






A Scoping Review of Predictors Associated with Self-Efficacy Among Patients with Coronary Heart Disease

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Abstract: Self-efficacy (SE) is the main predictor of self-care behaviour in patients with coronary heart disease (CHD). Several studies identified factors that influence SE in CHD patients. However, review studies have yet to synthesize these results systematically. This review aims to identify SE and the factors influencing SE in CHD patients. This scoping review is reported based on the PRISMA Extension for Scoping Reviews (PRISMA-ScR). We searched using relevant keywords using five databases: CINAHL Plus with Full Text and Academic Search Complete, PubMed, ScienceDirect, Scopus, Taylor and Francis, and one search engine: Google Scholar, which was accessed on June 23, 2023. Articles with an observational design were included without date restrictions. The quality of evidence was assessed using the Joanna Briggs Institute critical appraisal checklist, and data synthesis used thematic analysis. We found 11 articles discussing SE and the factors influencing SE in CHD patients. In this review, most studies reported that the SE level of CHD patients tends to be low to moderate. Factors associated with SE in this population are classified into three categories (low, moderate, and high). Cardiac knowledge and patient activation are the most influential predictors of SE in CHD patients. Public health interventions such as raising awareness about heart disease, modifying health behaviours, early screening, diagnosis, and appropriate treatment are critical to improving SE and cardiac care outcomes.

Keywords: coronary heart disease, self-care, self-efficacy

Introduction

Coronary Heart Disease (CHD) is a health problem with high morbidity and mortality rates in various countries.¹ In 2020, American Heart Association data shows that 244.1 million people worldwide suffer from CHD.² In addition, from 2012 to 2022, 1.522.669 deaths related to heart disease, including CHD, occurred in the United States.² Meanwhile, CHD cases in Indonesia have increased from 0.5% in 2013 to 1.5% in 2018.³ This death rate is expected to continue to increase to 24.2 million people in 2030.¹

CHD is a non-communicable disease caused by coronary atherosclerosis, which results in stenosis and occlusion of the coronary artery lumen, resulting in insufficient blood supply to the heart.¹ If this process lasts a long time, it can cause cardiac ischemia, myocardial infarction, and the risk of death.⁴ This situation requires revascularization as soon as possible to restore blood flow and myocardial reperfusion.⁵

The increase in CHD mortality and morbidity goes hand in hand with poor quality of life (QoL) and self-efficacy (SE).⁶ Patients with CHD experience a decline in their physical and psychological health status, so they need a high SE to support the management and control of self-care behaviour until the end of their lives.⁷⁻⁹ SE is an individual's belief about a person's ability to organize and carry out certain activities.¹⁰

SE has an essential role in managing CHD and reducing risk factors.^{11–13} SE is essential in initiating and maintaining healthy behaviours, leading to reduced recurrence of cardiac events.¹⁴ CHD patients with high SE rates will have good disease management, increased psychological well-being and quality of life, and they will be more compliant in participating in cardiac rehabilitation.^{10,15,16} Meanwhile, if CHD patients have a low SE level, they will have poor self-care, especially in exercise.¹⁷ Poor self-care can disrupt emotional balance and reduce a person's ability to deal with stress and affect their physical and psychological health.¹⁸ In addition, low SE in CHD sufferers is also associated with a lack of self-acceptance, poor health status, and the onset of depressive symptoms.¹¹ Therefore, paying more attention to the factors that influence SE in this population is necessary.¹⁹

Previous studies conducted in Nepal said that the strongest predictor of SE in CHD patients was knowledge related to heart disease.²⁰ CHD patients with good health knowledge and behaviour will undoubtedly have a high SE.²⁰ In addition, SE in CHD patients is also influenced by several factors such as age, gender, place of residence, social status, education, occupation, income, BMI, smoking history, length of suffering from CHD, and medical history.^{14,20,21}

Several studies have found various predictors affecting SE in patients with CHD.^{11,14,20,22–27} However, based on our literature search, no studies have been systematically reviewed to explore synthesizing SE and its predictors. Previous reviews reported that SE is a significant predictor of self-care behaviour in hypertensive patients and a prognostic indicator in patients with chronic disease.^{28–30} In addition, previous cohort studies also reported that SE could predict hospitalization in heart failure patients and all causes of death.³¹ Therefore, it is essential to systematically explore predictors of SE so that it can facilitate health workers to develop interventions and strategies to improve SE among this population.

Self-care behaviour in patients with CHD has different characteristics from several other diseases, as in the results of the studies previously mentioned, so there may be some specific things related to different SE predictors. It shows the importance of exploration in this regard. Based on these considerations, we need to explore the factors that influence SE in CHD patients through scoping reviews so that they can provide input to anticipate a decrease in SE in this population.

Materials and Methods

Design

This study uses a scoping review design. This design has flexible methodological techniques to identify and explore the latest rapidly developing topics.³² Besides, a scoping review has a more comprehensive conceptual range to explain relevant study results. The framework for writing a scoping review consists of several stages, including identifying research questions, relevant study results, selecting studies, mapping data, compiling, summarizing and reporting the results of a literature search.³² The study protocol was not published or registered.

Eligibility Criteria

The articles were selected for this review by six reviewers based on the PRISMA Extension for Scoping Reviews (PRISMA-ScR) (see Figure 1).³³ Research questions and eligibility criteria for research articles use the PCC (Population, Concept, and Context) approach. The research question in this review is: what factors are associated with self-efficacy in CHD patients?

P (Population) : Adults and Patients with Coronary Heart Disease

C (Concept) : Cardiac self-efficacy OR Self-efficacy

C (Context) : Predictors of self-efficacy

The inclusion criteria in this review were full-text articles in English, with cross-sectional and cohort designs discussing predictors of SE in CHD patients. Then, this review excluded studies using non-English languages, inaccessible full-text publications, and secondary research.

Data Collection and Analysis

Search Strategy

The literature search process was carried out systematically using five databases: CINAHL Plus with Full Text and Academic Search Complete, PubMed, ScienceDirect, Scopus, Taylor and Francis, and one search engine: Google

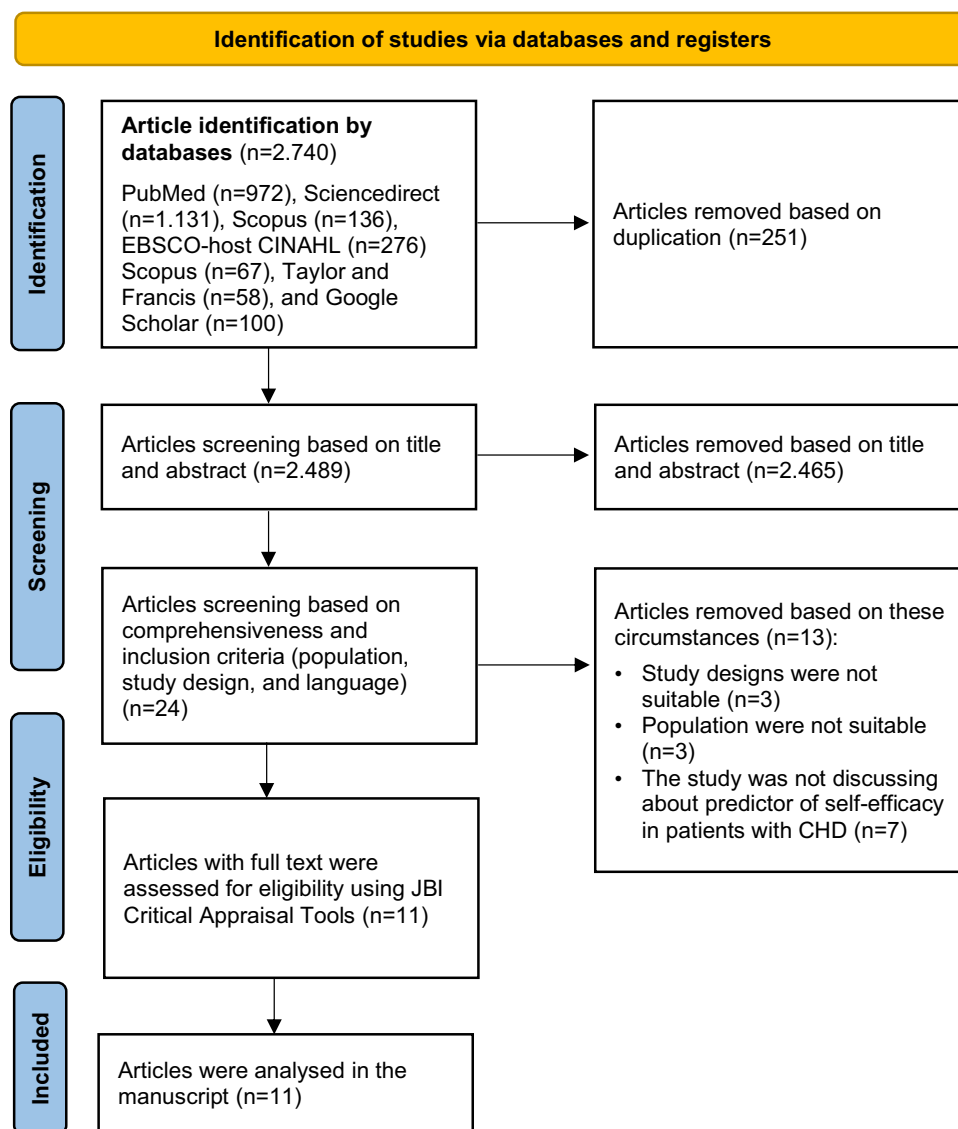


Figure 1 PRISMA Flow Diagram.

Notes: PRISMA figure adapted from Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021; 372: n71. Creative Commons.³³

Scholar, which was accessed on June 23, 2023. The search results are expanded using the snowballing technique based on relevant topics. The keywords used were

coronary heart disease OR coronary artery disease OR myocardial infarction OR cardiovascular disease OR Heart Disease AND Predictors OR Factors AND Self-efficacy OR Cardiac Self-efficacy OR General Self-efficacy.

Study Selection and Quality Appraisal

Four independent authors selected studies that were relevant and met the eligibility criteria. The authors checked for duplication in the initial article selection process using Mendeley's reference manager. Then, the writer checked the title, abstract and read the article in full according to the relevance of the selected research topic based on the inclusion and exclusion criteria set by the author. The final process at the selection study stage is for the authors to assess each article that meets the inclusion criteria using the Joanna Briggs Institute (JBI) critical assessment checklist for cross-sectional studies.³⁴

This guideline consists of eight assessment criteria consisting of research sample inclusion criteria, explanation of the study subject and research setting, exposure measurement, use of objective and standard criteria in measurement, identification of

confounding factors, explanation of strategies for overcoming confounding factors, valid and reliable outcome measurement, and the accuracy of the use of statistics.³⁵ The assessment consists of “yes”, “no”, “unclear”, and “not applicable”, with a score of 1 for each “yes” answer and a score of 0 for other answers. The total number of these scores will determine how worthy the article is to be included in the review. It allows the researcher to ascertain the extent to which the level of trust and relevance of the study results are included in further discussion. After the JBI assessment, we eliminated all studies that had a JBI score of <70% with final approval from the first, second, and third authors so that the final decision resulted in a unanimous opinion regarding the feasibility of the study, which will analyze in depth in this scoping review.

Data Extraction and Analysis

In the data extraction and analysis stages, this review uses extraction tables to describe all research results that are related and relevant to the research topic. The extraction table contains information related to the studies' characteristics, including authors, study design, country, sample (sample size and mean age), research findings (Level of SE, category of SE, and predictors of SE), and final results of the JBI. All studies analyzed were primary studies with cross-sectional and cohort designs. Therefore, data analysis was done thematically and qualitatively with an exploratory, descriptive approach. The process of data analysis begins with the identification and presentation of the data obtained in tabular form based on the articles reviewed. After obtaining the data, all authors analyzed and explained the results of each study that focused on predictors of cardiac SE among patients with CHD.

The authors divide the predictor category into three classifications based on the odds ratio (OR) value. It was categorized as low if the OR value was <0.5, medium if the OR value was ≥ 0.5 to 1, and high if the OR value was more than 1. In addition, in studies that did not display an OR value, we categorized SE predictors based on the *r* correlation value where the predictor category was high. It has a correlation value of *r* > 0.60, the medium category is in the range of 0.41 to 0.60, and the low category is less than 0.41. If the research does not include OR and *r* correlation values, then it is considered that it cannot be categorized.

Results

Study Selection

The results of the selection of studies in the early stages of this review obtained 2.740 articles. Furthermore, the authors selected the articles based on the title, abstract, and predetermined inclusion criteria so that the remaining 24 studies were then analyzed based on full-text article analysis. As a result, 11 studies were appraised with the JBI tool. Figure 1 shows the process of selecting study flow to obtain 11 studies which are further analyzed in this scoping review using the PRISMA flowchart.

Study Characteristics

All studies analyzed in this review were cross-sectional (*n* = 11). Based on the results, most studies reporting SE in CHD patients have an average low to moderate level of SE (see Table 1). Most of the studies (*n*=6) were conducted in developing countries. All samples analyzed were patients with CHD (*n* = 2.164) with a mean age of 54 to 68 years. The largest sample is 451 respondents²⁷ and the smallest 85 respondents.²² The results of the JBI analysis show that all studies analyzed using the cross-sectional method have good quality (>70%). Most of the studies examined had weaknesses in identifying confounding factors and did not include strategies to address these factors.

Level and Category of Self-Efficacy

The analysis results in this review show that the SE level has heterogeneous results, some of which are analyzed using categorization^{24,27} and there is also analysis with numerical data.^{11,14,16,20,22,23,25,26,36} Two studies classified SE into three categories (low, moderate, and high).^{24,27} While, four studies were classified numerically and displayed minimum and maximum values,^{11,16,20,23} and five studies do not display minimum and maximum values.^{14,22,25,26,36} Based on research results, most studies report that SE in CHD patients tends to have a low to moderate average SE level (see Table 1).

Factors Associated with Self-Efficacy

This review identifies factors significantly associated with SE in patients with CHD. Based on the analysis results, demographic characteristics, health perception, knowledge and awareness of the illness, environmental factors, health

Table 1 Characteristics of Study

Study	Design	Country	Sample		Findings			Critical Appraisal
			Size	Mean Age	Level of SE	Category of SE	Predictors of SE	
[20]	Cross-Sectional Study	Nepal	170	60.45 ± 10.39	37.14 ± 7.32	Min-max (16–52)	Age (B: -0.23; SE: 0.052) ($p<0.000$)*** The period since diagnosis (first time) (B: 0.68; SE: 0.0341) ($p=0.048$)*** Cardiac knowledge (B: 0.475; SE: 0.145) ($p=0.001$)*** Cardiac health behaviour (B: 0.432; SE: 0.078) ($p<0.000$)***	6/8 75%
[24]	Cross-Sectional Study	Iran	391	54.15 ± 15.77	Low (43.2%)	3 Categories (Low, Moderate, and High)	Perception of caring behaviours ($r: 0.16$; $p=0.001$)*	6/8 75%
[25]	Cross-Sectional Study	Sweden	157	68 ± 8.5	3.13 ± 0.52	N/I	Gender (Male) (B:-0.20, 95%CI:-0.039–(-0.005)) ($p=0.045$)*** Age (B:0.008, 95%CI: -0.010–0.010) ($p=0.005$)*** Living alone (B:-0.24, 95%CI:-0.43–(-0.05)) ($p=0.011$)*** Current self-rated health (B:0.008, 95%CI: 0.004–0.013) ($p<0.001$)*** Well being (B: 0.065, 95%CI:0.021–0.109) ($p=0.004$)***	8/8 100%
[27]	Cross-Sectional Study	China	451	N/I	21.62 ± 3.54 (Moderate)	3 Categories (Low, Moderate, and High)	Patient activation (patient awareness of the disease and initiative to participate) ($r=0.740$, $p<0.01$) Social support (B: 0.485, SE: 0.03, $t: 11.766$) ($p<0.001$)***	8/8 100%
[14]	Cross-Sectional Study	Korea	214	60.71 ± 10.07	39.2	N/I	Occupation (unemployed) (B: 0.17; SE: 0.970) ($p=0.01$)*** Diagnosis Stable Angina (B: 0.20; SE: 1.22) ($p=0.02$)*** BMI (B:-0.17; SE: 0.16) ($p=0.01$)*** Awareness of risk factors (B: 0.16; SE: 0.35) ($p=0.02$)*** CAD knowledge (B: 2.02; SE: 0.98) ($p=0.04$)***	6/8 75%

(Continued)

Table 1 (Continued).

Study	Design	Country	Sample		Findings			Critical Appraisal
			Size	Mean Age	Level of SE	Category of SE	Predictors of SE	
[26]	Cross-Sectional Study	UK	248	65.3 ± 10.8	3.63 ± 0.59	N/I	Exercise outcome expectation (B: 0.16, 95%CI: 0.02–0.21) (p=0.013)*** History of heart problem (B: -0.146, 95%CI -0.522 – (-0.040)) (p=0.023)*** Gender (B= 0.138, 95%CI 0.01–0.32) (p=0.040)***	6/8 75%
[22]	Cross-Sectional Study	Hong Kong	85	64.5 ± 10.8	60.4	N/I	Age (OR: 0.17, 95%CI: 0.001–0.33) (p=0.049)*** Female (OR:-0.45, 95%CI: -8.69–0.45) (p=0.030)*** BMI (OR:-0.50, 95%CI: -0.98–0.01) (p=0.044)*** Social support (OR: 0.22, 95%CI: 0.13–0.32) (p<0.001)*** Social drinker (OR: -0.53, 95%CI:-8.97–1.63) (p=0.005)***	7/8 87.5%
[11]	Cross-Sectional Study	Indonesia	112	55–64 (54.5%)	3.60	(Min-max) (2.90–4.00)	Religiosity (r: 0.54; p=0.001)*	8/8 100%
[23]	Cross-Sectional Study	Iran	136	58.85	29.24 ± 8.2	(Min-max) (9–50)	Personal strength (B: 0.474; SE: 0.18; t: 2.7) (p=0.01)*** Tolerance for negative emotions (B: 0.38; SE: 0.19; t: 1.98) (p=0.04)***	7/8 87.5%
[16]	Cross-Sectional Study	Indonesia	150	57.3 ± 9.19	47 ± 4.97	(Min-max) (28–64)	Psychological well-being (r: 0.41; p=0.018)**	6/8 75%
[36]	Cross-Sectional Study	US	50	65 ± 1.6	52 ± 25	N/I	Income (p<0.05)** Level of education (p=0.04)**	8/8 100%

Notes: *Spearman rank test, **Pearson Correlation, ***Multiple Linear Regressions.

Abbreviations: BMI, Body Mass Index; CAD, Coronary Artery Disease; CI, Confidence Interval; N/I, Not Information; OR, Odd Ratio; SE, Standard Error.

behaviour, medical history, and psychological factors have a significant relationship with the level of SE in patients with CHD. Furthermore, these factors are then classified into three categories.

These factors were divided into three categories based on the OR and r correlation values, namely low ($OR < 0.5$ or $r < 0.41$), moderate ($OR \geq 0.5$ to 1 or $r = 0.41$ to 0.60), and high ($OR > 1$ or $r > 0.60$) (see Table 2). The higher the OR or r correlation value, the variable becomes the most influential predictor of SE in CHD patients. In this review, the

Table 2 Predictors of Cardiac Self-Efficacy

Predictors	Highest Ratio OR (95% CI) or B (SE)	Lowest Ratio OR (95% CI) or B (SE)	r Correlation	Category of Predictor	Ref
Demographic Characteristics					
Age	-0.23 (0.052)	0.008 (-0.010–0.010)	-	Low	[20,22,25]
Gender					
- Male	-0.20 (-0.039–0.005)	-0.20 (-0.039–0.005)	-	Low	[25]
- Female	-0.45 (-8.69–0.45)	-0.45 (-8.69–0.45)	-	Low	[26]
Occupation	0.17 (0.970)	0.17 (0.970)	-	Low	[14]
BMI	-0.50 (-0.98–0.01)	-0.17 (0.16)	-	Moderate	[14,22]
Income	$p < 0.05^*$	$p < 0.05^*$	$p < 0.05^*$	Uncategorized	[36]
Level of education	$p = 0.04^*$	$p = 0.04^*$	$p = 0.04^*$	Uncategorized	[36]
Living alone	-0.24 (-0.43–)(-0.05)	-0.24 (-0.43–)(-0.05)	-	Low	[25]
Health Perception, Knowledge, and Awareness of the Illness					
Perception of caring behaviours	-	-	$r = 0.16$	Low	[24]
Perception of Current self-rated health	0.008 (0.004–0.013)	0.008 (0.004–0.013)	-	Low	[25]
Patient activation (patient awareness)	-	-	$r = 0.74$	High	[27]
Exercise outcome expectation	0.16 (0.02–0.21)	0.16 (0.02–0.21)	-	Low	[27]
Cardiac Knowledge	2.02 (0.98)	0.475 (0.145)	-	High	[14,20]
Environment Factors					
Social Support	0.485 (0.03)	0.22 (0.13–0.32)	-	Low	[22,27]
Social Drinker	-0.53 (-8.97–1.63)	-0.53 (-8.97–1.63)	-	Moderate	[22]
Health Behaviour					
Cardiac Health Behaviour	0.432 (0.078)	0.432 (0.078)	-	Low	[20]
Medical History					
Period since diagnosed	0.68 (0.0341)	0.68 (0.0341)	-	Moderate	[20]
Diagnosis stable angina	0.20 (1.22)	0.20 (1.22)	-	Low	[14]
Psychological Factors					
Psychological well-being	0.065 (0.021–0.109)	0.065 (0.021–0.109)	-	Low	[16,25]
Personal strength	0.474 (0.18)	0.474 (0.18)	-	Low	[23]
Tolerance for negative emotions	0.38 (0.19)	0.38 (0.19)	-	Low	[23]
Religiosity	-	-	$r = 0.54$	Moderate	[11]

Notes: *Pearson Correlation with Significant at $p < 0.05$.

Abbreviations: BMI, Body Mass Index; CI, Confidence Interval; OR, Odd Ratio; SE, Standard Error.

predictors included in the high category are health perception, knowledge, and awareness of the illness (patient activation and cardiac knowledge). In addition, the moderate predictors included demographic characteristics (BMI), environmental factors (social drinkers), medical history (period since diagnosis), and psychological factors (religiosity). Then, predictors included in the low category are demographic characteristics (age, gender, occupation, and living alone), health perception, knowledge, and awareness of the illness (perception of caring behaviours, perception of current self-rated health, and exercise outcome), environmental factors (social support), health behaviour (cardiac health behaviour), medical history (diagnosis of stable angina), and psychological factors (psychological well-being, personal strength, and tolerance for negative emotions). Finally, the uncategorized factors are income and level of education. In this review, cardiac knowledge ($B: 2.02$; $SE: 0.98$; $p=0.04$) and patient activation (patient awareness) ($r=0.74$) was the most influential predictor of SE in patients with CHD (see Table 2).

Discussion

This scoping review identifies SE and factors that may influence SE in patients with CHD. In general, the results of this review show that most of the studies analyzed reported that patients with CHD tended to have low to moderate SE rates. There are six predictors that can influence the level of SE, including demographic characteristics, health perception, knowledge and awareness of the illness, environment, health behaviour, medical history, and psychological factors. Then, we classified these predictors into three categories, namely low, moderate, and high.

The factors that most influence SE in this review are included in the high category (see Table 2). Cardiac knowledge is the most influential factor on SE in patients with CHD^{14,20} SE, and internal locus of control has direct and indirect effects on health where knowledge of risk factors is treated as a potential mediator affecting SE.³⁷ Previous studies reported that patient knowledge of risk factors for CHD was associated with low rates of disease recurrence and SE in sufferers.³⁷ Moreover, patients who are knowledgeable about CHD and accurately understand their risk factors may realize that they have more control over their symptoms and maintain functional activity, so it is not surprising that they have high SE rates.¹⁴

Another predictor included in the high category is patient activation.²⁷ In this review, patient activation refers to the patient's awareness of the disease and the initiative to participate in disease management which is closely related to the level of knowledge.^{14,20,27} Previous studies reported that patients with CHD almost do not feel their CHD risk factors, such as gender, hyperlipidemia, hypertension, obesity, and so on.³⁸ Knowledge of CHD risk factors will inform individuals to adopt a healthy diet, weight management, and physical activity.³⁹ Moreover, patient activation is a major driver of effective self-management among patients with chronic disease.⁴⁰ Patients who have a high level of activation, most of them have a high SE, so they are considered to easy to face various difficulties or problems in disease rehabilitation, promote their behaviour change, actively cooperate with medical staff and participate in management.²⁷ Higher patient activation rates are also associated with better self-management, lower medical costs, and improved health outcomes in different groups of patients with chronic diseases.^{27,40,41}

Predictors in the moderate category that influence SE in this review are BMI, social drinkers, the period since diagnosis, and religiosity.^{11,14,20,22} Previous studies reported that BMI was a significant predictor of low exercise SE in CHD patients.^{14,22} In addition, social drinkers have an impact on someone having an excess BMI.²² Individuals with an overweight BMI category are one of the barriers for someone to do activities or sports.¹⁴ The same thing was reported by the research of Rachmah et al, which informed that the level of physical activity is related to BMI and sedentary activity.⁴² Individuals who engage in moderate to vigorous levels of activity have a higher SE and are, therefore, more able to overcome obstacles than their counterparts who are included in the light physical activity category.⁴²

The period since diagnosis and religiosity also have an influence on the SE of CHD patients in the moderate category. Patients diagnosed with CHD for a long time have more knowledge and experience, so they will apply good health care and behaviour in their daily lives.²⁰ In addition, religion is also a predictor in the moderate category because it provides reinforcement and a person's belief through prayer to improve the patient's health and recovery.¹¹ Patients with CHD perform prayer services to gain strength, comfort and hope for the meaning of support in improving their quality of life and can improve coping in overcoming obstacles while managing the disease.⁴³ Previous studies reported that patients with CHD with a high religious level are better able to manage lifestyles such as quitting smoking, reducing alcohol

consumption, and increasing exercise so that they have fewer cardiovascular risk factors at the onset of the disease.¹¹ Therefore, the relationship between religiosity and SE can have a substantial value and have a positive effect on better self-care levels in CHD patients, so this can also prevent prolonged hospital stays and participation in cardiac rehabilitation.^{44–46}

In this review, predictors in the low category that affect SE based on demographic characteristics are age, gender, occupation, and living alone.^{14,20,22,25,26} Increasing age is often associated with a decrease in the SE of patients with heart disease.^{20,22,25} With increasing age, SE will tend to decrease due to ageing and decreased muscle strength, so it has an impact on tolerance in carrying out daily physical activities.²⁰ However, these results differ from a study conducted in Nepal which reported that people with heart disease at a younger age had a lower SE compared to elderly patients.²⁰ This can happen because it is related to lifestyle, such as excessive alcohol consumption by these patients.²²

Gender can also affect SE in the low category.^{25,26} The study results show that women are identified as having significantly more symptoms of heart disease, which are more likely to reduce SE compared to men.²⁶ The group that has a job shows a much higher cardiac SE than the unemployed group.¹⁴ Also, previous studies suggest that older adults have more hours of productive activity.⁴⁴ Thus, involvement in productive activities such as working at the end of life can maintain or even increase SE. Furthermore, living alone is also included in the low predictor that affects SE.²⁵ Patients who live alone are often unable to develop independent coping mechanisms due to a lack of adequate social support.⁴⁷ This impacts the lack of adherence to recommended therapy guidelines, fewer visits to doctors or cardiac rehabilitation, and also seeking medical help when needed.⁴⁷

Factors such as perception of caring behaviours, perception of current self-rated health (SRH), and exercise outcome expectation are included in the low category based on health perception, knowledge, and awareness of the illness, which can affect SE. Perception of caring behaviour is described by the patient's perception of the nurse's caring behaviour in physical touch and being empathetic with patients.²⁴ Meanwhile, the perception of SRH is used to evaluate the state of health based on biological, mental, functional, and spiritual dimensions that can assist in making decisions for each individual in critical situations. Thus, someone who has a good perception of SRH will affect the increase in SE in CHD patients.²⁵ Exercise outcome expectations also play an essential role in high or low SE.²⁷ Someone who has high outcome expectations in curing their illness will be more motivated to perform the correct health behaviour to get the desired outcome.⁴⁸

Other predictors in the low category that affect SE in CHD patients are the type of patient diagnosis, psychological factors, and social support. Diagnosis is a significant predictor that can affect cardiac SE.¹⁴ The study results show that patients diagnosed with stable angina tend to have a higher level of cardiac SE than patients diagnosed with unstable angina.¹⁴ This difference can be explained through the characteristic symptoms of each patient with the two diagnoses. As mentioned in previous studies, increased symptom burden, physical impairment, and lower health status are associated with poor cardiac SE.¹³ Although chest pain is a common symptom of angina, in unstable angina or myocardial infarction (MI), the chest pain will not wholly subside with rest or nitroglycerin.¹³

Differences in diagnostic conditions do not only have an impact on the patient's physical condition, but also affect the physical and psychological burden of the patient so that it has an impact on the SE level, which in turn affects the patient's well-being and ability to adapt to the conditions of the disease he is suffering.^{13,16,25} This is in line with the findings in this review, where psychological well-being is a predictor in the low category, which affects SE in patients with CHD.^{16,25} Even though it is included in the low category, improving the well-being of CHD patients indirectly has the potential to increase cardiac SE in CHD patients.⁴⁹

Other psychological factors contributing to CHD sufferers' SE are personal strength and tolerance for negative emotions.²³ Personal strength and tolerance for negative emotions are aspects or parts of one's resilience. As is well known, CHD patients experience physical and cognitive and emotional processing disorders.⁵⁰ In this context, an increase in SE in CHD patients can be supported by increasing the patient's resilience in dealing with dynamic changes in physical and psychological aspects.⁵¹ Even though a person can change and adapt to the difficulties experienced, family and community support is still needed to increase resilience.⁵²

In this review, social support is one of the low-category predictors of SE, which also has an essential role for CHD patients.²⁷ This is because good social support can reduce psychological stress, increase patient confidence in

overcoming the disease, and encourage patient participation in disease management.⁵³ This strengthens the results of previous studies, which state that social support is associated with SE.^{22,27} Patients with good cardiac SE tend to have the motivation to adopt positive behaviours related to their health problems.⁵⁴ These results align with previous studies, which state that increased cardiac SE is associated with improved cardiac health behaviour.²⁰ This behaviour can be related to physical activity, smoking, dietary intake, and BMI.⁵⁵ Considering that the management of CHD patients is a continuous chronic process, patients with good SE who are active in the disease management process are more likely to get better long-term health outcomes.⁵⁶

The predictors included in the uncategorized category in this review are income and level of education.³⁶ Although these predictors are uncategorized, patients with CHD with high incomes and education levels tend to have high SE values. A better SE level in this group will make them more confident and have more time and resources that can support and maintain healthy behaviour.^{14,36} The same thing was also reported in research conducted in China, which explained that someone with a low income also tends to have a low SE level.⁵⁷ Low income is reported to cause difficulties in accessing health literacy so that patients receive less information regarding self-management and disease knowledge.⁵⁷

In this review, the predictors of SE in CHD patients are multifactorial. However, the most important finding in this review is that knowledge and patient activation are predictors in the high category affecting CHD patients' SE rate. Therefore, health education is the primary strategy to improve SE in CHD patients. Previous studies in Indonesia reported that health education using workbooks significantly improved SE in CHD patients.⁵⁸ The same thing was reported in previous studies, which ascertained that increased knowledge about self-care of patients with heart disease was associated with increased cardiac SE.^{59,60} In addition, the digital cardiac rehabilitation program also positively affects knowledge and SE in CHD patients.⁶¹ Therefore, some of these strategies are expected to increase SE in CHD patients so that the increase in SE will align with the increase in QoL in patients with CHD.

Strengths and Limitations

The limitation of this scoping review is that the authors found it difficult to classify the levels and predictors of SE. The SE categorization and predictors in the analyzed articles are quite heterogeneous, so it is not easy to generalize them. In overcoming this limitation, the author decided not to categorize the level of SE because it could cause bias and only mentioned it descriptively in the results section. Then, in determining the predictor categories, the author carried out an in-depth analysis regarding the meaning of each predictor so that each predictor with the same meaning can be combined. In addition, the SE predictor categories in this review are based on OR and *r* correlation values, where these values are quite variable, and most of them tend to be small. When new research (cohort studies) is added, this category will change depending on how large the OR or *r* correlation value is obtained from the analyzed studies. Therefore, to clarify SE categories based on OR/B values, it is necessary to identify predictors of SE in CHD patients in the future using a cohort design. When compared cross-sectionally, research results from cohort studies will be much better and more comprehensive if the research objective is to identify predictors or risk factors.

Although this study has several limitations, this study is the first review regarding predictors of SE in CHD patients. Apart from that, the studies analyzed in this review are of good quality and have carried out critical appraisal using the JBI tool. This review may provide a better understanding of the factors influencing SE of CHD patients. Thus, it can assist health professionals in developing more effective and evidence-based health interventions to improve the SE of CHD patients.

Conclusions

Cardiac knowledge and patient activation are the most influential predictors of the low SE of CHD patients. The predictors of SE are multifactorial, so health workers, especially nurses, can correctly identify these factors and design a strategy to optimize or increase the level of SE. Policymakers can encourage implementing public health education programs that focus on improving SE in CHD patients. In addition, health professionals can also participate in facilitating patients by providing health education and encouraging patients to adopt a healthy lifestyle. Health education can be specifically designed to increase the SE of this population so that an increase in SE will go hand in hand with the fast healing process and good disease management. Identification of appropriate educational methods for improving SE in

CHD patients is also essential so that future researchers can consider this in the process of developing future educational strategies.

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Disclosure

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