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# *Self-Care Predictor in Heart Failure: A Cross-Sectional Study Analysis of Person, Problem, and Environment Factors*

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***Abstract:***
*Understanding the predictors of self-care behavior in heart failure (HF) patients is crucial for designing effective interventions tailored to patient needs. The situation-specific theory of HF self-care emphasizes the interaction between the person, problem, and environmental as factors influencing self-care. This study aimed to identify predictors of self-care behavior in HF patients by examining individual characteristics, disease-related variables, and environment influences. This cross-sectional study was conducted on 110 HF patients at the outpatient cardiac clinic of Kendari City Hospital, selected using consecutive sampling method. Self-care behavior was measured using the European Heart Failure Self-Care Behavior Scale-9. The predictor variables included person-related factors (age, gender, occupation, self-efficacy as measured by the CSES, and spiritual well-being as measured with the FACIT-Sp12), problem-related factors (HF duration and symptom severity), and environmental factors (social support as measured by the 12-item MSPSS). A Binary logistic regression was used to identify the significant predictors. Variables with p-value < 0.05 in multivariate analysis were considered significant predictors of self-care. Among the participants (65.5% male; mean age 62.27 ± 9.10 years), 66.4% reported inadequate self-care. Higher Self-efficacy (AOR = 1.35; 95% CI: 1.15–1.58) and greater social support (AOR = 1.08; 95% CI: 1.01–1.16) were significantly associated with better self-care. In contrast, HF duration ≥ 2 years (AOR = 0.66; 95% CI: 0.46–0.96) was associated with poorer self-care. These findings recommend that nursing interventions should integrate person, problem, and environmental components, with an emphasis on strengthening self-efficacy and enhancing social support to optimize self-care among HF patients.*

***Keywords***: *Heart failure; self-care; self-efficacy; social support; spiritual well-being*

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## INTRODUCTION

Heart failure (HF) remains one of the most pressing global health problems, affecting an estimated 59.19 million people worldwide (Yan et al., 2023). In 2019, the global age-standardized prevalence of HF reached 1.5%, with disproportionately higher burdens observed in low- and middle-income countries. (Feng et al., 2024). Beyond its high prevalence, HF is associated with substantial morbidity and mortality, with reported one-year mortality rates ranging from 17% to 45%. In Asian countries, HF prevalence varies widely, ranging from 1.3% to 6.7%, and has been reported to reach approximately 5% in Indonesia. (Savarese et al., 2022). This wide variation reflects differences in demographic characteristics, healthcare access, and health systems across the region. Notably, Indonesia bears a

particularly heavy burden, with an age-standardized prevalence of 900.9 per 100,000 population and a one-year mortality rate of 34.1%, which exceeds that reported in several other Asian countries. (Feng et al., 2024).

In Indonesia, the burden of HF has shown a consistent upward trend over the past decade. Data from the 2013 Basic Health Research (Riskesdas) survey reported a national HF prevalence of 0.13%, with the highest prevalence observed in East Nusa Tenggara (0.8%). By 2018, this figure had increased markedly to 1.5% nationally, with North Kalimantan recording the highest prevalence (2.2%). (Kemenkes-RI, 2019a). A particularly concerning increase has been documented in Southeast Sulawesi, where HF prevalence rose from 0.2% in 2013 to 1.4% in 2018. (Kemenkes-RI, 2013, 2019a). This rapid escalation mirrors broader epidemiological transitions in the region, characterized by a growing burden of non-communicable diseases such as hypertension, diabetes mellitus, and cardiovascular disease (Kemenkes-RI, 2019b). In clinical practice, this trend translates into a growing number of patients experiencing complex physical limitations, psychological distress, and social challenges, which often culminate in reduced functional capacity, diminished quality of life, and frequent hospital readmissions. (Mengistu et al., 2024; Niriayo et al., 2024). These consequences further contribute to the persistently high morbidity and mortality associated with HF, both in developed and developing countries, including Indonesia. (Hasanah et al., 2023; Heidenreich et al., 2022).

Given this escalating burden, strengthening HF management has become an urgent priority, particularly in resource-limited settings such as Southeast Sulawesi. Without comprehensive and sustained interventions, the rising prevalence of HF is likely to continue driving avoidable readmissions, premature mortality, and increasing healthcare costs. Strengthening HF care is therefore crucial for reducing readmissions and mortality, and enhancing the overall quality of life for patients with this chronic condition (Pobrotyn et al., 2021).

Long-term approaches to HF management emphasize the central role of patients' active involvement through consistent self-care behaviors. Self-care reflects patients' capacity and willingness to take responsibility for maintaining health, monitoring symptoms, and adhering to recommended treatment regimens. (Riegel et al., 2022). Evidence suggests that effective self-care is associated with improved clinical outcomes, including reduced hospital readmissions and unscheduled healthcare visits, enhanced quality of life, and lower morbidity and mortality rates among patients with HF. (Baymot et al., 2022; Pobrotyn et al., 2021). However, adherence to self-care practices remains suboptimal, particularly in low-resource settings, such as Indonesia (Widiastuti et al., 2023).

This study adopts the Situation-Specific Theory of Heart Failure Self-Care, which provides a comprehensive framework for understanding self-care behavior in HF. According to this theory, self-care is shaped by the dynamic interaction among the person, the problem, and environmental factors. Person-related factors include demographic and psychosocial characteristics such as age, gender, educational background, occupation, self-efficacy, and spiritual well-being. Problem-related factors are disease-specific attributes, such as symptom severity, duration of HF, and comorbidities, that may either facilitate or hinder patients' ability to engage in self-care. Environmental factors include external conditions such as marital status, family income, and social support, which provide emotional, informational, and practical resources that influence patients' motivation and capacity to perform self-care behaviors. (Riegel et al., 2022).

Although this theoretical framework has been widely applied in international research, studies examining the combined influence of person, problem, and environmental factors remain limited within the Indonesian healthcare context. Moreover, evidence from Eastern Indonesia is particularly scarce, despite the region's distinct cultural values, patterns of social support, and variability in access to healthcare services. In Indonesian society, collectivism and strong family involvement play a central role in daily life, positioning the family as the primary source of support for individuals living with chronic illness. (Hudiyawati et al., 2021). In addition, spirituality is deeply embedded in everyday practices and is often perceived by patients as an essential component of healing and recovery, alongside medical treatment. (Okviasanti et al., 2021). These cultural dimensions may uniquely shape how patients perceive and engage in self-care behaviors.

Considering these contextual characteristics, further investigation into the predictive role of person, problem, and environmental factors is essential to better understand self-care behavior among patients with HF in Indonesia. By identifying key predictors of self-care, this study aims to generate evidence that can inform the development of targeted, culturally sensitive nursing interventions. Ultimately, the findings are expected to contribute not only to improving self-care strategies and clinical outcomes for HF patients in Indonesia but also to enriching the broader global discourse on heart failure self-care.

## METHODS

This study employed a quantitative cross-sectional design to identify predictors of self-care behavior among patients with HF. Data were collected at a single point in time to capture the relationships among person, problem, and environmental factors that influence the self-care behavior, in line with the Situation-Specific Theory of HF Self-Care. The study was conducted at the outpatient cardiac clinic of Kendari City Hospital, Southeast Sulawesi, Indonesia, from May to August 2024.

This study has obtained ethical approval from the Research Ethics Committee, Faculty of Medicine, Halu Oleo University (Approval Number: 042/UN29.17.1.3/ETIK/2024). In addition, formal permission to conduct the study was obtained from the Hospital's Education and Training Department. Ethical considerations were integrated throughout the research process to ensure the protection of participants' rights and well-being.

All eligible patients were provided with a clear explanation of the study's objectives, procedures, potential risks, and expected benefits. Written informed consent was obtained from each participant before participation. To maintain confidentiality, all data were anonymized and stored securely, with access limited to the research team. Participants were informed that their involvement in the study was entirely voluntary and that declining to participate or withdrawing at any stage would not affect the quality of their medical care.

Participants were recruited using a non-probability consecutive sampling approach. Patients attending the outpatient cardiac clinic during the study period were screened for eligibility. Inclusion criteria consisted of adults aged 18 years or older who had been diagnosed with HF for at least six months and were able to provide written informed consent. Patients with cognitive impairment, communication difficulties, or an inability to communicate in Bahasa Indonesia were excluded from the study. All patients who met the inclusion criteria were approached consecutively and invited to participate. In total, 110 patients agreed to participate and provided written informed consent, and all were included in the final analysis. Patients who chose not to participate were acknowledged and excluded from the study without any form of pressure or repeated invitation. Participation was not associated with financial incentives or other forms of compensation, and no consequences were imposed on patients who declined. By adopting this approach, the study ensured that participation was entirely voluntary, thereby reducing the risk of coercion and selection bias.

Study variables were defined and organized in accordance with the underlying theoretical framework. Data on person-related factors were collected using interviewer-assisted structured questionnaires, which allowed clarification when needed and helped ensure accurate responses. These variables included age, gender, educational attainment, occupation, and ethnicity. Self-efficacy was assessed using the Cardiac Self-Efficacy Scale (CSES), an instrument designed to evaluate patients' ability to control symptoms, manage their disease, and maintain function. The CSES has been widely used in cardiac patient populations and has demonstrated satisfactory validity and internal consistency. (Almeida et al., 2024).

Spiritual well-being was measured using the Functional Assessment of Chronic Illness Therapy–Spiritual Well-being Scale (FACIT-Sp-12). This instrument assesses three core dimensions—meaning, peace, and belief—which are closely linked to spiritual aspects of quality of life among patients living with heart failure (HF) (Deng et al., 2021). The Indonesian version of the FACIT-Sp-12 has demonstrated acceptable psychometric properties, with reported validity coefficients ranging from r = 0.503 to 0.876

and a reliability coefficient of 0.768. (Nasution et al., 2020). These characteristics support its use for assessing spiritual well-being in the present study.

Problem-related factors were obtained through a review of patients' medical records to ensure clinical accuracy. These variables included the duration of HF, New York Heart Association (NYHA) functional class, left ventricular ejection fraction (LVEF), and the presence of comorbid conditions. Environmental factors were assessed by measuring perceived social support using the 12-item Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS evaluates support received from family members, friends, and significant others and has demonstrated excellent internal consistency in clinical populations (Cronbach's $\alpha = 0.94$). (Wenn et al., 2022).

Self-care behavior, as the primary outcome variable, was assessed using the European Heart Failure Self-Care Behavior Scale–9 (EHFScBS-9). This scale is widely used to evaluate daily self-care maintenance and management behaviors among patients with HF. Higher scores indicate better engagement in self-care practices, and the instrument has been shown to possess satisfactory reliability and validity across diverse populations. (Meraz et al., 2023; Sedlar et al., 2017).

Data analysis was performed using SPSS version 25.0. Descriptive statistics were applied to summarize sociodemographic and clinical characteristics. Continuous variables were presented as means and standard deviations (SD) or medians and interquartile ranges (IQR), depending on data distribution, while categorical variables were summarized using frequencies and percentages. To explore associations between independent variables and self-care behavior, bivariate analyses were conducted using chi-square tests for categorical variables and t-tests for continuous variables. Variables with a p-value of $\leq 0.25$ in the bivariate analysis were subsequently included in a multivariate logistic regression model to adjust for potential confounding factors.

A backward elimination approach was used to identify the most parsimonious model. Model fit was evaluated using the Hosmer–Lemeshow goodness-of-fit test. Multicollinearity among independent variables was assessed by examining tolerance values and the Variance Inflation Factor (VIF). A VIF greater than 10 or a tolerance value below 0.1 was considered indicative of problematic multicollinearity. (Naufal et al., 2025). The results of the multivariate analysis were reported as adjusted odds ratios (AOR) with corresponding 95% confidence intervals (CI), and statistical significance was determined at a p-value of $< 0.05$. (Getachew et al., 2022).

## RESULTS

### Demographic Data and Disease-related characteristics among Patients with Heart Failure

This study involved 110 participants with a median age of 61 years. Most were male, married, and nearly half had less than a high school education. All participants reported living with family members (spouse, children, or siblings) and having health insurance. The occupational distribution was relatively dominated by homemakers and retirees, with a monthly family income of less than IDR 2,885,964. Clinically, most participants had a low ejection fraction (LVEF ≤ 40%), NYHA class II classification, and had multiple comorbidities. Interestingly, nearly three-quarters had been living with heart failure for two years or more. These key sociodemographic and clinical characteristics provide an overview of the study population, while full details are presented in Table 1.

**Table 1. Participants' Sociodemographic and disease-related characteristics**

| Characteristics | n | % | Median (IQR) | Min-Maks |
|---|---|---|---|---|
| Age (years old) | | | 61 (69-56) | 34 - 82 |
| Sex | | | | |
| - Male | 38 | 34.5 | - | - |
| - Female | 72 | 65.5 | | |
| Level of formal education | | | | |
| - Less than high school | 50 | 45.5 | - | - |
| - High school | 28 | 25.5 | | |
| - College or higher | 32 | 29.1 | | |
| Occupation | | | | |
| - Homemakers | 33 | 30.0 | - | - |
| - Retired | 20 | 18.2 | | |
| - Farmer, Laborer | 20 | 18.2 | | |
| - Self-employee | 23 | 20.9 | | |
| - Employee | 14 | 12.4 | | |
| Marital status | | | | |
| - Widow/ widower | 19 | 17.3 | - | - |
| - Married | 91 | 82.7 | | |
| Living status | | | | |
| - Live alone | 0 | 0.0 | - | - |
| - Family | 100 | 100.0 | | |
| Monthly family income (based on UMR Rp. 2,885,964) | | | | |
| - Less than the UMR | 63 | 57.3 | - | - |
| - More than or equal to the UMR | 47 | 42.7 | | |
| Having insurance | | | | |
| - No | 0 | 0.0 | - | - |
| - Yes | 110 | 100.0 | | |
| LVEF | | | | |
| - LVrEF: ≤ 40% | 46 | 41.8 | - | - |
| - LVmEF: 41 – 49% | 42 | 38.2 | | |
| - LVpEF: ≥ 50 % | 22 | 20.0 | | |
| Functional class of NYHA | | | | |
| - Class I | 22 | 20.0 | - | - |
| - Class II | 53 | 48.2 | | |
| - Class III | 35 | 31.8 | | |
| Comorbidity status | | | | |
| - ≥ 2 comorbidities | 66 | 60.0 | - | - |
| - < 2 comorbidities | 44 | 40.0 | | |
| HF duration (years) | | | | |
| - ≥ 2 years | 82 | 74.5 | | |
| - < 2 years | 28 | 25.5 | | |

**Self-care behavior, Self-efficacy, Social Support, and Spiritual Well-Being among Patients with Heart Failure**

Analysis of the descriptive data showed that more than half of the participants exhibited poor self-care behavior. In parallel, overall self-efficacy levels among participants tended to be low, indicating limited confidence in managing heart failure symptoms and daily care demands. Perceived social support was distributed almost evenly between high and low categories, suggesting substantial variability in the availability of support systems among patients. A similar pattern was observed for spiritual well-being, with participants demonstrating a relatively balanced distribution between higher and lower levels.

These findings indicate that a considerable proportion of patients with heart failure experience challenges not only in self-care practices but also in key psychosocial domains that support long-term disease management. The coexistence of poor self-care with low self-efficacy and inconsistent social and spiritual resources highlights the need for clinical interventions that extend beyond medical treatment alone. A detailed summary of the descriptive characteristics for these variables is provided in Table 2.

**Table 2. Participants' Self-care behavior, self-efficacy, social support, and spiritual well-being**

| Characteristics | n | % | Median (IQR) | Min-Maks | Mean (SD) |
|---|---|---|---|---|---|
| Self-care behavior | | | | | |
| - Poor | 73 | 66.4 | - | - | - |
| - Good | 27 | 33.6 | | | |
| Self-efficacy | - | - | - | - | 31.74 (±5.79) |
| Social support | - | - | - | - | 58.41 (±11.03) |
| Spiritual well-being | - | - | - | - | 32.99 (±4.82) |

**Relationship between sociodemographic and disease-related characteristics with self-care behavior of patients with HF**

The bivariate analysis revealed that occupation, marital status, monthly family income (Table 3), age, self-efficacy, social support, and spiritual well-being (Table 4),were significantly associated with self-care behavior. A significance level of $\alpha = 0.05$ was applied. Variables with a p-value of ≤ 0.25 in the bivariate analysis were included in the multivariate (Table 5) model to control for potential confounding effects.

The bivariate logistic regression analysis showed that age, sex, education level, occupation, marital status, monthly family income, LVEF, NYHA class, HF duration, self-efficacy, social support, and spiritual well-being were associated with self-care behavior at a p-value < 0.25 (Table 4). However, as presented in Table 5, the multivariate logistic regression model identified only three variables—HF duration, self-efficacy, and social support—as significantly associated with self-care behavior ($p < 0.05$). At the 95% confidence level, self-efficacy and social support were positively associated with self-care behavior, whereas HF duration showed a negative association. Monthly income and occupation were retained in the model as confounding variables, since their exclusion would have resulted in a change in the odds ratio (OR) greater than 10%. The multicollinearity test showed that all predictors had VIF values ranging from 1.05 to 1.16 and tolerance values between 0.86 and 0.95. Thus, no multicollinearity issues were detected in the final model.

Respondents with higher self-efficacy were 1.08 times more likely to exhibit good self-care behavior compared to those with lower self-efficacy (AOR = 1.08; 95% CI: 1.01–1.16). Respondents with higher social support were 1.35 times more likely to demonstrate good self-care behavior than those with lower social support (AOR = 1.35; 95% CI: 1.15–1.58). Conversely, respondents with an HF duration of ≥ 2

years were 0.66 times less likely to engage in good self-care behavior compared to those with a shorter duration (< 2 years).

**Table 3. Relationship between sociodemographic and disease-related characteristics and self-care behavior among Patients with Heart Failure**

| Variables | Self-Care Behavior | | p-value |
|---|---|---|---|
| | Poor, n (%) | Good, n (%) | |
| Sex | | | |
| - Female | 30 (78.9) | 8 (21.1) | 0.069 |
| - Male | 43 (59.7) | 29 (40.3) | |
| Level of formal education | | | |
| - Less than high school | 38 (76.0) | 12 (24.0) | |
| - High school | 19 (59.7) | 9 (32.1) | 0.051 |
| - College or higher | 16 (50.0) | 16 (50.0) | |
| Occupation | | | |
| - Homemakers | 28 (84.8) | 5 (15.2) | |
| - Retired | 11 (55.0) | 9 (45.0) | 0.001* |
| - Farmer, Laborer | 17 (85.0) | 3 (15.0) | |
| - Self-employee | 13 (56.5) | 10 (43.5) | |
| - Employee | 4 (28.6) | 10 (71.4) | |
| Marital status | | | |
| - Widow/ widower | 17 (89.5) | 2 (10.5) | 0.038* |
| - Married | 56 (61.5) | 35 (38.5) | |
| Monthly family income (based on UMR Rp. 2,885,964) | | | |
| - Less than the UMR | 49 (77.8) | 14 (22.2) | 0.006* |
| - More than or equal to the UMR | 24 (51.1) | 23 (48.9) | |
| LVEF | | | |
| - LVrEF: ≤ 40% | 35 (76.1) | 11 (23.9) | |
| - LVmEF: 41 – 49% | 26 (61.9) | 16 (38.1) | 0.157 |
| - LVpEF: ≥ 50 % | 12 (54.5) | 10 (45.5) | |
| NYHA | | | |
| - NYHA class I | 12 (54.5) | 10 (45.5) | |
| - NYHA Class II | 33 (62.30 | 20 (37.7) | 0.096 |
| - NYHA Class III, IV | 28 (80.0) | 7 (20.0) | |
| Comorbidity status | | | |
| - ≥ 2 comorbidities | 43 (65.2) | 23 (34.8) | 0.902 |
| - < 2 comorbidities | 30 (68.2) | 14 (31.8) | |
| HF Duration (years) | | | |
| - ≥ 2 years | 50 (61.0) | 32 (39.0) | 0.069 |
| - < 2 years | 23 (82.1) | 5 (17.9) | |

* p-value ≤ 0.05

**Relationship between age, self-efficacy, social support, and spiritual well-being and self-care behavior among Patients with Heart Failure**

**Table 4. Relationship between age, self-efficacy, social support, and spiritual well-being with self-care behavior among Patients with Heart Failure**

| Variables | Self-Care Behavior | n | Mean (±SD) | Median (IQR) | 95%CI | T/Z | p - value |
|---|---|---|---|---|---|---|---|
| Age | - Poor<br>- Good | 73<br>37 | - | 63 (71-58)<br>58 (63.5-53.5 | - | -3.02 | 0.003 |
| Self-efficacy | - Poor<br>- Good | 73<br>37 | 29.26 (±4.59)<br>36.63 (±4.70) | - | -9.22 – (-5.51) | -7.87 | 0.000 |
| Social support | - Poor<br>- Good | 73<br>37 | 55.59 (±10.38)<br>63.97 (±10.26) | - | -12.52 – (-4.25) | -4.01 | 0.000 |
| Spiritual Well-being | - Poor<br>- Good | 73<br>37 | 31.97 (±4.73)<br>35.00 (± 4.39) | - | -4.87 – (-1.18) | -3.33 | 0.001 |

**Table 5. Multivariate logistic regression analysis results as predictors of self-care behavior among Patients with Heart Failure**

| Varibles | B | Sig. | Exp (β) | 95% CI for Exp (β) (Lower-Upper) |
|---|---|---|---|---|
| Occupation | -1.166 | 0.380 | 0.312 | 0.02 - 4.22 |
| Family Income | -1.297 | 0.087 | 0.273 | 0.06 – 1.21 |
| Duration of HF | -0.413 | 0.029* | 0.662 | 0.46 – 0.96 |
| Self-efficacy | 0.300 | 0.000* | 1.083 | 1.01 – 1.16 |
| Social Support | 0.080 | 0.026* | 1.350 | 1.15 – 1.58 |
| Constant | -13.260 | | | |

* p values ≤0.05

## DISCUSSION

This study aimed to assess self-care behavior among heart failure (HF) patients and identify its predictors by integrating person, problem, and environmental factors within the framework of the Situation-Specific Theory of Heart Failure Self-Care. This theory provides a conceptual foundation for understanding how individual characteristics, disease-related conditions, and surrounding social contexts interact to shape patients' engagement in self-care. The findings of the present study indicate that self-efficacy and social support are positive predictors of self-care behaviour, whereas a longer duration of HF is a negative predictor. This section discusses the implications of these findings, considering existing literature, and provides recommendations for clinical practice and future research.

### Self-care Behavior

The findings revealed that a substantial proportion of participants (66.4%) demonstrated poor self-care behavior. This result is consistent with previous studies conducted in Ethiopia and Nepal, which reported poor self-care behaviour among 58.3% and 72% of patients with HF, respectively. (Sugebo et al., 2024; Tegegn et al., 2021). In contrast, a study conducted in the Wollega zones of Ethiopia found that more than half of the participants (51.2%) reported good self-care practices. (Fetensa et al., 2021). Such variation across studies suggests that self-care behavior among patients with HF is strongly influenced by contextual factors rather than being solely determined by clinical characteristics.

Differences in sociodemographic profiles and health system contexts may partially explain these contrasting findings. Factors such as age distribution, educational attainment, socioeconomic status,

rural or urban residence, and cultural beliefs related to illness and caregiving can shape patients' understanding of HF and their capacity to engage in daily self-care activities. In addition, variations in healthcare infrastructure, access to follow-up services, and continuity of care after hospital discharge may further influence self-care practices. (Moaddab et al., 2020). These observations highlight the importance of considering local context when interpreting self-care outcomes and designing interventions aimed at improving HF management.

**Person Factors Influencing Heart Failure Self-Care**

The present study found that several person-related characteristics were significantly associated with self-care behavior among patients with heart failure. These findings are generally consistent with previous research reporting that poorer self-care occurs among the elderly (Sugebo et al., 2024), individuals with lower levels of education, male patients, and those who are unemployed (Baymot et al., 2022). Various physiological changes associated with aging and chronic illness, such as decreased vision and hearing, balance problems, and fatigue, can limit patients' ability to consistently perform daily self-care activities. (Jaarsma et al., 2017; Sugebo et al., 2024).

Educational level also appears to play a critical role in shaping self-care behavior. Patients with limited formal education may experience difficulties in recognizing early warning signs, interpreting health information, and implementing appropriate self-care responses. (Koirala et al., 2020).

In addition, socioeconomic conditions were closely linked to self-care practices. Participants with lower income and unstable employment were less likely to engage in adequate self-care, as socioeconomic barriers influence medication adherence. (Moaddab et al., 2020). In contrast, patients with higher family incomes may benefit more from access to health services, medications, nutritious foods, and information sources, including digital media. Additionally, ongoing support from a family doctor or primary health care provider may help them improve adherence to self-care recommendations. (Baymot et al., 2022).

Interestingly, and in contrast to some previous studies, male patients in this study demonstrated better self-care behavior. This discrepancy may be explained by cultural and contextual differences between study populations. Gender is an important social determinant of health, influencing individuals' perceptions, roles, and responsibilities in illness management. Therefore, gender-specific factors and sociocultural expectations warrant further investigation to better understand their impact on self-care behaviors in HF populations. (Koirala et al., 2020). In certain cultural settings, men may receive more family support or be more involved in decision-making regarding healthcare, which could positively influence adherence to self-care behaviors. These findings suggest that gender-specific and sociocultural factors should be carefully considered when designing and implementing self-care interventions for patients with HF.

Among the person-related factors examined, self-efficacy emerged as one of the strongest predictors of self-care behavior. Patients who reported greater confidence in their ability to manage HF demonstrated significantly better adherence to recommended self-care practices. This finding aligns with a growing body of evidence highlighting the central role of self-efficacy in fostering motivation, sustaining health-related behaviors, and improving clinical outcomes in patients with chronic illness. (Baymot et al., 2022; Jiang et al., 2023). Self-efficacy is closely related to an individual's attitudes, motivation, and perceptions of their abilities (AM et al., 2023). In this study, patients with higher self-efficacy were 1.08 times more likely to engage in good self-care behavior, and each one-unit increase in self-efficacy score was associated with a measurable improvement in self-care performance.

These findings suggest that higher self-efficacy strengthens patients' beliefs in the benefits of proper medication adherence and encourages them to consistently take medications as prescribed and take necessary actions toward desired health outcomes. (Zhou et al., 2022). Moreover, self-efficacy has been shown to directly influence both self-care maintenance and management and to mediate the relationship between social support and self-care behavior. (Jiang et al., 2023). Importantly, self-efficacy is not a static attribute; it can be enhanced through improved health literacy, positive healthcare experiences, and adequate social support. (Baymot et al., 2022).

In addition to self-efficacy, spiritual well-being was positively associated with better self-care behavior in this study. This finding supports existing literature that links spiritual dimensions—such as meaning, peace, and belief—to patients' resilience, coping capacity, and engagement in health-promoting behaviors . (Deng et al., 2021). For patients living with HF, spiritual well-being may provide a sense of purpose and emotional stability that supports sustained self-care efforts. Previous studies have also demonstrated that interventions aimed at strengthening spiritual health, particularly when combined with family and social support, can improve quality of life and self-care skills among patients with heart failure. (Amini et al., 2023).

**Problem Factors Influencing Heart Failure Self-Care**

Problem-related factors in this study indicated that the duration of heart failure had a significant influence on patients' self-care behavior. Patients who had been living with heart failure for two years or longer were less likely to demonstrate good self-care practices. This finding differs from several previous studies suggesting that a longer duration of illness may improve self-care through increased knowledge and repeated interactions with healthcare professionals. (Fetensa et al., 2021).

A possible explanation for this difference is that prolonged exposure to a chronic condition such as heart failure may result in emotional exhaustion, declining motivation, or progressive physical limitations. Over time, these factors may reduce patients' capacity or willingness to consistently follow recommended self-care behaviors. While earlier research emphasizes the benefits of disease familiarity in enhancing self-management, the present findings highlight the importance of sustained and adaptive interventions that also address the emotional and cognitive burden experienced by patients with long-standing heart failure.

In contrast, other clinical variables examined in this study—including left ventricular ejection fraction (LVEF), New York Heart Association (NYHA) functional class, and comorbidity status—were not significantly associated with self-care behavior. This result differs from prior studies that identified lower LVEF and worse NYHA class as predictors of self-care behavior. (Koirala et al., 2020; Silva et al., 2023). One explanation offered in the literature is that patients with more severe symptoms, particularly those in NYHA classes III and IV, may have heightened disease awareness and therefore show better adherence to both pharmacological and non-pharmacological management strategies (Baymot et al., 2022).

These contrasting findings underscore the complexity of heart failure as a chronic condition, where objective clinical indicators do not always correspond with patients' perceived health status or their ability to engage in self-care. Moreover, evidence from global cohort studies has demonstrated inconsistencies between clinician-assessed NYHA classification and patient-reported health status. (Caraballo et al., 2019; Cosiano et al., 2023). Such discrepancies may also be influenced by contextual factors, including regional healthcare systems, access to care, and variations in patient education and support.

**Environmental Factors Influencing Heart Failure Self-Care**

Environmental factors were found to play an important role in shaping self-care behavior among patients with heart failure. In this study, marital status, monthly family income, and perceived social support were significantly associated with better self-care outcomes. Patients who perceived stronger social support tended to follow self-care recommendations more consistently, a finding that is in line with previous studies from Ethiopia and Nepal, where family and social support were identified as key facilitators of adherence to self-care practices. (Koirala et al., 2020; Sugebo et al., 2024). Social support may contribute to improved self-care through several pathways. Support from family and significant others can enhance psychological well-being, reduce stress, and provide practical assistance, all of which help patients maintain lifestyle modifications and adhere to treatment regimens. (Getachew et al., 2022).

In addition to emotional reassurance, strong support networks may offer tangible resources that assist patients in managing heart failure symptoms more effectively. Similarly, patients with higher

family incomes demonstrated better self-care behavior, which may reflect improved access to essential resources such as medications, nutritious food, and transportation to healthcare facilities. (Baymot et al., 2022). Together, these findings emphasize the importance of considering social and economic contexts when designing interventions aimed at strengthening self-care in heart failure patients.

Quantitatively, respondents with higher perceived social support were 1.35 times more likely to demonstrate good self-care behavior compared to those with lower levels of support. Furthermore, each one-unit increase in social support score was associated with a 0.08-point improvement in self-care behavior. These results are consistent with earlier studies conducted in Ethiopia and Nepal, which similarly identified social support as a central determinant of adherence to self-care behaviors (Koirala et al., 2020; Sugebo et al., 2024). Higher perceived support may encourage patients to initiate and sustain self-care behaviors by fostering emotional well-being and a sense of belonging. Individuals who feel supported are more likely to experience better psychological health, possibly due to improved emotional regulation and reduced stress exposure.

Beyond psychological benefits, social and environmental support may also buffer the physiological effects of chronic stress and contribute to overall health improvement. (Getachew et al., 2022). Adequate social support has been recognized as a critical driver of behavioral change, as it reinforces motivation and strengthens engagement in positive health behaviors. Previous evidence also suggests that satisfactory social support can enhance patients' confidence in managing their condition, thereby improving self-care maintenance and management. (Jiang et al., 2023). In the multivariable analysis of this study, self-efficacy, perceived social support, and heart failure duration emerged as independent predictors of self-care behavior. These findings highlight the need for heart failure management strategies that extend beyond clinical indicators and incorporate psychological and social dimensions as integral components of comprehensive care.

## CONCLUSION

This study demonstrates that self-efficacy, perceived social support, and the duration of heart failure are key factors influencing self-care behavior among patients with heart failure. These findings align with the situation-specific theory of HF self-care, which emphasizes the dynamic interaction between individual capabilities, contextual factors, and illness-related characteristics. By highlighting these relationships, the present study contributes to the nursing science literature by underscoring the need to view self-care not only as a clinical outcome, but also as a behavior shaped by personal, social, and disease-related contexts. From a clinical perspective, the findings of this study contribute to nursing science by emphasizing the importance of integrating personal, clinical, and environmental factors into heart failure management. Nursing practice should prioritize interventions that enhance self-efficacy through structured education and self-management training, strengthen family and community support, and address patients' psychological burden experienced by patients with long disease duration. Incorporating psychosocial support and family involvement into HF care programs may improve continuity of care and potentially reduce hospital readmission. Future research is needed to develop and test culturally appropriate and scalable care models that integrate self-efficacy, social support, and disease duration as core components. Such approaches are particularly relevant in resource-limited settings, where optimizing self-care remains a critical strategy for improving patient outcomes.

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**AUTHOR CONTRIBUTION**

HH : Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, and Writing - Review & Editing

TH : Supervision, Conceptualization, Methodology, Writing – Writing - Review & Editing

BBS : Supervision, Conceptualization, Methodology, Writing – Writing - Review & Editing

**DATA AVAILABILITY**

The datasets used and analyzed in this study are not publicly available due to privacy or ethical restrictions.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest

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