

Self-care needs of patients with coronary heart disease in Islamabad, Pakistan: cohort study protocol

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ABSTRACT

Introduction Coronary heart disease (CHD) is a leading cause of mortality affecting millions of people worldwide. The prevalence and incidence of CHD are increasing due to traditional and emerging risk factors. Despite advancements in CHD management, improving patient outcomes remains a challenge. Self-care practices can improve patient outcomes. This paper summarises a longitudinal cohort protocol to investigate self-care needs, determinants and outcomes in patients with CHD.

Methods and analysis This study employed a prospective longitudinal cohort design and will be conducted in a tertiary care hospital in Islamabad during 1 May 2024 to 30 December 2024. A total of 354 patients with confirmed CHD will be enrolled. Data collection will occur at baseline and 3 months later, employing validated instruments to measure self-care, self-efficacy, anxiety, depression and comorbidities. This study will examine person-related factors (age, sex and education), problem-related factors (comorbidities, anxiety and depression) and environment-related factors (residence, religious engagement and resources). The outcomes are hospital readmissions, emergency department visits and unscheduled clinic visits. To estimate the self-care predictors on outcomes, the following data analysis will be conducted: descriptive statistics and logistic regression.

Ethics and dissemination The study was approved by the institutional review board and the ethics committee of Shifa International Hospital, Islamabad. Permission was obtained from the department head. Informed consent will be taken from patients. Participation in the study will be voluntary. The data will be collected anonymously. The results of this study will be disseminated through presentations at national and international conferences, peer-reviewed manuscripts and digital social media platforms.

INTRODUCTION

Coronary heart disease (CHD) is a prominent global cause of mortality, contributing to approximately nine million deaths annually. This condition significantly affects the lives of approximately 126 million individuals worldwide.^{1 2} The incidence of CHD is rising due to an epidemiological transition in many global regions, including the

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Coronary heart disease (CHD) is a threat to public health.
- ⇒ Traditional and emerging risk factors complicate CHD management.
- ⇒ Self-care can improve patient outcomes.

WHAT THIS STUDY ADDS

- ⇒ This study will use demographic, clinical and self-care variables to predict hospital re-admissions, emergency department visits, and unscheduled clinic visits. These findings will build on existing theory of self-care.
- ⇒ The independent variables are based on self-care determinants (person, problem and environment), self-care self-efficacy as moderator, self-care process (maintenance, monitoring, management) and are expected to predict outcomes.
- ⇒ Analysis is driven by assumptions of self-care theory.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Clinicians can use results from this study to tailor CHD management while considering specific needs and determinants of patients.
- ⇒ Policymakers can implement comprehensive and globally aligned population strategies to reduce inequalities, promote healthy lifestyles and improve access to cardiovascular care.
- ⇒ Researchers can use results to design patient-centred interventional studies.

Eastern Mediterranean, leading to a higher prevalence of risk factors, such as tobacco use, hypertension, hypercholesterolaemia, physical inactivity, obesity, diabetes and metabolic syndrome.³ Considering these alarming trends, CHD poses a significant and persistent threat to sustainable development in the present era and foreseeable future.⁴ Moreover, individuals living with non-fatal CHD often grapple with diminished quality of life and the burden of chronic frailty.⁵ The Global Burden of Diseases (GBDs), Injuries and Risk Factors Study database reports that more than 60 million people in Europe live with

cardiovascular disease (CVD) and almost 13 million new cases are diagnosed each year.⁶ The highest prevalence of new CHD cases has been reported in Central and Eastern Europe. In addition, Western Europe continues to show an increasing prevalence, which is substantially higher than that of South Asia and the rest of the world.² According to the Centers for Disease Control and Prevention, one person dies of CVD every 33 seconds,⁷ and the American Heart Association predicts that an American will have a myocardial infarction (MI) every 40 seconds in the USA, which is a leading killer among men.⁸

CHD poses a substantial global burden, with low-income and middle-income countries facing this challenge. These countries account for over three-quarters of the worldwide CHD burden,⁹ resulting in nearly 7 million deaths and 129 million disability-adjusted life-years.¹⁰⁻¹¹ Survivors of acute myocardial infarction (AMI) face an increased risk of recurrent infarctions, with annual mortality rates five to six times higher and a greater mortality risk.¹²⁻¹⁴ The pattern of CHD prevalence and its associated death rates differs markedly between high-income countries and low-income and middle-income countries.¹⁵ Global estimates from the WHO report the highest number of deaths from CVD in China, India, Russia, Ukraine, the USA, Brazil, Pakistan, Japan and Indonesia. The lowest number of deaths occurred in Suriname, Guyana, Iceland, Gabon, Bhutan, Fiji and Guinea.¹⁶ The GBD study reported that high blood pressure is a major contributor to CVDs, followed by high low-density lipoprotein cholesterol, high fasting plasma glucose, air pollution, high body mass index (BMI), tobacco use, kidney dysfunction, high sodium intake, lead exposure, physical inactivity and alcohol

consumption.^{16,17} As we delve into the multifaceted landscape of CHD, reducing its burden is a formidable and multifaceted challenge.

Despite significant advancements in the management of CHD, challenges persist in improving patient prognosis and enhancing quality of life. Nursing has advocated the potential of self-care to improve quality of life, prognosis and mortality rates in individuals with chronic diseases.¹⁸⁻²¹

Extensive research has been conducted on various management approaches for chronic conditions including heart failure,²² diabetes mellitus,²³ chronic obstructive pulmonary disease²⁴ and stroke.²⁵ However, how people adopt CHD and engage in self-care requires further research. A state-of-the-art review underscores the importance of using a multifaceted dynamic approach in the care of patients with CHD.²⁶ Over the past 5 years, there has been a notable surge in the volume of literature delving into the impact of factors such as specific health issues, individual characteristics and environment on self-care.¹⁸ In this context, this protocol was developed based on the recently updated situation-specific theory¹⁸ to contribute to the growing body of knowledge on self-care practices for patients with CHD, shedding light on the unique dynamics and opportunities in this critical area of healthcare.

Framework

The foundation of this framework (figure 1) is based on middle range and situation-specific theories. A recent update of this theory accentuates the dynamics between person, problem and environment.¹⁸

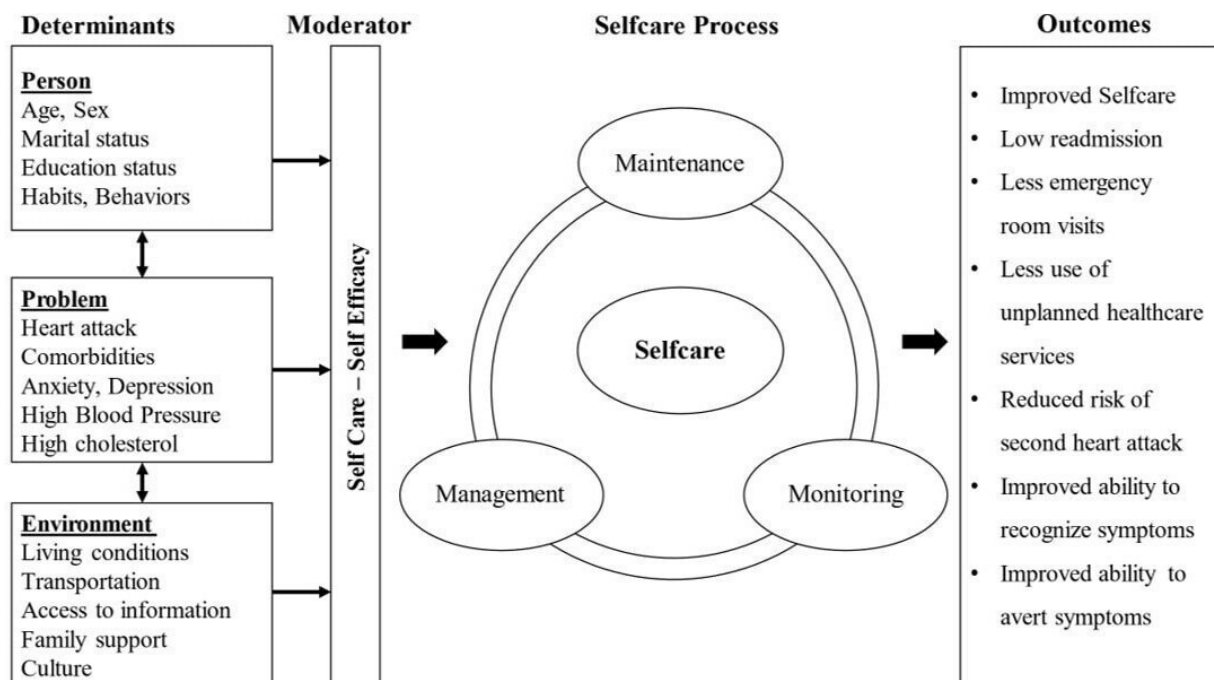


Figure 1 Self-care framework for coronary heart disease patients.

Person

This model emphasises the importance of individual self-care characteristics, as age influences self-care behaviours. Older individuals may face challenges owing to age-related physical limitations and cognitive abilities that affect self-care activities and decision making.¹⁸ A recent review highlighted the importance of the conscious choice to participate in self-care.^{18 27}

Symptoms and personal values heavily influence decision-making. Recognising the life-threatening symptoms of CHD can prompt help-seeking actions.¹⁸ Education significantly influenced self-care behaviours. Higher education level was associated with better self-care outcomes. However, lower education does not necessarily hinder effective self-care if individuals possess strong cognitive abilities, experience in managing their condition and fewer additional health issues.^{28 29} Sex is linked to CHD³⁰ and may be a significant factor in predicting self-care behaviours. Heart disease commonly occurs in men at a younger age than in women.² However, a higher prevalence has been reported in women in Pakistan³¹ and Europe.³² Sex roles and societal expectations can influence lifestyle choices that contribute to self-care in patients with CHD. A meta-analysis reported that active involvement in religious and spiritual practices decreased CHD risk.³³ Religion can also be a driving force behind self-care behaviours. Some people turn to faith and prayer for healing, whereas others actively participate in religious activities as a part of their regular self-care regimens.

Problem

In this model, we examined individuals with CHD, which has been confirmed through hospitalisation and typically involves coronary angiography and cardiac markers such as Troponin and Creatine kinase-MB. However, it is important to recognise that a person's real-life experiences with this condition can vary and that it is often perceived as life-threatening. Individuals with CHD often present with complex problems, including multiple comorbidities that can affect quality of life, making it a challenging endeavour to care for oneself.³⁴ The burden of self-care can become particularly pronounced in cases where individuals with CHD contend with coexisting health conditions. Managing symptoms can be particularly daunting due to the intricacies of health problems. The updated self-care theory places a significant emphasis on the connection between symptom recognition and management, acknowledging that overlapping symptoms further compounded the challenges associated with self-care.¹⁸

Environment

Living conditions contribute to lifestyle choices and psychosocial resources within social groups.³⁵ Accessing healthcare in rural areas is a concern, especially in emergencies, such as cardiac events, where time is crucial to reach the hospital to benefit from treatment decisions,

such as thrombolysis.³⁶ Therefore, transportation can affect the treatment and self-care activities.

Family support is essential for individuals seeking treatment.³⁷ Family members often provide unpaid care to patients and assist them with self-care. This support is typically seen as a family obligation, with patients relying on their relatives during illness. Aligning self-care with patient values can enhance their motivation and engagement in these activities.³⁷ One study found that shared racial and cultural backgrounds influenced the positive uptake of self-care behaviours. However, cultural differences that diminish trust and lack cultural sensitivity can make self-care more challenging.³⁸ Patients may have indigenous ways to manage their health. For instance, people may pray, visit shrines, or seek help from indigenous people or spiritual healers.

Self-care outcomes

Studies on self-care outcomes in CHD remain limited and little research has been conducted in this area in Pakistan. Pakistan and other countries in these regions have high CVD prevalence and mortality rates.^{16 39} Furthermore, inadequate manpower preparation, inadequate health and a lack of scientific literacy also exist. The dynamic relationships between the mediators and moderators of self-care play a significant role in predicting these outcomes. In the context of effective self-care for CHD, patients are assumed to experience event-free survival.¹⁸ Effective self-care offers multiple benefits, including reduction of risks associated with a second MI, lower readmission rates, decreased mortality rates, reduction in unplanned healthcare service utilisation and prevention of symptom exacerbation.⁴⁰ Conversely, ineffective self-care can lead to adverse consequences such as recurrent MI, increased economic burden and worsening of illness.

Objectives

In patients with CHD to:

- ▶ Describe self-care behaviours pertaining to self-care monitoring, self-care maintenance and self-care management.
- ▶ Identify person, problem and environment-related determinants of self-care.
- ▶ Estimate if self-care, sociodemographic and clinical variables predict hospital readmissions, emergency department visits and unscheduled clinic visits.

METHODS AND ANALYSIS

Design

This study used a longitudinal cohort design. Using this approach, the patients can be tracked over time. A recent study revealed that recurrent MI can occur within 2 weeks after acute MI, and unfortunately, 50% of individuals who experience this second event do not survive beyond 5 years.⁴¹

Table 1 Sample size determination

Outcome variables	CI %	Sample	Attrition 20%	Final sample	
Self-care ⁵⁵	56%	95	107	21	128
Readmission (90 days) ⁵⁶	27.5%	95	295	59	354
Unplanned use of healthcare services (emergency department visits)	50%	95	107	21	128
Averting worsening symptoms ⁵⁷	72%	95	55	11	66

Study settings

This study will be conducted in the cardiac department of a tertiary hospital in Islamabad from 1 May 2024 to 30 December 2024. The private teaching hospital is a renowned internationally accredited tertiary care facility with 32 dedicated cardiac beds. It boasts a dedicated cardiac department, cardiac unit, coronary care unit and state-of-the-art cardiac catheterisation laboratory.

Patients

Patients admitted to the hospital with confirmed CHD will be invited to participate in the study.

Sample size

The sample size was determined for each outcome measure. We employed a method based on a standardised width of the CI.⁴² This technique allows for precise estimation of proportions with CIs. The required sample size must consider factors such as the desired confidence level, expected variability in the data and the desired level of precision for the estimates to draw reliable conclusions. The calculations yielded a target sample size of 354 patients (table 1). This number was deemed to be sufficient to meet the objectives of this study.

Sampling

Consecutive sampling will be used to recruit patients for the study. Patients meeting two of the three criteria (chest pain, enzyme changes and ECG changes) will be invited to participate in the study. To be eligible, the patient must be 18 years old and have received a confirmed diagnosis of CHD. Patients will be excluded if they are in an unstable clinical condition at the time of enrolment or if they cannot understand spoken Urdu.

Data collection

Patients will be enrolled during hospitalisation. Data will be collected during face-to-face interviews with the patients in Urdu. Data will be collected face-to-face at baseline (T0) and 3 months later (T1) via telephone calls. The primary healthcare team will be informed if a life-threatening abnormal finding is recorded.

Measures

Person-related measures

Person-related measures will be obtained from the recommendations of self-care research⁴³ age, sex, BMI, marital status, family type, employment status, income, nature of employment (active/sedentary), and lifestyle habits will be assessed. Self-care, as a core measure will be assessed

using the Self-Care of Coronary Heart Disease Inventory (SC-CHDI).⁴⁴ This instrument contains three subscales, namely self-care maintenance (nine items) that measures the frequency of actions focused on maintaining CHD stability (eg, keeping medical appointments). The self-care monitoring section consisted of eight items that monitored the signs and symptoms of CHD (eg, blood pressure). The self-care management section comprises (six items) that aimed to reduce symptoms (eg, changing the activity level). Each item is rated on a 5-point Likert scale. Each SC-CHDI scale has a standardised score of 0–100, with higher scores indicating better self-care. The SC-CHDI had Cronbach's alpha reliability scores ranging between 0.76 and 0.87 in a sample of American patients diagnosed with stable CHD.⁴⁴

The self-efficacy of a patient as a strong mediator of self-care will be measured with the Self-Care Self-Efficacy Scale (SC-SES).⁴⁵ The SES is comprised of the 10 items. Each item on the scale was rated 1=not confident and 5=extremely confident. It is recommended that the scale score be standardised from 0 to 100, with higher scores indicating higher self-efficacy.

Problem-related measures

Situation-related contributors will be measured using the Generalised Anxiety Disorder (GAD) screener-7⁴⁶ and Patient Health Questionnaire (PHQ).⁴⁷ The GAD Screener will be used to evaluate anxiety. The instrument comprises seven items rated on a Likert scale from 0 to 3, with a total score ranging from 0 to 21, with higher scores indicating higher anxiety levels. The instrument had an adequate reliability score of 0.88.⁴⁸ The PHQ-9 is recommended for screening for depressive symptoms in patients with CVD.⁴⁹ The PHQ-9 contains nine items rated on a 4-point Likert scale, with scores ranging from 0 to 21. Higher scores indicate higher levels of depressive symptoms. A previous study reported a Cronbach's alpha 0.89 value.⁴⁷

The comorbidity and multimorbidity of patients will be measured using the Charlson Comorbidity Index (CCI),⁵⁰ which allocates scores to 19 diseases according to their severity. The total score ranges from 0 to 37, with higher scores indicating more severe comorbidities. The predictive value of the CCI was high in patients with CHD.⁵¹ Problem-related measures, including lipid profile, cardiac marker level, angiography report, blood pressure, discharge summary for take-home medications and instructions, will also be recorded.

Environment-related measure

Environment-related measures will be taken from the recommendations of self-care research⁴³ that include residence, engagement in religious activities, resources for self-care (blood pressure and weight monitoring), mode of travel to access the hospital and distance from the hospital.

Self-care outcomes measures

The outcomes of the proposed model will be measured using readministration of SC-SES. The improvement in scores determines the improvement in self-care and self-care efficacy. Other outcomes will be measured using a checklist of hospital readmissions, emergency department visits and unscheduled clinic visits.

Planned data analysis

All quantitative information obtained from the instruments will be recorded using the SPSS V.27.0. Data will be screened for missing values, extreme outliers and normality distributions. Data within a skewness range of 0 ± 2 is to be determined as normally distributed.

Sociodemographic information (ie, categorical) will be reported as proportions, frequency and percentage, and continuous variables with mean and SD.

Analysis is planned for each objective, as follows. For the first objective, the SC-SES and CHDI subscale scores for maintenance, monitoring and management will be calculated and standardised on a scale of 0–100. A score ≥ 70 was considered as adequate.⁵²

For the second objective, the proportions of self-care determinants, including person (sex, education, marital status, cigarette smoking, etc), score of problem (comorbidities, anxiety, depression), and proportions of environment (residence, resources)-related variables will be reported. Categorical variables will be analysed using Spearman's r , and continuous variables with Pearson's r values will be reported. ORs with 95% CI will be determined using a logistic regression analysis to examine self-care determinants.

For the third objective, an analysis is planned to test the mediating effect of self-care efficacy on comorbidities. This analysis will be implemented using structural equation modelling to assess the fit with related fit indices.⁵³ Bivariate correlation analysis will be employed between self-care efficacy, comorbidity index, anxiety, depression, CHDI subscales and BMI will be determined. Linear regression will be proceeded with for correlation coefficient 0.40 and higher.

For the fourth objective, logistic regression analysis will be used to assess which independent variables are determinants of the following outcomes: hospital readmission, unscheduled clinic visits, emergency department visits, symptom recognition and symptom aversion.

Ethics and dissemination

The research protocol was approved by the Institutional Review Board and Ethics Committee of Shifa

International Hospital, Islamabad (IRB #126-24). This study will be conducted in accordance with the principles of the Declaration of Helsinki.⁵⁴ Permission was obtained from each department head and institutional director. An information sheet will be shared, with brief information regarding the study, objectives, significance of the study and informed consent with patients. On consent, data will be collected from patients. Data will be collected and analysed anonymously.

Patient and public involvement

The study design did not initially include direct input from patients or members of the public. However, recognising the importance of patient perspectives, the research team adjusted to accommodate the patient preferences. These modifications included altering the data collection schedule and refining the language used for certain study items. This adaptive approach demonstrates a commitment to patient-centred research, even if it is implemented after the initial design phase.

The research team outlined strategies for disseminating study outcomes to pertinent stakeholders, ensuring that the findings reach those who may be affected by or benefit from them. Additionally, we plan to conduct an interventional study. In this future project, we will commit to active patient engagement in the intervention development and implementation phases. This proactive approach towards patient involvement signifies a positive shift towards more inclusive and patient-oriented research methodologies, potentially yielding more relevant and impactful outcomes in future investigations.

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Contributors GV: conceptualised the study and methodology, prepared the protocol, and sought IRB approval. GV is also responsible as the overall guarantor for the content, conduct of the study, and publication. ESF: conceptualised the study and methodology, performed intellectual revisions and reviewed the draft. EV: conceptualised the study, and methodology, performed intellectual revisions and reviewed the draft.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval The research protocol was approved by the Institutional Review Board and Ethics Committee of Shifa International Hospital, Islamabad (IRB #126-24). This study will be conducted in accordance with the principles of the Declaration of Helsinki.

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Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study.

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