Patient Preference and Adherence

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ORIGINAL RESEARCH

The Influence of Perception on Self-Efficacy Among Patients with Coronary Artery Disease in Indonesia: A Rasch Analysis

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Background: The prevalence of Coronary Artery Disease (CAD) in Indonesia continues to rise, necessitating practical management approaches. Self-efficacy (SE) is critical in supporting CAD patients' autonomy in managing their condition. Patients' perceptions of their disease significantly influence decision-making and health management behaviours.

Purpose: This study aimed to identify the influence of perceptions on self-efficacy in managing CAD among diagnosed patients.

Patients and Methods: A cross-sectional study design was employed among 102 adult patients with CAD. The sample was selected using convenience sampling based on predefined inclusion and exclusion criteria. Data were collected using the Health Belief Related to Cardiovascular Disease (HBCVD) Scale to assess perceived susceptibility, severity, benefits, and barriers; the Health Belief Model instrument to evaluate cues to action; and the Self-Efficacy Questionnaire for Coronary Heart Disease Management to measure self-efficacy (SE). The scale has been validated and demonstrated strong psychometric properties (validity ≥ 0.7, reliability ≥ 0.8). The Rasch model approach was employed in this study, with data analysis conducted using Pearson correlation and simple linear regression.

Results: A total of 91.2% of respondents exhibited high levels of SE. The mean logit scores for CAD management-related perceptions were as follows: perceived severity (0.494 ± 1.28), perceived susceptibility (−0.961 ± 3.06), perceived barriers (0.261 ± 1.00), perceived benefits (3.68 ± 2.25), cues to action (0.968 ± 1.17), and perception (0.544 ± 0.668). The analysis revealed a significant relationship between perceptions and SE ($p<0.001$). Perceived severity and perceived barriers emerged as the most influential predictors of SE, with an adjusted $R^2 = 0.899$ and a standardized estimate of 0.949 (95% CI = 0.886–1.01; $p<0.001$).

Conclusion: Perceived severity and perceived barriers significantly influence self-efficacy in CAD patients. These findings provide a foundation for healthcare professionals to design perception-based interventions, such as health education and personalized counselling, to enhance SE within this population.

Keywords: coronary artery disease, perception, self-efficacy

Introduction

Coronary Artery Disease (CAD) is a condition with a steadily increasing prevalence each year, accompanied by a high mortality rate across various countries worldwide.[1] Furthermore, as many as 1,522,669 deaths in the United States are attributed to heart diseases, including CAD.[2] Similarly, in Indonesia, the mortality rate due to CAD has been rising and is projected to reach 23.3 million deaths by 2030.[3]

The increasing mortality and morbidity rates among CAD patients each year are closely associated with poor self-care behaviours and low adherence to cardiac rehabilitation (CR) programs.[4,5] Previous studies have reported that the level of self-care among CAD patients remains relatively low.[6,7] Likewise, a study conducted in Indonesia also reported that many CAD patients had low levels of self-care.[8–10] Additionally, prior reviews have indicated that a significant proportion of participants in the analyzed studies exhibited low CR participation rates (≤50%).[11] This issue has been

Received: 6 December 2024
Accepted: 14 April 2025
Published: 16 May 2025

further exacerbated by the COVID-19 pandemic, which significantly impacted the quality of life and self-care behaviours of patients with heart disease.[12–14]

Self-efficacy (SE) is a primary predictor of self-care in CAD patients.[15] SE refers to an individual's confidence or belief in their ability to achieve desired outcomes.[16] It plays a pivotal role in behavioural changes. It influences how individuals approach goals, tasks, and challenges, enabling them to perform tasks with less stress, more profound interest, and a stronger sense of commitment.[17] This is because SE affects how people think, address problems, manage stress and depression, maintain emotional well-being, and make decisions.[18] Furthermore, CAD patients with high SE are more capable of carrying out tasks and tend to succeed in their processes.[17,19,20] Therefore, greater attention should be given to SE and its influencing factors in this population.

Previous reviews have concluded that knowledge about heart disease and patient activation are the most influential predictors of self-efficacy (SE) in CAD patients.[15] Patients with adequate knowledge of CAD risk factors are associated with lower disease recurrence rates.[21] Additionally, patient activation, which refers to patients' awareness of their condition and their initiative to participate in disease management, is closely linked to their level of knowledge.[22] Other factors contributing to SE in CAD patients include demographic characteristics, health perception (perception of caring behaviours, self-rated health, and exercise outcomes), and social support.[15] Therefore, it is very important to improve SE through various interventions and control for predictors that have been identified in previous reviews.[15,23]

The model proposed by Shin et al (2013) suggests that SE mediates the relationships between social support, perceived benefits, perceived barriers, knowledge, physical functioning, and self-care. The study indicates that an individual's knowledge, physical functioning, and social support influence their emotional and cognitive perceptions, affecting self-care adherence through SE.[24] This aligns with prior research highlighting SE's role in influencing quality of life (QoL), specifically as an intermediary step before self-care. SE also indirectly affects QoL through self-care behaviors and modifiable risk factors.[5] However, according to the Health Belief Model (HBM), SE holds an equivalent position alongside other variables such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action in influencing self-care behaviors.[25] While these variables collectively shape self-care behaviors, it remains unclear whether they interact with or influence one another directly.

To date, based on the researchers' knowledge and a thorough review of the literature, no studies have clarified whether factors such as SE, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action are interrelated in influencing self-care behaviours in CAD patients. The study conducted by Shin et al (2013) does not explicitly address the influence of perceived benefits and perceived barriers on SE, despite the potential of these factors to strengthen their impact on self-care in CAD patients. Additionally, previous reviews have identified predictors of SE in CAD patients.[15] Studies specifically analyzing SE and its factors in CAD patients using the Rasch model have only been conducted by Nuraeni et al (2023).[16] In Indonesia, the application of the Rasch model has predominantly been in student populations.[26–30] Therefore, this study aimed to delve deeper into the influence of patient perceptions on self-efficacy in managing CAD using the Rasch model approach.

Methods

Study Design

This study employed a quantitative correlational multivariate design with a cross-sectional approach, utilizing secondary data from a previous study.[31] Data collection was conducted from April to May 2019. The Rasch model was applied to transform the data for analysis.

Sample and Setting

The population of this study consisted of CAD patients receiving treatment at a referral hospital in West Java, Indonesia. Data collection utilized a convenience sampling technique with the following inclusion criteria: CAD patients aged 18 years or older, undergoing treatment in the outpatient cardiology unit, with stable hemodynamic status and no symptoms of chest pain. The exclusion criteria included patients who did not understand Indonesian and those diagnosed with psychosis, as determined based on the patient's medical history data.

The sample size for this study was determined based on the minimum requirement for multivariate regression analysis, which is at least ten respondents per variable analyzed.[32] With seven variables to be measured, a minimum of 70 respondents was needed, plus an additional 20% to account for potential dropouts. Therefore, the minimum required sample size was 84 respondents. In this study, a total of 102 respondents participated.

Research Instrument

The demographic characteristics questionnaire includes gender, age, marital status, educational background, occupation, duration of illness, smoking status, medication usage, and adherence to cardiac rehabilitation. Additionally, patient perceptions (perceived susceptibility, perceived severity, perceived benefits, and perceived barriers) in CAD were assessed using the Health Belief Related to Cardiovascular Disease (HBCVD) Scale.[33] This instrument consists of 25 questions covering four perception constructs based on the Health Belief Model (HBM). Cues to action were measured using the Health Belief Model instrument utilized in Alalawi's (2018) dissertation titled "Knowledge, Perception, Action and Intention to Modify Healthy Lifestyle Behaviour in Omani Patients at Risk of Stroke".[34] This instrument consists of four items, specifically statement numbers 26, 27, 28, and 29. Self-efficacy was measured using the Self-Efficacy Questionnaire for Coronary Heart Disease Management.[16] However, only four items were selected, each representing a specific aspect of CAD management post-hospitalization: medication adherence, diet, physical activity or cardiac rehabilitation, and psychosocial management. In total, the patient perception questionnaire consisted of 33 items, with four response options: strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD). The authors have obtained approval to use these instruments in the study.

The instrument used in this study underwent reliability and unidimensionality testing using Rasch analysis. The first test assessed reliability and the separation index. The Cronbach's alpha item reliability was 0.97, while the person reliability was 0.82, indicating the instrument's quality was categorized as excellent. Additionally, the person reliability score of 0.82 reflected good response consistency, further supported by the instrument's high quality. The next step involved item and person separation. Item separation was calculated using the following formula: H (grouping)= [(4 x separation value)+1)/3]).[35] Based on these calculations, the item separation value was 7.62, and the person separation value was 3.13. This indicates that the items can be grouped into 8 distinct groups, while the respondent data can be categorized into 3 outcome groups.

The next test involved identifying the unidimensionality of the instrument. Based on unidimensionality measurements, the raw variance explained by measures was 33.7%, exceeding the acceptable threshold of 20%.[35,36] Additionally, the unexplained variance in the 1st–5th contrasts of the PCA of residuals was less than 10%, considered a good indicator of unidimensionality.[37]

Data Analysis

The data, initially in the form of ordinal data, was first transformed into numerical data using the Rasch model (via the Winsteps application) before further analysis. The numerical data, represented as Log Odds Unit (logit) scores, were then used to categorize self-efficacy (SE) into two levels: low SE and high SE. The categorization was based on the mean logit score cut-off and standard deviation, with scores > 0 logit indicating high SE and scores < 0 logits indicating low SE.[38,39] Additionally, a Wright map analysis was conducted to detect and align items appropriately according to their level of difficulty and the respondents' ability levels. This provided further insights into the interaction between item difficulty and respondent ability.

The frequency distribution and the relationship between perception and SE categories were analyzed using a Pearson correlation test with a significance level of $p<0.05$. Furthermore, the normality of SE data was identified using the Kolmogorov Smirnov obtained $p>0.05$ and the QQ plot, which indicates normally distributed data. The results of other assumption tests indicated no heteroscedasticity, as evidenced by $p>0.05$ using the Breusch-Pagan and Harrison McCabe tests. However, the collinearity and autocorrelation tests revealed multicollinearity and positive autocorrelation issues. Specifically, the Variance Inflation Factor (VIF) exceeded 10, indicating multicollinearity and the Durbin-Watson statistic was close to 0, indicating positive autocorrelation. As a result, the effect analysis was not performed by including all independent variables simultaneously. In this study, linear regression modelling was conducted by testing each perception

variable against SE individually using simple linear regression. For data analysis, the researchers utilized the Winsteps application version 5.4.0.0 for Rasch analysis and Jamovi version 2.3.21 for statistical analysis.

Ethical Consideration

This study received ethical approval from the Research Ethics Committee of Universitas Padjadjaran (No. 245/UN6. KEP/EC/2019) in accordance with the Declaration of Helsinki. Researchers provided both verbal and written information about the study to patients who were potential respondents. Patients who agreed to participate signed an informed consent form. Participation in this study was voluntary and non-coercive, allowing respondents to decline or withdraw from the study at any point without any consequences. In this context, participants agree that the responses they provide can be published in anonymous form or quoted directly without including personal identity. Researchers are responsible for maintaining the confidentiality of participant data and ensuring that published information does not lead to individual identification. Respondent data were kept confidential, analyzed in aggregate to ensure individual anonymity, and used solely for academic purposes. Additionally, the respondents in this study were CAD patients with stable hemodynamics and no chest pain, ensuring that there were no risks associated with completing the questionnaire for the respondents.

Results

Sample Characteristics

Table 1 showed that the majority of respondents in this study were female (77.5%), over 55 years old (63.7%), married (92.2%), had higher education (68.6%), and were unemployed (55.4%). Additionally, 84.3% of respondents had been diagnosed with CAD for more than six months and demonstrated high medication adherence (93.1%). Upon diagnosis, most respondents (62.7%) immediately quit smoking; however, 63.7% did not regularly attend cardiac rehabilitation programs.

Table 1 Sample Characteristics (n=102)

Variable	Self-Efficacy				n (%)
	High		Low		
	n	%	n	%	
Gender					
Female	71	69.6	8	7.8	79 (77.5)
Male	22	21.6	1	1.0	23 (22.5)
Age					
26–35 years old	1	1.0	0	0	1 (1.0)
36–45 years old	11	10.8	0	0	11 (10.8_
46–55 years old	23	22.5	2	2.0	25 (24.5)
≥ 56 years old	58	56.9	7	6.9	65 (63.7)
Marital Status					
Married	86	84.3	8	7.8	94 (92.2)
Unmarried	7	6.9	1	1.0	8 (7.8)
Educational Background					
No Formal Education	3	2.9	0	0	3 (2.9)
Elementary Education	15	14.7	0	0	15 (14.7)

(*Continued*)

Table 1 (Continued).

Variable	Self-Efficacy				n (%)
	High		Low		
	n	%	n	%	
Intermediate Education	12	11.8	2	2.0	14 (13.8)
Higher Education	63	61.8	7	6.9	70 (68.6)
Occupation					
Employed	43	42.6	2	2.0	45 (44.6)
Unemployed	49	48.5	7	6.9	56 (55.4)
Duration of Illness					
< 6 Months	15	14.7	1	1.0	16 (15.7
≥ 6 Months	78	76.5	8	7.8	86 (84.3)
Smoking					
No	30	29.4	2	2.0	32 (31.4)
Quit after Being Diagnosed	57	55.8	7	6.9	64 (62.7)
Currently Smoking	6	5.9	0	0	6 (5.9)
Medication					
Never Missed	87	85.3	8	7.8	95 (93.1)
Missed Several Times	6	5.9	1	1.0	7 (6.9)
Cardiac Rehabilitation Adherence					
Routine	32	31.4	5	4.9	37 (36.3)
Not Routine	61	59.8	4	3.9	65 (63.7)

Descriptive Statistics of Perception and Self-Efficacy

Based on Table 2, most respondents in this study demonstrated high self-efficacy (SE) (91.2%). Respondents with high SE were predominantly female (69.6%), over 56 years old (56.9%), and married (84.3%). Additionally, respondents with higher education (61.8%), those who quit smoking after being diagnosed (55.8%), those with a disease duration of more than six months (76.5%), and those who consistently adhered to medication (85.3%) also exhibited high SE in managing CAD. Furthermore, high SE was also observed among respondents who were unemployed and those who did not regularly attend cardiac rehabilitation programs, accounting for 48.5% and 59.8%, respectively (see Table 1).

Table 2 Descriptive of Self-Efficacy (n=102)

Category	SE Logit	SE Score	Frequency (f)	Percentage (%)
High	≥ 0.0	≥ 11	93	91.2
Low	< 0.0	< 11	9	8.8
Total			102	100

Abbreviation: SE, Standard Error.

https://doi.org/10.2147/PPA.S510692

Based on the Wright map analysis (Figure 1), the most challenging item for respondents to agree with was item no. 10: "If I have heart disease, I might die within ten years", followed by item no. 5: "I am at risk of experiencing a recurrent heart attack in the near future". Conversely, the most straightforward items for respondents to agree with were item no. 15: "When I eat healthily, I am doing something good for myself", item no. 12: "Eating healthy food will reduce my risk of having a recurrent heart attack", and item no. 14: "When I exercise, I do something good for myself".

Table 3 showed that respondents generally had positive perceptions regarding CAD management, with the following mean logit scores: perceived severity (0.494 ± 1.28), perceived susceptibility (−0.961 ± 3.06), perceived barriers (0.261 ± 1.00), perceived benefits (3.68 ± 2.25), cues to action (0.968 ± 1.17), and overall perception (0.544 ± 0.668).

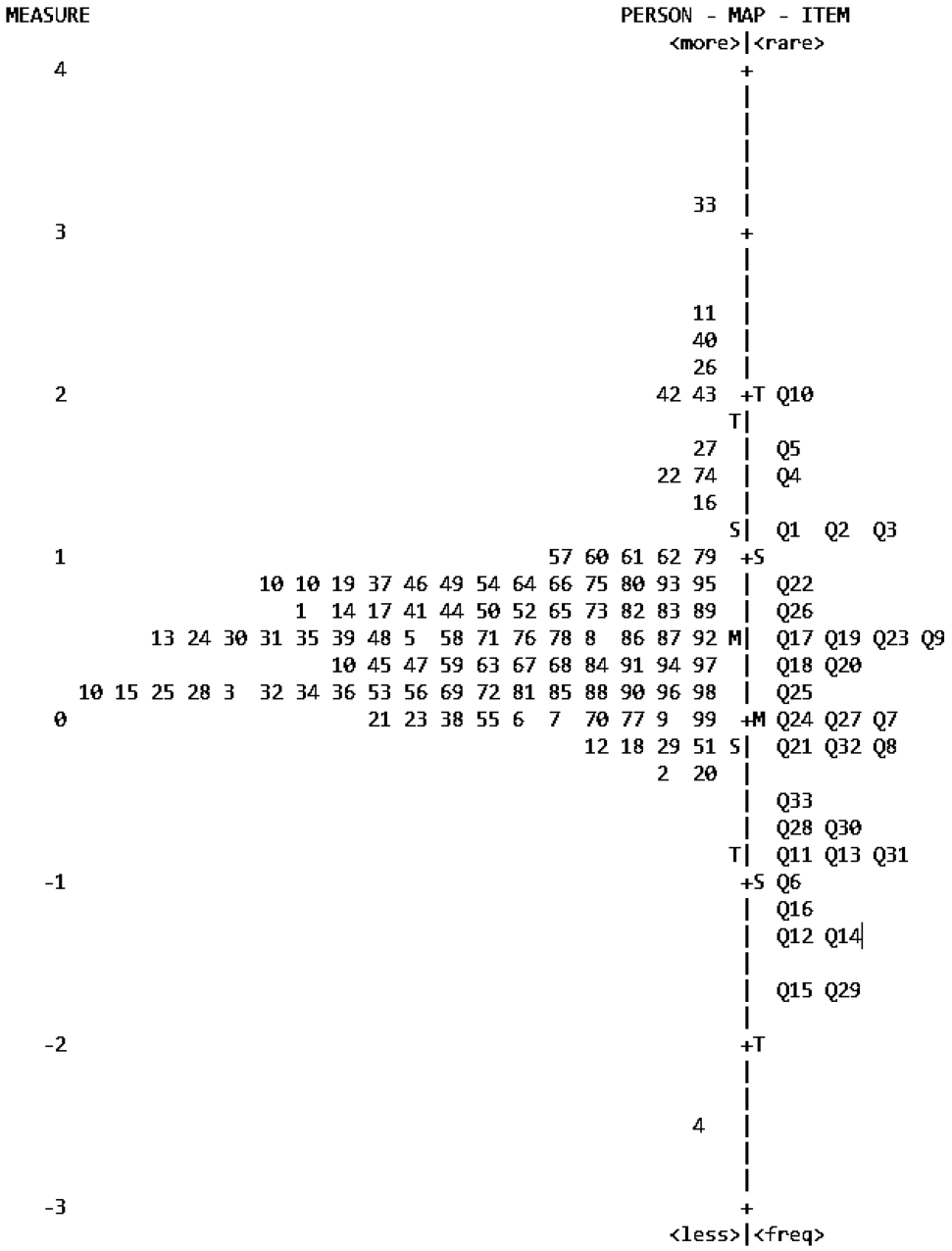

Figure 1 Wrightmap Perceptions, self-efficacy, and cues to action among patients with CAD.

Table 3 Descriptive of Perceptions (n=102)

Category	Mean Logit	SD	Minimum	Maximum
Perceived Severity	0.494	1.28	−3.87	3.69
Perceived Susceptibility	−0.961	3.06	−8.48	4.13
Perceived Barriers	0.261	1.00	−3.07	3.23
Perceived Benefits	3.68	2.25	−2.78	8.73
Cues to Action	0.968	1.17	−2.17	4.48
Perception	0.544	0.668	−2.49	3.25

Relationship Between Perception and Self-Efficacy

Table 4 showed that all perception variables, namely perceived severity (r= 0.949; $p<0.001$), perceived susceptibility (r= 0.877; $p<0.001$), perceived barriers (r= 0.949; $p<0.001$), perceived benefits (r= 0.920; $p<0.001$), cues to action (r= 0.939; $p<0.001$), perception (r= 0.937; $p<0.001$) have a very strong relationship with SE in patients with CHD. In addition, each perception variable also influences each other ($p<0.001$).

The Influence of Perception on Self-Efficacy

Table 5 showed that perceived severity and perceived barriers were the most significant predictors of self-efficacy (Adjusted R^2 = 0.899; Stand. Estimate = 0.949; 95% CI = 0.886–1.01; $p<0.001$), independent of the influence of other predictors.

Table 4 Relationship Between Perception and Self-Efficacy (n=102)

Variable	Pearson Correlation					
	Severity	Susceptibility	Barriers	Benefits	Cues to Action	Perception
Perceived Severity	–	–	–	–	–	–
Perceived Susceptibility	0.957*	–	–	–	–	–
Perceived Barriers	0.928*	0.881*	–	–	–	–
Perceived Benefits	0.953*	0.959*	0.956*	–	–	–
Cues to Action	0.937*	0.903*	0.965*	0.965*	–	–
Perception	0.901*	0.832*	0.971*	0.924*	0.943*	–
Self-Efficacy	0.949*	0.877*	0.949*	0.920*	0.939*	0.937*

Note: Pearson Correlation test with significance $p<0.05$. *$p<0.001$.

Table 5 The Influence of Perception on Self-Efficacy

Predictor	Adjusted R^2	Estimate	SE	*p*-value	Stand. Estimate	95% CI	
						Lower	Upper
Perceived Severity	0.899	1.187	0.0396	<.001	0.949	0.886	1.01
Perceived Susceptibility	0.768	0.459	0.0251	<.001	0.877	0.782	0.973
Perceived Barriers	0.899	1.52	0.0507	<.001	0.949	0.886	1.01

(*Continued*)

Table 5 (Continued).

Predictor	Adjusted R^2	Estimate	SE	*p*-value	Stand. Estimate	95% CI	
						Lower	Upper
Perceived Benefits	0.844	0.656	0.0280	<.001	0.920	0.842	0.998
Cues to Action	0.880	1.284	0.0471	<.001	0.939	0.870	1.01
Perception	0.876	2.250	0.0842	<.001	0.937	0.867	1.01

Note: Simple Linear Regression with significance at $p<0.05$.

Discussion

This study uses the Rasch model approach to examine the influence of perception on SE in patients with CAD. The findings reveal that the majority (91.2%) of respondents demonstrated high SE. This indicates that respondents are confident in their ability to manage symptoms related to CAD. This is evident from the high percentage of respondents with high SE in several aspects of CAD management, such as non-smoking behaviour (85.2%) and adherence to medication regimens (85.3%). However, based on the Wright Map analysis, it was identified that the most challenging aspect for respondents to agree with was the belief in the possibility of dying within the next ten years. In addition, respondents found it difficult to acknowledge the risk of experiencing recurrent heart attacks in the near future (see Figure 1). Difficulty in agreeing with these statements may influence the respondents' choice of responses. For instance, respondents might choose responses that avoid acknowledging risks perceived as threatening, which could, in turn, affect their SE in managing CAD.

Several factors influence the level of SE in patients with CAD. Table 1 shows high SE in respondents who have had the disease for more than 6 months (76.5%). This finding is supported by previous studies which report that the duration of illness in CAD patients is associated with levels of SE.[16] In addition, a previous review highlighted that disease perception, knowledge, and awareness are essential factors that affect SE in patients with CAD.[15]

The results of this study indicate that SE can also be influenced by patients' perceptions (such as perceptions of susceptibility, severity, benefits, barriers, and cues to action), as shown in Table 3 and Figure 1. In general, most respondents have a positive perception of disease management, which supports implementing effective disease management. The positive logit scores of SE evidence this. Furthermore, based on the correlation and simple linear regression tests, all dependent factors/constructs of perception show a relationship and influence on the respondents' SE.

Based on the analysis of each item, Figure 1 demonstrates that all items related to "cues to action" yielded positive results in supporting CAD management. Additionally, respondents' perception of barriers was "slightly high", as evidenced by logit scores slightly above the average logit score (0.0). Respondents generally endorsed the perception of benefits related to CAD management. However, a barrier concerning the lack of knowledge about healthy diet practices emerged as an area that requires attention. Meanwhile, the item related to the perception of susceptibility, specifically the likelihood of experiencing a heart attack in the near future, was most frequently negated. This indicates that respondents perceive themselves to have a low vulnerability to the occurrence of a recurrent heart attack. Similarly, within the severity construct, the perception most commonly rejected was the likelihood of death within ten years after being diagnosed with CAD.

The relationship and influence of all aspects of perception on beliefs (Self-Efficacy, SE) in managing CAD in this study further strengthen the findings of previous studies. Although the direct correlation between perception and SE remains scarce, several concepts can explain the indirect relationship between these two variables. Some studies have successfully identified knowledge as a predictor of SE.[40–42] Other research has identified that a lack of knowledge regarding Acute Coronary Syndrome (ACS) is significantly associated with attitudes, beliefs, and perceptions of disease risk.[43] Risk perceptions related to the disease can be represented by the constructs of susceptibility and severity in this study. Therefore, the findings from these studies indirectly support the results of the current study, suggesting that perception is related to and influences patients' SE in managing CAD.

Another finding of this study is that respondents' perception of susceptibility was categorized as low. This indicates that other factors SE. This is also reflected in the results, which show that the severity aspect indicates a relatively high perception of the seriousness of the disease, along with an excellent perception of the benefits of disease management, including exercise and healthy diet practices (Table S1). These findings contribute to patients' high confidence level in managing their disease despite their suboptimal perception of susceptibility. Conceptually, a high perception of susceptibility can increase an individual's vigilance to prevent worse outcomes.[44]

However, a different pattern was identified in this study. As seen in the Wright map (Figure 1), items related to other perceptions, such as barriers, severity, benefits, and cues to action, were found to be easily agreed upon by respondents, particularly about the perception of benefits (Q11–16) and severity (Q6–8). These findings suggest that the four other perceptions influence high SE, implying that the influence of the other perception constructs may overshadow the low perception of susceptibility. This is further supported by the results of simple regression analysis, which indicate that perceptions of severity and barriers significantly influence SE more than the other perception variables among these perceptual factors.

When considered individually, perceptions of severity and barriers have a more significant influence on patients' beliefs in managing CAD than other perceptions. An individual's awareness of their disease, specifically their perception of severity, can positively impact their confidence in achieving specific skills or their ability to perform self-care activities.[45] Furthermore, previous studies have reported that perceived barriers most frequently influence health-related behaviours, followed by perceptions of susceptibility, benefits, and severity.[46] Patients with a positive perception of their disease tend to have a better ability to engage in activities and behaviours related to SE.[47]

In this study, the perception of barriers showed a "slightly high" result, particularly regarding the lack of access to equipment and facilities for physical exercise. However, the item related to engaging in physical exercise for at least 30 minutes once a week was not considered a barrier by the respondents. Nevertheless, this result did not significantly affect respondents' confidence in performing safe activities and following a low-sodium diet. Other studies have indicated that perceived barriers can predict an individual's physical activity levels,[48] this finding contrasts with our results. This discrepancy may be attributed to the fact that the high barriers in this study were related to the lack of access to equipment for physical activity. However, the requirement for specific exercise facilities was not considered a barrier by the respondents, as routine weekly exercise can be performed without specialized equipment, such as walking. This is also reflected in the high SE related to safe physical activity (Table S1).

Other perceived barriers identified as "higher" were related to knowledge about healthy diets that could prevent recurrence and the lack of time to cook. Both factors, related to a lack of knowledge and time, can certainly influence an individual's belief in their ability to perform certain behaviors. However, in the context of SE, the belief measured was explicitly related to controlling a low-sodium diet. As a result, the barriers related to the two factors mentioned above were not reflected in the SE outcomes of this study. This represents one of the limitations of the research.

Strengths and Limitations

The limitation of this study may have stemmed from the integration of several instruments into a single combined tool: the HBCVD scale, which measured perceived susceptibility, perceived severity, perceived benefits, and perceived barriers; the cues to action from the HBM instrument; and self-efficacy (SE) from the Self-Efficacy Questionnaire for Coronary Heart Disease Management. However, the researcher conducted validity and reliability tests using the Rasch model, which allowed for a more precise measurement of instrument quality by simultaneously testing person and item fit. Another limitation identified by the researcher was that the data did not meet the assumptions required for linear regression analysis. As a result, the researcher employed simple linear regression to assess the individual effects of perception variables on SE. Then, because this study focuses on the influence of perception on SE, the researcher did not indirectly analyze the relationship between patient characteristics and SE. However, we acknowledge that individual characteristics have the potential to shape patient perceptions, so we suggest it as a potential path for future research. Despite these limitations, the study's strength lay in using the Rasch analysis approach, which transformed Likert-scale data into logit data, providing a linear scale with equal intervals and thus ensuring a more valid measurement of perceptions.

Conclusion

This study indicates that perception factors such as perceived severity, perceived susceptibility, perceived barriers, perceived benefits, and cues to action are significantly associated with the self-efficacy of patients with Coronary Artery Disease (CAD) in managing their condition. Most patients exhibited high self-efficacy; however, the perception related to perceived susceptibility needs improvement, as patients need to fully recognize the potential for disease recurrence if management is adequately performed. Therefore, healthcare providers need to address patients' perceptions of disease risk and continuously enhance self-efficacy through regular health education, which could encourage better behavioral changes in managing CAD.

Acknowledgments

All authors would like to thank Padjadjaran University, Bandung, West Java, Indonesia, for facilitating the database and funding this research.

Disclosure

The authors report no conflicts of interest in this work.

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