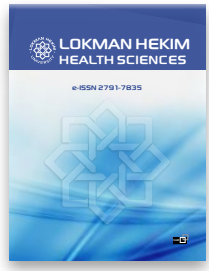
LOKMAN HEKIM HEALTH SCIENCES

DOI: 10.14744/lhhs.2026.29868
Lokman Hekim Health Sci 2026;6(4):730–738



lokmanhekimhs.com

ORIGINAL ARTICLE

The Relationship between Caregivers' Contribution to Self-Care and Symptom Intensity in Patients with Heart Failure and Influencing Factors: A Descriptive Study

Ulviye Özcan Yüce[1], Nilay Bektaş Akpınar[2], Kübra Uyanık[3], Şerafettin Demir[3]

[1]Department of Nursing, Osmaniye Korkut Ata University Faculty of Health Sciences, Osmaniye, Türkiye
[2]Department of Nursing, Ankara Medipol University, Faculty of Health Sciences, Ankara, Türkiye
[3]University of Health Sciences, Adana City Training and Research Hospital, Adana, Türkiye

Abstract

Introduction: Caregivers play a crucial role in facilitating engagement in self-care practices and improving symptom experiences among individuals with heart failure (HF). This study aimed to examine the relationship between caregiver contributions to HF self-care and symptom intensity experienced by patients, as well as patient- and caregiver-related sociodemographic factors influencing this relationship.

Methods: This descriptive and correlational study was conducted in a public hospital between January and May 2023. The sample consisted of patients diagnosed with HF classified as New York Heart Association class II or higher (n=192) and their primary caregivers (n=192) who provided at least six hours of care per day. Data were collected using a Personal Information Form, the Symptom Status Questionnaire–HF (SSQ-HF), and the caregiver contribution to self-care of HF index (CCSCHFI).

Results: The mean SSQ-HF score was 48.63±17.56, indicating symptom intensity above a moderate level. Weak but statistically significant positive correlations were identified between SSQ-HF scores and the CCSCHFI total score and its subscales: Caregiver contribution to self-care maintenance (r=0.147, p=0.042), self-care management (r=0.245, p=0.001), and confidence in contributing to self-care (r=0.241, p=0.001). Overall, caregiver contributions to patient self-care were found to be at a moderate level.

Discussion and Conclusion: Despite moderate caregiver contribution, patients experienced relatively high symptom intensity, suggesting that characteristics of the patient–caregiver dyad and disease-related self-efficacy may significantly influence symptom outcomes. Interventions targeting caregivers' knowledge gaps, enhancing self-efficacy, and strengthening caregiver–patient communication may help reduce symptom intensity in patients with HF.

Keywords: Caregivers; Heart failure; Nursing; Self-care; Symptom burden

The abstract of this article was presented as an oral presentation at the 25th National Internal Medicine Congress. (25th National Internal Medicine Congress, 2024, Antalya).

Cite this article as: *Yüce UÖ, Akpınar NB, Uyanık K, Demir Ş. The Relationship between Caregivers' Contribution to Self-Care and Symptom Intensity in Patients with Heart Failure and Influencing Factors: A Descriptive Study. Lokman Hekim Health Sci 2026;6(4):730–738.*

Correspondence: Ulviye Özcan Yüce. Osmaniye Korkut Ata Üniversitesi Sağlık Bilimleri, Fakültesi Hemşirelik Anabilim Dalı, Osmaniye, Türkiye
E-mail: ulviyezcan6@gmail.com **Submitted:** 08.10.2025 **Revised:** 31.03.2026 **Accepted:** 07.04.2026 **Available Online:** 14.09.2026

Clinically, heart failure (HF) is a condition that results from a structural or functional disorder of the heart in which patients experience typical symptoms and findings.[1] HF is among the most commonly seen chronic diseases around the world as a result of factors including the aging of the global population, increases in other comorbidities, and individuals' adoption of lifestyle habits that may pose a risk to cardiovascular health.[2] It was reported that there were approximately 56.5 million patients with HF in the world in 2021. Therefore, HF is accepted as a global public health problem.[3] Similar to the global situation in Türkiye the estimated prevalence of HF was 2.114% at the end of 2022.[4] However, according to the Turkish Cardiology Association, the average age of patients with HF in Türkiye is 60, and HF is seen approximately 10 years earlier in Türkiye compared to Western societies.[5] This data indicate the need for a more comprehensive approach for HF.

Patients with HF commonly experience many disturbing symptoms related to decreased cardiac functions.[6] Studies in the literature have reported that the total symptom intensity is quite high among patients diagnosed with HF.[7,8] An increase in the frequency and severity of these symptoms is linked to recurrent hospital admissions and life-threatening adverse clinical outcomes.[9,10] Patients with HF who practice better self-care are more likely to reach their treatment goals than those with poor self-care.[11] However, patients may have difficulty in performing effective self-care as a result of multiple factors, such as aging, ineffective coping with treatments, cognitive impairment, comorbidities, depression, and complex medical regimens that are challenging to follow. In addition, the self-care behaviors of patients living with HF, such as medical visits, medication treatment management, recognition and control of key symptoms, and the adoption of a lifestyle in accordance with recommended diet and physical activity styles, are activities that may be difficult to perform independently.[12,13] Therefore, most patients living with HF need support from family members, friends, or relatives.[3] Caregivers, therefore, play a crucial role in supporting the self-management of individuals with HF. Caregiver's contribution to the self-care of individuals with HF can be defined as the process of supporting the maintenance of self-care, recognizing symptoms, and facilitating behaviors that help respond when symptoms of an HF exacerbation emerge. This can involve suggesting appropriate actions or acting on behalf of the patient.[14] The situation-specific theory of caregiver contributions to HF self-care, developed by Vellone et al.,[14] provides a conceptual framework that enables a detailed understanding of how caregivers' active contributions to the self-care process of individuals with HF influence patient outcomes. According to this theory, caregivers assume roles such as monitoring symptoms, supporting self-care decision-making, and assisting in the maintenance of self-care behaviors. Many of the activities performed by caregivers to contribute to patient care are not merely forms of social support but are directly related to the provision of self-care. The theory proposes that active caregiver involvement in the self-care process can facilitate early recognition of symptoms and timely intervention, thereby improving patient outcomes and reducing hospital visits and symptom burden. At the same time, the theory suggests that the effect of caregiver contribution on self-care is directly influenced by certain characteristics related to the caregiver, the patient, and the caregiver–patient relationship.[14] In this context, examining the impact of caregiver contributions on patients' experiences of symptom intensity is theoretically meaningful and clinically important.

Recent evidence indicates that greater caregiver contribution to the maintenance of HF self-care is associated with better patient self-care and lower symptom burden, and that patient self-care may mediate this relationship.[15] Although the importance of caregiver support is widely recognized, most previous HF research has focused on caregiver burden, psychological outcomes, or general support variables, rather than on how caregiver involvement specifically contributes to patients' self-care behaviors and symptom experiences. An updated systematic review demonstrates that caregivers are involved in multiple HF self-care activities, including care provision, monitoring, and management; however, it also highlights significant gaps in clearly defining these activities and their effects on clinical outcomes.[16]

Based on this evidence and the situation-specific theory of HF self-care, we hypothesized that higher caregiver contributions to HF self-care would be associated with lower patient-reported symptom intensity, mediated through improved patient self-care behaviors. By integrating caregiver contributions within a specific theoretical framework and directly examining their relationship with symptom outcomes in HF, this hypothesis extends the existing literature.

Materials and Methods

Study Design and Participants

A descriptive cross-sectional study design was employed to examine the relationship between symptom intensity and caregiver contributions in patients with HF, as well

as patient- and caregiver-related sociodemographic characteristics influencing this relationship. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology checklist.

The study was conducted between January and May 2023 in the cardiology outpatient clinic and inpatient cardiology service of a public hospital in Adana, Türkiye. The necessary sample size was calculated to be a minimum of 139 pairs of patients and caregivers through power analysis using the G*Power 3.1.9.4 program with an alpha value of 0.05, beta value of 0.95, and effect size (Cohen's g) of 0.14.[8,17,18] As the data collection period allowed for the recruitment of a greater number of eligible participants, the study was finalized with a total of 192 dyads consisting of patients and their caregivers.

The inclusion criteria for patients were as follows: (1) being over 18 years of age, (2) not having any physical or cognitive disabilities that would make it difficult to respond to the data collection tools, and (3) having been diagnosed with HF of Class II or above according to the classification of the New York Heart Association (NYHA). The inclusion criteria for caregivers were: (1) being over 18 years of age and (2) being the primary caregiver who assists the patient in self-care for at least 6 h daily. Caregivers were excluded if they had any cognitive disabilities interfering with the ability to participate in the study. Patients were excluded if they were diagnosed with any other disease during the data collection period or if they had to leave the study because of the worsening of their current health status or diagnosis with an additional disease, and had to receive treatment in another clinic.

Data Collection Tools

The symptom status questionnaire-HF (SSQ-HF) and the Caregiver Contribution to Self-care of HF Index (CCSCHFI) were used. The personal information form was developed by the researchers. It addressed the characteristics of the patient and caregiver, such as age, gender, marital status, education level, and employment status. The form also included the HF classification, time of diagnosis, and with whom the individual lived as patient-specific questions. Questions addressing the level of kinship with the patient (spouse, child, relative, or friend), duration of care responsibility, and daily caring time were included in the form as caregiver-specific questions.

SSQ-HF

The SSQ-HF was developed by Heo et al.[19] and adapted to Turkish by Gök Metin and Gülbahar.[20] The Cronbach's alpha value of the scale is 0.86,[20] while in our study it was found to be 0.937. The SSQ-HF consists of seven questions that assess the presence, frequency, severity, and distress of common physical symptoms of HF, including daytime dyspnea, dyspnea while lying down, fatigue, chest pain, edema, difficulty in sleeping, and dizziness or loss of balance. If the symptom is present, the patient is asked to report the frequency of the symptom on a scale of 1 ("less than once per week") to 4 ("nearly daily"). Severity responses range from 1 ("slight") to 4 ("very much"), while distress responses range from 0 ("not at all") to 4 ("very much"). Higher scores indicate more severe symptoms. A score of 0 signifies the absence of the respective symptom.[20]

CCSCHFI

The CCSCHFI was developed by Vellone et al.[21] who adapted it from the self-care of HF index (SCHFI) to assess the psychometric characteristics of the scale in evaluating caregiver contributions. Their scale was subsequently converted to Turkish by Akbıyık and Enç.[22] Akbıyık and Enç reported the Cronbach's alpha coefficients of the scale as 0.66 for the caregiver contribution self-care maintenance subscales, 0.81 for the caregiver contribution to self-care management subscale, and 0.80 for the caregiver confidence in contributing to self-care.[22] In our study, the Cronbach's alpha coefficients were 0.788, 0.662, and 0.904 for the respective subscales, while the overall Cronbach's alpha of the SCHFI was 0.878. The index consists of 22 items within three subscales: "caregiver contribution to self-care maintenance," "caregiver contribution to self-care management," and "caregiver confidence in contributing to self-care." The first subscale comprises four factors: Symptom monitoring, physical activity, medical treatment adherence, and sodium intake control. The second comprises two factors: autonomous management and directive-dependent management. The third also consists of two factors: Advanced confidence and basic confidence. Each of the three subscales uses a 4-point Likert-type scale for responses. The total possible score that can be obtained from the first subscale is 40. The highest scores that can be obtained from the second and third subscales are 24 in both cases. Higher scores reflect greater contributions to self-care.[22]

Implementation of Data Collection Tools

The data were collected by the researchers through face-to-face interviews. The purposes of the survey forms used in the study were first explained to the patients and caregivers by the researchers. For each participant who met the inclusion criteria, an explanation of how to answer

the questions within the scope of the survey was provided in a face-to-face discussion in the outpatient clinics or the patient's own room in the inpatient services. Care was taken to ensure that no one other than the patient or caregiver was present in these places where face-to-face interviews were held for informational purposes. Afterward, the patients answered the SSQ-HF questionnaire, and the caregivers answered the CCSCHFI questionnaire. It took 30 min in total. The interviews were performed first with the patient and then with the caregiver in the cardiology outpatient clinics and units.

Statistical Analysis

IBM Statistical Package for the Social Sciences Statistics 26.0 for Windows (IBM Corp., Armonk, NY, USA) was used to analyze the data. The normality of the dataset was examined both visually, using histogram and probability graphs, and with the Shapiro–Wilk test. Sociodemographic variables were analyzed using descriptive statistics and provided as mean values, percentages, and ranges. For group comparisons, Student's t-test was used for two independent groups, and one-way analysis of variance (ANOVA) was used for more than two independent groups.

Relationships between the sociodemographic features of the caregivers and the total mean SSQ-HF and CCSCHFI scores were analyzed with Student's t-test and one-way ANOVA, and the differences between the groups were determined through post hoc analysis with Bonferroni correction. Correlations between variables were assessed using Pearson correlation analysis, as the data were normally distributed. Statistical significance was accepted at $p<0.05$ within a 95% confidence interval (CI).

A multivariable linear regression analysis was performed to identify independent factors associated with SSQ-HF total scores. Variables with a $p<0.10$ in univariate analyses were included in the model.

Ethical Considerations and Data Collection

The study was conducted with the approval of Osmaniye Korkut Ata University Non-Interventional Clinical Research Ethics Committee granted approval for this study (date: August 05, 2022, number: E.79002).

Written permission was obtained from the selected hospital. Oral and written informed consent were obtained from all voluntary participants. To ensure reliability, it was explained to patients and caregivers that their answers should not be shared with each other or anyone else. This research adhered to the principles of the 2008 Declaration of Helsinki.

Table 1. The mean score of SSQ-HF by sociodemographic characteristics of patients (n=192)

Sociodemographic features	n	%	Mean±SD	p*
Sex				**0.011***
Male	102	53.1	45.63±17.24	
Female	90	46.9	52.06±17.39	
Age				**0.031****
41–54	23	12.0	39.95±20.08	
55–65	53	27.6	49.58±17.74	
66–75	70	36.5	51.98±14.81	
76–94	46	24.0	46.84±18.71	
Education				0.647*
Primary education	143	75.0	48.97±17.40	
High school and University	48	25.0	47.62±18.19	
Current working status				0.157*
Employed	22	11.5	43.63±18.33	
Unemployed	170	88.5	49.28±17.41	
Job				0.106**
Retired	93	48.4	47.75±17.32	
Housewife	76	39.6	51.44±17.11	
Worker	22	11.5	43.63±18.33	
Marital status				**0.002***
Married	142	74.0	55.14±16.31	
Single	50	26.0	46.32±17.46	
NYHA classes				**<0.001**
Class 2	94	49.5	40.91±17.77	
Class 3	75	39.1	57.45±12.86	
Class 4	22	11.5	51.55±15.99	
Diagnosis time (month)				**0.001**
2–6	44	22.9	40.11±19.50	
7–24	45	23.4	49.50±16.80	
25≥	103	53.6	51.90±16.17	

*: Independent-samples t-test; **: One-way analysis of variance (Bonferroni). %: Percentage; SD: Standard deviation; SSQ-HF: Symptom status questionnaire - heart failure; NYHA class: New York Heart Association's classification.

Results

A total of 192 patients with HF and 192 informal caregivers took place in the study. Table 1 presents the characteristics of patients, and Table 2 presents the sociodemographic characteristics of caregivers.

Table 3 presents the mean scores of the SSQ-HF and CCSCHFI subscales (n=192; n=192, respectively). The mean score of SSQ-HF of patients was 48.63±17.56, indicating that they experienced symptoms characterized by an intensity that

Table 2. Comparison of CCSCHFI and subscale scores across caregivers' sociodemographic characteristics (n=192)

		CCSCHFI subscale scores									
		CCSCHFI-A Mean±SD				CCSCHFI-B Mean±SD			CCSCHFI-C Mean±SD		
Socio-demographic features	**n (%)**	**SM**	**PA**	**MTA and NI**	**Total**	**AM**	**D/DM**	**Total**	**AC**	**BC**	**Total**
Age											
20–40	62 (32.3)	5.41±1.45	4.01±1.82	18.22±4.68	27.66±6.44	11.67±2.87	6.09±1.82	17.77±4.01	9.80±1.81	10.24±1.56	20.04±3.09
41–60	99 (51.6)	5.39±1.57	3.95±1.91	18.04±4.29	27.39±5.94	12.19±3.16	5.84±1.79	18.04±4.27	9.78±2.47	10.06±2.30	19.84±4.55
61–81	31 (16.1)	6.00±1.59	3.29±1.67	18.74±4.07	28.03±5.45	12.25±2.94	5.90±1.75	18.16±4.09	10.09±2.31	10.22±2.14	20.32±4.29
p**		0.144	0.163	0.740	0.870	0.526	0.691	0.891	0.792	0.840	0.846
Sex											
Male	50 (26.0)	5.36±1.42	3.98±1.85	18.68±4.09	28.02±5.84	11.30±2.92	5.76±1.54	17.06±3.80	9.56±2.01	9.74±1.93	19.30±3.73
Female	142 (74.0)	5.54±1.58	3.83±1.86	18.04±4.47	27.42±6.07	12.29±3.03	6.00±1.87	18.29±4.22	9.94±2.32	10.28±2.08	20.23±4.17
p*		0.458*	0.627	0.382	0.551	**0.046**	0.417	0.070	0.300	0.105	0.165
Education											
Primary education	104 (54.2)	5.57±1.69	3.43±1.74	18.13±4.35	27.14±6.06	12.30±2.97	5.79±1.87	18.10±4.20	9.90±2.39	10.01±2.20	19.92±4.47
High school	88 (45.8)	5.40±1.35	4.38±1.86	18.30±4.42	28.10±5.93	11.71±3.08	6.10±1.68	17.81±4.09	9.77±2.06	10.29±1.87	20.06±3.58
p*		0.455	**<0.001**	0.787	0.272	0.179	0.242	0.633	0.688	0.355	0.807
Working status											
Employed	56 (29.2)	5.37±1.31	4.41±1.88	18.82±4.22	28.60±5.63	11.58±3.09	5.82±1.64	17.41±3.88	9.57±2.13	10.25±1.88	19.82±3.62
Unemployed	136 (70.8)	5.55±1.63	3.64±1.80	17.96±4.27	27.16±6.12	12.22±3.00	5.98±1.85	18.20±4.24	9.95±2.28	10.10±2.13	20.05±4.26
p*		0.473	**0.009**	0.218	0.130	0.191	0.566	0.228	0.282	0.614	0.715
Marital status											
Married	142 (74.0)	5.44±1.49	3.84±1.84	18.24±4.73	27.53±5.52	12.09±2.96	5.80±1.71	18.20±4.65	9.83±2.17	10.14±1.99	19.97±3.92
Single	50 (26.0)	5.66±1.68	3.94±1.91	18.12±4.79	27.72±7.26	11.88±3.25	6.32±1.95	17.89±3.96	9.88±2.45	10.14±2.24	20.02±4.53
p*		0.396	0.757	0.861	0.852	0.673	0.079	0.655	0.895	0.981	0.951
Family member cared for											
Spouse	53 (27.6)	5.58±1.65	3.66±1.92	18.07±4.05	27.32±5.43	11.86±2.67	5.73±1.53	17.60±3.45	9.94±2.34	9.90±2.22	19.84±4.41
Children	107 (55.7)	5.42±1.52	3.97±1.87	18.28±4.70	27.67±5.54	12.10±3.17	6.04±1.90	18.14±4.47	9.83±2.30	10.23±2.10	20.06±4.17
Other relatives	32 (16.7)	5.62±1.43	3.87±1.73	18.21±3.84	27.71±5.11	12.09±3.16	5.90±1.82	18.00±4.00	9.71±1.98	10.25±1.56	19.96±3.18
p**		0.724	0.610	0.962	0.932	0.894	0.586	0.737	0.903	0.609	0.951
Length of time as caregiver											
2–6 months	68 (35.4)	5.35±1.56	3.82±1.62	17.76±4.45	26.94±5.89	11.82±3.22	5.58±1.83	17.71±4.47	9.76±2.12	9.91±1.81	19.67±3.69
7–24 months	40 (20.8)	5.67±1.28	4.12±2.04	18.57±4.30	28.37±5.14	11.55±2.63	5.92±1.47	17.47±3.16	9.97±2.01	10.45±1.90	20.42±3.65
1 year ≥	84 (43.8)	5.53±1.64	3.78±1.95	18.40±4.36	27.72±6.27	12.41±3.03	6.25±1.84	18.86±4.21	9.84±2.45	10.19±2.29	20.03±4.56
p**		0.558	0.619	0.566	0.470	0.274	0.060	0.124	0.896	0.410	0.651

Table 2 (cont.). Comparison of CCSCHFI and subscale scores across caregivers' sociodemographic characteristics (n=192)

		CCSCHFI subscale scores									
		CCSCHFI-A Mean±SD				CCSCHFI-B Mean±SD			CCSCHFI-C Mean±SD		
Socio-demographic features	n (%)	SM	PA	MTA and NI	Total	AM	D/DM	Total	AC	BC	Total
Daily caregiving hours											
6–12	56 (29.2)	5.35±1.41	4.16±1.81	18.39±4.33	27.91±6.35	11.17±2.97	5.42±1.72	16.60±3.80	9.33±2.10	10.01±1.81	19.35±3.43
>12	136 (70.8)	5.55±1.59	3.75±1.86	18.13±4.40	27.44±5.88	12.38±2.99	6.14±1.78	18.53±4.54	10.05±2.27	10.19±2.15	20.25±4.30
p*		0.412	0.165	0.717	0.629	**0.012**	**0.011**	**0.003**	**0.046**	0.581	0.169

*: Independent-samples t-test; **: One-way analysis of variance (Bonferroni). CCSCHFI: Caregiver contribution to Self-care of heart failure index; CCSCHFI-A: Caregiver contribution to self-care maintenance; CCSCHFI-B: Caregiver contribution to self-care management; CCSCHFI-C: Caregiver confidence in contributing to self-care; SM: Symptom monitoring; PA: Physical activity; MTA&NI: Medical treatment adherence and sodium intake control; AM: Autonomous management; D/DM: Directive-dependent management; AC: Advanced confidence; BC: Basic confidence.

Table 3. SSQ-HF and CCSCHFI subscale's points averages

SSQ-HF and CCSCHFI Subscale's points averages			
Min-Max	**Mean**	**SD**	**n**
SSQ-HF total 9–84	48.63	17.56	192
CCSCHFI -A total 10–40	27.58	6.00	192
CCSCHFI -B total 8–25	17.97	4.15	192
CCSCHFI -C total 6–24	19.99	4.08	192

CCSCHFI-A: Caregiver contribution to self-care maintenance; CCSCHFI-B: Caregiver contribution to self-care management; CCSCHFI-C: Caregiver confidence in contributing to self-care; SD: Standard deviation.

surpassed the moderate threshold. The average score of the CCSCHFI "caregiver contribution to self-care maintenance" subscale was 27.58±6.1, for the "caregiver contribution to self-care management" subscale was 17.97±4.1, and for the "confidence in contributing to the self-care" subscale was 19.98±4.1. These results indicated that the caregivers contributed moderately to the patients' self-care (Table 3).

The mean score of SSQ-HF by characteristics of patients (n=192) is presented in Table 1. Married patients had significantly higher mean SSQ-HF score than the single ones (p=0.002). Symptom severity score of female patients was statistically higher than that of male patients (p=0.011). The difference between the NYHA Classes of patients was found to be statistically significant in terms of symptom severity (p<0.001). When post hoc tests were performed, patients with NYHA Class III had the highest symptom severity, and it was determined that the difference between classes in terms of symptom severity resulted from Class II – III and Class II and IV (p<0.001; p=0.015, respectively). The difference between the diagnosis times was found to be statistically significant (p=0.001). Post hoc tests suggested that symptom severity gradually increased up to ≤25 months. It was determined that the difference between months in terms of diagnosis time was due to 2–6 months/7–24 months and 2–6 months and ≥25 months (p=0.031; p<0.001, respectively).

Multivariable linear regression analysis demonstrated that sex (β=5.187, 95% CI: 0.493–9.882, p=0.031) and NYHA stage (β=8.510, 95% CI: 5.284–11.736, p<0.001) were independent predictors of higher SSQ-HF total scores. Age (β=-0.053, 95% CI: -0.262–0.155, p=0.613), marital status (β=-4.925, 95% CI: -10.392–0.542, p=0.077), and diagnosis time (β=0.563, 95% CI: -1.610–2.736, p=0.610) were not significantly associated with SSQ-HF total scores.

Table 2 shows the comparison between CCSCHFI subscale scores and sociodemographic characteristics of caregivers (n=192). Female caregivers had a significantly higher

Table 4. The relationships between SSQ-HF and CCSCHFI subscale scores ("R" values of the correlation analysis)

	CCSCHFI subscale scores		
	CCSCHFI-A	**CCSCHFI-B**	**CCSCHFI-C**
SSQ-HF			
r	0.147	0.245	0.241
p	0.042	0.001	0.001

SSQ-HF: Symptom status questionnaire - heart failure; CCSCHFI: Caregiver contribution to self-care of heart failure index; CCSCHFI-A: Caregiver contribution to self-care maintenance; CCSCHFI-B: Caregiver contribution to self-care management; CCSCHFI-C: Caregiver confidence in contributing to self-care.

mean CCSCHFI "autonomous management" score than male caregivers (p=0.046). Those who graduated from high school and university and employed caregivers had significantly higher mean CCSCHFI "physical activity" scores (p<0.001; p=0.009, respectively). Caregivers who provided care for more than 11 h daily had significantly higher mean CCSCHFI "autonomous management","directive-dependent management," "caregiver contribution to self-care management," and "advanced confidence" scores than those who provided care for less than 11 hours daily (p=0.012; p=0.011; p=0.003; p=0.046, respectively).

There was a weak positive correlation between SSQ-HF scores and CCSCHFI "caregiver contribution to self-care maintenance" (r=0.147, p=0.042), "caregiver contribution to self-care management" (r=0.245, p=0.001), and "confidence in contributing to the self-care" subscale scores (r=0.241, p=0.001) (Table 4).

Discussion

The aim of this study was to investigate the relationship between caregiver involvement in HF self-care and patient symptom intensity, as well as the factors influencing this relationship. A weak but statistically significant association was found between caregiver contribution and symptom intensity; notably, symptom burden remained high despite a moderate level of caregiver involvement. Although the correlation coefficients were relatively weak, they may still reflect meaningful associations; therefore, the findings should be interpreted in a balanced and cautious manner.

In the present study, sex and NYHA functional class were identified as independent predictors of symptom severity in patients with HF. The strong association with NYHA class is expected, as it directly reflects disease severity and symptom burden.[23] The effect of sex is also consistent with recent evidence indicating that women tend to report higher symptom burden and poorer quality of life compared to men.[24–26] In contrast, age, marital status, and duration of diagnosis were not significant, suggesting that clinical severity may play a more dominant role than sociodemographic factors in determining symptom burden.[25]

An important finding is the weak positive association between caregiver contribution and symptom intensity, which appears to contradict the expectation that greater caregiver involvement would reduce symptom burden. This may be explained by a reactive relationship, whereby caregiver involvement increases in response to worsening symptoms rather than leading to their reduction. In this context, higher symptom intensity may trigger greater caregiver involvement, particularly among patients with advanced disease or higher care needs. Therefore, caregiver contribution may reflect increased care demand rather than effective symptom control. However, due to the cross-sectional study design, the results show association only, not causation.

The situation-specific theory of HF self-care supports this interpretation by emphasizing that outcomes are shaped by the interaction among patient, caregiver, and dyadic factors.[15] Although previous studies have shown that caregiver contribution can improve self-care and quality of life,[15,27] other findings suggest that such contributions may be insufficient and do not consistently lead to improved outcomes.[17,28]

In our sample, patients' low educational levels, advanced age, comorbidities, and functional limitations may have reduced the effectiveness of caregiver support. Limited self-care awareness and skills may have further hindered the translation of caregiver involvement into improved symptom management.

Caregiver-related factors such as education, experience, perceived control, and confidence in caregiving were found to influence contribution.[14,29] Consistent with the literature, higher education, longer cohabitation, and extended caregiving duration were associated with greater confidence in symptom management in our study. Spending more time with the patient may facilitate closer observation and greater disease-related knowledge, thereby enhancing care management skills. However, findings regarding caregiving duration remain inconsistent.[30]

Female caregivers demonstrated more effective recognition and management of symptoms. This may reflect sociocultural norms in Türkiye, where caregiving roles are predominantly assumed by women.[31,32] Previous studies also highlight the positive impact of female caregivers on patient outcomes.[17,27]

Finally, patient–caregiver communication may play a critical role in determining outcomes. Patients' reluctance

to share symptoms and caregivers' limited self-efficacy may reduce the effectiveness of caregiver contributions. Consistent with Lyons et al.,[33] inadequate communication and insufficient help-seeking behaviors may contribute to higher symptom intensity.

Overall, these findings suggest that caregiver involvement alone is not sufficient; its effectiveness depends on patient capacity, caregiver competence, and the quality of dyadic interaction. Therefore, interventions should focus not only on increasing caregiver involvement but also on improving caregiver education, self-efficacy, and patient–caregiver communication.

Limitations

This study has several limitations. First, due to the descriptive cross-sectional design, the findings can only be interpreted as associations rather than causal relationships. The study was conducted in a single hospital, which may limit the representativeness of the sample and restrict the generalizability of the findings to broader populations of patients with HF and their caregivers. Furthermore, psychosocial variables that may influence caregiver contributions and symptom intensity, such as caregiver burden, psychological distress, quality of the patient–caregiver relationship, and social support, were not assessed. The absence of these variables may have limited a more comprehensive interpretation of the observed associations. Finally, no structured intervention targeting caregivers was implemented; therefore, caregiver contributions were evaluated only within the context of existing care practices.

Conclusion

This study emphasizes that while caregivers' contributions to patients' self-care are at an acceptable level, it is crucial to consider the characteristics of patient-caregiver dyads that influence the care process, the appropriateness of their interaction and communication, and the caregiver's self-efficacy in caregiving when addressing symptom intensity in HF. Interventions aimed at addressing caregivers' knowledge gaps regarding HF self-care, supporting their self-efficacy behaviors, and strengthening caregiver-patient communication may help reduce symptom severity in patients. In line with these results, it is recommended to carry out studies to improve the characteristics of patient-caregiver pairs that affect the care process, the appropriateness of interactions and communication between them, and the caregiver's self-efficacy level in care, to reduce symptom intensity through the care provided.

Ethics Committee Approval: The Osmaniye Korkut Ata University Non-Interventional Clinical Research Ethics Committee granted approval for this study (date: 05.08.2022, number: E.79002).

Informed Consent: Oral and written informed consent were obtained from all voluntary participants.

Conflict of Interest: None declared.

Financial Disclosure: The authors declared that this study has received no financial support.

Use of AI for Writing Assistance: The authors declared that artificial intelligence (AI) supported technologies were not used in the study.

Authorship Contributions: Concept: UÖY, NBA; Design: UÖY, NBA; Data Collection or Processing: UÖY, KU, ŞD; Analysis or Interpretation: UÖY, NBA; Writing: UÖY, NBA; Critical Review: UÖY, NBA, KU, ŞD.

Acknowledgments: We thank all patients and caregivers who participated in our research.

Peer-review: Double blind peer-reviewed.

References

1. Heidenreich P, Bozkurt B, Aguilar D, Allen LA, Byun JJ, Colvin MM, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Journal of Cardiac Failure 2022;28(5):e1-e167.
2. Kitko L, McIlvennan CK, Bidwell JT, Dionne-Odom JN, Dunlay SM, Lewis LM, et al. Family Caregiving for Individuals With Heart Failure: A Scientific Statement From the American Heart Association. Circulation 2020;141(22):e864-e78. [CrossRef]
3. Savarese G, Becher PM, Lund LH, Seferovic P, Rosano GMC, Coats AJS. Global burden of heart failure: a comprehensive and updated review of epidemiology. Cardiovasc Res 2023;118(17):3272-87. [CrossRef]
4. Celik A, Ural D, Sahin A, Colluoglu IT, Kanik EA, Ata N, et al. Trends in heart failure between 2016 and 2022 in Türkiye (TRends-HF): a nationwide retrospective cohort study of 85 million individuals across entire population of all ages. Lancet Reg Health Eur 2023;33:100723. [CrossRef]
5. Değertekin M, Erol C, Ergene O, Tokgözoğlu L, Aksoy M, Erol MK, et al. Türkiye'deki kalp yetersizliği prevalansı ve öngördürücüleri: HAPPY çalışması. Turk Kardiyol Dern Ars 2012;40(4):298-308. [CrossRef] [in Turkish]
6. Arnold SV. Assessment of the patient with heart failure symptoms and risk factors: A guide for the non-cardiologist. Diabetes Obes Metab 2023;25(Suppl 3):15-25. [CrossRef]
7. Lin CY, Miller JL, Lennie TA, Biddle MJ, Mudd-Martin G, Hammash M, et al. Perceived Control Predicts Symptom Status in Patients With Heart Failure. J Cardiovasc Nurs 2020;35(6):530-7. [CrossRef]
8. Li J, Feng L, Shui X, Deng C, Hu A. Relationship Between symptom burden and self-management among patients with

chronic heart failure: a cross-sectional study. Patient Prefer Adherence 2023;17:1909-21. [CrossRef]
9. Moradi M, Daneshi F, Behzadmehr R, Rafiemanesh H, Bouya S, Raeisi M. Quality of life of chronic heart failure patients: a systematic review and meta-analysis. Heart Fail Rev 2020;25(6):993-1006. [CrossRef]
10. Yang X, Lupón J, Vidán MT, Ferguson C, Gastelurrutia P, Newton PJ, et al. Impact of frailty on mortality and hospitalization in chronic heart failure: a systematic review and meta-analysis. J Am Heart Assoc 2018;7(23):e008251. [CrossRef]
11. Jaarsma T, Hill L, Bayes-Genis A, La Rocca HB, Castiello T, Čelutkienė J, et al. Self-care of heart failure patients: practical management recommendations from the Heart Failure Association of the European Society of Cardiology. Eur J Heart Fail 2021;23(1):157-74. [CrossRef]
12. Riegel B, Moser DK, Buck HG, Dickson VV, Dunbar SB, Lee CS, et al. Self-Care for the Prevention and Management of Cardiovascular Disease and Stroke: A Scientific Statement From the American Heart Association. J Am Heart Assoc 2017;6(9):e006997. [CrossRef]
13. Negarandeh R, Aghajanloo A, Seylani K. Barriers to Self-care Among Patients with Heart Failure: A Qualitative Study. J Caring Sci 2020;10(4):196-204. [CrossRef]
14. Vellone E, Riegel B, Alvaro R. A Situation-specific theory of caregiver contributions to heart failure self-care. J Cardiovasc Nurs 2019;34(2):166-73. [CrossRef]
15. Locatelli G, Iovino P, Jurgens CY, Alvaro R, Uchmanowicz I, Rasero L, et al. The influence of caregiver contribution to self-care on symptom burden in patients with heart failure and the mediating role of patient self-care: a longitudinal mediation analysis. J Cardiovasc Nurs 2024;39(3):255-65. [CrossRef]
16. Buck HG, Howland C, Stawnychy MA, Aldossary H, Cortés YI, DeBerg J, et al. Caregivers' contributions to heart failure self-care: an updated systematic review. J Cardiovasc Nurs 2024;39(3):266-78. [CrossRef]
17. Bidwell JT, Vellone E, Lyons KS, D'Agostino F, Riegel B, Paturzo M, et al. Caregiver determinants of patient clinical event risk in heart failure. Eur J Cardiovasc Nurs 2017;16(8):707-14. [CrossRef]
18. Heckman MG, Davis JM, Crowson CS. Post Hoc Power Calculations: An Inappropriate Method for Interpreting the Findings of a Research Study. J Rheumatol 2022;49(8):867-70. [CrossRef]
19. Heo S, An M, Kim J. Validation of the symptom status questionnaire-heart failure in Korean patients. Appl Nurs Res 2017;38:141-6. [CrossRef]
20. Metin ZG, Gülbahar M. Kalp yetersizliği semptom durumu ölçeğinin Türkçe geçerlik ve güvenirlik çalışması. HUHEMFAD 2020;7(2):95-103. [CrossRef] [in Turkish]
21. Vellone E, Jaarsma T, Strömberg A, Fida R, Årestedt K, Rocco G, et al. The European Heart Failure Self-care Behaviour Scale: new insights into factorial structure, reliability, precision and scoring procedure. Patient Educ Couns 2014;94(1):97-102. [CrossRef]
22. Akbıyık G, Enç N. Validity and reliability of the Turkish version of the caregiver contrubition to self-care of heart failure. Journal of Cardiovascular Nursing 2016;7(14):169-77. [CrossRef]
23. Hobbach AJ, Feld J, Köppe J, Sindermann JR, Reinecke H. Sex-specific differences in disease severity and outcomes in left ventricular heart failure: a nationwide cohort study. Clin Res Cardiol 2026. [CrossRef]
24. Chyou JY, Qin H, Butler J, Voors AA, Lam CSP. Sex-related similarities and differences in responses to heart failure therapies. Nat Rev Cardiol 2024;21(7):498-516. [CrossRef]
25. Zorlu Ç, Yılmaz V, Güngör G, Karaman K, Karayakalı M, Çelik A. Sex-specific differences in heart failure outcomes in Turkiye - a 2024 urban-rural analysis. BMC Cardiovasc Disord 2025;25(1):662. [CrossRef]
26. Sethares KA, Chin E. Age and gender differences in physical heart failure symptom clusters. Heart Lung 2021;50(6):832-7. [CrossRef]
27. Karimi P, Mohammadi MA, Mozaffari BDN. The relationship between caregiver contributions to self-care and quality of life in heart failure patients in Ardabil hospitals in Ardebil-Iran. International Journal of Africa Nursing Sciences 2023;18:100511. [CrossRef]
28. Sousa MM, Nepomuceno AMT, Feitosa RP, Loureiro LSN, Silva RA, Fernandes MDGM, et al. Contribution of informal caregivers to self-care in individuals with heart failure. Rev Bras Enferm 2024;77(3):e20230492. [CrossRef]
29. Wilson AMMM, Almeida GSM, Santos BCF, Nakahara-Melo M, Conceição AP, Cruz DALM. Factors associated with caregivers' contribution to self-care in heart failure. Rev Latino-Am Enfermagem 2022;30:e3633. [CrossRef]
30. Çevik S, Özden G, Sarıtaş SÇ. The relationship between e-health literacy and caregiver contribution in heart failure self-care. JAREN 2020;6(3):476-82. [CrossRef]
31. Ergin AK, Baysan LA, Mutlu ES. The relationship between caregiver burden and psychosocial adjustment of patient's relatives in intensive care unit. İzmir Katip Çelebi University Faculty of Health Science Journal 2020;5(3):281-9.
32. Yıldız H, Karakahya R. A qualitative research on the problems of family members caring for heart patients. Journal of Social Health 2022;2(1):30-43.
33. Lyons KS, Sadowski T, Lee CS. The role of concealment and relationship quality on patient hospitalizations, care strain and depressive symptoms in heart failure dyads. Eur J Cardiovasc Nurs 2020;19(2):118-24. [CrossRef]