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Original Article

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The impact of self-care behavior on quality of life among patients with heart failure in Malaysia: a cross-sectional study

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ABSTRACT

Introduction: Individuals with heart failure anticipate adjustment to self-care behaviors following hospital discharge. Self-care in heart failure includes medication adherence, dietary modifications, symptom monitoring, and activity adjustment. Adequate self-care behavior may contribute to enhanced outcomes, decreased hospitalization, and improved quality of life in patients with heart failure. This study aimed to determine the level of self-care behavior, quality of life, and its relationships among patients with heart failure.

Methods: A cross-sectional study using purposive sampling was conducted among 200 heart failure patients at a teaching hospital in Selangor, Malaysia. The sample size was determined using G*Power to ensure adequate statistical power. Data were collected using the Self-Care of Heart Failure Index (SCHFI) and the Minnesota Living with Heart Failure Questionnaire (MLHFQ). Descriptive statistics, Pearson's correlation, and multiple linear regression were used in this study.

Results: The results indicated that the total mean score of self-care behavior was 145.42 and SD=16.23. Most patients demonstrated good quality of life (n=73, 36.5%), moderate quality of life (n=62, 31%), and poor quality of life (n=65, 32.5 %). Pearson's correlation revealed a significant ($p<0.001$) correlation ($r = 0.651$) between self-care behavior and quality of life.

Conclusions: In conclusion, this study demonstrated that higher levels of self-care are associated with better quality of life in patients with heart failure. It is recommended that nurses provide individualized self-care education at discharge, focusing on medication adherence, symptom monitoring, and lifestyle changes to improve quality of life.

Keywords: heart failure, quality of life, Self-care behavior

Introduction

Heart Failure (HF) is a medical condition defined by structural or functional issues in the heart that compromise the ventricle's capacity to either fill with or pump out blood (Harrington et al., 2023). HF is among the most common diseases worldwide, impacting over 60 million individuals globally and affecting between 1.3% and 6.7% of the population in Asia (Savarese et al., 2022). The burden of HF seems to be expanding because of population undergoing worldwide ageing and an increasing number of post-myocardial infarction survivors (Groenewegen et al., 2020; Savarese & Lund, 2017). HF patients are younger in Asia, with a mean age of 60 and two-thirds <65 years (Lam et al., 2016).

Additionally, HF patients may experience multiple physical, psychological, and emotional signs and symptoms, with the most common being more physiological, such as dyspnea and swelling of the legs, ankles, and feet. Physical symptoms are the most vigorous precipitants of hospitalizations, readmissions, emergency treatment, and mortality in HF patients (Okada et al., 2019).

Apart from HF-related hospitalizations, all-cause hospitalizations were elevated as well and seen in 60% of patients (Hessel, 2021). In Malaysia, the HF reported that the percentage of 30-day readmissions due to cardiovascular causes was half (50.1%), with HF alone representing 27.8% (Mohd Ghazi et al., 2022). Hospitalizations, as well as death due to HF, develop in 80-90 % of patients aged 65 and older (Asadi et al., 2019). Length of stay increased with each hospitalization (Mohd Ghazi et al., 2022). Even though these figures highlight the increasing burden of HF in Malaysia, there is still a remarkable paucity of local research focusing on self-care behavior that correlates with quality of life (QoL).

Long-term management is mandatory for HF patients after hospital discharge. Control of HF has been shown to prevent frequent hospital readmissions or reduce costs, as well as its morbidity and, eventually, QoL improvement (Tung et al., 2013). Medeiros and Medeiros (2017) conducted a study that found self-care is a decision-making process used by patients to select activities to maintain physiological homeostasis through symptom response when they arise. In the context of HF evidence, self-care behavior means performing actions intended to promote and protect health and well-being and manage or prevent disease (Sahlin et al., 2022).

Self-care behavior includes activities that patients do to take care of themselves in their disease. This encompasses taking medications correctly, changing diet, staying active, watching for signs and symptoms, and knowing when to seek medical attention. Self-care has improved health outcomes, including symptom control and functional status, and has decreased hospital readmissions (Leigh et al., 2022). Sociodemographic characteristics, disease-related factors, psychosocial variables, and access to healthcare can all impact the ability to perform effective self-care behaviors (Negarandeh et al., 2019). HF significantly affects both physical and mental health, as it can restrict patients from performing daily activities and reduce their QoL. Research has shown that people with HF are more likely to face restrictions in their daily activities (Rubio et al., 2021).

Assessing QoL in patients with HF can provide valuable medical insights, as HF significantly impacts the QoL of those affected. QoL is a multidimensional concept with dimensions that include physical, mental, and social, as well as the ability to carry out daily activities, including social and occupational roles (Gallagher et al., 2018). An instance of assessing QoL is objectively examining the extent to which the disease affects people and how they cope. These assessments may be helpful as a baseline and outcome measure, providing a framework for measuring the impact of any changes on patients' QoL. HF seems to affect QoL in patients dramatically, as their QoL has been described as the worst compared with patients with other chronic disorders (Lee et al., 2020).

Establishing characteristics associated with QoL changes among HF patients is essential for identifying individuals requiring long-term care and creating appropriate therapies to improve their QoL. Age, gender, educational level, culture, social support network, marital status, and feeling of belonging have been reported to correlate with QoL among HF (AbuRuz & Alaloul, 2018; Polikandrioti et al., 2019). Besides the alarming physical symptoms of HF, its emotional and social impact has been described mainly in terms of its effect on well-being and QoL (Yeh & Shao, 2021). In HF, where patients often face substantial health challenges, QoL is an essential patient-centered clinical outcome. QoL is inversely and independently related to mortality in chronic HF (Luo et al., 2017).

In Malaysia, a limited number of published studies have highlighted self-care management for HF patients. Thus, by determining self-care behavior and QoL, we need to explore the aspects and nuances of patients with HF that are most challenging and burdensome.

Materials and Methods

Study Design

A cross-sectional study design was utilized to investigate self-care and QoL among patients with HF. This study was conducted on patients who met the inclusion criteria and attended a follow-up at a cardiology clinic in a teaching hospital in Selangor, Malaysia.

Samples

This study used purposive sampling. The sample size calculation was performed using the G*Power 3.1 Program. The result of the calculation showed that the sample size required for 20 independent variables (predictors) to detect a medium effect ($f^2 = 0.15$) in a hierarchical multiple regression analysis, with a power of 80% and a level of significance of 0.05 using a 2-tailed test, was 157. However, during this study, researchers managed to get 200 samples. The inclusion criteria were: (1) a diagnosis of HF greater than 1 year in the past, (2) currently receiving care at the cardiology clinic, and (3) willingness and ability to participate in the study. Patients with (1) a history of heart surgery, (2) arterial or valve disease, chronic obstructive pulmonary disease (COPD), and (3) refusal to give consent were excluded.

Research Instruments

This study utilized a self-administered questionnaire with three parts. Seven questions, including age, gender, marital status, smoking status, level of education, the New York Heart Association (NYHA) classification, and comorbidities, were used to determine the participants' sociodemographic characteristics.

The self-care behavior was assessed using the Self-Care of Heart Failure Index version 7.2 (SCHFI v7.2). The questionnaire was adopted from the study of Riegel et al. (2019) and translated into Malay. The Malay version maintained the conceptual integrity of the original instrument and was culturally adapted to ensure linguistic clarity and relevance for Malaysian patients. The SCHFI v.7.2 is a 39-item instrument consisting of four subscales: Self-care maintenance, symptom perception, and self-care management. Responses to items for each scale are based on a Likert-type option. Specifically, the self-care maintenance subscale contains ten items that evaluate behaviors used to maintain physiological stability, such as medication adherence and diet. Items' responses range from never (1) to always (5). The symptom perception was composed of 11 items; nine items assessed the frequency with which patients performed specific monitoring behaviors (e.g., weighing daily), ranging from never (1) to always (5), and two items assessed the speed with which patients recognized and interpreted HF-related symptoms the last time they occurred. For these two items, patients can choose if symptoms were not present (not applicable), followed by a scale from not quickly (1) to very quickly (5). Next, the self-care management scale consists of 8 items. This domain covers strategies such as limiting sodium and fluid intake, adjusting activity levels, seeking guidance from healthcare providers, and evaluating the effectiveness of symptom management. Likelihood of performing these behaviors is rated from not likely (1) to very likely (5), with one item assessing perceived treatment effectiveness. Finally, the self-care confidence measures perceived self-efficacy in maintaining stability, following treatment plans, monitoring health status, and addressing symptoms. Confidence is rated on a scale from not confident (1) to extremely confident (5).

Researchers assessed the QoL of patients with HF using the Minnesota Living with Heart Failure Questionnaire (MLHFQ) (Bilbao et al., 2016). The MLHFQ is a validated instrument for assessing QoL and comprises 21 items that patients complete independently. Each item is evaluated using a 6-point scale, ranging from 0 (none) to 5 (very much). Total score range (0–105) from best to worst QoL. In contrast, when the score is less than 24, QoL patients have a (Good) range of 24–45, (Moderate), and more than 45 (Poor) QoL (Molla et al., 2021). The questionnaire's reliability was confirmed through Cronbach's alpha coefficients, which demonstrated high values between 0.92 and 0.96 (Chen et al., 2019).

Data collection

Before data collection, the eligibility of respondents was confirmed by the inclusion and exclusion criteria. Data were collected at cardiology clinics from August to November 2022. Eligible patients with HF were identified after their routine consultations and invited to participate. Respondents were then informed about the objectives of the study. Those who agreed signed an informed consent to answer the printed Malay version of SCHFI v7.2 and MLHFQ in a private room. Participation was voluntary, with confidentiality and anonymity assured. During the survey, researchers were present to assist respondents who needed clarification on the study. Respondents took about 20 – 30 minutes to complete the questionnaire. The completed questionnaires were collected immediately after completion.

Ethical Consideration

The Research Ethics Committee, Universiti Teknologi MARA (UiTM) Shah Alam, granted ethical approval for the research, with the reference number REC/12/2021 (MR/1125). Additionally, the study received authorization from the Department of Research, Innovation, and Industrial Linkages, UiTM Hospital 500-PJI (18/4/27).

Data Analysis

Data extracted from this study were assessed and summarized using the SPSS program version 25.0. Self-care behavior and the level of QoL were described using descriptive statistics, frequencies and percentages, and mean and standard deviation, respectively. A multiple linear regression analysis was performed. This statistical method was selected to evaluate the simultaneous influence of multiple independent variables on a continuous dependent variable, the QoL score. Before conducting the regression analysis, the assumptions of

Table 1 Socio-demographic characteristics of patients with heart failure (n=200)

Variable	Frequency (*n*)	Percentage (%)
Age		
18-30	9	4.5
31-49	84	42.0
50-65	78	39.0
66 and above	29	14.5
Gender		
Male	98	49.0
Female	102	51.0
Marital status		
Single	24	12.0
Married	143	71.5
Divorced /Widowed	33	16.5
Smoking status		
Active smoker	41	20.5
Ex-smoker	47	23.5
Nonsmoker	112	56.0
Educational level		
Primary school	10	5.0
Secondary school	80	40.0
College/University	110	56.0
NYHA Classification		
I	23	11.5
II	102	51.0
III	67	33.5
IV	8	4.0
Comorbidities		
Hypertension	44	22.0
Diabetes mellitus	14	7.0
Renal Failure	1	0.5
Other	6	3.0
2 and above	135	67.5

Table 2: Self-care behavior among patients with heart failure

Variables	Mean	Standard Deviation (SD)
Self-Care Maintenance Scale	35.40	5.09
Symptom Perception Scale	38.50	6.19
Self-Care Management Scale	31.98	3.93
Self-Care Confident	39.54	4.51
Total	145.42	16.23

normality, linearity, homoscedasticity, and independence of residuals were evaluated and met. Multicollinearity was assessed using variance inflation factors, and no issues were identified.

Results

Demographic Data

Two hundred questionnaires were completed by patients with HF who fulfilled the inclusion criteria at the cardiology clinic. The result shows (Table 1) that participants were predominantly aged 30–49 years (42.0%), followed by 50–65 years (39.0%), ≥66 years (14.5%), and 18–30 years (4.5%). Females comprised 51.0% of the sample. Most were married (71.5%), with others being divorced/widowed (16.5%) or single (12.0%). Over half (55.0%) had a university education, while 40.0% and 5.0% completed secondary and primary education, respectively. Most were nonsmokers (56.0%), with 23.5% ex-smokers and 20.5% smokers. NYHA class II was the most common (51.0%), and 67.5% had two or more comorbidities, primarily hypertension (22.0%) and diabetes (7.0%).

The level of Self-care behavior

Descriptive statistics of self-care behaviors of patients with HF evaluated by four important scales are detailed in Table 2. The mean score of the self-care maintenance scale was 35.40 (SD = 5.09). The symptom perception scale assesses patients' ability to identify and interpret their symptoms as they relate to their heart failure. Average symptom perception (mean = 38.50 and SD = 6.19). The self-care management scale assesses how patients respond to symptoms, how they manage exacerbations, or changes in the condition. Its mean score is 31.98 with a standard deviation of 3.93. The last section was the self-care confidence section with a mean score of 39.54 (SD = 4.51). The total of the overall mean score for this questionnaire was 145.42 (SD = 16.23).

Table 3: Correlation between Self-care and Quality of Life among Patients with Heart Failure

Variables	Level of Quality of Life	
	Correlation Coefficient	***p*-level**
Level of Self-care behavior	0.651*	<0.001

$p < 0.05$

*Correlation is significant at the 0.01 level (2-tailed)

The quality of life

The MLHFQ inquired about the participant's QoL. The overall mean for the QoL was 71.1 ±14.5. The most significant proportion of participants, 73 (36.5%), reported having a good QoL. A substantial portion of the sample, 62 participants (31%), indicated a moderate QoL. The remaining 65 participants (32.5%) reported poor QoL.

Relationship Between Self-care and Quality of Life

Pearson's correlation coefficient was used to demonstrate the correlation between self-care and QoL among patients with HF. Table 3 showed that the two variables were significant ($p < 0.001$) and positively associated ($r = 0.651$). This relationship indicates that patients with HF who practice a higher level of self-care have a higher level of QoL.

Predictors of Quality of Life among Patients with Heart Failure

The results of the multiple linear regression analysis were examined to determine the predictors of QoL, as shown in Table 4. The predictors included in the model were age, gender, marital status, smoking status, education level, NYHA classification, and comorbidities. Before running the regression, the assumptions of linearity, independence of errors, normality, homoscedasticity, and absence of multicollinearity were assessed and met. The regression model showed a coefficient of determination (R^2) of 0.621, indicating that approximately 62.1% of the variance in QoL scores was explained by the combined predictors. Three variables were statistically significant predictors: an education level ($\beta = 4.225$, 95% CI = 1.268 to 7.182, $p = 0.005$). Notably, patients with secondary education or above reported significantly higher quality of life scores compared to those with lower educational attainment. Second is NYHA classification ($\beta = 11.221$, 95% CI = 8.897 to 13.544, $p < 0.001$); higher NYHA classes, reflecting more severe functional limitation, were strongly associated

Table 4: Predictors of Quality of Life among Patients with Heart Failure

Variables	*b (95% CI)*	t-statistic	*p-value*†	r^2
				0.621
Age	1.908 (-0.579, 4.396)	1.513	0.132	
Gender	0.280 (-3.723, 4.284)	0.138	0.890	
Marital Status	-0.104 (-3.765, 3.558)	-0.056	0.955	
Smoking Status	-0.787 (-3.296, 1.721)	-0.619	0.536	
Education Level	4.225 (1.268, 7.182)	2.818	0.005**	
NYHA Classification	11.221 (8.897, 13.544)	9.526	<0.001**	
Comorbidities	-1.103 (-2.123, -0.083)	-2.133	0.034*	

† Multiple linear regression

* $p < 0.05$, ** $p < 0.01$

with increased QoL scores and the third predictor is number of comorbidities (β = –1.103, 95% CI = –2.123 to –0.083, $p = 0.034$), a greater number of comorbidities was significantly associated with lower quality of life scores. Other variables, including age, gender, marital status, and smoking status, did not predict QoL substantially ($p > 0.05$).

Discussions

The research assesses self-care practices among HF patients. Findings from this investigation suggest that the aggregate self-care score, which incorporates three distinct scales, represents the overall self-care behaviors exhibited by individuals with HF. This composite score indicates that HF patients demonstrate a moderate level of engagement in self-care activities. This finding is consistent with the results of previous research, which identified several predictors of poor self-care among patients with heart failure, including comorbidities, lower education level, and reduced access to healthcare (Lee et al., 2021). Over one-third of HF patients are reported to participate in maladaptive self-care behaviors that result in significant hospitalizations and adverse outcomes (Smith et al., 2023). Moderate self-care behaviors can include taking medications or monitoring symptoms occasionally. They might, however, fail to engage consistently with more holistic self-care practices—such as weighing themselves daily, changing their diet, or exercising regularly.

On the other hand, a study reported low self-care scores among patients with HF (Mohammad et al., 2023). Self-care is patients' actions to keep their HF under control, which may include adhering to treatment guidelines as prescribed, monitoring symptoms, and avoiding behaviors that aggravate HF symptoms (e.g., excessive sodium intake or lack of sufficient physical activity). Other studies consider self-care behavior the most critical component of a comprehensive HF management program (Liou et al., 2015). Self-care in HF patients enhances the QoL by preventing recurrence and decreasing the mortality rate (Cocchieri et al., 2015; Riegel et al., 2016). Based on the findings, structured education is recommended to enhance self-care behaviors in HF patients, aiming to improve outcomes and reduce hospital readmissions.

The MLHFQ results should be highlighted as valuable, providing insights into the QoL among HF patients. QoL impairment is observed among patients with significant variability. This finding indicates that seventy-three patients have a good QoL, which implies that despite the chronic and frequently disabling features of HF, many patients can preserve a relatively high QoL. This can be explained by high levels of efficiency in managing the disease, both related to adherence to pharmacological treatment and lifestyle modifications, and possibly a more remarkable family or social support system, as they affect QoL (Riegel et al., 2019). However, the significant proportion of sixty-two patients reporting moderate and sixty-five patients with poor QoL underscores the pervasive impact of HF on patients' daily lives. These results are in accordance with the literature recognizing that HF is a multi-component disease; economic, physical, and emotional health, and hospitalizations account for poor QoL (Garin et al., 2014). Patients with lower QoL scores may be experiencing advanced disease stages, limited treatment responsiveness, or inadequate self-care support, which reduces their ability to adapt to illness demands.

The study states that self-care in HF involves complex and multifaceted skills and behaviors, particularly when it comes to medication management, symptom monitoring, dietary adjustments, and activity (Hughes & Granger, 2014). Prior work has established that patient participation in their care correlates with better clinical outcomes and QoL, such as lower hospital readmission rates (Leigh et al., 2022).

This research corroborated a robust connection between self-care practices and QoL among HF patients. The results underscore the importance of self-care in boosting QoL for individuals with HF. Those who actively self-monitor and adhere to treatment plans often experience fewer symptoms and improvements in their physical, mental, and overall QoL (Jaarsma et al., 2013). As a result, QoL will also lower the risk of re-hospitalization and death in patients with favorable self-care outcomes (Wiśnicka et al., 2022). Individuals with stronger self-care management skills have been shown to reduce their risk of hospital readmission by up to 40% within one year (Toback & Clark, 2017). HF patients will address health as a need that requires ongoing treatment, specific education, and motivation to help the patient prevent disturbances in daily life, which has allowed for institutionalization and gives them control over their health. Adapting to self-care following hospitalization has improved confidence and QoL (Butler et al., 2023).

Additionally, the association between self-care behavior and QoL is mutually reinforcing. QoL may be positively associated with some aspects of self-care, as effective self-care can improve QoL. Such a bidirectional link is critical for effective HF management, as both QoL and self-care behaviors must be addressed (Buck et al., 2012). The notable association seen here reinforces the notion that improving self-care behaviors in clinical practice is a key component to optimizing patient outcomes.

Information gathered from the multiple regression analysis exploring QoL predictors in patients with HF is of practical significance. The present study shows that the NYHA functional classification is an essential determinant of QoL in HF patients and corroborates previous studies' findings (Juárez-Vela et al., 2020; Santoro et al., 2019). These results indicate a substantial decline in QoL of patients with worsening NYHA classification. This aligns with older studies where increased NYHA classes, denoting worse functional impairment, were correlated with physical and mental health devastation in HF patients (Kelishadi et al., 2021). This reflected studies by Nieminen et al. (2015), who noticed that when patients with higher NYHA class had poorer QoL, they highlighted an essential role of combined symptom severity and functional status in discordant responders. The non-significance of the other variables (age, gender, marital status, smoking status, education level, and comorbidities) may suggest that these factors might not impact QoL. The results differed from previous studies that have indicated associations of age, sex, and comorbidities with QoL in HF (Bekfani et al., 2021).

The findings underscore the necessity for healthcare providers to consider the impact of self-care on QoL outcomes in patients with HF. Furthermore, the results support that early and continuous determination of HF severity based on the NYHA classification can help healthcare providers make therapeutic decisions focused on preserving or improving QoL. This study has several limiting factors. These variables may directly affect outcomes or be mediated through other vital clinical variables, but the sample size may have lacked the power to detect subtle effects. Additionally, the primary role of NYHA classification as a determinant of QoL highlights the importance of functional capacity in understanding patient well-being, underscoring the need for targeted interventions to manage symptoms and improve functional status.

The strengths of this study encompass the utilization of validated culturally adapted instruments and a sample size surpassing the minimum threshold established by G*Power, hence augmenting measurement precision and statistical efficacy. The incorporation of varied sociodemographic and clinical variables facilitated a thorough study. Nonetheless, purposeful sampling from a singular teaching hospital constrains the generalizability to the broader HF demographic. The cross-sectional design prevents causal inference, and dependence on self-reported surveys may introduce recollection and social desirability biases.

Conclusion

Conclusively, these findings emphasize the need to promote self-care behaviors in individuals with HF. Improving individual QoL is a crucial component of providing excellent care. Even though some patients performed moderate to good self-care behaviors, more than one-fifth of patients showed poor self-care behaviors and required additional improvement. One of the most significant insights from this study is the clear relationship between self-care behavior and QoL in patients with HF. As patients improve their self-care, their perceived QoL also enhances. Moreover, it was found that when patients progress to more advanced stages of HF, their physical and emotional capacity diminishes, leading to lower QoL.

On the other hand, a lower degree of NYHA classification is associated with a better QoL, suggesting that less severe disease leads to a more favorable outcome. Future research should focus on developing and testing targeted interventions to improve self-care behaviors in HF patients. These interventions should be tailored to the unique challenges faced by different patient populations, considering factors such as age, comorbidities, and socioeconomic status. By doing so, it may be possible to improve self-care practices and QoL for a broader range of individuals living with HF. Ultimately, enhanced self-care has the potential to not only improve health outcomes but also enhance the overall well-being and daily living of those affected by HF.

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Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Authors’ contributions

[Author 1] conceived and designed the study, supervised data collection, and led the overall project administration. [Author 2] contributed to the development of the research instruments, coordinated participant recruitment, and managed data collection. [Author 3] performed the statistical analysis and contributed to data interpretation. [Author 4] contributed to the literature review, assisted in drafting sections of the discussion, and provided critical input on the interpretation of findings. [Author 5] drafted the initial manuscript. All authors contributed to critical revisions of the manuscript, approved the final version, and agree to be accountable for the work.

Declaration of Interest

None.

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