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A Study on the Current Situation and Related Factors of Personal Mastery in Patients with Chronic Heart Failure: A Cross-Sectional Study

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Purpose: To explore the status quo and influencing factors of personal mastery in Chinese patients with chronic heart failure, based on the analysis of patient characteristics.

Methods: The sample of the study comprised 249 chronic heart failure patients who visited a university hospital in China. We collected the data using general demographic Information, personal mastery scale, the Simple Coping Style Questionnaire and Minnesota Living With Heart Failure Quality of Life Questionnaire (MLHFQ). SPSS26.0 was used to describe the survey results statistically, and univariate analysis, Pearson correlation analysis and multiple linear regression were used to analyze the influencing factors of personal sense of control.

Results: Chronic heart failure patients' total personal mastery scores were (20.63±4.486), which is in the medium level. Multiple linear regression analysis shows that Age group (β=−1.627, p=0.036), NYHA functional classification (β=−1.563, P<0.001), Positive coping style (β= 0.088, P=0.004) and MLHFQ (β= −0.121 P<0.001) significantly influenced patients' personal mastery (P<0.001).

Conclusion: Our study suggests that the personal mastery of patients with chronic heart failure is at a moderate level in China. Additionally, age group, NYHA functional classification, Positive coping style and MLHFQ emerged as significant influencing factors. Clinical staff should dynamically observe the changes in the level of personal mastery of patients with chronic heart failure, pay more attention to the elderly and patients with poor heart function according to the influencing factors, and encourage active responses to improve the level of personal mastery of patients with heart failure.

Keywords: chronic heart failure, the personal mastery, positive coping style, negative coping style, quality of life

Introduction

Chronic heart failure (CHF) is the leading cause of death from various cardiovascular diseases and is manifested by a persistent state of heart failure. The occurrence of heart failure in developed nations is between 1.5% and 2.0%.[1–3] The number of heart failure patients in China is expected to reach 8.9 million by the year 2021, as per the latest estimates.[2] The recurrence and worsening of heart failure symptoms is an important reason for its readmission, and studies have shown that the 30-day readmission rate is as high as 20–25%, and the 5-year survival rate is 56.7%.[3] The overall prognosis of heart failure disease is poor, and patients are prone to negative emotions and problems.

Personal mastery, a psychological mechanism that can explain the association between stressors and cardiovascular disease risk factors, has been widely used in the study of chronic disease stress and coping in recent years, which refers to the feeling and belief that individuals effectively control and cope with stressful events, which has a profound impact on people's life and is an important part of positive psychology.[4–6] Scholars believe that sense of personal mastery has a comprehensive impact on an individual's ability to produce expected results (internal factors), rather than fate or

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uncontrollable external factors.[7,8] Individuals with strong personal mastery believe that their own actions are responsible for the management of their disease and are less likely to believe that life events are determined by chance, fate, or other people. Perceived control is widely recognized as a key factor in psychology that promotes effective coping strategies and cultivates adaptive behaviors.[9,10]

In patients with enterostomy, a higher level of sense of control can help patients better cope with the challenges of the disease process, address anxiety or depression, and improve adherence to self-care behaviors.[11] In patients with chronic heart failure, feelings of personal mastery were negatively correlated with fear of exercise.[12] In addition, Wu's research suggests that older adults with high levels of control have a lower risk of declining physical function and adverse outcomes.[13] Light found that a higher sense of personal mastery is associated with better physiological functioning,[14] and that individuals with a higher sense of control have higher levels of oxytocin, a neuropeptide that can reduce blood pressure and cardiovascular responsiveness, reduce the risk of chronic disease, and improve mental health (such as reducing negative effects, depressive symptoms, anxiety and the risk of death).[15–18] Therefore, the sense of control, as a protective psychological resource, plays a positive role in the disease management of patients with chronic heart failure.

Therefore, identifying and coping with the factors affecting the sense of personal mastery can help improve the mental health and quality of life of patients with heart failure. However, compared with the developed countries, the research on the sense of personal mastery in China started late, and most of these studies have primarily focused on children with epilepsy, kidney transplant patients and older adults, there were no reports on the status and associated factors of the sense of personal among CHF patients have been previously published.[19–21] Understanding the relationship between demographic variables (such as age, gender, coping styles, etc.) in patients with heart failure and their sense of personal mastery is critical to developing targeted interventions and strategies to enhance this attribute of personal sense of control. Therefore, the purpose of this study is to investigate the level of personal mastery of patients with heart failure in a certain area of China and make up for the research gap on the status quo of personal mastery of patients with heart failure in China.

Materials and Methods

Statement of Ethics

The research was conducted in compliance with the ethical guidelines outlined in the Declaration of Helsinki and received approval from the Ethics Committee of Nanjing Drum Tower Hospital (2023–091).

Design and Participates

This study was conducted from August 2023 to March 2024. Participants included in the present secondary data analysis were met those inclusion criteria, as follows: (a) being diagnosed with CHF by physician and medical records; (b) being ≥18 years old; (c) having a New York Heart Association cardiac function classification of II ~ IV;[22] (d) being able to cooperate with the investigation and (e) signing an informed consent form. The exclusion criteria were also specified: (a) being associated with serious diseases, such as malignant tumors; (b) having mental illnesses. The questionnaire was distributed by two nursing graduate students within 3 days after the patient was hospitalized. In the process of data collection, the researcher had direct communication with the patient and gave corresponding explanations with the aim of ensuring the integrity of the data. After the data collection is finished, the collection personnel will organize and verify the data in time. All information was thoroughly double-checked and entered into a computer independently by two investigators. The sample size was calculated according to the requirements of multiple linear regression analysis. G*Power 3.1 software was used to select the medium effect size $f^2 = 0.15$, $\alpha = 0.05$, $1\text{-}\beta = 0.9$. The estimated number of independent variables in this study was 21, and the calculated sample size was 195 cases. Taking into account the unqualified rate of samples,249 people were included according to the actual survey results.

Measures

General Demographic Data

In this study, self-made questionnaire was utilized to collect the socio-demographic data of patients, encompassing variables such as age, gender, educational attainment, and marital status. Additionally, patients who met the inclusion

criteria and provided informed consent were included in the study. The clinical information was sourced from electronic medical records, including the New York Heart Association (NYHA) functional classification and left ventricular ejection fraction (LVEF)%, among other relevant parameters. According to China's education system, we divide education levels into five categories. According to the guidelines, NT-proBNP is divided into three categories: HFrEF, LVEF <40%, HFmrEF, LVEF between 40% and 49% and HFpEF, LVEF≥50%. Left ventricular ejection fractions (LVEF) were derived from echocardiography, which was performed by blinded assessors at the cardiology department of Nanjing Drum Tower Hospital.

The Personal Mastery Scale

The personal mastery was assessed using the Personal Mastery Scale (PMS), a reliable and valid measure of sense of mastery symptoms in individuals with chronic medical conditions, which developed by Pearlin et al,[23] contains seven items to measure individuals' sense of mastery over the outcome of life events. The scale adopts Likert 5-level scoring method, with 1–5 points for "completely inconsistent" to "very consistent". The 5 items are scored in reverse. The higher the score, the stronger the sense of control of individual life. In this study, our Cronbach α is 0.832.

The Simple Coping Style Questionnaire (SCSQ)

The Simplified Coping Style Questionnaire (SCSQ) compiled by Xie Yaning was selected.[4,24] There are 12 positive coping items and 8 negative coping items, using a 0–4 scale scoring method, the higher the score, the more positive coping style. The Cronbach α coefficient of positive coping scale in this study was 0.832, and the Cronbach α coefficient of negative coping scale in our study was 0.852.

Minnesota Living with Heart Failure Quality of Life Questionnaire(MLHFQ)

Quality of life (QOL) was assessed using the Minnesota Heart Failure Patient Living Questionnaire (MLHFQ). The MLHFQ includes 21 entries representing different degrees of impact of heart failure on their quality of life using a 6-point Likert scale, with scores ranging from 0 to 105. A higher score indicates a poorer quality of life. In this study, our Cronbachα was 0.979.

Data Analysis

We use sample examples and percentages (*n, %*) to express disaggregated information such as age, sex, education, marital status, residence, etc. Mean ± standard deviation was used to show coping styles and MLHFQ scores. Differences in individual mastery of each factor among different subgroups were analyzed using univariate analysis, including age, sex, religion, place of residence, number of physicially diagnosed comorbidities, number of newly diagnosed CHF, and number of hospitalizations within a year using Chi-square tests; Kruskal–Wallis *H*-test was used to compare the differences among groups, such as education level, marital status, relationship with caregivers, per capita family income, CHF duration, LVEF, Barthel self-care ability, NYHA functional classification, BMI. Pearson correlation analysis was used to estimate the correlation coefficient between the study variables. We took individual mastery level as the dependent variable, and variables with statistical significance (P<0.05) in the univariate analysis as the independent variable. Then, multiple linear regression analysis is used to explore the factors that affect personal mastery. SPSS 26.0 statistical software was used to analyze the data, and $P<0.05$ was considered statistically significant.

Results

Descriptive Statistics

A total of 255 adults with HF were approached by research assistants and screened for eligibility. Of these, 249 individuals enrolled in the study with mean score of PMS for CHF patients, 20.20±4.45, mean total positive coping style of 19.41±6.76, and mean negative coping style of 9.17±5.50, mean total QOL of 32.69±20.14.

Characteristics of the Participants

Table 1 shows the general data of the participants in this study. Among them, 76.71% were over 60 years old, 61.85% were male, and the rest were female, 99.20% had no religious belief, 85.94% had less than a bachelor's degree, 89.96%

were married, and 58.23% were registered urban residents. 47.39% were spouses of patients with heart failure, 79.12% had a family income of less than 5000, more than half of the patients had 63.86% medical insurance for employees, 58.63% had more than three diseases, 53.41% had less than one year of heart failure, and 68.67% had less than three times of hospitalization due to heart failure within one year. 86.35% patients' self-care ability was close to normal, 54.62% patients' heart function was grade II, 37.35% patients' heart function was grade III, 8.03% patients' heart function was grade IV.

46.99% patients had normal BMI. In addition, Table 1 also shows the differences in physical function and psychological characteristics of patients with CHF, which also includes other general data and disease-related information. Upon conducting univariate analysis, it was discovered that age, sex, education level, residence, relationship with caregiver, household incomes per capita, course of CHF, newly diagnosed CHF, hospitalizations in the past year, Barthel self-care ability, NYHA functional classification were all significantly associated with CHF (P<0.05).

Table 1 General Data and Univariate Analysis of Patients with CHF (N=249)

Variable	Number(%)	Total Score	*p*-values
Age group			<0.001*
<60	58(23.29%)	21.93±0.611	
≥60	191(76.71%)	19.68±0.308	
Sex			0.031*
Male	154(61.85%)	20.59±0.352	
Female	95(38.15%)	19.57±0.463	
Religion			0.569*
Have no religious belief	247(99.20%)	20.19±0.284	
Have religious belief	2(0.80%)	22.00±2.000	
Education level			<0.001**
Illiteracy	76(30.52%)	19.17±0.502	
Primary	77(30.92%)	20.36±0.422	
Middle	61(24.50%)	19.98±0.621	
College	33(13.25%)	22.42±0.835	
Graduate	2(0.80%)	23.00±3.000	
Marital status			0.465**
Married	224(89.96%)	20.30±0.291	
Unmarried	7(2.81%)	20.14±2.668	
Widowed	15(6.02%)	18.60±1.241	
Divorced	3(1.20%)	21.00±0.577	
Residence			0.024*
Village	104(41.77%)	19.46±0.443	
City	145(58.23%)	20.73±0.360	

(*Continued*)

Table 1 (Continued).

Variable	Number(%)	Total Score	*p*-values
Relationship with caregiver			<0.001**
Spouse	118(47.39%)	20.67±0.403	
Offspring	86(34.54%)	19.60±0.436	
Relative	25(10.04%)	17.96±0.960	
Others	20(10.04%)	22.80±1.033	
Household incomes per capita			0.047**
<1000(CNY)	38(15.26%)	19.16±0.799	
1000~3000(CNY)	61(24.50%)	19.28±0.573	
3000~5000(CNY)	98(39.36%)	20.84±0.406	
>5000(CNY)	52(20.88%)	20.85±0.641	
Health insurance			0.211**
Urban health care	63.86%)	20.41±0.358	
Rural medical security	71(28.51%)	19.32±0.540	
Self-paying	18(7.23%)	21.78±0.664	
Others	1(0.40%)	21	
Number of physician-diagnosed comorbidities			0.37*
>3	146(58.63%)	20.13±0.394	
≤3	103(41.37%)	20.30±0.393	
Course of CHF			0.039**
<1year	133(53.41%)	18.16±0.312	
1~5 year	57(22.89%)	20.12±0.526	
5~10 year	39(15.66%)	18.56±0.817	
>10 year	20(8.03%)	20.35±0.674	
Newly diagnosed CHF	140(56.22%)	20.86±0.337	0.043*
Yes	140(56.22%)	20.86±0.337	
No	109(43.78%)	19.36±0.466	
Hospitalizations in the past year			0.035*
>3	78(31.33%)	20.74±0.573	
≤3	171(68.67%)	19.95±0.316	
LVEF			0.513**
HFrEF	62(24.90%)	20.46±0.322	
HFmrEF	100(40.16%)	20.12±0.016	
HFpEF	87(34.94%)	19.71±0.539	

(*Continued*)

Table 1 (Continued).

Variable	Number(%)	Total Score	*p*-values
Barthel self-care ability			0.004**
No	85(34.14%)	21.18±0.455	
Low level	130(52.21%)	20.20±0.368	
Medium level	29(11.65%)	17.55±0.995	
High level	5(2.01%)	19.00±1.703	
NYHA			<0.001**
II	136(54.62%)	21.93±0.246	
III	93(37.35%)	20.10±0.290	
IV	20(8.03%)	8.90±0.538	
BMI			0.995**
Normal	117(46.99%)	20.10±0.449	
Overweight	89(35.74%)	20.51±0.387	
Obesity	30(12.05%)	20.03±0.849	
Thin	11(4.42%)	19.00±1.716	
Remain in bed	2(0.80%)	21.50±2.500	

Notes: *presents chi-square test; ** presents Kruskal–Wallis Test.
Abbreviations: CNY, China Yuan; CHF, chronic heart failure; LVEF, left ventricular ejection fraction; HFrEF, heart failure with reduced ejection fraction; HFmrEF, heart failure with mid-range ejection fraction; HFpEF, heart failure with preserved ejection fraction; NYHA, New York Heart Association; BMI, body mass index.

Correlations of Personal Mastery, Coping Style and MLHFQ in CHF Patients

The results of the Correlation analyses are presented in Table 2. CHF patients with positive coping styles scored higher on their personal mastery (r=0.423, P<0.001)and patients with negative coping styles had a lower personal mastery (r=−0.507, P<0.001). The worse the quality of life was associated with lower personal mastery (r=−0.772, P<0.001).

Related Factors of Personal Mastery in CHF

The multivariate linear regression results indicate that age (*OR*=0.036, 95% CI=0.231–0.385), NYHA (*OR*=0.019, 95% CI=0.002–0.142), active coping style (*OR*=0.191, 95% CI=0.084–0.438), and QQL (*OR*=0.138, 95% CI=−0.170–0.136) were all independent factors of CHF (P<0.05). That is that age, NYHA, active coping style, and QQL could affect the level of control in CHF patients, and these variables explained 84.3% of the total variation. Table 3 displays the specific outcome.

Table 2 Correlation Analyses

		Score of positive coping style	Score of negative coping style	Score of QOL
Score of personal mastery	Pearson correlation	0.423**	−0.507**	−0.772**
	P-value	<0.001	<0.001	<0.001

Notes: *P*-values <0.05 were considered significant. **, at level 0.01 (two-tailed), the correlation was significant.
Abbreviation: QOL, quality of life.

Table 3 Multivariate Linear Regression of Personal Mastery

Variable	Unstandardized Coefficients		Standardization Coefficients	T	*P*-value	Exp(B)	*95% CI*	
	Beta	S.E.	B				Lower	Upper
Age	−1.627	0.346	−0.083	−2.109	0.036	0.210	0.231	0.385
NYHA functional classification	−1.563	0.341	−0.235	−4.706	<0.001	0.019	0.002	0.142
Score of positive coping style	0.088	0.030	0.133	2.941	0.004	0.191	0.084	0.438
Score of QOL	−0.121	0.010	−0.548	−11.856	<0.001	0.138	−0.170	−0.136

Abbreviations: NYHA, New York Heart Association; QOL, quality of life.

Discussion

The study aimed to examine the current situation and related factors of personal mastery in patients with CHF in China. Our findings revealed the total PMS score of CHF patients was (20.20±4.448), which is in the middle, lower than Zhang's research.[25] It is worth noting that the level of personal mastery of patients is not very stable, and the results of relevant longitudinal studies show that the level of personal mastery of patients is dynamic.[26] In the early stage of diagnosis, patients are deeply affected by the disease and have the lowest level of sense of personal mastery. Subsequently, as the sense of personal mastery is usually rebuilt in the process of overcoming difficulties and solving problems, the level will be improved, which will affect the whole life.[27] Research by scholar Arnon Blum points out that the personal mastery of patients can predict their ability to learn and adhere to medical advice/recommendations. Therefore, dynamic observation of patients' sense of personal mastery and timely intervention at the early stage of the disease will be an important research direction to improve the quality of life of patients with heart failure.

The results of this study showed that the level of personal mastery in CHF patients was affected by many factors, such as age, NYHA functional classification, coping style and quality of life. CHF patients aged 60 years or older had lower scores on sense of personal mastery, which is consistent with Moreira's findings.[28] This significant association between sense of control and subjective age has also been demonstrated in earlier studies.[29,30] It may be due to the decline of central nervous system function and cerebral blood flow self-regulation function in elderly patients with heart failure, and heart failure disease is more likely to cause brain blood supply insufficiency and impaired neurotransmitter function, resulting in gradual decline of cognitive and memory function,[31–33] which causes CHF patients can not effectively master the relevant knowledge of heart failure, and are prone to frustration and a low level of control during the long-term treatment of the disease. Therefore, the elderly patients with heart failure need to focus on the health care workers to develop reasonable measures to promote the improvement of patients' sense of personal mastery.

NYHA functional classification is another influence factor of personal mastery in CHF patients, this means that the worse the patient's heart function, the lower the level of personal mastery. Similar to the results of a Korean study.[34] NYHA classification is one of the main ways to evaluate cardiac function in patients with heart disease, which can effectively reflect the severity of the disease in patients with CHF. The poorer the heart function, the poorer the physical activity ability and activity endurance, the lower the degree of disease management and self-care, resulting in a decline in the level of personal mastery. Therefore, medical staff should focus on patients with poor heart function, pay attention to the level of personal mastery of patients, and strengthen education.

We have found that positive coping styles are an influence factor for personal mastery in CHF patients and positive coping styles are positively correlated with feelings of personal mastery. Research finds that the maintenance and growth of personal mastery can provide the cognitive basis related to positive experience by influencing individual thinking patterns,[35,36] and reduces the physical experience of negative emotions, thus directly or indirectly affecting individual coping behaviors,[21,27,37] which is similar to the results of this study. Positive coping means that patients correctly face the stress response brought by the disease, which can help them establish good communication, face difficulties with a positive attitude, help patients recover their social role, establish confidence in fighting the disease, and reduce fear.

Studies have found that the maintenance and growth of personal mastery can directly or indirectly affect an individual's coping behavior by influencing the individual's thought patterns, providing the cognitive basis associated with positive experiences and reducing the physical experience of negative emotions.[27–29,]Therefore, stimulating positive psychological qualities of patients with heart failure and encouraging them to adopt positive coping styles can enhance their level of personal mastery, adapt to the changes brought by the disease, and further improve their quality of life.

The results of our study showed that CHF patients with higher MLHFQ score had lower level of sense of personal mastery, which was similar to the results of Kearney.:[4] quality of life can affect patients' ability to recognize and control disease symptoms, and is a protective factor for sense of personal mastery.[38] Patients with good quality of life suffer less trouble from disease symptoms, less changes in diet, living habits and environment caused by disease, and patients can still adapt to and control life; On the contrary, the control ability is poor. It should be noted in this study that the higher the score of the MLHFQ scale used in this study, the worse the quality of life.

Our study showed that people with heart failure have a moderate level of personal mastery. Positive coping style positively affected patients' personal mastery, while age, NYHA and quality of life score negatively affected patients' personal mastery. This personal mastery can have an impact on their life and the self control ability, which is increasingly relevant due to older retirement ages and should be studied. In clinical work, nurses should pay attention to the factors related to the sense of personal control of patients with heart failure, provide targeted medical care for patients of different ages, pay more attention to patients with poor heart function and poor quality of life, encourage patients to adopt positive coping methods, enhance patients' confidence in disease control, and thus improve their health status. However, this study only analyzed the influencing factors of personal sense of control in patients with heart failure, and did not deeply explore its mechanism, which needs further research in the future.

Limitation

Although this study provides valuable insights, it also has some limitations that need to be considered. First, it was a single-center study using convenience sampling, which can result in an unrepresentative sample. Second, the study was conducted only in a hospital setting, which may limit the applicability of the findings in other settings. Third, the study used a self-reported questionnaire to collect data on the personal sense of control of heart failure patients, which may introduce a degree of social desirability bias, resulting in self-reported bias. Finally, this study is limited by its cross-sectional design, which precludes the establishment of any causal relationship. In future studies, we intend to use more rational sampling methods to enhance the generality and robustness of the results.

Conclusion

In China, chronic heart failure patients' personal mastery was at a moderate level, compared with age, NYHA functional classification, active coping style, and MLHFQ score Related. We suggest that factors such as patient age, cardiac function, and coping style should be considered when constructing clinical interventions to enhance patients' sense of personal mastery. In addition, future studies can carry out multi-center studies and qualitative studies to further explore the influencing factors of personal mastery in patients with heart failure, and provide more evidence for improving the level of personal mastery in patients with heart failure.

Disclosure

The author(s) report no conflicts of interest in this work.

References

1. Jones NR, Roalfe AK, Adoki I, Hobbs F, Taylor CJ. Survival of patients with chronic heart failure in the community: a systematic review and meta-analysis. *Eur J Heart Fail*. 2019;21:1306–1325. doi:10.1016/j.msard.2019.101481
2. The Writing Committee of the Report on Cardiovascular Health and Diseases in China. Report on cardiovascular health and diseases in China 2021: an updated summary. *Chin Circ J*. 2022;35:553–578. doi:10.3969/j.issn.1007-5410.2022.04.001.3
3. McDonagh TA, Metra M, M A, et al. Focused update of the 2021 ESC guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J*. 2023;44:3627–3639.
4. Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav*. 1978;19:2–21. doi:10.2307/2136319

5. O'Kearney EL, Brown CR, Jelinek GA, Neate SL, Weiland TJ. Mastery is associated with greater physical and mental health-related quality of life in two international cohorts of people with multiple sclerosis. *Mult Scler Relat Disord*. 2019;38:101481. doi:10.1016/j.msard.2019.101481
6. Hagger MS. A guide to constructs of control. *Frontiers Media S A*. 2014.
7. Celano CM, Villegas AC, Albanese AM, Gaggin HK, Huffman JC. Depression and anxiety in heart failure: a review. *Harv Rev Psychiatr*. 2018;26:175–184. doi:10.1097/HRP.0000000000000162
8. Patrick M, Miller B, Will B, Bena JF, Morrison SL, Siegmund LA. Anxiety and depression moderate the relationship between quality of life and self-care in patients with heart failure. *Geriatr Nurs*. 2022;44:54–59. doi:10.1016/j.gerinurse.2021.12.020
9. Wook GR, Sook YY, Mona C. Mediating role of coping style on the relationship between job stress and subjective well-being among Korean police officers. *BMC Public Health*. 2020;20(1):470. doi:10.1186/s12889-020-08546-3
10. Shen C, Lin Y-C, Lin H-Y, et al. Effects of declines in personal mastery on self-perceived mobility, physical function, cognitive function, and depressive symptoms: a 6-year follow-up study from the Social Environment and Biomarkers of Aging Study. *Aging Clin Exp Res*. 2023;35 (12):3215–3226. doi:10.1007/s40520-023-02613-6
11. Han X, Li W, Gao JR, et al. Effects of personal control on implementation intention of self care behavior in patients with intestinal stoma. *Nurs J Chin PLA*. 2021;38(11):58–62. doi:10.3969/j.issn.1008-9993.2021.11.015
12. Mao L. Correlation analysis between sense of personal control and fear of exercise in elderly patients with chronic heart failure. *Chin Gen Pract Nurs*. 2020;(28):4013–4015.
13. Wu I-C, Hsiung CA, Chang I-S, et al. Personal mastery, multisystem physiological dysregulation and risk of functional decline in older adults: a prospective study in Taiwan. *Geriatrics Gerontol Int*. 2015;15(6):707–714. doi:10.1111/ggi.12334
14. Light KC, Grewen KM, Amico JA, et al. Deficits in plasma oxytocin responses and increased negative affect, stress, and blood pressure in mothers with cocaine exposure during pregnancy. *Addict Behav*. 2004;29(8):1541–1564. doi:10.1016/j.addbeh.2004.02.062
15. Robinson SA, Lachman ME. Perceived control and aging: a mini-review and directions for future research. *Gerontology*. 2017;63:435–442. doi:10.1159/000468540
16. Cardarelli KM, Vernon SW, Baumler ER, Tortolero S, Low MD. Sense of control and diabetes mellitus among U.S. Adults: a cross-sectional analysis. *Biopsychosoc Med*. 2007;1:19. doi:10.1186/1751-0759-1-19
17. Turiano NA, Chapman BP, Agrigoroaei S, Infurna FJ, Lachman M. Perceived control reduces mortality risk at low, not high, education levels. *Health Psychol*. 2014;33:883–890. doi:10.1037/hea0000022
18. Infurna FJ, Gerstorf D. Linking perceived control, physical activity, and biological health to memory change. *Psychol Aging*. 2013;28:1147–1163. doi:10.1037/a0033327
19. Vrščaj E, Perković BM, Oražem MJ, Bizjak N, Osredkar D. The perceived health of children with epilepsy, sense of control, and support for their families. *Epilepsy Behav*. 2020;112:107454. doi:10.1016/j.yebeh.2020.107454
20. Buster S, Ozsaker E. Locus of control, self-efficacy perception and treatment adherence in kidney transplant patients. *Transpl Immunol*. 2022;75:101723. doi:10.1016/j.trim.2022.101723
21. Hong JH, Lachman ME, Charles ST, et al. The positive influence of sense of control on physical, behavioral, and psychosocial health in older adults: an outcome-wide approach. *Prev Med*. 2021;149:106612. doi:10.1016/j.ypmed.2021.106612
22. Nahler G. *New York Heart Association Classification (NYHA)*. Springer Vienna; 2009.
23. Younger J, Finan P, Zautra A, Davis M, Reich J. Personal mastery predicts pain, stress, fatigue, and blood pressure in adults with rheumatoid arthritis. *Psychol Health*. 2008;23:515–535. doi:10.1080/08870440701596593
24. Rector TS. Patients' self-assessment of their congestive heart failure. Part 2: content, reliability and validity of a new measure, the Minnesota living with heart failure questionnaire. *Heart Failure*. 1987;3.
25. Zhang Y. Study on the level of resourcefulness and its Influencing factors in patients with chronic heart failure. D.Shandong University.2023.
26. Ross CE, Sastry J. *The Sense of pers onal mastery*. Springer US; 1999.
27. Kamoei K, Meschi F. The relationship between perceived stress and coping styles with psychological well-being in cardiac patients. *Int J Med Res Health Sci*. 2016;5:707–711.
28. Zhen Q, Wei C, Rehabilitation DO, Hospital CD, Rehabilitation DO, Hospital XC. Research progress in cognitive impairment in patients with heart failure. *J Clin Pathol Res*. 2018.
29. Bellingtier JA, Neupert SD. Feeling young and in control: daily control beliefs are associated with younger subjective ages. *J Gerontol B Psychol Sci Soc Sci*. 2020;75:e13–e17. doi:10.1093/geronb/gbz015
30. Prasad A, Shellito N, Alan ME, Burr JA. Association of chronic diseases and functional limitations with subjective age: the mediating role of sense of control. *J Gerontol B Psychol Sci Soc Sci*. 2023;78:10–19. doi:10.1093/geronb/gbac121
31. Williams SE, Quinton ML, Veldhuijzen Van Zanten JJCS, et al. Mastery imagery ability is associated with positive anxiety and performance during psychological stress. *Front Psychol*. 2021;12:568580. doi:10.3389/fpsyg.2021.568580
32. Roepke SK, Grant I. Toward a more complete understanding of the effects of personal mastery on cardiometabolic health. *Health Psychol*. 2011;30:615–632. doi:10.1037/a0023480
33. Suzanne BA, Behnam S, De CAJM, Van DMRC, Jacobijn G. High sensitivity cardiac troponin T and cognitive function in the oldest old: the Leiden 85-plus study. *J Alzheimers Dis*. 2017;60:235–242. doi:10.3233/JAD-170171
34. Jang Y, Chiriboga DA, Lee J, Cho S. Determinants of a sense of mastery in Korean American elders: a longitudinal assessment. *Aging Mental Health*. 2009;13:99–105. doi:10.1080/13607860802154531
35. Ward MM. Sense of control and sociodemographic differences in self-reported health in older adults. *Qual Life Res*. 2012;21:1509–1518. doi:10.1007/s11136-011-0068-4
36. Day JR, Miller B, Mott SL, et al. Quality of life outcomes in sarcoma patients receiving care at a tertiary center. *J Clin Oncol*. 2021;39:e23557. doi:10.1200/JCO.2021.39.15_SUPPL.E23557
37. Omran MS, Sadeghpour M, Yaghoubi AA, Shamsi R. A comparison of coping styles and quality of life in patients with coronary heart disease and healthy people. *Majallah-i Danishgah-i 'Ulum-i Pizishki¯-i Babul*. 2017;19:7–14.
38. Msetfi R, O'Sullivan D, Walsh A, Nelson J, Van de Ven P. Using mobile phones to examine and enhance perceptions of control in mildly depressed and nondepressed volunteers: intervention study. *JMIR mHealth uHealth*. 2018;6:e10114. doi:10.2196/10114