

Mediating role of self-efficacy in the relationship between family functioning and self-management behaviors in patients with coronary heart disease: A cross-sectional study in Jiangsu, China



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Abstract

Background: Self-management behaviors can prevent the negative consequences among patients with coronary heart disease (CHD). The reality of patients followed the self-management behaviors rate are unoptimistic.

Objective: This study aimed to examine whether self-efficacy serves as a mediating role between family functioning and self-management behaviors among coronary heart disease patients.

Methods: A cross-sectional approach was applied, and 140 patients with CHD were included using a cluster sampling strategy. Family functioning was assessed utilizing the Family APGAR Index, self-efficacy was evaluated using the Self-efficacy for Chronic Disease 6-item Scale, and self-management behaviors was examined utilizing the Coronary Artery Disease Self-Management Scale. Data were collected from July to October 2022 and analyzed using descriptive statistics and regression analyses to evaluate the mediating influence.

Results: The degree of self-management behaviors among patients with CHD was at a low level (Mean = 82.23, SD = 11.863). Self-efficacy had a direct and positive impact on self-management behaviors ($\beta = 0.39$, $p < 0.001$). Moreover, self-efficacy had a partially intermediary function in the relationship between family functioning and self-management behaviors (indirect effect = 0.14, 95% CI [0.04, 0.27]; direct effect = 0.39, $p < 0.001$).

Conclusion: Self-efficacy demonstrated an association with self-management behaviors and served as a mediation function in the relationship between self-management behaviors and family functioning. Therefore, the significance of family functioning and self-efficacy should be highlighted in nursing practice when developing methods to encourage patients with CHD to improve their self-management behaviors.

Keywords

China; coronary artery disease; family; self-efficacy; self-management

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Background

Coronary heart disease (CHD), additionally named as ischemic heart disease, is a significant global health burden that is increasing in terms of its high rates of morbidity and mortality. It has implications for individuals, families, society, and healthcare systems. CHD is the primary reason for cardiovascular mortality in both developed and developing countries (WHO, 2024), and its mortality has risen from 7.2 million in 2012 to 8.9 million in 2019 (WHO, 2021). Over 11.39 million people in China have been affected by CHD, which is still one of the principal reasons for fatalities in this country.

Because of improvements in the therapy and control of CHD, a growing number of individuals are living with CHD. As a result, efficient and easily accessible healthcare services are

now crucial for the management of CHD. The development process of CHD is correlated with multiple risk factors, including low levels of high-density lipoprotein cholesterol, high levels of low-density lipoprotein cholesterol, tobacco use, a family history of the condition, hypertension, diabetes mellitus, postmenopausal status in women, and age over 45 in men. Moreover, obesity can potentially be a risk factor that contributes to CHD (American Heart Association [AHA], 2016). World Health Organization data shows that risk factor adjustment and good self-care practices can prevent nearly 80% of cardiac incidents (WHO, 2021).

"The individual's capacity to effectively manage the symptoms, treatments, physical and psychosocial consequences, as well as the lifestyle changes built-in living with a chronic condition" is the definition of self-management

(Barlow et al., 2009). For patients with CHD, self-management encompasses a range of behaviors that need to be adaptable to physical and psychological changes, and improved behaviors about secondary prevention must be considered, such as adherence to medications, respecting prescriptions, and maintaining a healthy lifestyle (Dorje et al., 2018). Even though self-management can improve patient health outcomes and prevent cardiac events, numerous investigations have stated that the self-management behaviors of individuals with CHD show a lack of optimism; it is at a lower or intermediate level (Zhu et al., 2023).

Effective self-management requires the availability of various supportive resources, especially families. A more in-depth comprehension of self-management (SM) is critical as managing one's health shifts from healthcare providers to individuals and families (Bauer et al., 2023). According to Ryan and Sawin (2009), SM is a complex phenomenon in which people manage chronic diseases and promote health using dyads, families, and individuals' behaviors across all developmental phases. The family is the cornerstone of society, providing necessary spiritual and emotional support in addition to practical support (Yuan et al., 2021). When a family is understood as a coherent unit, family functioning includes all of the physical, emotional, and psychological interactions between family members. The dynamic has a significant impact on a multitude of diverse aspects of family life. According to a previous study, patients with healthy families can considerably lessen the adverse effects of illness stress and other challenges on all family members (Song et al., 2019). The findings of Bennich et al. (2017) emphasized the significance of family participation in enhancing target patients' persistence to self-management practices and found that family functioning is correlated with self-management positively. In addition, a prior investigation has demonstrated that family functioning significantly influences patients who suffer from chronic illnesses (Yuan et al., 2021).

Self-efficacy is a person's conviction in their capabilities to plan and conduct particular tasks (Almeida et al., 2022). Self-efficacy is the principal predictor of self-management behaviors in patients with CHD. When self-efficacy levels were depressed, patients with CHD were found to exhibit diminished quality of life, insufficient self-care, and a decline in health status (Nuraeni et al., 2023). It was suggested that those with poor health habits are more likely than people with relatively high self-efficacy to experience decreased cardiac self-efficacy (Shrestha et al., 2020).

The prior research has demonstrated that family functioning is independently linked to self-efficacy and self-management. As is widely acknowledged, self-efficacy has been identified as a pivotal factor affecting how successfully CHD patients manage their condition on their own. The combined effect of these variables on self-management behaviors remains to be studied. Hence, for the purpose of filling in gaps in prior research in this field, whether self-efficacy has a major influence on the psychological mechanisms that underlie the connection between family functioning and self-management in CHD patients was explored.

By examining the interactions among these variables, nurses can gain valuable perspectives on the roles of family functioning and self-efficacy in promoting patient self-

management behaviors. These findings are essential as they can inform nurses in developing targeted nursing interventions to promote positive health consequences and encourage self-management behaviors in individuals with CHD.

Our study examined the associations between family functioning, self-efficacy, and self-management behaviors in Chinese CHD patients. It was designed using the Individual and Family Self-management Theory (IFSMT) and research evidence as a conceptual framework. Additionally, our study sought to ascertain if self-efficacy intermediates the relationship between family functioning and self-management behaviors among CHD patients.

Conceptual Framework

This study complied with the principles expounded in the IFSMT (Ryan & Sawin, 2009), which conceptualized self-management as a dynamic progression wherein patients need to apply knowledge, beliefs, and social facilitation to achieve self-management goals. According to this framework, self-management can be viewed as an event founded on the individual and/or family condition integrated with factors that either promote or impede self-management behaviors. When formulating self-management plans, the detailed situation of CHD patients must be initially evaluated, encompassing the condition-specific factors, the physical and societal surroundings of the patient, and the personal and family aspects involved. In this study, family functioning is regarded as an individual and family factor, whereas self-efficacy is viewed as a knowledge and beliefs factor. The conceptual framework proposed for this research is shown in Figure 1.

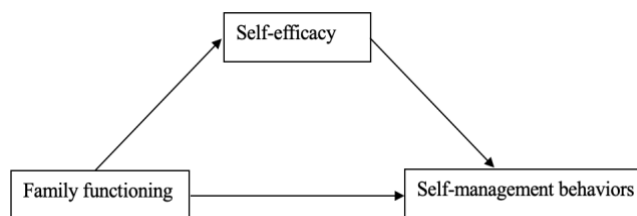


Figure 1 Conceptual framework of family functioning and self-efficacy on self-management behaviors of patients with CHD

Two hypotheses were proposed in this study. The first hypothesis posits that family functioning has a direct effect on self-management behaviors. The second hypothesis suggests that family functioning indirectly influences self-management behaviors through self-efficacy among patients with CHD.

Methods

Study Design

A descriptive correlational study proved advantageous in investigating the moderating role of self-efficacy in the connection between family functioning and self-management behaviors.

Samples/Participants

In a tertiary general hospital in Yancheng, Jiangsu, China, all patients diagnosed with CHD by cardiologists were recruited for this study using a cluster sampling approach. The Demographic Data Questionnaire, Family APGAR Index, Self-

Efficacy for Chronic Disease 6-item Scale, and Coronary Artery Disease Self-Management Scale were all included in the survey. Information was gathered within the timeframe spanning from July 2022 to October 2022. The criteria for inclusion were enumerated as below: (1) Aged more than 30 years; (2) Able to communicate, read, and write in Chinese; (3) No disabilities that may affect their ability to perform ADL; and (4) No cognitive impairment. Patients were excluded if they had severe complications such as heart failure, renal failure, advanced cancer, or other lung disease.

The dominant variables that affect the scale of a study sample should be effect size, statistical power, α , and β . An acceptable alpha level (α) of 5%, a beta level (β) of 20%, and a statistical power of 95% were determined for this study. This study's sample quantity was evaluated using a G*power (Faul et al., 2009). One hundred eleven individuals were required for the projected sample size after a 0.05 α level, a power of 0.95, and an effect size of 0.3 were established (Chuang et al., 2021). Considering the attrition rate of 20%, the total sample size of participants recruited in this research was 134 individuals.

Instruments

The present study utilized four questionnaires, detailed as follows:

Demographic Record Form. It includes two parts: the general information encompassed age, gender, educational level, marital status, types of insurance, and household income. Disease-related characteristics included cardiac function grading, disease duration, and other chronic illnesses.

Family APGAR Index. The Family APGAR Index is used to quantify family functioning. Smilkstein et al. (1982) authored the original English version, which was converted into Chinese by Lv and Gu (1995). On this scale, adaptability, cooperation, growth, affection, and resolution are the five components. There are three alternative responses for each item: hardly = 0, sometimes = 1, and always = 2. The overall score was between 0 and 10. When the score was higher, it indicated that the experience with family functioning was the most fulfilling. Regarding family dysfunction, a score between 0 and 3 indicates severe dysfunction, between 4 and 6 represents medium dysfunction, and between 7 and 10 stands for effective family functioning. In the research carried out by Kroplewski et al. (2019), the scale exhibited a substantial extent of internal consistency, as displayed by a Cronbach's α value of 0.879.

Self-Efficacy for Chronic Disease 6-item Scale (SECD6). The Center for Patient Education and Research at Stanford University developed the original English version, which measures a person's confidence in their ability to control the symptoms of chronic diseases (Lorig et al., 2001). The six components in the SECD6 are divided into two fields: (a) confidence in controlling symptoms (CCS), comprising four entries concerning self-assurance in averting fatigue, physical discomfort, psychological distress, and other associated symptoms; (b) confidence in maintaining function (CMF), comprising of two items concerning self-assurance in handling medical conditions and mitigating the consequences of illness. The overall mean score falls between 1 (no confidence) and 10 (perfect confidence). The degree of self-efficacy is represented by the average score across all items. The

elevated scores signify a higher degree of self-efficacy. A score of ≥ 7 is considered a high degree of self-efficacy; A score of < 7 is regarded as a low level of self-efficacy. Strong internal consistency of the Chinese form of SECD6 is demonstrated by a Cronbach's α of 0.91 in the previous study (Jiang et al., 2020).

Coronary Artery Disease Self-Management Scale (CSMS). The CSMS was created by Ren et al. (2009). To evaluate self-management behaviors in three different areas, the instrument is equipped with a Likert scale that comprises 27 entries and ranges from 1 (never) to 5 (always). The scale covers: (a) Daily Life Management: eight items cover various areas of lifestyle, such as the management of risky behaviors and the encouragement of a healthy lifestyle; (b) Disease Medical Management: fourteen items examine the capacity to manage their symptoms, such as disease knowledge acquisition, adherence to treatment protocols, and emergency response strategies; (c) Emotional Management: Four items are utilized to evaluate mood, leisure activities, and coping methods. Greater total scores are related to greater levels of self-management behaviors. The score falls within the range of 27 to 135 points. The Chinese edition of the CADSS boasts great intrinsic consistency, as shown by a Cronbach's α of 0.85 (Ren et al., 2009).

The Chinese version of the aforementioned three scales has been previously employed within the Chinese population, demonstrating strong validity and reliability. Permission to utilize the Family APGAR index, SECD6, and CSMS in this study was obtained from the original developers.

Data Collection

The Demographic Record Form, Family APGAR Index, Self-Efficacy for Chronic Disease 6-item Scale, and Coronary Artery Disease Self-Management Scale are among the forms that participants must fill out. Two experienced research assistants, registered nurses with no less than two years of work experience in treating patients with CHD, delivered all of the scales to the participants and then collected the completed forms. When participants had impaired vision or experienced difficulty reading the items, the researcher and study assistants read the items to them and recorded their answers.

During the data-collecting phase, participants were introduced to the researcher and research assistants and informed of the study's objectives, methodology, potential dangers, and advantages. Individuals who chose to participate in this survey signed an informed consent document. Participants were guaranteed that their participation in the trial would not harm the quality of their treatment or their ability to obtain hospital nursing services in the future. At any moment during the trial, participants were free to decline participation.

All data gathered for this research were handled in complete confidence. The researcher would be the only one with access to this data once the participants' names were revealed. To maintain patient confidentiality, code numbers were allocated to the questionnaires filled out by the patients. The reports were given in an aggregated style without mentioning any individual or organizational identities. The information would only be employed to further this research project. Once the research was completed, the data were erased. In a secluded room within the outpatient facility,

patients completed the surveys alone or with researchers' assistance; the process took around ten to fifteen minutes.

Data Analysis

SPSS version 25.0 was employed for data analysis. To accurately define the kinds and prevalence seen, demographic data had to be supplied using frequency and percentage distributions. The average value and standard deviation were applied to display the overall scores for family functioning (FF), self-efficacy (SE), and self-management behaviors (SM). The Pearson correlation coefficient was applied to assess the nature of the connection between FF, SE, and SM. A significance level of $p < 0.05$ was considered to be statistically significant. All multiple regression assumptions, including normal distribution, linearity, outliers, homoscedasticity, and multicollinearity, were met. The testing program was used for regression analysis.

In Equation 1, the regression coefficient between the independent variable (family functioning) and the dependent variable (self-efficacy) was analyzed. In Equation 2, the relationships between the independent variable (family functioning) and the dependent variable (self-management behaviors) were investigated. In Equation 3, the regression analysis treats self-management behaviors as the dependent variable, while self-efficacy and family functioning are considered independent variables.

Ethical Considerations

Before data collection, this study was approved by the Institutional Review Board, Burapha University, Thailand (Approval No. G-HS052/2565) and The Yancheng First People's Hospital's Institutional Review Board of Directors (Approval No. 2022-K-037) in accordance with the Declaration of Helsinki's guiding principles. Participants were informed that there would be no consequences if they refused or withdrew from participation at any point. Before being used, every sample was anonymous.

Results

Demographic and Disease Characteristics

This study included 140 patients with CHD; 77.1% (108 subjects) of the patients were men, and 22.9% (32 subjects) were women. The average age of the participants was 62.76 years (SD = 12.142), with 42 subjects (30%) completing primary school or less. The average duration of the CHD was 3.29 years (SD = 4.291). The mean of the number of stent implants was 1.76 (SD = 0.970).

Furthermore, 32 subjects (22.9%) had an AMI history; most subjects (112 subjects, 80%) had more than two chronic diseases combined with CHD; 20 subjects (28.6%) had a family history of CHD; the mean drug therapy condition for these subjects was 2.69 (SD = 1.638). Other information about the patients' demographics is shown in [Table 1](#).

Table 1 Patients' demographics and medical conditions related to coronary heart disease (N = 140)

Variables	n	%	Minimum	Maximum	Mean	SD
Gender						
Male	108	77.1				
Female	32	22.9				
Educational Level						
Primary School or below	42	30				
Junior High School	38	27.1				
Senior High School	28	20				
College Degree or above	32	22.9				
Marital Status						
Unmarried	2	1.4				
Married	124	88.6				
Widowed/Divorced	14	10				
Age			30	86	62.76	12.142
Number of Stent Implants			1	4	1.76	0.970
Duration of CHD (Years)			1	30	3.29	4.291
Comorbidity	112	80	2	4	2.71	0.674
AMI History						
Yes	32	22.9				
No	108	77.1				
Family History Of CHD						
Have	20	28.6				
None	120	71.4				
Medication			1	8	2.69	1.638

Family Functioning, Self-Efficacy, and Self-Management Behaviors of Patients with CHD

The mean score of family functioning of the patients with CHD was 7.93 (± 2.073), indicating a relatively high level of family functioning among the patients. The mean score of self-efficacy was 6.08 (± 2.096). The mean score of self-management behaviors was 82.23 (± 11.863), showing a low level of self-management practice among the patients with

CHD. The multivariate normality and multicollinearity between variables were tested. The absolute values of skewness (0.615, 0.073, and 0.006) were <3, and the absolute values of kurtosis of the three variables (1.018, 0.24, and 0.665) were <10, indicating multivariate normality. All VIFs (1.161) were <10; thus, multicollinearity was not problematic in this study. The specific descriptive statistics of these variables are shown in [Table 2](#).

Table 2 Scores of family functioning, self-efficacy, and self-management behavior scales among participants (N = 140)

Scales	No. of items	Mean ± SD	Skewness	Kurtosis	VIF
Family Functioning	5	7.93 ± 2.073	-0.615	-1.018	1.161
Self-Efficacy	6	6.08 ± 2.096	-0.073	-0.240	1.161
Self-Management Behaviors	27	82.23 ± 11.863	-0.006	-0.665	

Correlation among Family Functioning, Self-Efficacy, and Self-Management Behaviors

Significant correlations between the subjects' family functioning, self-efficacy, and self-management behaviors were explored through correlation analysis. Family functioning exhibited a positive association with self-management

behaviors ($r = 0.468, p < 0.001$) and self-efficacy ($r = 0.372, p < 0.001$). Meanwhile, self-management behaviors positively correlated ($r = 0.473, p < 0.001$) with self-efficacy. The correlations between family functioning, self-efficacy, and self-management behaviors are revealed in **Table 3**.

Table 3 Correlations between family functioning, self-efficacy, and self-management behaviors (N = 140)

Variables	Family Functioning	Self-Efficacy	Self-Management Behaviors
Family Functioning	1.00		
Self-Efficacy	0.372***	1.00	
Self-Management Behaviors	0.468***	0.473***	1.00

*** $p < 0.001$

To evaluate the influence of self-efficacy on the correlation between family functioning and self-management practices, 2000 samples of the bootstrap sampling technique were utilized to examine the mediating impact while controlling for other pertinent factors. We selected self-efficacy as the mediating factor M, family functioning as variable X, and self-management as variable Y. The statistics are shown in **Table 4** and **Table 5**, together with **Figure 2**.

Based on the findings of the mediation effect test conducted using the distributed regression approach, it was indicated that the family functioning exerted a substantial influence on the self-efficacy of the mediating variable in the course of the initial phase (model 1) ($\beta = 0.46, p < 0.001$). Considering the results of the second model review, there is a substantial correlation between self-management behaviors and family functioning ($p < 0.001, \beta = 0.53$).

Table 4 Regression analysis examining the relationship between self-management and self-efficacy (N = 140)

Independent Variables	Dependent Variables	R ²	Adjusted R ²	F	B	SE	β	t	p-value
Family Functioning	Self-Efficacy	0.22	0.21	37.86	2.69	0.44	0.46	6.15	<0.001
Family Functioning	Self-Management Behaviors	0.28	0.27	52.99	2.86	0.39	0.53	7.28	<0.001
Family Functioning	Self-Management Behaviors	0.35	0.34	36.10	2.12	0.42	0.39	5.00	<0.001
Self-Efficacy	Self-Management Behaviors				0.28	0.07	0.29	3.76	<0.001

Table 5 The bootstrap mediation effect test Results (N = 140)

Effect Relationship	Effect Size	LLCI	ULCI	Utility Percentage
Total Effect	0.53	2.09	3.63	
Direct Effects	0.39	1.29	2.95	74.11%
Indirect Effects	0.14	0.04	0.27	25.89%



Figure 2 The mediation effect model diagram

Note: *** $p < 0.001$

All of the above results indicated the validity of the overall impact. Moreover, self-efficacy ($\beta = 0.29, p < 0.001$) and family functioning ($\beta = 0.39, p < 0.001$) were revealed to substantially affect self-management behaviors in the third phase (model 3) analysis. Consequently, the established model suggests that

self-efficacy has a partly mediating influence. The bootstrap approach used in the testing indicates that self-efficacy is a pivotal mediating factor inside the model. The 95% confidence interval [0.04, 0.27] and the indirect influence value of 0.14 indicate that the indirect impact is statistically significant and highlight the crucial role that self-efficacy plays in this model. Moreover, the statistical significance of the direct effect test is indicated by the fact that 0 is not included in the confidence range. Based on the proportion of causes, self-efficacy explains 25.89% of the variation.

Discussion

This study demonstrated that Chinese patients with CHD had a relatively high level of family functioning while manifesting a low degree of self-management behaviors. The family functioning score in the study sample was higher than that of patients with CHD in Lanzhou, China (Zhang et al., 2022). The observed discrepancies in the results might be explained by the economic and cultural disparity between these two disparate regions within China. The availability of medical resources among cities in addressing and managing health

conditions shows variation. Specifically, the study involving patients from Lanzhou predominantly included individuals who had not completed their education beyond junior high school (67%), with only 12% attaining a college degree or higher, and they concentrated on inpatients (Zhang et al., 2022).

In this research, the majority of outpatients had family functioning that ranged from good (29.9%) to outstanding (53.1%). The impact of traditional Chinese family values is observed in the comparatively high level of FF found among CHD patients. Enhancing family functionality and improving the ability to offer assistance during illness management constitute two advantages of these principles. The FF score of the CHD outpatients in this study is similar to what was found in an older Chinese community-dwelling person with chronic illness (Yuan et al., 2021). The results of the observation of self-management practices among outpatient CHD patients were consistent with those of other investigations on Chinese CHD patients in community settings (Zhang et al., 2019). However, it was higher than that observed in patients following stent implantation at the long-term stage (Zhu et al., 2022). This suggests that self-management behaviors decline over time after discharge from the hospital. In addition, the self-efficacy scores among outpatients with CHD in this study were revealed to exhibit a low degree, indicating a necessity for improvement in the participants' self-efficacy. These findings are consistent with results from previous research (Yuan et al., 2021). Thus, the study's findings suggest that FF, self-efficacy, and self-management behaviors within Chinese patients with CHD need to be improved.

This study's correlation analysis indicated that FF and self-efficacy presented a positive association, which aligns with the results of other investigations, including older people with chronic illnesses (Yuan et al., 2021). Elderly individuals with one or several chronic diseases, for instance, diabetes, hypertension, or other ailments, were incorporated into the prior study. According to a study by Chen et al. (2020), those who have strong family functioning typically perceive getting professional psychiatric assistance more favorably. Thus, a healthy family dynamic can increase the likelihood of effective illness management (Chen et al., 2020). Furthermore, the literature indicates that family functioning significantly influences self-efficacy. It is recommended that nurses assist patients in establishing a structured support system within their families and social circles. In order to encourage family members' participation in the patient's condition care, it is equally essential to give specific attention to spouses and children. Physicians and nurses can supervise and offer complete emotional support to family members while educating them on providing patients with the appropriate care. In order to increase the self-efficacy of patients, prolong the steady phases of their diseases, and speed up their recovery, this involvement is paramount.

Self-efficacy can be regarded as an individual's confidence in their capacity to conduct particular tasks to achieve a desired result (Bandura, 2001). Based on Bandura's social cognitive theory, self-efficacy is a key factor influencing behaviors. The results of this investigation show a strong connection between self-efficacy and self-management behaviors, which is congruent with previous studies. Among patients diagnosed with liver cirrhosis, their self-efficacy was thought to have a connection with health behaviors,

medication adherence, and life quality (Dong et al., 2020). Several cross-sectional research show a correlation between increased self-management behaviors and a greater level of self-efficacy (Liu et al., 2023; Zhang et al., 2023). One possible reason is that if therapy and care are provided over an extended period, higher levels of self-efficacy help cardiac patients become more adaptive to their disease, which in turn improves their psychological health (Banik et al., 2018). In fact, across a range of patient demographics, improved self-efficacy and successful self-management behaviors are connected with optimal medication adherence, pain management techniques, and physical exercise.

This study further demonstrated that FF was directly associated with self-management behaviors, which aligns with the results of related research on patients with hypertension in Tianjin, China (Zhang et al., 2020). Maintaining happy emotions and adopting a healthy lifestyle are made possible by good family functioning (Bennich et al., 2017). According to another study, patients' self-management improves when their unique behavioral talents are combined with a stable and effective family unit (Wensu et al., 2021). Based on Bandura's cognitive theory, self-management might be significantly impacted by psychosocial elements like family functioning. Therefore, improving family functioning offers an opportunity to enhance the methods by which CHD patients self-manage their condition. However, the study's factors include family functioning and self-efficacy, explaining only 35% of self-management behaviors variance, suggesting further investigation into other unmeasured factors.

According to IFSMT, individuals with good family functioning tend to be more confident and have strong beliefs that facilitate them to insist on self-management behaviors for a period of time after discharge (Ryan & Sawin, 2009). A study shows that only when family members fulfill their designated roles, effectively execute practical tasks, and sustain relationships both within the family unit and in broader social contexts can diabetes patients acquire effective family functioning (Bennich et al., 2020). The family functioning is important for supporting diabetes patients to maintain a positive mood and adopt a healthier lifestyle (Bennich et al., 2017). Another study indicated that patients with effective family functioning tend to have a positive attitude toward seeking professional psychological assistance. Consequently, robust family functioning can enhance the potential for successful disease management (Chen et al., 2020). The investigation revealed a correlation between family functioning and mental health in participants from both single- and dual-parent families, with improved mental health outcomes linked to better family functioning (Cheng et al., 2017).

This investigation demonstrated that family functioning exerts a direct influence on self-efficacy and, via the mediation of self-efficacy, an indirect impact on self-management behaviors, in accordance with the IFSMT and prior research. The connection between self-management behaviors and family functioning was moderated by self-efficacy. In particular, self-efficacy amplifies the beneficial effect of family functioning on CHD patients' self-management practices. Consequently, it is of utmost importance to emphasize the significance of patients' self-efficacy. Patients' good family functioning contributes to optimal self-efficacy, which subsequently fosters a higher degree of self-management

behaviors. These findings correspond to other investigations showing that among Chinese patients with CHD, self-efficacy not only directly affects health-promoting behaviors but also functions as an intermediary in the interaction between psychological variables and health-promoting behaviors (Du et al., 2022). Because self-efficacy plays a mediating role, treatments focusing only on helping patients' families operate better may be insufficient to improve their self-management behaviors if self-efficacy isn't addressed. Therefore, future projects to enhance self-management in CHD patients should focus on boosting self-efficacy and improving family functioning.

Strengths and Limitations

The study's strengths included using accurate and trustworthy tools to measure the important variables and a very low non-response rate (0.08%). However, this study had certain limitations. The cross-sectional methodology made it impossible to determine the causal links between self-efficacy, self-management behaviors, and family functioning. The patients with CHD were chosen from a single hospital. As such, the family functioning, self-efficacy, and self-management behaviors shown could not accurately reflect the circumstances faced by all Chinese patients with CHD. Further longitudinal research and comparative studies in other contexts would be helpful to acquire a comprehension of the interactions between these factors.

Furthermore, the analysis conducted in this investigation mostly relied on the overall scores of the important factors without doing subgroup analyses because of the relatively small sample size. As a result, the outcomes might be inflated. Subgroup analysis facilitates the identification of differences between groups to better understand the characteristics or behaviors of particular groups. In certain circumstances, subgroup analysis enables researchers to control or adjust for the effect of confounding variables, resulting in more accurate results. Further research should involve a larger cohort of patients with CHD to facilitate a more comprehensive analysis.

Implications of this Study for Nursing Practice

This study provides insightful information on illness management for medical professionals, especially nurses who care for patients with CHD. In the health sector, self-efficacy exerts a mediating function that deserves consideration in future nursing practice. In actuality, nurses and other health professionals should assess the degree of self-efficacy among CHD patients and help them get the confidence to change their lifestyle. Because self-efficacy plays a mediating role, family functioning treatments may indirectly enhance self-management behaviors by improving self-efficacy levels and directly promoting self-management behaviors. Equipping CHD patients with the skills they need to improve their self-management requires providing them with the right information and training. The strategy is to improve their level of self-efficacy, thereby facilitating better family functioning.

Conclusion

The findings of this investigation demonstrated that among Chinese patients with CHD, self-efficacy mediated the association between self-management behaviors and family

functioning. The findings provide insightful information for future studies aimed at creating efficient treatments to promote the self-management practices of CHD patients. Health professionals who engage with patients in this capacity, such as nurses, should emphasize the value of self-efficacy and implement plans to assist patients in boosting it. This approach is designed to strengthen family functioning, ultimately leading to improved self-management behaviors.

Declaration of Conflicting Interest

There are no conflicts of interest to declare.

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Authors' Contributions

The first author (YW) contributed to the research design, sample selection, data collection, data analysis, and initial manuscript writing. KM and WC contributed to the study's conceptualization, methodology, research, and critical analysis. All authors obtained responsibility for each research step and approved the publication of the final version.

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Data Availability

The datasets analyzed for the current study results are available from the first and corresponding authors upon reasonable request.

Declaration of Use of AI in Scientific Writing

There is nothing to declare.

References

- Almeida, J. A. B., Florêncio, R. B., Lemos, D. A., Leite, J. C., Monteiro, K. S., & Gualdi, L. P. (2022). Self-efficacy instruments for individuals with coronary artery disease: A systematic review protocol. *BMJ Open*, 12(7), e062794. <https://doi.org/10.1136/bmjopen-2022-062794>
- American Heart Association [AHA]. (2016). *Coronary Artery Disease - Coronary Heart Disease*. <https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/coronary-artery-disease>
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1), 1-26. <https://doi.org/10.1146/annurev.psych.52.1.1>
- Banik, A., Schwarzer, R., Knoll, N., Czekierda, K., & Luszczynska, A. (2018). Self-efficacy and quality of life among people with cardiovascular diseases: A meta-analysis. *Rehabilitation Psychology*, 63(2), 295-312. <https://doi.org/10.1037/rep0000199>
- Bartlow, J. H., Turner, A. P., & Gilchrist, M. (2009). A randomised controlled trial of lay-led self-management for myocardial infarction patients who have completed cardiac rehabilitation. *European Journal of Cardiovascular Nursing*, 8(4), 293-301. <https://doi.org/10.1016/j.ejcnurse.2009.02.002>
- Bauer, W. S., Schiffman, R. F., Ellis, J. L., Erickson, J. M., Polfuss, M., Taani, M. H., & Sawin, K. J. (2023). An integrative review of the use of the individual and family self-management theory in research.

- Advances in Nursing Science*. <https://doi.org/10.1097/ANS.0000000000000512>
- Bennich, B. B., Munch, L., Overgaard, D., Konradsen, H., Knop, F. K., Røder, M., Vilsbøll, T., & Egerod, I. (2020). Experience of family function, family involvement, and self-management in adult patients with type 2 diabetes: A thematic analysis. *Journal of Advanced Nursing*, 76(2), 621-631. <https://doi.org/10.1111/jan.14256>
- Bennich, B. B., Røder, M. E., Overgaard, D., Egerod, I., Munch, L., Knop, F. K., Vilsbøll, T., & Konradsen, H. (2017). Supportive and non-supportive interactions in families with a type 2 diabetes patient: An integrative review. *Diabetology & Metabolic Syndrome*, 9, 57. <https://doi.org/10.1186/s13098-017-0256-7>
- Chen, P., Liu, X. J., Wang, X. Q., Yang, B. X., Ruan, J., & Liu, Z. (2020). Attitude toward seeking professional psychological help among community-dwelling population in China. *Frontiers in Psychiatry*, 11, 417. <https://doi.org/10.3389/fpsy.2020.00417>
- Cheng, Y., Zhang, L., Wang, F., Zhang, P., Ye, B., & Liang, Y. (2017). The effects of family structure and function on mental health during China's transition: A cross-sectional analysis. *BMC Family Practice*, 18, 59. <https://doi.org/10.1186/s12875-017-0630-4>
- Chuang, L. M., Wu, S. F. V., Lee, M. C., Lin, L. J., Liang, S. Y., Lai, P. C., & Kao, M. C. (2021). The effects of knowledge and self-management of patients with early-stage chronic kidney disease: Self-efficacy is a mediator. *Japan Journal of Nursing Science*, 18(2), e12388. <https://doi.org/10.1111/jjns.12388>
- Dong, N., Chen, W.-T., Bao, M., Lu, Y., Qian, Y., & Lu, H. (2020). Self-management behaviors among patients with liver cirrhosis in Shanghai, China: A cross-sectional study. *Clinical Nursing Research*, 29(7), 448-459. <https://doi.org/10.1177/1054773818777914>
- Dorje, T., Zhao, G., Scheer, A., Tsokey, L., Wang, J., Chen, Y., Tso, K., Tan, B. K., Ge, J., & Maiorana, A. (2018). SMARTphone and social media-based Cardiac Rehabilitation and Secondary Prevention (SMART-CR/SP) for patients with coronary heart disease in China: A randomised controlled trial protocol. *BMJ Open*, 8(6), e021908. <https://doi.org/10.1136/bmjopen-2018-021908>
- Du, S., Feng, Z., Wang, W., Tian, L., & Wang, Y. (2022). A structural equation model linking health literacy, self efficacy and quality of life in adults with coronary heart disease. *BMC Cardiovascular Disorders*, 22(1), 285. <https://doi.org/10.1186/s12872-022-02720-8>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Jiang, W., Zhang, Y., Yan, F., Liu, H., & Gao, R. (2020). Effectiveness of a nurse-led multidisciplinary self-management program for patients with coronary heart disease in communities: A randomized controlled trial. *Patient Education and Counseling*, 103(4), 854-863. <https://doi.org/10.1016/j.pec.2019.11.001>
- Kroplewski, Z., Szcześniak, M., Furmańska, J., & Gójska, A. (2019). Assessment of family functioning and eating disorders—The mediating role of self-esteem. *Frontiers in Psychology*, 10, 921. <https://doi.org/10.3389/fpsyg.2019.00921>
- Liu, A.-k., Liu, Y.-y., Su, J., Gao, J., Dong, L.-j., Lyu, Q.-y., & Yang, Q.-h. (2023). Health literacy and quality of life of patients with coronary heart disease in Tibet, China: The mediating role of self-efficacy and self-management. *Heart & Lung*, 57, 271-276. <https://doi.org/10.1016/j.hrtlng.2022.10.009>
- Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M. (2001). Effect of a self-management program on patients with chronic disease. *Effective Clinical Practice: ECP*, 4(6), 256-262.
- Lv, F., & Gu, Y. (1995). The family APGAR scale and its clinical application. *Hospital Management Forum*, 2, 56-59.
- Nuraeni, A., Sugiharto, F., Anna, A., Sari, E., Mirwanti, R., Trisyani, Y., & Emaliyawati, E. (2023). Self-efficacy in self-care and its related factors among patients with coronary heart disease in Indonesia: A rasch analysis. *Vascular Health and Risk Management*, 19, 583-593. <https://doi.org/10.2147/VHRM.S427488>
- Ren, H., Tang, P., & Zhao, Q. (2009). Development and evaluation of coronary artery disease self-management scale. *Journal of Third Military Medical University*, 31(11), 1087-1090. <https://doi.org/10.3321/j.issn:1000-5404.2009.11.026>
- Ryan, P., & Sawin, K. J. (2009). The individual and family self-management theory: Background and perspectives on context, process, and outcomes. *Nursing Outlook*, 57(4), 217-225. <https://doi.org/10.1016/j.outlook.2008.10.004>
- Shrestha, R., Rawal, L., Bajracharya, R., & Ghimire, A. (2020). Predictors of cardiac self-efficacy among patients diagnosed with coronary artery disease in tertiary hospitals in Nepal. *Journal of Public Health Research*, 9(4). <https://doi.org/10.4081/jphr.2020.1787>
- Smilkstein, G., Ashworth, C., & Montano, D. (1982). Validity and reliability of the family APGAR as a test of family function. *The Journal of Family Practice*, 15(2), 303-311.
- Song, J., Chen, H., & Liang, T. (2019). Family functioning and 1-year prognosis of first-episode major depressive disorder. *Psychiatry Research*, 273, 192-196. <https://doi.org/10.1016/j.psychres.2019.01.021>
- Wensu, Z., Xidi, Z., Shaojie, L., Baohua, Z., Yunhan, Y., Huilan, X., Zhao, H., & Xiyue, X. (2021). Does the presence of anxiety and depression symptoms mediate the association between family functions and self-efficacy in pregnant women in the third trimester?: A community-based cross-sectional survey. *Frontiers in Psychiatry*, 12, 726093. <https://doi.org/10.3389/fpsy.2021.726093>
- WHO. (2021). *Cardiovascular diseases (CVDs)*. <https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-cvds>
- WHO. (2024). *The top 10 causes of death*. <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
- Yuan, Y., Xu, H. w., Zhang, S., Wang, Y., Kitayama, A., Takashi, E., Gong, W. j., & Liang, J. y. (2021). The mediating effect of self-efficacy on the relationship between family functioning and quality of life among elders with chronic diseases. *Nursing Open*, 8(6), 3566-3574. <https://doi.org/10.1002/nop2.906>
- Zhang, H., Wang, Y., Cai, X., Tang, N., Wei, S., & Yang, Y. (2022). Family functioning and health-related quality of life of inpatients with coronary heart disease: A cross-sectional study in Lanzhou city, China. *BMC Cardiovascular Disorders*, 22(1), 397. <https://doi.org/10.1186/s12872-022-02844-x>
- Zhang, S., Wang, Z., Lin, X., Li, Y., Xue, Y., Ban, J., Li, G., & Fa, T. (2023). Kinesiophobia and self-management behaviour related to physical activity in Chinese patients with coronary heart disease: The mediating role of self-efficacy. *Nursing Open*, 10(1), 105-114. <https://doi.org/10.1002/nop2.1283>
- Zhang, X., Zheng, Y., Qiu, C., Zhao, Y., & Zang, X. (2020). Well-being mediates the effects of social support and family function on self-management in elderly patients with hypertension. *Psychology, Health & Medicine*, 25(5), 559-571. <https://doi.org/10.1080/13548506.2019.1687919>
- Zhang, Y., Yan, F., & Jiang, W. (2019). Relationship between self-management behaviors and health-related quality of life among Chinese patients with coronary heart disease: A cross-sectional study. *Contemporary Nurse*, 55(6), 554-564. <https://doi.org/10.1080/10376178.2020.1731316>
- Zhu, H., Chen, G., Xue, X., & Zheng, S. (2022). Self-management in patients with coronary heart disease after stent implantation at the long-term stage: A cross-sectional study. *Annals of Palliative Medicine*, 11(7), 2265274. <https://doi.org/10.21037/apm-21-2465>
- Zhu, X., Yang, Y., & Cao, M. (2023). Effect of a mutual goal-based continuous care program on self-management behaviour and health outcomes in patients after percutaneous coronary intervention: A randomized controlled trial. *Nursing Open*, 10(6), 3707-3718. <https://doi.org/10.1002/nop2.1625>

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