	.030
	5~8h/d	37 (31.6)	17.13±9.37		
	9~12h/d	32 (27.4)	19.13±9.53		
	13~h/d	25 (21.4)	23.00±7.11		
Relationship to the patient	Spouse	76 (65.0)	18.41±9.55	0.910	.406
	Child	35 (29.9)	18.26±8.81		
	Other relatives	6 (5.1)	23.67±10.97		
Financial source	Self-paid	34 (29.1)	22.71±10.19	3.112	.002
	Medical insurance	83 (70.9)	16.96±8.56		

Table 5

Multiple linear regression analysis performed with the depression score as the dependent variable (n = 117).

Dependent variable	Independent variable	Partial regression coefficient				Standardized partial regression coefficient	R^2	R^2_{adj}
		Coefficient (β/Coef)	Standard error (SE)	t	P			
Depression	Financial source	−5.470	1.789	−3.057	.003	−0.266	0.142	0.127
	Care time	2.300	0.785	2.929	.004	0.254		

SE = standard error.

payment source of medical expenses, the daily care time and education. Among them, the care time per day was positively correlated with the anxiety score.

3.5. Univariate analysis of the influencing factors of depressive symptoms of the main caregivers

In order to analyze the factors that influence the depression of stroke caregivers, univariate analysis was performed. The results showed that gender, care time per day, medical payment method had effects on the depression of caregivers, and the difference among different groups was statistically significant ($P < .05$, Table 4). Female depression scores were significantly higher than those of males ($P < .01$), and the depression levels of the family members in the medical insurance group were lower than that of the self- paid group ($P < .01$). The depression scores of caregivers of different care time were significantly different ($P < .05$). Post hoc test showed that the depression score of the caregivers with care time of more than 13 hours/day was obviously higher than that of the caregivers with care time of less than 8 hours/day ($P < .05$), but had no significant difference from that in of the caregivers with care time of 9~12 hours/day ($P > .05$).

3.6. Multiple linear regression analysis of the factors affecting the depression of caregivers

To further analyze the influencing factors of the depression of caregivers, multiple linear regression analysis was performed using the depression score of caregivers as the dependent variable and the 3 influencing factors of depressive symptoms of the caregivers in the Univariate analysis as the independent variables (Table 5). The results showed that 2 variables appeared in the regression equation, and the 2 variables could explain 12.7% of the total depression variation of the main caregivers of the stroke patients. The main contributors of the depression scores of major caregivers of stroke patients from the high to low order were the payment source of medical expenses and the care time per day, in which the care time per day was positively correlated with the depression score.

3.7. The burden of caregivers for stroke patients

To understand the burden status of stroke caregivers, the burden distribution was analyzed. The personal burden score of the 117 caregivers was 19.53 ± 8.33, the responsibility burden score was 6.35 ± 3.05 and the total burden score of the caregivers was 25.88 ± 10.35. And, 55.6% of the caregivers had moderate burden, and 12.8% of the caregivers had severe burden.

3.8. The relationship between the anxiety/depression and burden scores of the stroke patient caregivers

To determine the relationship between anxiety/depression and caregiver burden, Piaget correlation analysis was performed, and

all the scores were significantly positively correlated ($P < .001$) (Table 6).

4. Discussion

Stroke survivors have varying degrees of dysfunction, which leads to their self-care deficiencies. Thus, they need long-term care by the caregivers, and this will disrupt the normal life and work of the caregivers to a certain extent. At the same time, long-term use of drugs, economic pressures of rehabilitation and concerns about the health status of patients also have a huge impact on the physiology, psychology and quality of life of the caregivers.[16] A large number of studies[4,5] have found that the incidence of mental illness of the main caregivers of stroke patients is equal to or greater than that of the stroke patients themselves. The main caregivers are in a status of high burden, anxiety and depression, leading to decreased quality of life.[7]

In our study, stroke caregivers had a high level of anxiety and depression, which is in consistent with the 40%~63.7% incidence of anxiety and depression symptoms of caregivers in previous studies.[17,18] The level of anxiety and depression is associated with the severity of functional disability of the patients.[19] Therefore, stroke caregivers who are in the high-risk group of depression should be mainly focused and given comprehensive assessment in the nursing work during inpatient rehabilitation of stroke patients,[20] which will be helpful for the mental health of caregivers and for the rehabilitation of stroke patients, and ultimately improve the life quality of the patients and family.[21]

Univariate analysis showed that gender, education, care time per day and medical payment method were related to the anxiety symptoms of caregivers. Gender, care time per day and medical payment method affected the depression of caregivers. Multiple linear regression analysis showed that medical payment method, care time per day and educational level had significant predictive effects on the anxiety and depression of stroke caregivers. From the gender aspect, univariate analysis showed that female anxiety and depression levels were significantly higher than those of male

Table 6

Correlation analysis of the anxiety and epression of caregivers and the burden score.

Items	Anxiety	Depression	Personal burden	Responsibility burden
Anxiety	1			
Depression	0.871[*]	1		
Personal burden	0.726[*]	0.708[*]	1	
Responsibility burden	0.641[*]	0.501[*]	0.556[*]	1
Total burden score	0.774[*]	0.718[*]	−0.909[*]	0.743[*]

The correlation coefficient was shown.
[*] $P < .001$.

caregivers. Consistently, previous stroke-caregiver-related studies[22,23] have also demonstrated that female caregivers are more susceptible to depression and negative life changes than male caregivers. However, the gender factor did not appear in the regression equation in the multiple linear regression results in this study. It may be because the gender factor has less influence on the anxiety and depression of the caregivers of stroke patients than the other factors. However, this does not indicate gender has no effect on the anxiety and depression.

Stroke rescue and late rehabilitation costs are relatively high. Family economic pressure on the 1 hand depends on the original economic situation of the family, on the other hand, is closely related with the medical payment method. In the present study, the anxiety and depression of the caregivers of the medical insurance payment families were less than those of the self-paid families, suggesting that the economic burden caused by disease is an important influencing factor of the caregiver anxiety and depression.[24] Carol et al[25] showed that the length of care time was an important factor influencing the mental state of caregivers. In this study, the length of care time was positively correlated with the anxiety and depression scores. Consistently, Kara et al[26] reported that negative emotions like anxiety and depression were more likely to appear with prolonged care time. This may be because the long care time per day occupies too much private time of the caregivers, and thus reduces their work, social and entertainment time. Low level of education results in the low level of disease-related knowledge and ability to acquire knowledge, and thus adversely affect the care ability of the caregivers to a certain extent,[27] causing anxiety, depression and other adverse emotional reactions to the caregivers. This suggests that health care workers should focus on women, self-financed, and long-term caregivers in future clinical work, and perform effective individualized interventions, such as psychological counseling, technical training and education,[28] to reduce the emergence and development of anxiety and depression of the caregivers.

Stroke events are a great source of stress for both stroke survivors and family caregivers, especially for the long-term family caregivers, who are subjected to physiological, psychological, and economic pressures, as well as family and social responsibilities. Thus, they are prone to bear care burden.[29,30] In this study, only 31.6% of the caregivers had no burden or light burden, and 68.4% of the caregivers had moderate burden and above, indicating that care stress of stroke caregivers are ubiquitous.[31] Literature review showed that the risk of anxiety and depression increased by 60% to 70% with each 1 unit increase of the caregiver burden.[32] The correlation analysis of our study showed that the burden of caregivers was positively correlated with the level of anxiety and depression, which is in accordance with the results of previous studies.[5,33–35] Further analysis found that personal burden had more correlation to anxiety and depression relative to the responsibility burden. This may probably be because that most caregivers are not professionals and lack of knowledge of the disease. Therefore, they spend more time and energy in the care process and have a self-restricted life and work, but with little support.[36] So the long-term care experience will lead to disorders in their physical and mental health, family and social role, and their personal burdens dramatically increase. Heavy burden not only leads to caregiver emotional problems but also reduces the enthusiasm of caregivers and affects the treatment and rehabilitation of patients.[37] This suggests that clinical nurses should strengthen the assessment of care burdens for the caregivers of stroke

patients and identify the carvigers with low-level social supports in the early stage to provide early assistance. In addition, a management team should be established including the nursing staff as the main member, and the specialist, physician, counselor and other members of the family,[38] to provide individualized home care instruction and counseling for caregivers. Furthermore, social or financial support can assist in reducing caregiver burden among the caregivers of post-stroke patients,[39] or a comprehensive caregiver support programme should be developed as the guide for caregivers.[40] This may fundamentally reduce the burden of stroke patients caregivers, relieve their emotional disorders, strengthen the family function of the patients to ensure their improvement of physical and mental health, and provide good conditions for their disease management.

However, there were also some limitations of this study. The study objects were from the Grade III, Class A general hospitals, and the patients and caregivers were mainly from the urban. And, there were only 117 cases, which was relatively small and might cause some bias. In addition, the severity of the patient's condition may have an impact on the mental condition and care burden of caregivers.

In summary, 43.9% of the stroke caregivers have anxiety symptoms, and 53.9% of the caregivers have varying degrees of depressive symptoms. About 68.4% of the caregivers bear moderate and severe care burden, indicating the emotion and burden of stroke caregivers are not optimistic. Care time per day, medical payment method, and education levels of caregivers are major influencing factors of caregivers' emotion. The personal and responsibility burden of caregivers are positively correlated with anxiety and depression. These results indicate that clinical nurses should provide home care guidance, psychological counseling and social support to caregivers to improve their mental health.

Author contributions

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