Self-care Status and Influencing Factors of Patients with Chronic Heart Failure in Community from The Perspective of Health Ecology

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Abstract

Objective To explore the current situation and influencing factors of self-care of patients with chronic heart failure in community.

Methods Patients with chronic heart failure in four community health service centers of a third class hospital in Nanjing were selected as the research object. A questionnaire was formed based on health ecology to understand the current situation and influencing factors of self-care. The data were analyzed by one-way ANOVA and multiple linear regression.

Results The self-care status of community patients with chronic heart failure was poor, and they were in the state of "low maintenance, low management and low confidence"; Social support level, anxiety, depression, number of complications, course of disease, education level and income were independent influencing factors of self-care ability of community patients with chronic heart failure ($P < 0.05$).

Conclusion The self-care ability of community patients with chronic heart failure needs to be improved, which is affected by many factors. Personalized evaluation and active intervention should be carried out to improve the self-care ability and quality of life of patients with chronic heart failure.

Introduction

Chronic heart failure has become a serious global disease due to its high incidence and high mortality^[1], at present, there are about 13.7 million patients with chronic heart failure in China ^[2], the overall prevalence has increased by 44% in 15 years ^[3], and the risk of sudden death is 6~ 9 times that of the general population ^[4],Community patients with chronic heart failure are often readmitted because they can not get continuous and effective medical support, which increases the loss of life and the burden on the health system. It is urgent to improve their self-care ability and improve their quality of life.Health ecology advocates individual health, which is the result of the interaction of individual patients, medical and health services and social environment^[5].The purpose of this study is to explore the current situation of self-care of community patients with chronic heart failure through cross-sectional survey and analyze the influencing factors under the theoretical guidance of health ecology, in order to provide personalized guidance for community patients with chronic heart failure and improve their self-care ability.

Research Objects And Methods

1.1 Research object

Patients with chronic heart failure who met the acceptance criteria in four community health service centers of a third class hospital from January to April 2020 were selected as the research object.Inclusion criteria: (1) meet the diagnostic criteria of chronic heart failure and New York Heart Association (NYHA) cardiac function grade II - III (2) Living in the research community (3) Between 18 and 80 years old(4) Have a certain ability of understanding and expression, have no barrier to communication, and agree to

participate in this study. Exclusion criteria: (1) complicated with other severe diseases (2) Suffering from mental illness or cognitive impairment (3) Illiteracy (4) Hearing impairment. This study was approved by the clinical research ethics committee of our hospital (Approval No: 2019ZDSYLL200-P01). During the investigation, all subjects signed informed consent.

1.2 Research method

1.2.1 research tool

1.2.1.1 General information questionnaire: The general data and clinical disease-related data designed by the researcher and discussed and revised by the team of the researcher's tutor mainly include age, gender, educational level, cardiac function grade, course of disease, complications, admission mode, preferred medical institution, medical satisfaction, etc.

1.2.1.2 Heart failure self care index scale (SCHIF): Prepared by Riegel^[6], translated and revised into Chinese by Chen Wei^[7]. The scale has 22 items and three subscales. The total average score of the scale is 0 ~ 100. The higher the score, the higher the patient's self-care ability. Riegel proposed that the total average score of 70 is the dividing point to judge whether the patient's self-care is sufficient^[8]. Overall Cronbach's scale α the coefficient was 0.836, and the content validity index of each item of the scale was 0.8 ~ 1.0.

1.2.1.3 Social support rating scale (SSRS): Designed by Xiao Shuiyuan^[9] in 1986, it includes three dimensions: subjective support, objective support and support utilization, with a total of 10 items. If the score of the scale is < 29, there is less social support; The score of 30 ~ 39 points is general social support; Scores of 40-49 were more social support; Score $\geq$ 50 points is a lot of social support^[10]. Overall Cronbach's scale α the coefficient is 0.896, Cronbach's for each dimension α the coefficient is 0.825 ~ 0.849.

1.2.1.4 Generalized anxiety scale (GAD-7): It is compiled based on the symptomatic standard of DSM-IV^[11], with 7 items in total, with a total score of 0 ~ 21. Scoring criteria: 0 ~ 4 points are no anxiety, 5 ~ 9 points are mild anxiety, 10 ~ 14 points are moderate anxiety, and 15 ~ 21 points are severe anxiety^[12]. The scale Cronbach's α The coefficient is 0.867.

1.2.1.5 Patient health questionnaire Depression Scale (PHQ-9): Based on the American Diagnostic and Statistical Manual of mental disorders (DSM-IV)^[13], it contains 9 items, with a total score of 0 ~ 27. Scoring criteria: 1-4 points are normal, 5-9 points are mild depression, 10-14 points are moderate depression, 15-19 points are moderate and severe depression, and 20-27 points are severe depression^[14]. The scale Cronbach's α The coefficient ranges from 0.8 to 0.9.

1.2.2 Data collection method

In this study, unified filling instructions were formulated, unified training was conducted for all investigators, and one-to-one guidance was adopted for questionnaire filling, In case of any patient who does not understand or cannot complete the questionnaire independently, the investigator shall ask one by one and the patient shall make an independent decision, which shall be taken back on site after filling in. A total of 156 questionnaires were distributed, of which 144 were valid, and the effective recovery rate was 92.3%.

1.2.3 Quality Control

Recheck according to the proportion of 5% of the recovered questionnaire, and the error of all survey columns shall not exceed 10%, so as to ensure the completeness and authenticity of the questionnaire. Remeasure the reliability of the four scales to ensure the authenticity and accuracy of the patients.

1.2.4 Statistical method

Epidata3.0 was used to input data, and spss20.0 software was used for statistical analysis. The counting data are expressed in frequency and percentage (%), and the measurement data are expressed in mean±standard deviation ($\bar{x}\pm s$). Independent sample t-test was used for the measurement data conforming to the normal distribution, and chi square test was used for the counting data. One way ANOVA was used for each variable to screen out the variables less than 0.05, and then entered the multiple linear regression analysis. The difference was statistically significant with $P < 0.05$.

Research Results

2.1 Self care status of patients with chronic heart failure

2.1.1 Self care score

The total average score of patients' self-care in this study is (42.27 ± 14.93). The highest average score is the self-care confidence dimension, and the lowest is the self-care management dimension, as shown in Table 1.

Table 1 self care scores of patients with chronic heart failure

Project	Number of entries	Score $\bar{x}\pm s$
Self care maintenance	10	40.51 ± 14.89
Self care management	6	36.67 ± 17.80
Self care confidence	6	49.62 ± 23.43
Total score	22	42.27 ± 14.93

2.1.2 Self care scores of different preferred medical institutions

Patients with different medical institutional preferences scored differently on self-care, as shown in Table 2.

Table 2 self care scores of patients in different preferred medical institutions

Preferred institution	Number	Self care maintenance	Self care management	Self care confidence	Total average
Third class hospital	109	39.67±14.61	35.96±17.47	49.59±23.88	41.74±14.67
Community Health Centre	35	43.14±15.68	38.86±18.87	49.68±22.31	43.90±15.82

2.2 Analysis of influencing factors of self-care in patients with chronic heart failure

2.2.1 Single factor analysis of self-care in patients with chronic heart failure

The results of univariate analysis showed that education level, monthly income, number of complications, course of disease, anxiety, depression and social support were the factors affecting the self-care level of patients with chronic heart failure, and the difference was statistically significant ($P < 0.05$), as shown in Table 3.

Table 3 Univariate analysis of influencing factors of self-care in patients with chronic heart failure

Project		Number	Total average	t/F	<i>P</i>
Gender	Male	54	41.22±14.84	0.42	0.52
	Female	90	42.89±15.03		
Age	60 and below	13	47.85±18.11	1.06	0.35
	61~70	47	42.30±14.29		
	71~80	84	41.38±14.75		
Educational level	Primary school and below	22	35.30±11.61	3.17	0.016
	Junior middle school	49	41.78±13.72		
	High school	29	41.84±13.73		
	Technical college	30	43.73±13.90		
	University and above	14	52.66±22.28		
Monthly income	<3000	27	36.85±14.66	3.20	0.025
	3000~5000	61	42.56±13.62		
	5000~8000	35	41.35±15.24		
	>8000	21	49.89±16.13		
Cardiac function	Ⅱ	104	42.16±15.78	0.02	0.89
	Ⅲ	40	42.54±12.63		
Number of complications	0	12	55.76±18.05	5.72	0.004
	1~2	41	41.41±12.63		
	3~	91	40.87±14.73		
Course of disease	<1	19	29.80±12.89	6.56	0.000
	1~5	44	41.55±11.34		
	5~10	26	44.30±16.59		
	>10	55	46.19±15.24		
Anxious	No anxiety	105	43.12±14.54	5.80	0.004
	Mild anxiety	32	43.44±14.97		
	Moderate anxiety	7	24.13±9.27		
Depressed	No depression	88	43.64±15.18	3.99	0.021
	Mild depression	41	43.00±12.10		

	Moderate and above depression	15	32.21±17.46		
Social support level	Less support	17	32.08±6.86	4.91	0.009
	General support	67	42.91±14.58		
	More and more support	60	44.44±15.95		

2.2.2 Multiple linear regression analysis of self-care in patients with chronic heart failure

The meaningful variables in the univariate analysis were taken as independent variables, and the total self-care was divided into dependent variables for multiple regression analysis. The assignment is shown in Table 4. The results show that social support level, anxiety, depression, number of complications, course of disease, per capita income and education level are independent influencing factors of self-care ability of patients with chronic heart failure in the community, as shown in Table 5.

Table 4 multivariate analysis of influencing factors of self-care in patients with chronic heart failure

Variable	Serial number	Assignment method
Educational level	X1	Primary school and below=1 Junior middle school=2 High school=3 Technical college=4 University and above=5
Per capita income	X2	<3000=1 3000-5000=2 5000-8000=3 >8000=4
Number of complications	X3	0=1 1=2 2=3 3=4
Course of disease	X4	Less than 1 year=1 1-5 years=2 5-10 years=3 More than 10 years=4
Anxious	X5	No anxiety=1 Mild anxiety=2 Moderate anxiety=3
Depressed	X6	Normal=1 Mild depression=2 Moderate and above=3
Social support level	X7	Less support=1 General support=2 More and more support=3

Table 5 multivariate analysis of total average score of self-care in patients with chronic heart failure

Entry variable	Partial regression coefficient	Standard error	Standard partial regression coefficient	t	P
Constant	28.252	5.163		5.472	<0.001
Education level	2.403	0.889	0.197	2.705	0.008
Per capita income	2.318	1.130	0.147	2.052	0.042
Number of complications	-2.678	1.366	-0.162	-1.961	0.048
Course of disease	3.048	1.265	0.223	2.409	0.017
Anxious	-9.912	2.416	-0.374	-4.103	<0.001
Depressed	-4.019	1.708	-0.183	-2.353	0.020
Social support level	8.662	2.562	0.389	3.381	0.001

PSF=10.85P0.01R²=0.358Adjust R²=0.325

2.3 Reliability of re measurement table

The reliability of the scale indicates the reliability and reliability of the measurement data. It is generally considered that more than 0.7 indicates good consistency of the scale. The reliability of the measurement scales in this study has reached more than 0.7, indicating that the quality of this survey is good. See Table 6 for details.

Table 6 Reliability of re measurement table (Cronbach's) α Coefficient) results

Project	SCHIF	Self care maintenance dimension	Self care management dimension	Self care confidence dimension	GAD-7	PHQ-9	SSRS
Cronbach'sα Coefficient	0.857	0.736	0.747	0.859	0.847	0.786	0.816

Summary

In conclusion, the self-care ability of community patients with chronic heart failure is poor. The level of social support, anxiety, depression, the number of complications, course of disease, education level and income are the influencing factors of self-care ability. Comprehensively improving the self-care ability of community patients with chronic heart failure from the three aspects of individual patients, medical and health services and social environment is of great significance to reduce the symptoms of heart failure and improve the quality of life. However, the sample size of this study is small, and the study is limited to

Nanjing, and the representativeness of the results needs to be considered. In the future, we can expand the sample size, broaden the scope of investigation and make the results more accurate.

Discussion

3.1 Analysis of self-care ability of patients with chronic heart failure in community

Self-care is one of the strategies to cope with the increased incidence of heart failure^[15], and can improve the prognosis of heart failure^[16]. The results of this study show that the total average score of self-care ability of community patients with chronic heart failure is (42.27 ± 14.93) , which is in the state of "low maintenance, low management and low confidence", which is consistent with the results of Wang Nan^[17], Xu Chang^[18], the analysis may be caused by the fact that nearly 50% of the patients' education level below high school affects the mastery of heart failure knowledge, and 63% of the patients have more than 3 kinds of complications, which leads to more complicated conditions and more difficulty in daily management. The highest score was the self-care confidence dimension, with an average score of (49.62 ± 23.43) , and the lowest score was the self-care management dimension, with an average score of (36.67 ± 17.80) . The reason may be that the rapid development of informatization can help patients obtain heart failure related knowledge from multiple channels, learn the management points of heart failure and make effective self-care behavior, and 88% of patients have a good level of social support. Strong social support can give patients diversified resources, including emotional support and information support, to support the development of patients' nursing confidence^[19]. Self care management is an active decision-making behavior, which requires patients to take measures when symptoms appear. In this study, 72% of patients' cardiac function is grade II, and the symptoms of heart failure are not serious. When the symptoms do not occur or worsen, patients may ignore treatment and continue an unhealthy lifestyle, which has an adverse impact on self-care management^[20]. At the same time, the complexity of heart failure treatment scheme^[21] also poses a great challenge to patients' self-care management, so the score of self-care management dimension is the lowest.

3.2 Analysis of the influence of health services on community chronic heart failure patients

3.2.1 Effects of different preferred medical institutions on patients' self-care

76% of the patients in this study preferred third class hospitals, 33% of whom believed third class hospitals had superior technology and rich medical resources, and 31% trusted third class hospitals, indicating that third class hospitals played a dominant role in diagnosis and treatment. However, the total average score of self-care and the scores of the three dimensions of the patients who choose the third class hospital are lower than those who choose the community health service center. The reason might be that 20 of the 35 patients belong to the same area of community health service center, which is most closely connected with our hospital and is prominent in medical experience and health education. Patients with chronic heart failure trust them and take good self-care. In addition, 83% of the patients had grade II cardiac function, mild symptoms of heart failure and low pressure of self-care, resulting in high

scores. It shows that after being fully supported and developed, the community health service center can provide high-quality medical services for patients with stable and regular chronic diseases, realize the linkage mechanism between class III hospitals and community health service centers, and promote the construction of "medical integration", which has good development prospects and great significance for improving the self-care ability and quality of life of patients with chronic heart failure.

3.2.2 Satisfaction analysis of different medical institutions

After the satisfaction survey, it was found that 83% of the patients were satisfied with the third class hospital and 73% were satisfied with the community health service center, and the difference was statistically significant ($P = 0.031$). The reason may be that the third class hospitals have rich medical resources and rich knowledge of medical personnel. However, the third class hospitals also have problems such as excessive traffic, time-consuming and laborious queuing, etc. In contrast, the community health service center is better than the third class hospitals in terms of health education and follow-up. The reason may be that it has close contact with patients' lives and is closest^[22], and the number of patients is far less than that of the third class hospitals. Moreover, the medical experience is better and the medical staff have enough time to answer questions for patients. However, medical staff's knowledge reserve of heart failure is not comprehensive and medical examination is not advanced, which are all factors affecting patient satisfaction. Therefore, under the guidance of the third class hospitals, promoting the sinking of medical resources and improving the diagnosis, treatment and management level of heart failure in community health service centers will help to alleviate the current situation of "difficulty in seeing a doctor".

3.3 Analysis of influencing factors of self-care ability in patients with chronic heart failure

3.3.1 Demographic factors

The results of this study show that education level is an independent influencing factor for patients with chronic heart failure in the community, which is consistent with the results of Li Difan^[23]. It may be related to the ability to learn and identify disease-related symptoms^[24]. Due to the complexity of the course of heart failure and the lack of disease-related knowledge and skills^[25], patients lack the ability of self-management and maintenance, resulting in the decline of self-care ability. Therefore, nurses should provide patients with personalized learning ways and methods to help patients identify and manage symptoms and improve their self-care ability. Per capita monthly income is also a factor affecting self-care ability. The lower the per capita monthly income, the lower the self-care ability, which is consistent with the previous research results^[26]. In this study, the self-care score of patients with income > 8000 was significantly higher than that of patients with income < 3000 . Low-income people did not have enough money to support the expenses related to heart failure, which had a great impact on the maintenance of self-care. In addition, due to the limitation of economic ability, low-income patients pay less attention to diseases and will not take the initiative to obtain better medical services^[27], which will lead to the decline of self-care ability.

3.3.2 Disease related factors

Multiple regression analysis showed that the course of disease was an independent influencing factor of self-care ability. It is consistent with the research results of Da concei ță o AP^[28] and inconsistent with the research results of Chen Liping^[29], the reasons may be that patients with a long course of disease have a more comprehensive understanding of their own diseases, can timely identify the symptoms of heart failure and take corresponding measures, have better control over the disease and strong self-care ability. Complications are usually related to the severity of heart failure. This study show that the more complications, the lower the self-care ability of patients, which is consistent with the views of Wang Bingqing^[30], the more complications of patients with chronic heart failure, the more complex the condition and the more accompanying symptoms. Patients do not have enough knowledge reserve and ability to self-management. Medical staff should make corresponding health education for different complications to promote patients to take effective self-care.

3.3.3 Psychological factor

In this study, the total average score of self-care of patients with moderate anxiety and depression is less than 40, indicating that the degree of anxiety and depression seriously affects the self-care ability of patients, which is consistent with previous studies^[31]. It may be that negative psychology makes the patients' life attitude become negative and their life beliefs decline, which affects the cognitive level and coping ability of heart failure, leads to the decline of willingness to take care of themselves, and increases the risk of poor prognosis and death. Nursing staff should focus on the psychological status of such patients and take it into account to help patients learn how to identify and manage negative emotions and meet their psychological needs.

3.3.4 Social factors

Social support includes emotional support, tool support and information support^[32]. The survival rate of patients with good social support increased by 50%^[33], indicating that social support is a reliable resource to maintain good self-care ability. Most social support comes from families, friends and hospitals. Especially in the case of uneven distribution of medical resources, family support is more important for patients. Family members can encourage patients with heart failure to develop a healthy lifestyle, supervise patients to take drugs on time according to doctors' advice, improve compliance and enhance their self-care ability. Medical staff should mobilize the existing and potential social support resources of patients, improve the utilization rate of patients' social support, and improve their self-care ability.

Declarations

Author Contributions: BY Zhou and CR Xu conceived the project. XL Xu, Y Chen, WH Tang obtained, validated the data. BY Zhou performed the statistical analyses and drafted the manuscript. CR Xu

supervised the project and provided operational support. All authors discussed the results and contributed to the final manuscript.

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Consent for publication: Not applicable.

Availability of data and materials: All raw study data can be obtained upon request from the corresponding author.

Ethical approval and informed consent: Study was approved by IEC for Clinical Research of Zhongda Hospital, Affiliated to Southeast University. (No 2019ZDSYLL200-P01) Informed consent was obtained from participants. Study was carried out in accordance with ethical guidelines of Zhongda Hospital affiliated to Southeast University.

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