ISSN: 1607-8322, e-ISSN: 2220-5799 Anaesthesia, Pain & Intensive Care
Vol 29(3); June 2025 DOI: 10.35975/apic.v29i3.2763

ORIGINAL RESEARCH PERIOPERATIVE MEDICINE

'Cardiac Self-Efficacy Scale' and quality of life in the cardiovascular patients in Saudi Arabia

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ABSTRACT

Background & objective: Cardiovascular diseases (CVD) put a significant burden on healthcare resources. Understanding the cardiac self-efficacy of those patients can help develop effective strategies for improving their cardiac self-efficacy and quality of life (QoL). Nevertheless, there is a gap in such research in the region. Consequently, this study aims to evaluate the cardiac self-efficacy scale and QoL in CVD patients in Saudi Arabia.

Methodology: This was an online observational cross-sectional survey conducted in Saudi Arabia in March 2025. Patients diagnosed with CVD and aged 18 years and above living in Saudi Arabia comprised of the study population. A previously validated questionnaire was utilized in this research to examine cardiac self-efficacy among patients with CVD in Saudi Arabia. Multiple logistic regression was used to identify factors affecting cardiac self-efficacy.

Results: A total of 161 patients were involved in this research. The most common CVD reported included diseases due to high blood pressure (29.2%) and other vascular diseases (32.9%). A total of 75 participants (46.58%) felt completely confident in taking their heart medication correctly, while only 13.66% felt same about regularly performing aerobic exercise. Regarding symptom management, 30.43% were very confident they could control shortness of breath with medication, but fewer (17.39%) felt completely confident in controlling chest pain though activity adjustment. Socially, (37, 89%) were very confident in maintain their usual social activities. The mean score of the scale was 44.4 ± 10.69, out of 65. The good level was achieved by 47.2% of the participants. People from Macca (OR = 5.72, 95%CI:1.78-18.45, p =0.003) had higher odds of better cardiac self-efficacy compared to those in Riyadh. Additionally, the people lived in other cities such as Jazan, Najran, and Jouf had higher odds of achieving Cardiac Self-Efficacy Management (OR =8.03, 95% CI: 1.33-48.67, P = 0.02).

Conclusion: This study emphasizes the discrepancy in cardiac self-efficacy among CVD patients in Saudi Arabia, specifically in symptom management, engagement in social and physical activities, and medication adherence. Factors such as demographic characteristics, accessibility to healthcare services, social support, and knowledge among healthcare providers and patients were suggested to result in these disparities. Implanting targeted strategies to enhance cardiac self-efficacy and QoL among CVD patients in Saudi Arabia is required.

Keywords: Cardiovascular diseases; Quality of life; Saudi Arabia; Self-efficacy

Citation: Alnemer KA, Alotaibi AA, Aseeri IM, Aati AO. 'Cardiac Self-Efficacy Scale' and quality of life in the cardiovascular patients in Saudi Arabia. Anaesth. pain intensive care 2025;29(3):478-487.
DOI: 10.35975/apic.v29i3.2763

Received: April 03, 2025; **Revised:** April 06, 2025; **Accepted:** April 17, 2025

1. INTRODUCTION

Cardiovascular diseases (CVD), which encompass many diseases that affect the blood vessels or heart, including sudden cardiac death, heart failure, valvular disease, coronary microvascular disease, coronary artery disease, atherosclerosis, and high blood pressure,[1] put a significant burden on healthcare resources and is the leading cause of death worldwide, accounting for approximately one-third of all deaths worldwide, or more than 20 million deaths.[2-4] CVD is also associated with numerous disabilities.Patients with CVD have a significantly reduced quality of life (QoL) due to physical symptoms such as chest pain, shortness of breath, and fatigue, which in turn negatively impact their social, psychological, and physical health,[5,6] which increases challenges faced by patients, in addition to the treatment challenges.[7]

Cardiac self-efficacy, a specific cardiac scale, measures the confidence of heart disease patients in their ability to perform activities that may be influenced by disease complications and symptoms.[8] A previous study demonstrates that cardiac rehabilitation programs increase cardiac self-efficacy for heart disease patients.[9] Also, levels of participation in these programs and self-care significantly impact patients' outlook and QoL.[10,11] For more positive patients, employing health approaches that motivate them, enable them to follow healthcare providers' recommendations, and increase their ability to manage their emotions can be associated with more reasonable QoL.[12]

CVD is a critical public concern in Saudi Arabia, accounting for more than 45% of all cases of mortality.[13] The prevalence of CVD is predicted to increase due to several factors, such as socioeconomic status, lifestyle changes (e.g., stress, smoking, unhealthy eating habits, and sedentary behavior,[14,15] and urbanization.[16] Thus, understanding the cardiac self-efficacy of those patients can help develop effective strategies for improving their cardiac self-efficacy and QoL. Previous studies examined different aspects related to knowledge, attitude, and practices related to different chronic diseases and complications.[17-21] Nevertheless, there is a gap in such research in the region. Consequently, this study aims to evaluate the cardiac self-efficacy scale and QoL in CVD patients in Saudi Arabia.

2. METHODOLOGY

This is an online observational cross-sectional survey study that was conducted in Saudi Arabia in March 2025. Patients diagnosed with CVD and aged ≥ 18 years living in Saudi Arabia were included in the study population. The study involved both male and female individuals, without any exclusion criteria, based on their sociodemographic characteristics.

2.1. Participants recruitment

Ethical approval for this research was obtained from the Imam Mohammad Ibn Saud Islamic University's institutional review board.

Convenience sampling technique was utilized to invite the study population to participate in the study and complete the questionnaire tool through social media platforms, e.g., X, WhatsApp, Facebook, and Instagram. The patients belonged to different demographic backgrounds. We highlighted the study inclusion criteria in the invitation letter in order to invite only participants who met the inclusion criteria to participate in the research only.

2.2. Questionnaire tool

A previously validated questionnaire was utilized in this research to examine cardiac self-efficacy among patients with CVD in Saudi Arabia.[22] The questionnaire examined demographic characteristics of the participants, e.g., age, gender, residency, marital status, education level, occupation, income, and history of cardiovascular disease. Moreover, the questionnaire examined cardiac self-efficacy management among heart disease patients in terms of confidence in symptom management and daily activities.

2.3. Data analysis

The Statistical Package for the Social Sciences (SPSS) version 29 was utilized to analyze the data. The categorical variables were reported as frequency and percentage, and continuous data was reported as mean and standard deviation (SD).

The cardiac self-efficacy management was assessed by 13 items, each comprising of 5 point Likert scale. The patients' responses were summated and the median = 46 was used as cut off point to perform the logistic regression. The score was then categorized and used as dependent variable, while demographic characteristics were utilized as independent variables in the multiple logistic regression. The findings of the regression analysis were presented as adjusted odds ratio (AOR) with its corresponding 95% confidence interval (CI). The level of significance was defined as $P < 0.05$.

3. RESULTS

A total of 161 patients were involved in this research. The majority of participants were male (77.6%), while females represented 22.4%. The most common age group is 50-59 years (33.5%), followed by 40-49 years (28.0%) and 60 years and older (28.0%). Regarding marital status, most participants were married (88.8%), while only 9 participants were single, 6 were divorced, and 3 were widowed. In terms of education level, 41.6% held a university degree, 28.6% completed high

school. The largest group iwa retired individuals (43.5%), followed by government employees (26.7%) and private sector employees (11.2%). The most common cardiovascular diseases reported include diseases due to high blood pressure (29.2%) and other vascular diseases (32.9%). Additional details regarding the demographic characteristics are provided in Table 1.

A total of 75 participants (46.58%) felt completely confident in taking their heart medication correctly, while only 22 (13.66%) felt same abut regularly performing aerobic exercise. Regarding symptom management, 49 (30.43%) were very confident they could control shortness of breath with medication, but fewer (28,17.39%) felt completely confident in controlling chest pain though activity adjustment. Socially, 61 (37, 89%) were very confident in maintain their usual social activities. These findings highlight areas where patient may need additional support in self-management.

The scale consists of 13 items to assess cardiac self-efficacy management among heart disease patients, the mean score of the scale was 44.4 ± 10.69, out of 65. The good level was achieved by 76 participants (47.2%). The below table showed the factors that influence the score level. In details, people from Macca (OR = 5.72, 95%CI:1.78-18.45, p =0.003) had higher odds of better cardiac self-efficacy compared to those in Riyadh. Additionally, the people lived in other cities such as Jazan, Najran, and Jouf had higher odd of achieving and cardiac self-efficacy management (OR =8.03, 95% CI: 1.33-48.67, P = 0.02). Additional details about the factors affecting the scale are provided in Table 3.

Table 1: The demographic characteristics of the participants

Demographic characteristics		Frequency	Percentage
Age	21-29	1	0.6%
	30-39	16	9.9%
	40-49	45	28.0%
	50-59	54	33.5%
	60-	45	28.0%
Gender	Male	125	77.6%
	Female	36	22.4%
Residency	Riyadh	63	39.1%
	Macca	28	17.4%
	Madina	9	5.6%
	Qasim	16	9.9%
	Sharqiya	20	12.4%
	Aseer	6	3.7%
	Tabouk	4	2.5%
	Hail	4	2.5%
	North	2	1.2%
	Jazan	3	1.9%
	Najran	4	2.5%
	Jouf	2	1.2%
Marital status	Single	9	5.6%
	Married	143	88.8%
	Divorced	6	3.7%
	Widowed	3	1.9%
Education level	Less than High school	16	9.9%
	High school	46	28.6%
	Diploma	18	11.2%
	University Degree	67	41.6%
	Post Grad	14	8.7%
Occupation	Government employee	43	26.7%
	Private sector	18	11.2%
	Retired	70	43.5%
	Self-employed	5	3.1%
	House wife	18	11.2%
	Unemployed	7	4.3%
Income	Less than 5000	30	18.6%
	5000-10000	41	25.5%
	10000-15000	33	20.5%
	>15000	57	35.4%
History of cardiovascular disease	Coronary artery disease	23	14.3%
	Heart Failure	3	1.9%
	Angina	7	4.3%
	MI	7	4.3%
	Disease due to high	47	29.2%
	Other vascular	53	32.9%
	Others	21	13.0%

4. DISCUSSION

Adherence to recommended CVD treatment and lifestyle modifications can diminish the rate of disease progression.[23]

This treatment typically involves medication[24,25] and lifestyle modifications (including physical exercise). Lifestyle modifications can treat CVD or reduce the risk of developing it if CVD is not present.[26] Our study found that 75 participants (46.58%) felt fully confident in taking their heart medication correctly, while only 22 (13.66%) felt the same about regularly performing

Table 2: Cardiac self-efficacy management among heart disease patients: confidence in symptom management and daily activities

Statement	Not confident	Slightly Confident	Somewhat Confident	Very Confident	Completely Confident
How confident are you that you can control chest pain by adjusting your activity level?	17 (10.56)	35 (21.74)	47 (29.19)	34 (21.12)	28 (17.39)
How confident are you that you can control shortness of breath by adjusting your activity level?	18 (11.18)	34 (21.12)	52 (32.30)	38 (23.60)	19 (11.80)
How confident are you that you can control chest pain by taking your medication?	9 (5.59)	14 (8.70)	44 (27.33)	49 (30.43)	45 (27.95)
How confident are you that you can control shortness of breath by taking your medication?	10 (6.21)	17 (10.56)	41 (25.47)	44 (27.33)	49 (30.43)
How confident are you that you can recognize when you need to call or visit a doctor regarding your heart condition?	11 (6.83)	24 (14.91)	42 (26.09)	46 (28.57)	38 (23.60)
How confident are you that you can effectively communicate your heart-related concerns to your doctor?	8 (4.97)	34 (21.12)	41 (25.47)	46 (28.57)	32 (19.88)
How confident are you that you can correctly take the heart medications prescribed to you?	2 (1.24)	16 (9.94)	19 (11.80)	49 (30.43)	75 (46.58)
How confident are you that you can determine the right amount of physical activity that is beneficial for you?	10 (6.21)	26 (16.15)	41 (25.47)	50 (31.06)	34 (21.12)
How confident are you that you can maintain your usual social activities?	9 (5.59)	21 (13.04)	39 (24.22)	61 (37.89)	31 (19.25)
How confident are you that you can maintain your usual activities at home with your family?	7 (4.35)	13 (8.07)	40 (24.84)	57 (35.40)	44 (27.33)
How confident are you that you can maintain your usual activities with others?	7 (4.35)	20 (12.42)	50 (31.06)	53 (32.92)	31 (19.25)
If you are married, how confident are you that you can maintain intimacy?	14 (8.69)	31(19.25)	40 (24.84)	28 (17.39)	33 (20.49)
How confident are you that you can regularly perform aerobic exercises (exercises that cause sweating and increase heart rate)?	27 (16.77)	40 (24.84)	44 (27.33)	28 (17.39)	22 (13.66)

Data presented as n (%)

aerobic exercise. Patients' confidence in healthcare tasks reflects their self-efficacy in managing this disease.[27-29] Thus, our findings suggest a disparity in cardiac self-efficacy among CVD patients regarding medication and aerobic exercise. Although cardiac self-efficacy regarding medication appeared higher than for aerobic exercise, it is still not sufficient because less than half of the patients felt entirely confident in taking their heart medication correctly.

Table 3: Multiple logistic regression: factors affecting the cardiac self-efficacy management

Variables		OR (95% CI)	P-value
Age	21-29	Reference	
	30-39	2.13 (0.46−9.86)	0.334
	40-49	1.68 (0.32−8.80)	0.539
	50-59	4.20 (0.65−27.24)	0.132
Gender	Male	Reference	
	Female	0.33 (0.07−1.48)	0.148
Marital status	Single	Reference	
	Married	0.80 (0.13−4.98)	0.812
	Divorced	1.38 (0.07−25.93)	0.831
	Widowed	1.49 (0.06−37.05)	0.808
Education level	Less than high school	Reference	
	High school	1.70 (0.34−8.38)	0.517
	Diploma	1.63 (0.23−11.81)	0.627
	University	2.16 (0.40−11.55)	0.368
	Postgraduate	1.91 (0.23−15.90)	0.551
Occupation	Government employee	Reference	
	Private sector	1.64 (0.37−7.37)	0.519
	Retired	0.97 (0.26-3.58)	0.966
	Self-employed	1.17 (0.09−14.62)	0.901
	House wife	1.49 (0.18−12.15)	0.709
	Unemployed	0.32 (0.02−5.51)	0.435
Income	Less than 5000	Reference	
	5000-10000	1.37 (0.31−6.00)	0.674
	10000−20000	2.44 (0.41−14.48)	0.328
	20000−	3.10 (0.57−16.77)	0.189
Heart diseases	Coronary artery	Reference	
	Heart failure	0.00 (0.00−0.00)	0.999
	Angina	0.59 (0.07−5.07)	0.634
	MI	0.21 (0.03−1.78)	0.153
	heart disease due to	0.66 (0.19−2.28)	0.507
	Other vascular	0.80 (0.25−2.57)	0.706
	Others	0.73 (0.17−3.18)	0.673
Residency	Riyadh	Reference	
	Macca	5.72 (1.78−18.45)	0.003
	Medina	6.26 (1.08−36.41)	0.041
	Qasim	5.19 (1.21−22.24)	0.027
	Sharqiyah	2.16 (0.60−7.71)	0.237
	Aseer	4.88 (0.58−40.88)	0.144
	Tabuk	9.92 (0.69−142.39)	0.091
	Hail	1.08 (0.08−13.76)	0.955
	Other	8.03 (1.33−48.67)	0.023

Data presented as Odd's Ratio (95% Confidence Interval); P < 0.05 considered significant

In line with our results, a previous investigation has demonstrated that medication-related self-care differs from other behaviors, including physical activity, among patients with chronic diseases, as most of their participants adhered to medication but neglected physical activity.[30] Several factors could contribute to low levels of cardiac self-efficacy regarding physical activity, more than medication. Firstly, the level of education and support required to implement non-pharmacological interventions is higher than that of pharmacological interventions.[31] Secondly, there is a significantly high prevalence of kinesiophobia among cardiac patients.[32] Besides, some physicians lack sufficient details about physical activity and exercise recommendations. Previous studies have found that 75% of internal medicine residents[33] and 88% of primary care physicians [34] lack comprehensive knowledge of the recommendations or benefits of exercise. Moreover, cardiac patients' view on life influences their confidence in following their physician's recommendations and controlling their feelings; the more positive their view, the greater their confidence and QoL.[12]

Still, there is a requirement to increase cardiac self-efficacy regarding medication and exercise. High self-management of CVD medication adherence is associated with optimal health outcomes. [35] Prior studies have indicated that medication adherence between patients improves their productivity, survival, and QoL[36,37] by reducing hospital admissions and controlling disease symptoms.[38,39] Likewise, regular exercise (based on recommendations) plays a significant role in CVD prevention and treatment.[26,40] Multiple approaches may aid in enhancing cardiac self-efficacy regarding medication and exercise, that's including preventive measures for kinesiophobia in cardiac patients, [32] educational programs to raise awareness about the benefits and necessity of medication adherence,[41] smartphone applications that provide exercise and physical activity recommendations,[42] and training programs that provide physicians with up-to-date information about exercise and physical activity recommendations.

In this study, regarding symptom management, 49 (30.43%) were very confident they could control shortness of breath with medication, but fewer (28,17.39%) felt entirely confident in controlling chest pain through activity adjustment. These findings support our suggestion regarding the disparity in cardiac self-efficacy among CVD patients regarding medication and activity adjustment. Nevertheless, both require enhancement. Our findings may also indicate that 30.43% of patients have a good knowledge of shortness of breath management, and 17.39% have a good understanding of managing chest pain. This is consistent with the results of previous research, which highlighted that the most effective strategies for managing shortness of breath include using medications, preserving air circulation, staying in a comfortable situation, and inhaling oxygen.[43] Also, an earlier study found that physical training for patients with normal coronary arteries who experience chest pain aids in delaying exertional pain onset, improving endothelial function, and enhancing pain threshold.[44]

In addition, the above findings also imply a lower level of cardiac self-efficacy regarding symptom management among most CVD patients in Saudi Arabia, which will be associated with inadequate treatment adherence and subsequent poor QoL. It will establish that adherence to cardiac treatment, whether medication or managing various aspects of life, including physical, reflects self-efficacy.[45,46] Moreover, even if patients adhere to treatment and recommendations, the deficiency of self-efficacy may lead to individuals not effectively following them. A previous study highlighted that even if people can do something, they will not perform it effectively if they lack the self-efficacy to do it.[47] The interventions mentioned before, such as educational awareness programs and mobile applications, can increase patients' self-efficacy and improve their QoL. Finally, although encouraging physical activity early in chronic disease is significant for maintaining patient health and preventing shortness of breath,[31] strenuous physical activity can increase the risk of sudden cardiac death and acute myocardial infarction for some patients.[48-50] Therefore, patients should be attentive and follow physical activity recommendations carefully.

Socially, 61 (37, 89%) of the current study participants were very confident in maintaining their usual social activities, which may indicate good cardiac self-efficacy and QoL for those CVD patients. Our indication is consistent with the findings of an earlier descriptive study conducted in Indonesia, where approximately 95% of individuals with a history of CVD had a good QoL based on several aspects, including social relationships.[51] Another previous study declared that self-efficacy in CVD patients is a measure of social and other functioning.[45] CVD is associated with psychological and physical symptoms such as chest pain, shortness of breath, depression, insomnia, edema, and fatigue.[52] These symptoms can hinder the patient's ability to perform social and physical activities, negatively impacting their QoL.[53] Research indicates that community, friends, and family support are crucial for the recovery and general well-being of patients with CVD.[54] Likewise, a previous systematic review documented improved outcomes for patients with heart disease, both psychologically and in meeting their necessities, due to enhanced social health.[55] Numerous studies have reported that social participation, especially among older adults,[56] is associated with considerable positive outcomes such as functional capacity,[57] QoL,[58,59] self-related health,[60] and longevity.[61] However, loneliness, social isolation, and weak social relationships exacerbate the consequences of CVD.[62,63] Therefore, awareness programs may enhance the QoL for patients who are not confident in their ability to maintain their usual social activities (11% of our participants). Also, healthcare providers must ensure that those who are optimistic will preserve their regular social activities and will do so.

Another finding is that the mean cardiac self-efficacy score was 44.4 ± 10.69 out of 65, with 76 participants (47.2%) achieving a "good" level. These indicate the moderation of cardiac self-efficacy among the participants in our study.Also, increased cardiac self-efficacy among CVD patients in the region is required since less than half of the participants have a "good" level. These results are consistent with our other findings about low patient confidence in medications and exercise. The level of cardiac self-efficacy may have been lower if the patients had not been confident in continuing their social activities. Self-efficacy is associated with better QoL for CVD patients, as it helps patients adopt positive health behaviors by increasing their self-confidence.[64] However, individuals with low self-efficacy have poor QoL because they easily give up when faced with challenges, adopt a negative attitude, and do not actively participate in their treatment.[65] In addition, our findings underscore variation in cardiac self-efficacy among CVD patients. The variation in self-efficacy among heart disease patients is due to several aspects, including psychological factors, medical history, health behaviors, environmental factors, awareness and knowledge of the disease, health perception, and demographic characteristics.[66] For example, in Nepal, health behaviors and age were the most influential factors on cardiac self-efficacy, and the risk of low cardiac self-efficacy was higher for individuals with poor health behavior.[67] Hence, all these factors must be considered when developing interventions to increase cardiac self-efficacy. Cardiac self-efficacy can increase through appropriate patient care, early diagnosis and screening, increased awareness of cardiac disease, and motivational and educational programs.[64,67] In line with these, previous studies have documented improved cardiac self-efficacy after increased cardiac knowledge.[68-70]

In this study, we identified that people from Macca (OR = 5.72, 95%CI:1.78-18.45, p =0.003) had higher odds of better cardiac self-efficacy than those in Riyadh. Additionally, the people who lived in other cities, such as Jazan, Najran, and Jouf, had higher odds of achieving cardiac self-efficacy management (OR =8.03, 95% CI: 1.33-48.67, P = 0.02). These discrepancies could be attributed to psychological and environmental factors and demographic characteristics, which were reported to be significantly associated with cardiac self-efficacy level, as mentioned earlier. There are several possible alternative explanations for these results, such as the limited availability of cardiac rehabilitation programs in some locations in Saudi Arabia; these programs face numerous challenges, including the qualifications of medical and nursing staff, capacity, and accessibility.[71] Besides, the health gap between rural and urban communities in Saudi Arabia is noticeable in several aspects, such as disease rates, dietary habits, CVD risk factors, physical activity, education, economic, demographic, and social factors.[13,72] Therefore, implemented awareness, educational programs, and targeted strategies may assist in ensuring that health services are equitably provided to patients while considering the differences between cities and all related risk factors.[72,73]

5. CONCLUSION

This study emphasizes the discrepancy in cardiac self-efficacy among CVD patients in Saudi Arabia, specifically in symptom management, engagement in social and physical activities, and medication adherence. Geographic differences were also reported. Factors such as demographic characteristics, accessibility to health care services, social support, and knowledge among health care providers and patients were suggested to result in these disparities. However, cardiac self-efficacy and QoL appeared to be moderate among those patients. Implanting targeted strategies to enhance cardiac self-efficacy and QoL among CVD patients in Saudi Arabia is required.

6. Data availability

The numerical data generated during this research is available with the authors.

7. Conflict of interest

All authors declare that there was no conflict of interest.

8. Funding

The study utilized the hospital resources only, and no external or industry funding was involved.

9. Authors' contribution

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