

ปัจจัยที่มีอิทธิพลต่อพฤติกรรมการจัดการตนเองในผู้ใหญ่ที่เป็นโรคหลอดเลือดหัวใจหลังการรักษาโดยการขยายหลอดเลือดหัวใจด้วยบอลลูนและใส่ขดลวด

Factors Influencing Self-management Behaviors among Adults with Coronary Heart Disease after Percutaneous Coronary Intervention

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาพฤติกรรมการจัดการตนเองและปัจจัยทำนาย ได้แก่ ความรอบรู้ด้านสุขภาพ การรับรู้ภาระแห่งตน การรับรู้ความสามารถแห่งตน และการสนับสนุนทางสังคมในผู้ป่วยผู้ใหญ่โรคหลอดเลือดหัวใจหลังการรักษาโดยการขยายหลอดเลือดหัวใจด้วยบอลลูนและใส่ขดลวด **วิธีการศึกษา:** งานวิจัยแบบตัดขวางนี้ศึกษาผู้ป่วยผู้ใหญ่โรคหลอดเลือดหัวใจภายหลังได้รับการรักษาโดยการขยายหลอดเลือดหัวใจด้วยบอลลูนและใส่ขดลวดในระยะหนึ่งถึงสามเดือนโดยการสุ่มตัวอย่างอย่างง่ายจำนวน 149 ราย ที่แผนกผู้ป่วยนอกของโรงพยาบาลทั่วไประดับ III เกรด A ในเมืองเวินโจ ประเทศจีน ระหว่างวันที่ 10 กันยายน ถึง 31 ธันวาคม 2566 รวบรวมข้อมูลทั่วไปของกลุ่มตัวอย่าง และประเมินความรอบรู้ด้านสุขภาพ การรับรู้ภาระแห่งตน การรับรู้ความสามารถแห่งตน การสนับสนุนทางสังคมและพฤติกรรมการจัดการตนเอง ทดสอบสหสัมพันธ์เพียร์สันและการวิเคราะห์ถดถอยแบบพหุ **ผลการศึกษา:** กลุ่มตัวอย่างมีคะแนนเฉลี่ยของพฤติกรรมการจัดการตนเอง 64.53 ± 8.69 คะแนนจัดอยู่ในระดับปานกลาง โดยความรอบรู้ด้านสุขภาพ การรับรู้ภาระแห่งตน การรับรู้ความสามารถแห่งตน และการสนับสนุนทางสังคม ร่วมกันอธิบายความแปรปรวนของพฤติกรรมการจัดการตนเองได้ 47.3% (adjusted $R^2 = 0.473$, $F(4,144) = 32.26$, $P\text{-value} < 0.001$) ปัจจัยที่สามารถทำนายได้สูงสุดคือการรับรู้ความสามารถแห่งตน ($\beta = 0.328$, $P\text{-value} < 0.001$) ตามด้วยการสนับสนุนทางสังคม ($\beta = 0.268$, $P\text{-value} < 0.001$) และความรอบรู้ด้านสุขภาพ ($\beta = 0.197$, $P\text{-value} < 0.05$) ส่วนการรับรู้ภาระแห่งตนไม่สามารถทำนายพฤติกรรมการจัดการตนเอง **สรุป:** ความรอบรู้ด้านสุขภาพ การสนับสนุนทางสังคมและการรับรู้ความสามารถของแห่งตน มีอิทธิพลอย่างมีนัยสำคัญทางสถิติต่อพฤติกรรมการจัดการตนเองของผู้ป่วยที่เป็นโรคหลอดเลือดหัวใจ บุคลากรสาธารณสุข รวมทั้งพยาบาลสามารถนำผลการวิจัยไปใช้ในการส่งเสริมพฤติกรรมการจัดการตนเองของผู้ป่วยเหล่านี้

คำสำคัญ: โรคหลอดเลือดหัวใจ; การขยายหลอดเลือดหัวใจด้วยบอลลูนและใส่ขดลวด; ผู้ใหญ่; พฤติกรรมการจัดการตนเอง; การรับรู้แห่งตน; ความรอบรู้ด้านสุขภาพ; การรับรู้ความสามารถแห่งตน; การสนับสนุนทางสังคม

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Abstract

Objective: To explore self-management behaviors and its predictors including health literacy, self-perceived burden, self-efficacy, and social support among adult patients with coronary heart disease (CHD) after percutaneous coronary intervention (PCI). **Methods:** A cross-sectional study was conducted with 149 adult patients with CHD who underwent PCI within one to three months through simple random sampling The data were collected from the patients who visited the outpatient department of a Class III Grade A general hospital in Wenzhou during September 10th to December 31st, 2022. Questionnaires were used to collect demographic characteristics and assess health literacy, self-perceived burden, self-efficacy, social support, and self-management behaviors. Pearson's correlation and multiple linear regression were employed for data analyses. **Results:** Mean score of self-management behaviors was 64.53 ± 8.69 points indicating a moderate level. Health literacy, self-perceived burden, self-efficacy, and social support explained 47.3% of the variance of self-management behaviors (adjusted $R^2 = 0.473$, $F(4,144) = 32.26$, $P\text{-value} < 0.001$). The best predictor was self-efficacy ($\beta = 0.328$, $P\text{-value} < 0.001$), followed by social support ($\beta = 0.268$, $P\text{-value} < 0.001$), and health literacy ($\beta = 0.197$, $P\text{-value} < 0.05$); whereas self-perceived burden was not. **Conclusion:** Health literacy, social support, and self-efficacy exerted significant influence on the self-management behaviors of patients with CHD. The findings of this study could be applied by health personnel including nurses to enhance the self-management behaviors of these patients.

Keywords: coronary heart disease; percutaneous coronary intervention; adults, self-management behaviors; self-perceived burden; health literacy; self-efficacy; social support

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Introduction

Coronary heart disease (CHD) is a prevalent cardiac ailment in clinical practice, primarily resulting from myocardial dysfunction caused by coronary artery stenosis and inadequate blood supply. This necessitates prolonged

pharmacotherapy, impairs patients' quality of life, and consumes substantial medical resources.^{1,2} By 2018, the global prevalence of coronary heart disease reached approximately 110.6 million patients, with a current prevalence

rate in the United States at 6.4%. The male and female prevalence rates are respectively at 7.9% and 5.1%, while it is projected that by the year 2030, the overall prevalence rate will increase to reach up to 18%.³ Cardiovascular disease is the main cause of death worldwide. In 2015, approximately 17.9 million individuals succumbed to cardiovascular disease, with an anticipated rise to 23.6 million by the year 2030. Of these cases, coronary heart disease accounts for roughly 13% of global fatalities.⁴ The reported mortality rate of coronary heart disease in China ranges from 121.59 to 130.14 per 100,000 individuals, with a continuing upward trend.⁵

Percutaneous coronary intervention (PCI) is the primary clinical approach for treating coronary heart disease. Although PCI has achieved an optimal therapeutic effect, inappropriate postoperative nursing care may lead to cardiogenic shock, heart failure and other complications.⁶ This can increase the psychological burden of critically ill patients, cause severe physiological and psychological stress reactions, and reduce their quality of life.⁷ The self-management towards cardiovascular disease by patients is crucial in effectively reducing complications, readmission rates, and adverse cardiovascular events following PCI, while also alleviating the burden on healthcare systems.⁸ Patients with coronary heart disease should strengthen their secondary preventive management after achieving stable condition post-treatment. By enhancing the secondary preventive measures, patients can avoid the influence of risk factors and effectively prevent angina pectoris.⁹ The prognosis following PCI is closely linked to patients' self-management behaviors, and inadequate self-management behaviors may exacerbate the recurrence of cardiovascular adverse events, significantly impacting patients' quality of life and overall prognosis.^{10,11}

Self-management refers to the proactive behaviors of the individuals in monitoring and managing their own illnesses over an extended period of time, with the aim of maintaining life and health, continuously improving their health status, reducing the negative impact of diseases, and achieving a satisfactory quality of life.¹² It is a measure of the results of self-management, and also a low-cost, cost-effective and highly operational disease rehabilitation management model.¹³ The self-management behaviors of patients with coronary heart disease after PCI includes a series of behaviors that patients need to adhere to for a long time, such as more healthy diet, smoking cessation and reduction of alcohol consumption, proper amount of physical activity, weight

control, disease self-monitoring, treatment compliance and emotional management.¹⁴ Relevant domestic research has indicated that the self-management behaviors of patients following PCI are generally suboptimal.^{15,16} WHO recommends that professional healthcare providers guide patients with coronary heart disease to improve their self-management behavior, thereby enhancing health-related indicators and quality of life.¹⁷ Various factors, such as patients' level of health literacy, perceived burden, self-efficacy, and social support were found to have the influence on individual self-management behaviors. Self-management behaviors pertain to an individual's capacity to actively engage in disease management. Patients with higher levels of these behaviors are more conducive to the recovery and better prognosis of their conditions.¹⁸

Studies have identified various factors that can enhance self-management behaviors among patients with coronary heart disease after undergoing PCI. Research indicates a noteworthy affirmative correlation between health literacy and self-management. Health literacy is a reliable predictor of an individual's ability to effectively self-manage their health. Research indicates that health literacy serves as a significant predictor of self-management proficiency ($\beta = 1.05$, 95% CI: 0.50 - 1.63).¹⁹ Patients exhibiting poor self-management behavior were observed to experience higher levels of negative self-perceived burden.²⁰ Self-efficacy plays a pivotal role in the implementation and modification of specific health behaviors. Positive self-efficacy can enhance the self-management capacity of patients with coronary heart disease, thereby ameliorating treatment outcomes and enhancing disease prognosis.²¹ Self-efficacy is the most important independent influencing factor for the self-management behavior of patients with coronary heart disease ($\beta = 0.288$, P-value < 0.001).²¹ Positive and effective social support can have a direct impact on patients' self-management, or an indirect influence by affecting variables such as self-efficacy, highlighting its crucial role in facilitating the practice of self-management behavior ($r = 0.791$, P-value < 0.01; $\beta = 0.325$, P-value < 0.001).²²

In this present study, psycho-social factors were selected based on the theoretical model of individual and family self-management and the reviews of literature. Health literacy, self-perceived burden, self-efficacy, social support, and the outcome were referred to in this study as self-management behaviors. The influencing factors included health literacy and

self-perceived burden which are influenced by individuals and family factors. Health literacy is context-specific, meaning that different environments can impact health literacy levels and lead to changes.²³ Self-perceived burden refers to the psychological response of patients who require care and support from others during treatment, and are concerned about becoming a burden on their caregivers. Self-efficacy pertains to an individual's belief which denotes an individual's subjective evaluation of his or her capabilities and self-assurance. Self-efficacy can influence their behavioral choices and attitudes when faced with challenges. Belief is a distinctive psychological state of human consciousness that aligns with the principles of IFSMT.²⁴ Social support is a key drive of social mobility. It plays a crucial role in facilitating individual advancement and aligns with the principles of social promotion espoused by IFSMT.²⁵ They serve as a measure of self-management.²⁶

Conceptually, based on the Individual and Family Self-Management Theory model and literature reviews, health literacy, self-perceived burden, self-efficacy, and social support are predictive factors for self-management behaviors in patients with coronary heart disease after percutaneous coronary intervention. Self-management behaviors are utilized for the management of chronic conditions and to engage in health promotion activities. Health literacy and self-perceived burden are contextual dimensions that influence self-management behavior, while self-efficacy and social support are process dimensions that impact it (Figure 1).

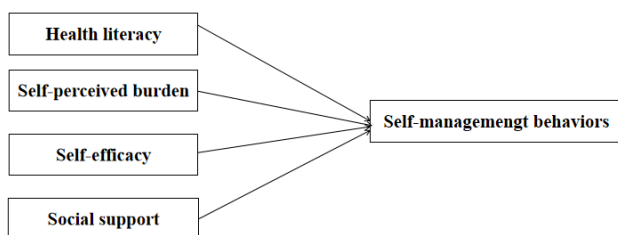


Figure 1 Conceptual framework.

There are few studies on self-management behaviors among patients with coronary heart disease treated after PCI in Wenzhou China. There are no reports on the relationship between health literacy, self-efficacy, self-perceived burden, social support, and self-management behaviors. This study aimed to determine the level of self-management behaviors of

adults with coronary heart disease after percutaneous coronary intervention and how health literacy, self-perceived burden self-efficacy, and social support predicted self-management behaviors. The findings obtained from this study are crucial for enhancing care interventions for this population.

Methods

This predictive correlation research was conducted in the year 2022 from September 10th to December 31st, 2022, at a tertiary teaching hospital in China. This hospital performs more than 2,500 percutaneous coronary interventions per year for patients with coronary heart disease.

The target population in this study included adult patients diagnosed with coronary heart disease who received percutaneous coronary intervention and subsequently underwent follow-up in the cardiology outpatient department of the study hospital. The study sample was drawn from this population with the following inclusion criteria. The participants had to be patients who met the diagnostic criteria for coronary heart disease as proposed by the Guidelines of the Chinese Society of Cardiology underwent successful emergency or elective first stent implantation, be classified as NYHA class I-III, be 18 to 59 years old, and be able to fluently communicate in Chinese through listening, speaking, and writing. We excluded patients with specific characteristics including those having damage to vital organ function or co-occurrence with other serious chronic conditions (e.g., malignant tumors, severe liver and kidney dysfunction, etc.), having severe audio-visual impairment, being unable to cooperate with the study protocol, or having serious systemic diseases or mental disorders as diagnosed by the physician/ psychiatrist.

This study enrolled patients with coronary heart disease who underwent PCI and were followed up for 1 to 3 months at the Department of Cardiology. Sample size was calculated using G*Power 3.1 software, assuming 4 predictors, a power of 90%, a type I error of 5%, and an effect size of 0.13 for multiple linear regression. This effect is at a moderate level in nursing research.²⁷ Therefore, the required sample size was 124 participants. To compensate for possible missing data and to increase the generalizability of the results, 20% of the required sample size was added leading to a total of 149 participants for this study.^{27,28}

Research instruments

The instrument was a set of questionnaires. The **first part** collected the participants' demographic data including age, gender, height, weight, marital status, living situation, place of residence, number of children, education level, duration of cigarette and alcohol consumption since first diagnosis, as well as the number of comorbidities.

The **second part** was questions assessing **self-management behaviors** which was defined as any post-PCI activities undertaken by adult CHD patients for the purpose of maintaining and promoting their health including management of diet, treatment, symptoms, and daily activities. We used the Coronary Heart Disease Self-Management Behaviors Scale developed by Lorig (2003) which was translated into Chinese by Wang (2011). It contained 4 dimensions namely diet management, treatment adherence, symptoms management, and daily activities management. The response was a Likert-type rating scale ranging from 1 to 5 points. With a total score of 21 to 105 points, the greater the score, the more effective the individual's self-management behaviors. The score index was utilized as a metric for analysis, calculated by dividing the actual score of the scale by its maximum possible value and multiplying by 100%. The score index for self-management behaviors have been categorized into three levels specifically low (60% or less), moderate (61% to 80%), and high (more than 80%).²⁹ In this study, the scale had a good internal consistency reliability (Cronbach's alpha coefficient of 0.906).

The **third part** assessed general **self-efficacy** which was defined as the belief held by adults with CHD after PCI in their ability to attain specific behavioral objectives, encompassing an overall confidence in one's capacity to navigate diverse environments and confront novel situations that may impact an individual's behavior, cognition, and emotional responses. The General Self-efficacy scale which was developed by Schwarzer et al (1995) and translated into Chinese by Wang et al (2001) was used. The Chinese version of general Self-efficacy Scale consists of 10 items. The response was a 4-point rating scale ranging from 1-completely incorrect, to 2-somewhat correct, 3-most correct, and 4-completely correct.³⁰ With a total score of 10 – 40 points, the higher scores indicated more perceived self-efficacy. Internal consistency reliability was good (Cronbach's alpha coefficient of 0.921).

The fourth part evaluated perceived social support which was defined as the perceived assistance or aid received by

adult patients with CHD after undergoing PCI from their family, friends, and significant others. The multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet in 1987 and translated into Chinese and revised by Jiang (2001) was used in this study. The MSPSS can assess the overall level of social support that individuals perceive. This scale has 12 items with three dimensions of support from family, support from friends and support from significant others, with 4 items each.³¹ The higher the score, the higher the degree of individual social support. Internal consistency reliability in this study was good (Cronbach's alpha coefficient of 0.926).

The **fifth part** assessed health literacy which was defined as the ability of adults with CHD after PCI to obtain, comprehend, and utilize health information and services to make informed decisions that promote their own health. This study used the health literacy scale for patients with chronic conditions developed by Jordan and revised by Sun (2013). The scale comprises 24 items, encompassing four dimensions namely information acquisition (9 items), interaction (9 items), willingness to improve health (4 items), and willingness to provide economic support (2 items). The response was 5-point Likert-type rating scale ranging from 1 to 5 points. With a total score of 24 – 120 points, higher scores indicated a higher level of the patients' health literacy. Adequate health literacy was based on a cut-off of 96 points or higher (80% correct).³² Internal consistency reliability in this study was good (Cronbach's alpha coefficient of 0.918).

The **sixth part** evaluated **self-perceived burden** which was defined as the perception of burden experienced by adult patients with CHD after undergoing PCI arising from disease management and dependence on caregivers. Self-Perceived Burden Scale (SPBS) was compiled by Cousineau (2003) and translated into Chinese by Wu (2010). The scale consists of 10 items with three aspects namely physical burden, emotional burden, and financial burden. The response was a 5-point rating scale ranging from 1 to 5 points. With a total score of 10 to 50 points, the higher the overall score, the greater the patient's self-perception burden. Levels of self-perceived burden were no, mild, moderate, and severe (< 20, 20 – 29, 30 – 39, and 40 – 50 points).³³ Internal consistency reliability in this study was good (Cronbach's alpha coefficient of 0.880).

Ethical protection for participants

The study was approved by the Institutional Review Board of Burapha University (approval number: G-HS051/2565) and the study hospital (approval number: 2022-K-77-02). Participants were informed of their human subject protection and they had the right to withdraw from the study at any times. Participants were asked to sign informed consent forms prior to this study participation.

Data collection procedure

The present study utilized a random sampling method to recruit 149 adult patients with CHD who came for follow-up at the cardiology outpatient of the study hospital. During outpatient visits, patients were evaluated based on the inclusion criteria. If met, they were asked to sign written informed consent. Participants completed questionnaires in a quiet private room during their free time during their visit at the cardiology clinic. The data collection process lasted about 20 to 30 minutes. Approximately, 5 to 10 participants were recruited on a daily basis until the desired sample size was achieved.

Data analysis

Descriptive statistics including frequency with percentage and mean with standard deviation were used to summarize demographic characteristics and study variables. The enter method of multiple regression analysis was employed to investigate the influence of health literacy, self-perceived burden, self-efficacy, and social support on self-management behaviors among the participants. The assumption testing of multiple regression was performed. Statistical significance was set at a type I error of 5% (i.e., P-value < 0.05). All statistical analyses were performed using the SPSS software program.

Results

Of the 149 participants, the majority of them were male (77.9%), within the age range of 40 - 49 years old (55.7%), overweight (47%), living in urban areas (80.5%) and with their spouse (62.4%), and with secondary education (47.0%) (Table 1).

In this study, the overall self-management behaviour was at a moderate level (mean = 64.53 ± 8.69 points) of which most of the participants were at a moderate level (72.5%) followed by low level (26.8%). Most dimensions were at a

moderate level, except symptom management which was at a low level (Table 2).

Table 1 Demographic characteristics (N = 149).

Characteristics	N (%)	
Gender		
Male	116	77.9
Female	33	22.1
Age (years old) Min = 23, Max = 59, Mean= 45.12, SD= 7.16		
Less than 29	5	3.4
30 - 39	24	16.1
40 - 49	83	55.7
50 - 59	37	24.8
BMI Min = 17.78, Max = 34.96, Mean= 24.69, SD= 3.17		
< 18.49	6	4.0
18.5 - 23.9	54	36.2
24 - 27.9	70	47.0
≥ 28	19	12.8
Residence		
City	120	80.5
Village	29	19.5
Living Status		
Spouse	93	62.4
Children/parents/grandchildren	43	28.9
Alone/others	13	8.7
Educational level		
Illiterate	3	2
Primary school	7	4.7
Secondary school	70	47.0
Vocational Certificate/High Vocational Certificate	53	35.6
Bachelor's degree	16	10.7
Marital Status		
Have spouse	126	84.6
Have no spouse	23	15.4
Number of children		
One	34	22.8
Two	76	51.0
Three	28	18.8
Four or more children	11	7.4
Average monthly household income (¥)		
The average salary of Chinese people in 2022 is 4,810.58¥ per month		
< 2000	16	10.7
2001 - 4000	76	51.0
4001 - 5000	47	31.5
> 5000	10	6.7
Occupation		
Civil servant	15	10.1
Professional technicians	50	33.6
Workers or staff	37	24.8
Farmer/other	47	31.5
Insurance		
Medical insurance for employees	54	36.2
Medical insurance for urban residents	83	55.7
Self-paying/others	12	8.1
Smoking		
No	96	64.4
Yes	53	35.6
Alcohol drinking		
No	111	74.5
Yes	38	25.5
Duration since first diagnosis (years)		
< 1	30	20.1
1 - 5	72	48.3
> 5	47	31.5
Others comorbidity		
No	31	20.8
At least one chronic disease	118	79.2
Number of stents implanted		
One	50	33.6
Two	77	51.7
≥ Three	22	14.8
Family history of CHD		
Yes	13	8.7
No	136	91.3

Table 2 Level of self- management behaviour (N =149).

Self-management behavior	Possible range	Actual range	Mean	S.D.	Level
Dimensions					
Diet management	5 - 25	6 - 25	15.75	3.95	Moderate
Treatment adherence	4 - 20	6 - 20	13.54	3.33	Moderate
Symptoms management	6 - 30	9 - 26	16.52	3.66	Low
Daily activities management	6 - 30	9 - 29	18.72	3.56	Moderate
Total	21 - 105	44 - 84	64.53	8.69	Moderate
Levels of self-management behavior					
	Criteria	n	%		
Low level	≤ 63	40	26.8		
Moderate level	64 - 83	108	72.5		
High level	≥ 84	1	0.7		

This study investigated four factors associated with self-management behaviors including self-efficacy, health literacy, social support, and self-perceived burden. The findings indicated that the mean score for self-efficacy was 27.56 (SD=4.26), while the mean score for health literacy was 63.65 (SD=7.49). Additionally, social support received a mean score of 65.17 (SD=6.50) and self-perceived burden had a mean score of 31.45 (SD=4.04) (Table 3).

Table 3 Level of factors related to self-management behaviours (N = 149).

Variables	Possible range	Actual range	Mean	S.D.
Health literacy	24 - 120	49-79	63.65	7.49
Self-perceived burden	10 - 50	23-41	31.45	4.04
Self-efficacy	10 - 40	16-38	27.56	4.26
Social support	12 - 84	49-80	65.17	6.50

Self-management behaviours were correlated positively with self-efficacy, health literacy, and social support with statistical significance ($r = 0.564, 0.514, \text{ and } 0.511$, respectively, $P\text{-value} < 0.01$ for all), and negatively with ($r = -0.436, P\text{-value} < 0.01$) (Table 4).

Table 4 Correlation^s between study variables (N = 149).

Variables	1	2	3	4	5
1. Health literacy	1				
2. Self-perceived burden	-0.507*	1			
3. Self-efficacy	0.471*	-0.370*	1		
4. Social support	0.390*	-0.378*	0.376*	1	
5. Self-management behaviors	0.514*	-0.436*	0.564*	0.511*	1

^s Pearson's product moment correlation coefficient.

* $P\text{-value} < 0.01$.

All four predictive factors together explained 47.3% of the variance of self-management behaviors with statistical significance ($F_{4,144} = 32.26, \text{ adjusted } R^2 = 0.473, P\text{-value} < 0.001$). The most predictive factor was self-efficacy ($\beta = 0.328$,

$P\text{-value} < 0.001$), followed by social support ($\beta = 0.268, P\text{-value} < 0.001$), and health literacy ($\beta = 0.197, P\text{-value} < 0.05$); while self-perceived burden was not a predictor (Table 5).

Table 5 The influence of factors predicting self-management behaviors (N = 149).

Predicting factors	B	SE	β	t	P-value
Health literacy	0.228	0.088	0.197	2.589	0.011
Self-perceived burden	-0.243	0.156	-0.113	-1.555	0.122
Self-efficacy	0.671	0.145	0.328	4.616	< 0.001
Social support	0.358	0.092	0.268	3.883	< 0.001

F (4,144) = 32.26, P-value < .001. R = 0.69, R² = 0.47, R² adjusted = 0.473.

Discussion and Conclusion

This study aimed to investigate the self-management behaviors after percutaneous coronary intervention (PCI) in Chinese adults with coronary heart disease, and its influencing factors. Health literacy, self-efficacy, and social support were shown to significantly impact self-management behaviors of patients with coronary heart disease after PCI. The score of self-management behaviors of adult patients in the study population was 64.53 ± 8.69 points and the score index was 61.46% of 150 points, which belonged to the lower middle level.

The findings are consistent with those reported domestically and internationally. It is consistent with the study conducted by Ding et al (2021).³⁴ The low educational background of the patients may result in a lack of understanding regarding the importance of self-management behaviors. This study indicated that 72.5% of patients exhibit moderate levels of self-management behaviors, while 26.8% demonstrated low levels.³⁵ The results obtained from this study is consistent with Ye's findings on the baseline level of overall coronary heart disease patients indicating that adult patients with coronary heart disease exhibited inferior self-management ability compared to other individuals.³⁶ In the study conducted by Wu, patients with coronary heart disease aged under 60 exhibited a lower baseline level of self-management compared to their older counterparts.³⁷ In addition, Wang et al conducted a study on 359 patients who underwent PCI and discovered that the self-management behaviors of patients after coronary artery stent implantation was rated at a lower middle level, which is far from reaching the ideal state.³⁸

The findings of this study provide empirical support for the research hypothesis that self-efficacy exerts a significant positive influence on self-management behaviors ($\beta = 0.328$, P -value < 0.001), and serves as one of the predictors of such behaviors. The self-efficacy of the population in this study is moderately low, which falls short of the optimal level and is inferior to the findings reported by Zhang et al (2018).³⁹ The correlation may be directly linked to whether adult patients undergo percutaneous coronary intervention (PCI) surgery, which is an invasive cardiac intervention procedure. PCI surgery is an invasive cardiac intervention procedure. Postoperatively, adult patients with coronary heart disease generally exhibit low self-efficacy and lack knowledge of managing medication and daily life, which may compromise their postoperative efficacy. This is consistent with Liu's findings which suggest that patients with a strong sense of self-efficacy exhibit better self-management behaviors; moreover, the level of self-management behavior increases in proportion to the degree of perceived self-efficacy.⁴⁰ This implies that during the process of disease treatment and education, medical personnel should focus on enhancing patients' confidence in managing their illness, instructing them how to effectively cope with health issues arising from the disease, and promoting adult patients' self-efficacy after PCI to facilitate their reintegration into society.

Social support emerged as a significant predictor of self-management behaviors ($\beta = 0.268$, P -value < 0.001). The CHD patients in this study demonstrated a moderate level of social support comprehension, surpassing that of the CHD patient group studied by Shang et al (60.11 ± 13.97), yet falling short of the breast cancer patient group studied by Pan (91.97 ± 13.82).⁴¹ The findings indicated that patients with coronary heart disease may exhibit a greater propensity to seek financial and spiritual support from their spouses and parents during times of illness. This outcome is consistent with Dao's research which demonstrated that increased social support can enhance patients' self-management capabilities.⁴² Therefore, it is imperative to acknowledge the pivotal role of social support in self-management behaviors after PCI. Furthermore, health education programs for patients should emphasize the significance of social support and encourage patients and their families to seek out such resources, thereby facilitating a speedy return to society.

Health literacy was also statistically significant predictor of the self-management behavior ($\beta = 0.197$, P -value < 0.05).

The health literacy score of patients with coronary heart disease in this study is suboptimal, and inferior to that of hypertensive patients. Specifically, their ability to access information and willingness to provide financial support were relatively deficient.⁴³ Research indicates that health literacy is a reliable predictor of self-management proficiency. Health literacy not only impacts individual health status, but also has a significant impact on public health.⁴⁴ A longitudinal study conducted abroad demonstrated that higher levels of health literacy can significantly reduce the incidence of adverse outcomes related to heart disease and decrease mortality rates associated with heart failure.⁴⁵ In addition, Liu's research has noted that the relationship between health literacy and disease outcome is not a straightforward linear correlation.⁴⁶ In conclusion, social support is one of the psychological factors that exert an impact on self-management behaviors. In recent years, scholars in the field have come to believe that enhancing patients' health literacy is conducive to improving their ability to manage their own health and has significant value for enhancing disease prognosis and quality of life. Xie et al (2020) discovered that inadequate health literacy resulted in low levels of self-management behaviors due to difficulties in acquiring and comprehending disease and health knowledge, which increased the risk of chronic diseases such as coronary heart disease or had a negative impact on the illness.⁴⁷

The self-perceived burden factor did not demonstrate a significant effect on self-management behaviors in this study despite the significant correlation between this factor and self-management behaviors ($r = -0.436$, P -value < 0.01). In this study, the self-perceived burden (SPB) score of adult patients who underwent coronary heart disease stent implantation was 31.45 ± 4.04 points, indicating a moderate level of burden. A significant negative correlation was observed between self-management behaviors and self-perceived burden suggesting that lower levels of self-management behavior were associated with higher levels of perceived burden among patients. These results are consistent with those reported by Li et al.²⁰ Effective self-management can enhance patients' self-care abilities, reduce their reliance on others, promote independence, and facilitate the achievement of physical balance and optimal health outcomes.⁴⁸ Additionally, they explored the relationship between perfectionism, self-management, and coping styles. In China, self-perceived burden is primarily influenced by general demographic and

disease-related factors, with relatively limited research on psychological factors.⁴⁹

The findings of this study indicated a suboptimal level of self-management behavior among hospitalized patients with coronary heart disease highlighting the urgent need for improvement. It is evident that medical professionals should enhance health education interventions specifically tailored to these patients including developing and implementing personalized exercise programs. We posit that the low score of patients' self-behavior management ability can be attributed to the following factors. The less invasive and prompt effects of PCI may inadvertently create a misconception among patients that their ailment has been completely cured, thereby undermining the significance of self-behavior management. Some patients, influenced by traditional notions of "medical refusal" or constrained by economic pressures and other factors, exhibit insufficient awareness regarding their condition and its prognosis. This finding provides information for strengthening the role of perceived self-efficacy, perceived social support and perceived health literacy in determining the self-management behaviors of adult patients with coronary heart disease after PCI. The results also emphasize that the score of symptom management sub-dimensions of self-management behavior is low. Therefore, it is suggested that nurses should develop appropriate intervention programs to improve patients' healthy lifestyle. Interventions should be formulated by changing the above variables, which would help improve the practice of self-management behaviors among these patients. Nurses in general and in adult nursing, could use these results to design effective interventions by taking into account of these significant predictors. In addition, one of the possible ways for nurses to provide more robust interventions and promoting patients' quality of life is through an in-depth understanding of the misunderstandings of patients with coronary heart disease might have, modify patients' unhealthy lifestyles and behaviors, and promote more social support, along with build their confidence to overcome the barriers in performing health promoting behaviors. This study's results are not only beneficial to the patients, and nursing practice but also in nursing education.

This study had certain limitations. One is the use of a cross-sectional design. Self-management behavior of patients with coronary heart disease after PCI changes over time, so data collected from longitudinal study is better suited to fully describe the nature of such change. Another limitation is the

settings for data collection. The study was conducted at only one hospital. Although the hospital is acknowledged as Class III, Grade A provincial hospital in Wenzhou, it may limit the generalization of the findings.

In conclusion, adult patients with coronary heart disease after PCI who reported inadequate health literacy, self-efficacy, and social support deserved more attentions. Development and render comprehensive interventions aimed at promoting self-management behaviors are recommended by taking into account these significant predictors. Given the multifaceted nature of self-management behavior among after PCI coronary heart disease patients, dynamic assessment and individualized interventions are essential for clinical practice.

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