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Original Article

Relationship Between Disease-Related Worry and Self-Efficacy in Patients With Heart Failure: A Cross-Sectional Study

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Abstract

Background: Patients with heart failure (HF) experience worries that may affect their self-efficacy, but this relationship remains underexplored in Iran.

Objectives: This study aimed to determine the relationship between disease-related worry and self-efficacy, and to identify the independent socio-demographic and clinical factors associated with worry among patients with HF.

Methods: This study was conducted from July to August 2023 among 208 patients with HF admitted to Madani Hospital in Tabriz, selected by convenience sampling. Data were collected using the worry and cardiac self-efficacy questionnaires. Descriptive statistics, Pearson's correlation coefficient, and multivariable linear regression were employed using SPSS version 24.

Results: Participants were mainly male (57.7%), with a mean age of 59.73 years. The mean (SD) scores for worry and self-efficacy were 85.76 (27.89) and 25.34 (8.99), respectively (higher worry score = lower worry). A significant positive correlation was observed between self-efficacy and worry ($r = 0.329$, $p < 0.001$). Regression revealed that self-efficacy ($\beta = 0.170$, $p = 0.023$), university education ($\beta = 0.293$, $p = 0.011$), below diploma ($\beta = 0.170$, $p = 0.044$), and higher income ($\beta = 0.230$, $p = 0.011$) were positively associated with worry scores. Conversely, hospital stay > 7 days ($\beta = -0.330$, $p = 0.001$) and hospitalization frequency > 7 times ($\beta = -0.206$, $p = 0.020$) were negatively associated ($R^2 = 0.519$, adjusted $R^2 = 0.495$, $p < 0.001$).

Conclusion: Disease-related worry in patients with HF was associated with self-efficacy and several patient factors, highlighting potential targets for future interventional studies.

Implications for Nursing and Midwifery Preventive Care

- Routine assessment of disease-related worry and self-efficacy enables early identification of at-risk HF patients.
- Targeted psycho-educational interventions to enhance self-efficacy may prevent psychological distress.
- Nurses should prioritize vulnerable patients.

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Introduction

The World Health Organization has emphasized the growing burden of non-communicable diseases and the need to prioritize them in health policies. HF is a clinical syndrome wherein disease progression leads to decreased cardiac output [1].

It is characterized by symptoms such as chest pain, dyspnea, edema, and dizziness, ultimately leading to activity intolerance and adverse lifestyle alterations [2]. Psychological symptoms such as hopelessness, low self-esteem, and low energy levels are present in approximately 50% of HF patients, contributing to a decline in their functional status [3].

The worry and problems faced by HF patients are multifaceted. Worry is a form of distress that has been defined as a cognitive process in which people feel anxious due to concerns regarding uncertainty about the future and the possibility of negative events [4]. In patients with HF, disease-related worry specifically encompasses concerns about physical symptoms, functional decline, cognitive changes, and uncertain prognosis [5]. High treatment costs and recurrent hospitalizations constitute significant sources of worry [6]. Moreover, living with HF is often experienced as an exhausting and frightening way of life, expressed through increasing disability, weakness, and dependence [7-8]. Most HF patients perceive death as a relief from suffering and express concerns about pain and loss of dignity in life [9]. These patients identify physical symptoms, disability, psychological symptoms, and concerns about death and life as hallmarks of HF [10].

Recent studies have continued to highlight the significant psychological burden experienced by patients with HF. For instance, Costa et al. reported that anxiety remains highly prevalent in this population and is associated with adverse socio-demographic and clinical characteristics [11]. Similarly, Jaarsma et al. emphasized the importance of addressing psychological factors, including worry and self-efficacy, as part of comprehensive HF self-care recommendations [12].

Therefore, a comprehensive and classified assessment of cardiac disease-related worry using precise quantitative tools and methods is essential in the nursing care process for patients with HF, followed by necessary planning to address or mitigate these concerns. Bagheri et al., in a study using a specific questionnaire, examined disease-related worry in HF patients. Results indicated the highest mean score was related to physical-psychological worry [5]. A positive psychological state is crucial in the treatment and care process for patients with HF. Empowering patients to control risk factors, improve lifestyle, and perform self-care behaviors is directly linked to their psychological status. In this regard, patient self-efficacy in disease management represents a key variable that should be considered by the healthcare team, including nurses [13]. Self-efficacy has been defined as individuals' perception of their ability or willingness to change or continue a behavior successfully [14]. Enhancing self-efficacy in disease management can increase patients' confidence in successfully performing self-care behaviors and foster greater hope for life [15]. Consequently, self-efficacy can be a valuable tool for nurses; assessing and promoting self-efficacy in patients with HF may increase their motivation for self-care [16-17].

Understanding the relationship between disease-related worry and self-efficacy is particularly relevant for preventive nursing care, as early identification of patients with low self-efficacy and high worry could enable nurses to implement targeted educational and psychological interventions to prevent the progression of psychological distress into clinically significant anxiety or depression, ultimately reducing the risk of poor health outcomes and hospital readmissions. Various factors, including patient education, age, literacy level, etc., influence self-efficacy. Accurate information and sufficient insight into factors affecting HF patients' ability to manage their disease will aid nurses and healthcare providers in selecting correct therapeutic, educational, and supportive strategies for their care. However, based on American heart association report some factors affecting self-efficacy in disease management remain unidentified, necessitating further research [18]. Given the absence of studies concurrently examining the relationship between disease-related worry and self-efficacy in Iranian

patients with HF, and given the need to identify which demographic and clinical factors contribute to patients' worry levels.

Objectives

This study aimed to determine the relationship between disease-related worry and self-efficacy, and to identify the independent socio-demographic and clinical factors associated with worry among patients with HF.

Methods

Study Design

A cross-sectional study design was employed to investigate disease-related worry and its relationship with self-efficacy in disease management among patients with HF.

Participants and Sampling

This study was conducted at Shahid Madani Hospital, a major cardiovascular referral center in Tabriz, Iran. Participants were selected using a convenience sampling method from eligible patients with HF admitted to the hospital's wards between July and August 2023.

Sample size was calculated using the correlation sample size formula: $n = [(Z_{1-\alpha/2} + Z_{1-\beta}) / C]^2 + 3$, $c = 0.5 \times \ln[(1+r)/(1-r)]$. Based on a pilot study of 25 participants where the correlation between disease-related worry and self-efficacy was estimated at $r = 0.35$, with $\alpha = 0.05$ and power $(1-\beta) = 0.90$, the required sample size was calculated to be 200. Allowing for a potential 10% attrition rate, the final sample size was estimated to be 220 patients. Inclusion criteria were: (1) age 18 years or older, (2) diagnosis of HF classified as Class II to IV based on the New York Heart Association [18], and (3) physically stable condition and adequate cognitive status to respond to questionnaire items. Exclusion criteria were patient deterioration during data collection precluding continued participation and questionnaires with more than 10% of items unanswered.

Measurement Instruments (Validity & Reliability)

Data were collected using three instruments:

1. Demographic and clinical information form: This form, developed by the researchers and used to collect data on age (years), gender (male/female), marital status (single, married, widowed, divorced), history of other diseases (none, unknown disclosed, hypertension, diabetes, both hypertension and diabetes, other), education level (illiterate, under diploma, diploma, university degree), having children (yes/no), income status (income less than expenses, income equals expenses, income more than expenses), residence status (personal, with parents, rented), number of hospitalizations (< 2 times, 2-5 times, > 5 times), and length of current hospital stay (< 3 days, 3-7 days, > 7 days).
2. Disease-related worry questionnaire in heart failure patients: This 23-item questionnaire, developed and validated by Bagheri et al. (2014) in Iran. It comprises four subscales including cognitive independence (9 items), physical-psychological worry (8 items), functional independence (4 items), and worry about future of disease (2 items). Items are scored on a 6-point Likert scale from 1 (completely agree) to 6 (completely disagree). The total score ranges from 23 to 138, 9 to 54 for cognitive independence, 8 to 48 for physical-psychological worry, 4 to 24 for functional independence, and 2 to 12 for worry about future of the disease subscales, with higher scores indicating lower levels of worry. The content validity of the questionnaire was confirmed, and its reliability, assessed by Cronbach's alpha, was reported as 0.90 for the entire tool [19]. In the present study Cronbach's alpha was 0.92.
3. Cardiac self-efficacy scale (CSE): This 9-item scale, developed by Steca et al. and validated in Persian by Rajati et al., measures self-efficacy in managing cardiovascular disease [13, 20]. It contains three subscales including self-efficacy in controlling cardiac risk (4 items), self-efficacy in adhering to treatment (2 items), and self-efficacy in recognizing symptoms (3 items).

Items are rated on a 5-point likert scale from 1 (not at all sure) to 5 (completely sure). The scores range from 9 to 45 for total, 4 to 20 for controlling cardiac risk, 2 to 10 for adhering to treatment, and 3 to 15 for recognizing symptoms subscales, with higher scores

indicating greater self-efficacy. The Persian version has demonstrated appropriate content, face, and criterion validity. Its reliability, reported by Cronbach's alpha, was 0.80 [20]. In the current study Cronbach's alpha was 0.79.

Data Collection Procedure

After obtaining necessary permits from the Ethics Committee of Tabriz University of Medical Sciences and an introduction letter from the Vice Chancellor for Research, the researcher attended Shahid Madani Hospital. Patient records were reviewed, and patients were checked for eligibility based on the inclusion criteria. When selected patients were stable, the researcher met them, introduced herself, explained the study's objectives, and administered the questionnaires. For illiterate or low-literacy participants, the researcher read the questions aloud, ensured comprehension, and recorded their responses.

Statistical Analysis

Data were analyzed using SPSS software (version 24). Descriptive statistics (frequency, percentage, mean, standard deviation) were used to summarize demographic characteristics and main variables. The relationship between the main variables (self-efficacy and disease-related worry) was assessed using Pearson's correlation coefficient. Multivariable linear regression analysis (enter method) was employed to control for potential confounders and to identify associated independent factors with disease-related worry scores. Assumptions of linear regression (linearity, independence of errors, homoscedasticity, normality of residuals) were checked and met. A p-value of less than 0.05 was considered statistically significant.

Result

Demographic and Clinical Characteristics

Of the 220 eligible patients approached, 208 agreed to participate (response rate: 94.5%). The remaining 12 patients declined participation due to personal reasons (n = 8) or were excluded due to incomplete questionnaires (n = 4).

The majority were male (57.7%, n= 120) with a mean (SD) age of 59.73 (12.13, range: 19-88) years. Detailed demographic and clinical characteristics are presented in Table 1.

Status of Disease-related Worry

The mean (SD) total score for disease-related worry was 85.76 (27.89) out of a maximum possible score of 138. Higher scores indicating lower levels of worry. Table 2 shows detailed subscale-level scores. The items with the highest levels of worry were "I feel physically tired", "I get palpitations when doing daily activities", and "I am unable to climb a slope or uphill". Detailed item-level scores are presented in Table 3.

Status of Self-efficacy in Disease Management

The mean (SD) total self-efficacy score was 25.34 (8.99) out of 45.

Table 2 shows detailed subscale-level scores. The items with the highest self-efficacy were "you can recognize your disease symptoms like chest pain", "you can follow doctor's orders about quitting smoking, ...", and "you can recognize your disease symptoms like palpitations, ...". Detailed item-level scores are presented in Table 3.

Correlation Between Main Variables

The results of the Pearson correlation coefficient test showed a significant positive correlation between the total score of self-efficacy and the total score of disease-related worry ($r = 0.329$, $p < 0.001$), indicating that higher self-efficacy was associated with lower levels of worry. Analyzing the subscales, self-efficacy showed significant positive correlations with cognitive independence ($r = 0.358$, $p < 0.001$), physical-psychological worry ($r = 0.314$, $p < 0.001$), and functional independence ($r = 0.215$, $p = 0.009$). No significant correlation was found between self-efficacy and worry about the future of the disease ($r = -0.08$, $p = 0.340$).

Associated Factors with Disease-related Worry

To examine factors associated with disease-related worry scores, multivariable linear regression analysis (enter method) was performed. The independent variables entered into the model included self-efficacy total score and all demographic/clinical variables that showed a significant relationship with worry scores in univariate analyses.

Six variables were identified as associated factors in the regression model ($R^2 = 0.519$, Adjusted $R^2 = 0.495$, $p < 0.001$). Variables that were not statistically significant in the final regression model ($p > 0.05$) included age, gender, marital status, employment status, residence status, having children, and history of previous illness. Table 4 presents the detailed results of the regression analysis.

Table 1. Demographic and Clinical Characteristics of Participants (N = 208)

Variables	Categories	N (%)
Gender	Male	120 (57.7)
	Female	88 (42.3)
Education level	Illiterate	89 (42.8)
	Under diploma	39 (18.8)
	Diploma	35 (16.8)
	University	45 (21.6)
Residence	Own house	170 (81.7)
	Rent	25 (12)
	With parents	13 (6.3)
Marital status	Single	15 (7.2)
	Married	135 (64.9)
	Divorced	13 (6.3)
	Widowed	45 (21.6)
Employment status	Unemployed	92 (44.2)
	Retired	55 (26.4)
	Full-time work	25 (12)
	Part-time work	36 (17.4)
Children	Yes	178 (85.6)
	No	30 (14.4)
Income	Income less than expenses	87 (41.8)
	Income equals expenses	104 (50)
	Income more than expenses	17 (8.2)
Length of hospitalization	Less than 3 days	77 (37)
	Between 3 to 7 days	83 (39.9)
	More than 7 days	48 (23.1)
Number of hospitalizations	Less than 3 times	80 (38.5)
	Between 3 to 7 times	71 (34.1)
	More than 7 times	57 (27.4)
History of previous illness	None	68 (32.7)
	High blood pressure	53 (25.5)
	Diabetes	20 (9.6)
	High blood pressure & diabetes	36 (17.3)
	Other	31 (14.9)

Note. The 'Other' category in the history of previous illness variable includes conditions such as coronary artery disease, valvular heart disease, chronic kidney disease, chronic obstructive pulmonary disease, peptic ulcer, hyperlipidemia, and history of stroke.

Table 2. Mean Scores of Disease-related Worry and Self-efficacy

Variable	Mean (SD)	Possible range
Disease-related worry	85.76 (27.89)	23–138
– Cognitive independence	40.51 (10.56)	9–54
– Physical-psychological worry	21.82 (8.89)	8–48
– Functional independence	17.11 (5.73)	4–24
– Future-related worry	6.32 (2.71)	2–12
Self-efficacy in disease management	25.34 (8.99)	9–45
– Cardiac risk self-efficacy	11.22 (3.78)	4–20
– Treatment adherence	4.83 (2.24)	2–10
– Symptom recognition	9.29 (2.97)	3–15

Table 3. Descriptive Statistics for Items of the Disease-related Worry and the Cardiac Self-efficacy Scale

Variable	Mean (SD)
Disease-related worry	
– Cognitive independence	
I am not confident in my memory for learning new material.	5.03 (1.15)
I have to read material several times to understand it.	5.43 (1.26)
I am unable to recall topics that happened in the last few days.	4.89 (1.12)
Sometimes I am unable to recognize the place where I am.	4.89 (1.12)
Sometimes I am unable to recognize the time.	4.85 (1.09)
Sometimes I don’t even recognize familiar people.	5.24 (0.95)
My attention to various topics has decreased.	3.55 (1.19)
The level of my attention to surrounding topics has decreased.	3.51 (1.41)
Sometimes I make mistakes in recalling the prescribed dosage of my medications.	3.12 (1.27)
– Physical-psychological worry	
Due to my illness, my family is facing many problems	2.67 (1.15)
I feel physically tired.	1.81 (0.93)
I have no hope for the recovery of my illness.	3.45 (1.10)
Because the recovery is uncertain, I cannot plan for my future life.	2.95 (1.05)
I am unable to go up a slope or an inclined surface.	2.57 (1.29)
I experience heart palpitations while doing daily activities.	2.53 (1.18)
My physical appearance has changed.	2.90 (1.13)
I experience chest pain while doing daily activities.	2.94 (1.06)
– Functional independence	
I need help from others to perform daily tasks (dressing, eating).	4.48 (1.45)
I am unable to bathe or use the toilet independently.	4.60 (1.53)
I am unable to maintain personal hygiene alone (washing my face, brushing teeth, combing my hair).	4.69 (1.45)
I am unable to do tasks outside the home, such as shopping, independently.	3.34 (1.30)
– Future-related worry	
The onset or exacerbation of my symptoms is unpredictable.	3.30 (1.34)
I do not know what will happen to me in the future because of my illness.	3.02 (1.37)
self-efficacy	
– Cardiac risk self-efficacy	
You can easily avoid life problems and minimize daily stress.	2.17 (0.80)
You can limit your physical activities and strenuous tasks, e.g., avoiding lifting heavy objects.	3.01 (1.08)
You can follow the dietary plans given by the doctor, even when you are very nervous.	2.89 (0.85)
You can follow the doctor’s instructions regarding smoking cessation, even when you feel very angry or upset.	3.15 (1.05)
– Treatment adherence	
You can take your medications on time, even when no one reminds you.	2.44 (1.13)
You can take your medications correctly, even when no one reminds you.	2.39 (1.11)
– Symptom recognition	
You can recognize the signs of your disease, such as palpitations and shortness of breath.	3.10 (0.95)
You can recognize the signs of your disease, such as chest pain.	3.26 (0.97)
You can recognize the severe symptoms of your disease and know when to consult a doctor.	2.93 (1.05)

Table 4. Multiple Linear Regression Analysis for Factors Associated With Disease-related Worry Scores

Predictor variable	B	β	*p*	95% CI
Self-efficacy	0.541	0.170	0.023	[0.076, 1.005]
University education level	12.26	0.293	0.011	[2.82, 21.71]
Below diploma education level	8.13	0.170	0.044	[0.206, 16.07]
Income more than expenses	15.64	0.230	0.011	[3.72, 27.57]
Hospital stay > 7 days	-14.67	-0.330	0.001	[-22.86, -6.49]
Hospitalization frequency > 7 times	-9.07	-0.206	0.020	[-16.71, -1.42]

Note. $R^2 = 0.519$, Adjusted $R^2 = 0.495$, $p < 0.001$. References: illiterate (education), income < expenses, hospital stay <3 days, hospitalization <3 times. Positive β = lower worry (reverse scoring).

Discussion

This study aimed to investigate disease-related worry and its correlation with self-efficacy in disease management, as well as to identify the independent socio-demographic and clinical factors associated with disease-related worry among patients with HF. The key findings of this study indicated a moderate level of disease-related worry and a moderate level of self-efficacy among patients with HF. Crucially, a significant positive correlation was found between self-efficacy and lower levels of overall worry (due to reverse scoring of the worry questionnaire), indicating that higher self-efficacy is associated with lower levels of worry. Furthermore, several socio-demographic and clinical factors, including education, income, and hospitalization history, were associated with disease-related worry.

These findings align with those of Bagheri et al. 2014, who also reported significant disease-related worry in this population [5, 19]. This is consistent with qualitative studies describing HF as a "frightening and exhausting" life experience marked by uncertainty and fear of the future [8, 21-23]. The specific worry identified, particularly regarding physical fatigue, palpitations, and functional limitations, highlights the profound impact of HF symptoms on daily life and psychological well-being, consistent with reports by Ekman et al. and Pihl et al. [21, 23] The finding that worry levels were moderate rather than severe could be attributed to coping mechanisms or the specific sample characteristics. Nonetheless, the presence of significant worry underscores the need for routine psychological assessment in HF care, as persistent concerns can evolve into clinical anxiety, adversely affecting outcomes [24, 11-12]. Our findings support calls for holistic care models that integrate psychological support alongside medical management for patients with HF [25].

The moderate level of self-efficacy found is consistent with some domestic studies but lower than reports from certain international contexts [26-27]. This discrepancy might be attributable to variations in healthcare systems, cultural beliefs about illness, and access to supportive resources. The positive correlation between self-efficacy and most worry domains (cognitive independence, physical-psychological, functional independence) is a pivotal finding. It suggests that patients who perceive themselves as more capable of managing cardiac risks, adhering to treatment, and recognizing symptoms experience less worry about their cognitive function, physical symptoms, and daily activities. This aligns with Bandura's theory, where higher self-efficacy fosters resilience and reduces anxiety by enhancing perceived control over challenging situations [14]. Studies by Xiong et al. and Zhang et al. similarly found that higher self-efficacy was associated with reduced fear of disease progression and improved quality of life in patients with HF [28-29]. The lack of a significant relationship between self-efficacy and "worry about the future" is noteworthy. This subscale encompasses fears about unpredictable long-term outcomes, which may be less amenable to personal control through self-management behaviors

measured by the CSE scale. Such worry might be more influenced by existential concerns, spiritual factors, or the perceived adequacy of social and healthcare system support [9].

The regression analysis offers a more nuanced understanding of the factors shaping disease-related worry. The finding that self-efficacy positively associated with worry scores (due to reverse scoring) reinforces its role as a potentially modifiable protective factor against distress. Thus, interventions aimed at enhancing self-efficacy could be crucial. The strong influence of socioeconomic factors is evident. Higher education and income predicted significantly less worry, likely mediated by better health literacy, access to resources, greater perceived control over one's life, and reduced financial strain. Conversely, prolonged hospital stays and frequent readmissions were associated with greater worry. These results align with the findings of a recent study, which highlighted the importance of individual and social determinants in health outcomes among HF patients [30].

This study has limitations. The cross-sectional design precludes causal inferences. Convenience sampling from a single tertiary center limits the generalizability of findings to all patients with HF in Iran or other healthcare settings. The use of self-report measures is susceptible to social desirability bias. The study did not include clinical severity indicators such as heart functional class, left ventricular ejection fraction, or duration of illness, which may have provided additional insight into the relationship between disease severity, worry, and self-efficacy. Future studies should incorporate these clinical variables to further elucidate the determinants of disease-related worry in HF patients.Despite these limitations, the study strengths include the use of validated, disease-specific instruments for both worry and self-efficacy, a reasonably large sample size, a high response rate (94.5%), and a comprehensive analysis that controlled for a wide range of potential confounders including demographic and clinical variables, providing a detailed picture of the relationships involved.

Conclusion

In conclusion, this study reveals that patients with heart failure experience a significant burden of disease-related worry, which is inversely related to their level of self-efficacy in managing their condition. Higher self-efficacy is associated with less worry regarding cognitive, physical-psychological, and functional aspects of the illness. Furthermore, socioeconomic factors (education, income) and clinical factors (hospitalization history) are significant determinants of patients' worry levels. These observed associations suggest that future interventional studies could investigate whether enhancing self-efficacy reduces disease-related worry.

Ethical Considerations

The study protocol was approved by the Regional Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1403.024). All participants provided written informed consent after receiving complete information about the study aims and procedures. Participants were assured of the confidentiality of their data, and names were not recorded on the questionnaires. They were informed of their right to withdraw from the study at any time without any consequences. It was also assured that results would be made available to them upon request.

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Conflict of Interest

The authors declare that they have no competing interests.

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Authors' Contributions

Conceptualization: M. Mohammadnejad, H. Feizollahzadeh
Methodology: M. Mohammadnejad, H. Feizollahzadeh
Investigation (Data Collection): M. Mohammadnejad
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Writing – Original Draft: M. Mohammadnejad, H. Feizollahzadeh
Writing – Review & Editing: H. Feizollahzadeh, A. Rahmani
Supervision: H. Feizollahzadeh, A. Rahmani
All authors read and approved the final manuscript.

Artificial Intelligence Utilization

The authors declare that artificial intelligence (AI) tools were not used for the scientific writing, data analysis, or interpretation of the results of this study. The authors only utilized automated translation and AI-assisted language tools, specifically Google Translate (Google LLC; web version; accessed October 3, 2026) and ChatGPT (OpenAI; GPT-4; accessed October 3, 2026), solely to assist with translating the draft from Persian into English. All translated text was critically evaluated and edited by the authors to ensure scientific accuracy and clarity. The authors assume full responsibility for the entire published work.

Data Availability Statement

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

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