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Advance care planning for stroke patients: status and influencing factors

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Abstract: *Objective: To understand the preparation level of the pre-established medical care plan (Advance Care Planning, ACP) in patients with stroke, and to analyze the influencing factors of ACP preparation..Methods: General data questionnaire, pre-established Medical Care Plan Readiness scale (Advance Care Planning Readiness Scale, ACPRS), and Social support scale (Social Support Rating Scale, SSRS) were used to investigate the current situation of 159 stroke patients admitted to Shaanxi traditional Chinese Medicine Hospital from February 2022 to June 2022. Multiple linear regression was used to analyze the influencing factors of ACP in stroke patients. Results: The ACP score of stroke patients was 67.65 ±10.92. the results of regression analysis showed that education level, family per capita monthly income, disease knowledge, and social support were the main influencing factors of ACP readiness in stroke patients (all P < 0.05). The total variation of ACP readiness in stroke patients was 48.9%. Conclusion:The ACP preparation degree of stroke patients in this group was in the upper-middle level. Doctors and nurses should give corresponding strategies according to the reasons, formulate nursing plans in line with the hospice care preferences of brain patients, and improve the level of ACP preparation of patients.*

Keywords: *Stroke, Pre-established Medical Care Plan; Preparation; Social Support*

1. Introduction

A stroke is a cerebrovascular accident, commonly known as a stroke, which includes ischemic stroke and hemorrhagic stroke. According to the epidemiological data [1] ,There are approximately two million stroke patients in China each year, with a 5-year survival rate of less than 50% and a 5-year recurrence rate of 25-30%[2-4],Stroke is the leading cause of death among Chinese residents. The high recurrence,lethality, and morbidity rates [5] have made it a serious public health problem. Therefore, early integration of palliative care into the management of stroke patients is essential to improve their quality of life. Advance Care Planning (ACP) is seen as an integral part of implementing quality palliative care services[6]. Our scholar [7] considers ACP as "the process by which patients, aware and informed of their condition, prognosis, and possible end-of-life care, indicate the care they want to receive in the future based on their personal life experiences and values, and communicate their wishes to their health care providers and/or family members".Promoting advanced medical care is one way to respect patient autonomy. Currently, foreign scholars have discussed the current status of stroke patients' participation in ACP and the timing of implementing ACP [8-9], while such studies in China are relatively late, focusing mostly on oncology [10] and chronic diseases [11], with few studies on stroke. This study aimed to understand the ACP readiness of stroke patients by questionnaire method and to analyze the influencing factors to provide a reference for future interventions.

2. Objects & Methods

2.1. Research peopel

A convenience sampling method was used to include stroke patients admitted to the cerebral disease and acupuncture wards of Shaanxi Provincial Hospital of Traditional Chinese Medicine during the

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period from February 2022 to June 2022 in the study. Inclusion criteria:(1)Patients with stroke who met the fourth national cerebrovascular diagnostic criteria [12] and were confirmed by intracranial CT or MRI; (2)Age ≥18 years; (3)Clear mental status and able to answer the investigator's questions correctly; (4) Those who gave informed consent and voluntarily participated in this study.Exclusion criteria:(1) those with a history of psychiatric disorders, severe cognitive and consciousness disorders;(2)those with severe cardiac, cerebral, and renal complications and unstable vital signs. This study is an existing survey, and the sample size was estimated according to the overall mean[13],Using the formula $n=(u\alpha/2\sigma/\delta)2$,Set significant $\alpha=0.05$, $U\alpha/2=1.96$,the Standard deviation of pre-survey results $\sigma=6.122$, Allowable error $\delta=1$,$u\alpha/2=1.96$,$n=(u\alpha/2\sigma/\delta)2\approx144$(Example),Taking into account a 10% sample loss rate, the sample size was 159 cases.

2.2. Research Tools

1) General Information Questionnaire Designed by the researchers themselves, including general information on age, gender, education level, etc.； Disease information duration of a stroke, and disease severity[14] ("normal," "mild," "moderate," "severe," "very severe") and medical experience [15] (whether or not they had been admitted to an intensive care unit).

2) Advance Care Planning Readiness Scale (ACPRS) The questionnaire, developed by Xinru Wang [16] et al. in 2019, was used to assess patients' readiness for advanced health care planning and consisted of 22 items addressing three dimensions of readiness for advanced health care planning: attitudes, beliefs, and motivation. A 5-point Likert scale was used, with scores ranging from 22 to 110, and the better the readiness of the pre-established medical plan, the higher the score. A score of 22 to 43 indicates low readiness, 44 to 65 indicates moderate to low readiness, 66 to 87 indicates moderate to high readiness, and 88 to 110 indicates high readiness. The overall Cronbach's a for this scale was 0.923.

3) Social Support Rating Scale (SSRS) The questionnaire was developed by Xiao Water [17] in 1986 to assess the level of social support received by patients, with 10 items, including 3 dimensions of subjective support, objective support, and support utilization, and the scores of all entries were summed to give a total score of 66 for social support, the higher the level of social support, the higher its score. The scale Cronbach's coefficient was 0.896.

2.3. Method of data collection

The questionnaires were administered in face-to-face interviews, where the researcher used a common instructional language to explain the purpose of the study, the confidentiality of the information, and the completion of the questionnaires to the subjects, with their consent, or, in the case of those unable to complete the questionnaires themselves, with the assistance of the researcher. Questionnaires were collected on the spot. A total of 170 questionnaires were collected in this study, of which 159 were valid, with an effective return rate of 93.5%.

2.4. Statistical methods

The data were statistically analyzed using SPSS26.0.expressed as mean ± standard deviation; one-way analysis of variance using independent samples t-test or ANOVA. Correlation analysis was performed by Pearson correlation analysis, and multivariate stepwise linear regression was used for multi-factor analysis. Significant differences were indicated by $P<0.05$.

3. Results

3.1. Univariate analysis of ACP scores in stroke patients

Table 1 shows the univariate analysis of the ACP scores of stroke patients. Table 1 shows that there were significant differences in the ACP scores of stroke patients when comparing marital status, education level, place of residence, employment status, type of medical payment, monthly per capita household income, child status, experience in caring for deceased loved ones and knowledge of the disease (all $P<0.05$).

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Table 1: Univariate analysis of ACP readiness scores in stroke patients (n=159)

Projects	n(Percentage,%)	ACP Readiness Score	*t/F*	*P*
Gender			t=0.543	0.588
Men	85(53.5)	68.09±10.58		
Female	74(46.5)	67.15±11.36		
Age (years)			F=0.829	0.438
18～45	10(6.3)	71.70±9.86		
46～60	46(28.9)	67.98±10.09		
⩾61	10(64.8)	67.12±11.37		
Marital Status			F=3.523	0.017
Unmarried	3(1.9)	76.00±4.36		
Married	119(74.8)	68.67±10.43		
Divorce	9(5.7)	68.67±11.60		
bereaved spouse	28(17.9)	62.11±10.92		
Education level			F=26.536	＜0.001
Elementary school and below	34(21.4)	57.62±8.72		
Middle School and High School	87(54.7)	69.16±10.11		
College and above	38(23.9)	73.18±8.66		
Area of residence			t=6.033	＜0.001
City	109(68.6)	70.85±9.78		
Rural	50(31.4)	60.68±10.08		
Religious beliefs			t=1.265	0.208
None	115(72.3)	68.33±10.84		
Yes	44(27.7)	65.89±11.06		
Working situation			F=16.387	＜0.001
Unemployed	53(33.3)	61.25±10.96		
Retirement/retirement	84(52.8)	70.73±9.72		
On-the-job	22(13.8)	71.36±8.42		
Medical Payment Method			F=7.794	＜0.001
Self-financed	28(17.6)	60.93±9.90		
Public funding	8(5.0)	73.63±4.69		
Medical Insurance	123(77.4)	68.80±10.84		
Monthly income per capita			F=29.346	＜0.001
⩽1000	8(5.0)	62.00±12.21		
1001～3000	50(31.4)	59.18±9.94		
3001～5000	66(41.5)	70.24±7.56		
⩾5001	35(22.0)	76.17±8.44		
Type of care			t=-1.478	0.141
Relative Care	133(83.6)	67.09±10.88		
Nanny/nursing care	26(16.4)	70.54±10.90		
Child Status			F=7.885	＜0.001
No children	12(7.5)	74.42±7.04		
One	45(28.3)	71.29±8.40		
Two or more	102(64.2)	65.25±11.55		
Stroke phase (months)			F=1.294	0.277
⩽1	9(5.7)	65.56±8.70		
1～6	31(19.5)	70.39±10.10		
⩾6	119(74.8)	67.10±11.23		
Bereavement experience			t=-3.491	＜0.001
Yes	121(76.1)	66.02±10.68		
No	38(23.9)	72.87±10.14		
Severity of the disease			F=1.117	0.351
Normal	8(5.0)	67.50±9.34		
Mild	48(30.2)	67.46±11.40		
Moderate	65(40.9)	68.77±11.30		
Severe	33(20.8)	64.85±8.95		
Extremely Heavy	5(3.1)	73.80±14.74		
Understanding of the disease			F=20.511	＜0.001
No knowledge	48(30.2)	60.63±12.11		
Partial understanding	88(55.3)	69.58±8.33		
Understanding	23(14.5)	74.96±9.51		
Have other chronic diseases			F=1.173	0.322
No	29(18.2)	69.55±11.72		
1	61(38.4)	66.70±12.12		
2	46(28.9)	66.33±9.14		
3 kinds and above	23(14.5)	70.43±9.51		
Have you ever been hospitalized in an intensive care unit?			t=1.289	0.199
Yes	57(35.8)	69.04±8.98		
No	102(64.2)	66.88±11.84		

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3.2. Stroke patient's ACP and Social Support Rating Scale scores

Table 2 shows the ACP readiness and social support scores of stroke patients. The results showed that the total ACP score (67.65±10.92) was in the middle to the upper level and the total social support score (36.81±8.29) was in the middle level.

Table 2: ACP readiness and social support scores of stroke patients (n=159)

Projects	Number of Entries	Total score or dimension score ($\overline{X}$ ±S, points)	The average score of entries
ACP Attitude Score	10	25.87±7.15	2.59±0.72
ACP Belief Score	5	18.19±2.82	3.64±0.55
ACP Motivation Score	7	23.80±3.90	3.4±0.56
ACP Readiness Score	22	67.65±10.92	3.08±0.50
The social support scale score	10	36.81±8.29	3.68±0.83

3.3. Correlation between ACP and social support scale in stroke patients

Pearson correlation analysis showed a significant and positive correlation between ACP readiness scores and social support scores in stroke patients (r=0.481, *P*<0.01).

3.4. Multiple linear regression analysis of ACP in stroke patients

The ACP score of stroke patients was used as the dependent variable, and the variables of *P*<0.05 in the univariate analysis and social support score were used as independent variables (see Table 3 for the assignment of independent variables).), explaining a total of 48.9% of the variance in ACP readiness. See Table 4.

Table 3: Independent variable assignment method

Independent variable	Assignment situation
Marital Status	1=unmarried, 2=married, 3=divorced, 4=widowed
Education level	1=Elementary school and below, 2=Junior high school, 3=High school and college, 4=College and above
Working situation	1=unemployed, 2=retired/retired, 3=working
Medical Payment Method	1=fully self-funded, 2=publicly funded health care, 3=medical insurance, 4other
Monthly income per capita	1=＜1000RMB, 2=1000-3000RMB, 3=3000=5000RMB, 4=＞5000RMB
Child Status	1=no children, 2=one, 3=two and more
Bereavement experience	1=yes, 2=no
Disease severity	0=normal, 1=mild, 2=moderate, 3=severe, 4=very severe
Understanding of the disease	1=do does not know, 2=partially know, 3=know
Social support	Input in actual values

Table 4: Multiple linear regression analysis of factors influencing ACP readiness in stroke patients

Variables	Regression coefficient	Standard error	Standardized regression coefficients	t-value	P	95.0% CI
(Constants)	30.289	3.287	-	9.216	＜0.001	23.796～36.781
Monthly income per capita	3.879	.906	.298	4.281	＜0.001	2.089～5.669
Social Support Scale score	.370	.082	.281	4.494	＜0.001	.208～.533
Knowledge of the disease	3.327	1.072	.198	3.104	.002	1.210～5.445
Education level	3.321	1.093	.205	3.039	.003	1.162～5.480

Note: R2=0.489,whole R2= 0.476, F=36.815 ,P<0.001, "-" indicates no data.

4. Discussion

4.1. Stroke patients have an intermediate to the high level of ACP readiness

The results of this study showed that the ACP score of stroke patients was (67.65±10.92), which

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was in the upper middle level, but lower than the ACP score of elderly stroke patients (78.7±10.6) of Shuai-Li Peng [18], probably because Peng's study was located in a first-tier developed city, where the patients were generally more educated, more self-aware, and less susceptible to traditional Chinese Confucianism and "filial piety". The patients in Peng's study were generally more educated, more self-aware, and less susceptible to the influence of traditional Chinese Confucianism and "filial piety".ACP not only recognizes patient autonomy and increases consistency between patients' end-of-life preferences and the care they receive, but also improves the quality of life for terminally ill patients and reduces the cost of hospital care.

The ACP readiness scores of stroke patients were, in descending order, ACP beliefs, ACP motivation, and ACP attitudes, indicating that stroke patients have a high sense of identification with ACP and a high level of self-confidence and motivation to actively participate in ACP. Having followed the health belief model, patients' outcome expectations of the accepted behavior had an impact on their behavioral beliefs, and patients received more benefits than difficulties in implementation when first exposed to ACP [19], resulting in higher behavioral beliefs that contribute to individual motivation and attitudes [20], suggesting that most stroke patients are willing to participate in future treatment and care decisions and that their family, friends, and physicians are aware of their preferences for future treatment and care. However, current studies have shown[21-22] that the awareness of ACP among health care workers and patients is still rudimentary. In this regard, medical institutions should strengthen the publicity of ACP and develop ACP interventions adapted to our national conditions, so that they can correctly understand the concept of ACP and better understand and accept ACP.

4.2. Analysis of factors influencing ACP in stroke patients

1) Stroke patients with high monthly per capita household income have higher ACP scores

The results of this study showed that there was a significant positive correlation between the level of monthly per capita household income and the ACP of stroke patients, (B=3.879, p<0.001), and as the per capita monthly household income of patients increased, their ACP scores were higher, consistent with the findings of Lin Hongyuan et al [23]. Patients with stroke have a high recurrence rate [5], and patients are repeatedly admitted to the hospital, causing a certain economic burden. Patients with a higher monthly income have a lower economic burden and better self-control of the disease; secondly, patients with a higher monthly income level receive a relatively wider range of medical information and resources and are therefore more prepared for ACP. Health care professionals should enhance humanistic care for patients with low per capita monthly household incomes to improve patients' readiness for ACP.

2) Stroke patients with high social support have higher ACP scores

The results of this study showed a significant correlation between social support and ACP in stroke patients, (B=0.370, p<0.001), with higher ACP scores as patients' social support increased, consistent with the findings of Wang Shoubi et al [22] in elderly with mild cognitive impairment and Shen Wenjia et al [24] in patients with chronic heart failure. Social support includes moral or material help and support from family, friends, social organizations, etc. There is both objective and subjective support. Objective support for self-protection and positive attitudes to life under stressful events; subjective respect for the patient's feelings of self, to feel respected, supported, and understood, which in turn has an impact on subsequent behavior and helps them to better deal with their illness. Therefore, patients, families, and healthcare professionals should be encouraged to communicate more, empower patients and their families to exercise their independent decision-making abilities, and actively promote "family-centered" ACP [25], and the more social support they receive, the more they can help raise awareness of patients' social roles and end-of-life issues and increase their readiness to participate in ACP.

3) Stroke patients with high knowledge of the disease have higher ACP scores

The results of this study showed that there was a significant correlation between disease knowledge and ACP of stroke patients (B=3.327, *P*=0.002), as the more patients knew about the disease, the higher their ACP scores, the more patients knew about the disease, the deeper their understanding of the disease would be, the more accurate their judgment of the disease would be, and the better they could assess the future development of the disease to face its possible negative outcomes, and indicate personal end-of-life wishes through adequate communication with medical care and family members. This is especially true for stroke patients with multiple recurrent admissions [5], who are more inclined to advance into good planning to reduce the burden on themselves and their families.

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4) Highly educated stroke patients have higher ACP scores

The results of this study showed a significant correlation between literacy and ACP in stroke patients (B=3.321, *p*=0.003), with higher ACP scores as patients' literacy increased, which is consistent with other scholars' views on end-of-life care [26]. Under the influence of the Chinese ideology of "life is taboo," the topic of death is considered taboo by many people, and most patients have a negative attitude toward the end of life, neglecting to explore its meaning. The more educated patients are, the more active they are in obtaining information about the disease, and the better they understand it, the more open they may be too accepting and endorsing the values behind ACP (improved quality of life at the end of life, reduced decision-making conflicts, rational use of health care resources, and reduced social burden, etc.).Therefore, it is recommended that health service professionals conduct regular ACP awareness campaigns, provide ACP knowledge, and engage family members (especially adult children) in such educational programs to increase ACP readiness.

5. Conclusion

In the current climate of promoting and facilitating hospice care, the ACP scores of stroke patients are in the middle to upper range, indicating that the use of ACP in stroke patients is feasible. Second, the results of multiple stepwise linear regression analysis can be used as a predictor of ACP readiness levels in stroke patients, which is helpful for medical professionals to identify people with high ACP readiness and use comprehensive treatment measures to improve the patients' ACP readiness level and improve their quality of survival. There are various factors influencing the readiness of ACP in stroke patients, and only 1 stroke patient from a tertiary general hospital was selected for this study, with limited factors included; further in-depth multicenter, large sample and multifactorial studies can be conducted in the future.

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