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Relationship between perceived fear of COVID-19 and self-care management in heart failure patients

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ABSTRACT

Introduction and aim. The fear of contracting COVID-19, which affects human health biopsychosocially, is expected to affect the self-care management of patients with heart failure (HF). This study was conducted to investigate the relationship between perceived fear of COVID-19 and self-care management in HF patients.

Material and methods. The study was conducted with 115 HF patients. "Sociodemographic characteristics form", "Fear of COVID-19 tool" and "Nine-item European Heart Failure Self-care Behavior Scale (EHFScB Scale-9)" were used to collect data.

Results. 51.3% of the participants in the study are in the 40–60 age range, 53.7% are male, 92.2% live with their family, 64.3% have a diagnosis of HF for less than 5 years. Levels of COVID-19 fear, and self-care management were found to be high in the participants who are 40 years old or younger, has higher education level, diagnosed within 1 to 3 years, received psychological support during the pandemic process, received training from doctor or nurse about COVID-19. Fear level and self-care levels were moderately positively correlated.

Conclusion. During the COVID-19 pandemic, it is necessary to develop effective care strategies to identify individuals with diseases such as HF who should have high self-care management skills.

Keywords. COVID-19 fear, heart failure, self-care management

Introduction

Heart failure (HF) is a prevalent chronic disease affecting millions worldwide, characterized by a gradual decline in cardiac pumping ability and ventricular function. HF is associated with high mortality and morbidity rates.[1] Decreased ventricular function results in failure of the circulation to meet systemic needs. With the increased workload of the heart, the emergence of symptoms such as dyspnea, chest pain, pulmonary oedema, peripheral oedema, cough, fatigue, and palpitations result in decreased physical mobility, activity intolerance, and limitations in cognitive functions.[1,2] This shows the importance of individual disease management in patients with HF.

In December 2019, a novel coronavirus, SARS-CoV-2, was identified as the causal agent of a pneumonia outbreak in Wuhan, China. This marked the inception of the COVID-19 epidemic. COVID-19 poses heightened risks, particularly for older adults and individuals with chronic diseases like heart failure.[3] The virus's impact has underscored the critical need for vigilance and specialized care in managing vulnerable populations with pre-existing health conditions, including those with heart-related issues.[4] The ongoing pandemic, marked by the emergence of COVID-19, has indeed instilled significant fear, especially among individuals with chronic conditions such as heart failure has contributed to increased concerns about mortality. In addition to the strong evidence of the effects of COVID-19 on the cardiac system, the psychosocial effects of COVID-19 such as phobia, fear, anxiety, and depression have made it challenging for HF patients to maintain self-care.[5-7] This unprecedented global health crisis has emphasized the importance of addressing not only the physical health aspects of individuals with heart failure but also the psychological and emotional well-being.[8] In this process, it is essential for individuals with HR to possess sustainable self-care skills to maintain their daily living activities, which is crucial for both physiological and psychological health, and it is essential to maintain it.[9] Self-care that involves lifestyle changes,

adherence of medication and regular monitoring HR patients is crucial for managing the condition and enhancing well-being. Key aspects include maintaining a heart-healthy diet, managing fluid intake, engaging in moderate physical activity, monitoring symptoms, attending regular medical check-ups, practicing stress management techniques, and ensuring good sleep hygiene.[10] Quarantine processes implemented worldwide caused a decrease in physical activity, which is important in managing chronic diseases.

In a study involving 1050 patients in England in 2021, the level of patients' perceived anxiety about COVID-19 was found to be significantly higher compared to HF. Additionally, patients reported that hospital appointments were cancelled or postponed, medication prescriptions were disrupted, and they had difficulties reaching HF teams. In the same study, HF patients were reluctant to go to the hospital because of the concerns they experienced.[11] We examined the relationship between perceived fear of COVID-19 and self-care management in HF patients.

Aim

The research aims to provide a comprehensive understanding of the factors shaping self-care behaviors in HF patients during the COVID-19 era, ultimately contributing valuable insights for the development of targeted interventions and support mechanisms.

Material and methods

Design and sample

This descriptive and cross-sectional study was conducted in a cardiology hospital in Istanbul between December 2021 and April 2022. The selection of a cardiology hospital was crucial for reaching patients who are regularly monitored. The study's sample comprised 115 patients with HF. These individuals applied to the hospital during the study period, met the sample selection criteria, and both verbally and in writing agreed to participate in the research. Inclusion criteria comprised individuals aged 18 years or older, diagnosed with HF for a minimum of one year, able to communicate verbally, not diagnosed with any psychiatric disorder, and who agreed to participate in the study. Researchers collected data within an average of 15 minutes through face-to-face interviews on weekdays when the patients and the researchers were available.

The Scientific Research Ethics Committee approved this research under the decision numbered 2021-40034-30, dated 12 July 2021. Participation was voluntary, anonymous, and did not involve any compensation. Informed consent was obtained from all the patients who were willing to participate in the study.

Research questions

1. What is the relationship between the level of fear related to COVID-19 and the level of self-care management observed in patients with heart failure?
2. Are there specific demographic factors that moderate the association between the fear of COVID-19 and self-care management in individuals with heart failure?

Data Collection Tools

Information form

The researchers designed this questionnaire to ascertain the sociodemographic and medical characteristics of patients with HF. The form facilitated the collection of information, including age, gender, marital status, education level, cohabitants, duration since the HF diagnosis, history of COVID-19 disease, and the current COVID-19 vaccination status of the participants.

Fear of COVID-19 scale

This valid scale was developed by Ahorsu et al. to measure the fear levels of individuals due to COVID-19.[12,13] The scale has a single-factor structure and consists of seven items rated on a five-point Likert scale (1=I strongly disagree; 5=I strongly agree). The total score on the scale ranges from 7–35, with higher scores indicating higher levels of fear of COVID-19. The internal consistency of the scale was 0.82. In this study, the Cronbach's alpha value was found to be 0.90.

Nine-item European Heart Failure Self-care Behavior Scale

This valid scale was created by Jaarsma et al. by revising the 12-item Heart Failure Self-Care Behavior Scale to a 9-item scale.[14,15] The scale was developed to determine the self-care behaviors of individuals with HF. The items of the scale are measured using a five-point Likert scale (1=I totally disagree, 5=I totally agree). Although the sub-dimensions of the scale are adherence to treatment and counselling, the score that can be obtained varies between 9 and 45. A high score on the scale indicates that self-care management is high. The reliability was determined as 0.82. For this study, the Cronbach's alpha value was 0.92.

Statistical analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 20.0 for Windows (SPSS Inc, Chicago, Illinois, USA). Continuous variables were expressed as mean ±standard deviation (SD), and categorical variables as percentages. The Kolmogorov-Smirnov test was used to assess whether the data was normally distributed. When the data was non-normal, the Mann-Whitney U test was used to compare two independent groups, and the Kruskal-Wallis test was used to compare three or more

independent groups. The Pearson correlation coefficient was used to determine the relationship between two variables. The reliability analysis of the scales was evaluated with the Cronbach's alpha reliability coefficient. Statistical significance was considered at $p < 0.05$.

Results

Of the participants, 51.3% were 41–49 years old, 47% were women, 73% were married, 39.1% were primary school graduates, 92.2% lived with their families, and 24.5% were retired. Most participants did not smoke (91.3%) or drink alcohol (98.3%). Of the participants, 50.4% were diagnosed with HF between 1–3 years, and 90.4% had a chronic disease in addition to HF, such as chronic obstructive pulmonary disease, renal failure, and hypertension. Moreover, 95.7% of the participants were vaccinated against COVID-19, 13.9% had COVID-19, and 3.5% were hospitalized when suffering COVID-19. Additionally, 91.3% of the participants did not receive psychological support, only 27.8% received training from their physician and nurse on the relationship between COVID-19 and HF, and 83.5% followed the news about COVID-19 (Table 1).

Table 1. Demographic and clinical characteristics of patients

Categories		n	%
Gender	Female	54	47
	Male	61	53
Age, years	< 40	23	20
	41–59	59	51.3
	≥ 60	33	28.7
Marital Status	Married	64	73
	Single	51	27
Educational Status	Illiterate	12	10.4
	Primary school	45	39.1
	High school	32	27.8
	University	26	22.6
Employment	Employed	87	75.5
	Retired	28	24.5
Income status	High income	4	3.5
	Middle income	21	18.3
	Low income	90	78.3
Smoking status	Yes	10	8.7
	No	105	91.3
Alcohol use	Yes	2	1.7
	No	113	98.3
Cohabitant	Alone	9	7.8
	Family or partner	106	92.2
Heart failure duration, years	1–3	58	50.4
	4–6	40	34.8
	≥ 7	17	14.8
Any other chronic diseases?	Yes	104	90.4
	No	11	9.6

Have you had COVID-19?	Yes	16	13.9
	No	99	86.1
Have you been vaccinated against COVID-19?	Yes	110	95.7
	No	5	4.3
Have you received training from your physician and nurse about the relationship between COVID-19 and heart failure?	Yes	32	27.8
	No	83	72.2
Time to follow news about COVID-19, hours	< 1	96	83.5
	1–2	15	13
	≥ 3	4	3.5

The COVID-19 fear scale mean score of the study participants was 20.78±5.68, and the self-care scale mean score was 29.71±7.79 (Table 2).

Table 2. Fear of COVID-19, self-care scale sub-dimensions and total score*

		Mean±SD	**The range value that can be obtained from the scales**	**Cronbach's alpha**
Fear of COVID-19 tool		20.78±5.68	7–35	0.90
Nine-item European	Adherence regimen	13.86±3.67	4–20	0.56
Heart Failure Self-care	Consulting behaviour	15.85±4.49	5–25	0.87
Behaviour Scale	Total	29.71±7.79	9–45	0.92

* SD – standard deviation

The mean scores of the participants on the fear of COVID-19 scale and the self-care scale were higher in those under the age of 40 (p=0.002, p<0.00a) and those with a bachelor's degree (p=0.001, p=0.000). In addition, the mean score of the self-care scale (p=0.046) was higher in alcohol users than in non-users. The

mean scores of the COVID-19 fear scale and the self-care scale were high in the following groups: those with a disease duration of 1–3 years (p=0.001, p=0.002), those who received psychological support during the pandemic process (p=0.017, p=0.001), those who received training by their physicians and nurses about COVID-19 (p=0.001, p=0.000), and those who had 1–2 hours to follow the news about COVID-19 (p=0.024, p=0.001) was high (Table 3).

Table 3. Comparison of COVID-19 fear, self-care sub-dimensions, and total score averages by the sociodemographic and clinical characteristics of the participants[a]

(n=115)		Fear of COVID-19	Nine-item European Heart Failure Self-care Behaviour Scale		
			Adherence to treatment	Consultation Behavior	Total
Gender	Female	21.98±5.69	14.40±3.48	16.42±4.64	30.83±7.67
	Male	19.72±5.51	13.37±3.80	15.34±4.33	28.72±7.82
		p=0.061**	p=0.303**	p=0.288**	p=0.282**
Age (year)	< 40	24.04±4.51	16.17±2.60	19.08±4.10	35.26±6.53
	41–59	20.67±5.56	13.64±3.42	15.33±4.29	28.98±7.54
	≥ 60	18.69±5.74	12.63±4.09	14.51±4.13	27.15±7.52
		p=0.002*	p=0.003*	p=0.001*	p<0.001*
Marital Status	Married	20.42±5.68	13.55±3.66	15.41±4.33	28.97±7.59
	Single	21.74±5.68	14.67±3.63	17.03±4.79	31.70±8.11
		p=0.509**	p=0.195**	p=0.130**	p=0.120**
Educational Status	Illitarate	16.83±6.24	11.50±4.01	11.83±3.37	23.33±5.97
	Primary school	19.44±5.56	12.75±3.56	14.44±3.63	27.20±6.72
	High school	21.56±5.16	14.00±3.13	15.87±4.14	29.87±7.06
	University	23.96±4.36	16.69±2.60	20.11±3.52	36.80±6.06
		p=0.001*	p<0.001*	p=0.000*	p<0.001*
Income status	High income	22.75±6.18	15.25±2.98	13.75±4.92	29.00±5.29
	Middle income	19.85±5.16	13.66±4.83	15.76±5.74	29.42±9.99
	Low income	20.91±5.81	13.84±3.41	15.96±4.17	29.81±7.37
		p=0.343*	p=0.679*	p=0.662*	p=0.954*
Smoking status	Yes	21.40±4.00	14.50±3.17	15.80±4.93	30.30±7.67

	No	20.72±5.83 p=0.731**	13.80±3.72 p=0.514**	15.85±4.47 p=0.780**	29.65±7.84 p=0.508**
Alcohol use	Yes	20.50±3.53	17.50±0.70	22.00±1.41	39.50±2.12
	No	20.78±5.72 p=0.881**	13.79±3.67 p=0.066**	15.74±4.45 p=0.043**	29.53±7.57 p=0.046**
Cohabitant	With family or partner	20.62±5.52	13.81±3.53	15.59±4.33	29.40±7.55
	Alone	22.66±7.46 p=0.381**	14.44±4.82 p=0.800**	18.88±5.51 P=0.085**	33.33±10.09 p=0.278**
Heart failure duration, years	1–3	22.65±5.03	14.82±3.42	17.27±4.50	32.10±7.54
	4–6	19.70±4.64	12.90±3.49	14.75±3.95	27.65±7.11
	≥ 7	16.94±7.50 p=0.001*	12.82±4.23 p=0.015*	13.58±4.21 p=0.002*	26.41±8.00 p=0.002*
Any other chronic diseases	Yes	20.67±5.83	13.88±3.80	15.83±4.62	29.72±8.04
	No	21.81±4.19 p=0.603**	13.63±2.29 p=0.519**	16.00±3.13 p=0.871**	29.63±5.14 p=0.879**
Have you had COVID-19?	Yes	20.75±6.00	14.43±3.91	16,37±4,39	30.81±8.03
	No	20.78±5.66 p=0.903**	13.76±3.65 p=0.482**	15.76±4.52 p=0.673**	29.53±7.78 p=0.630**
Where did you get over COVID-19?	Resting at home	21.50±6.38	14.66±3.74	17.58±4.50	32.25±8.15
	In hospital	19.50±3.69 p=0.428**	14.75±4.57 p=0.579**	14.25±2.98 p=0.160**	29.00±7.34 p=0.300**
Have you been vaccinated against COVID-19?	Yes	20.81±5.78	13.84±3.69	15.85±4.51	29.70±7.82
	No	20.00±3.16 p=0.616**	14.20±3.76 p=0.972**	15.80±4.65 p=0.783**	30.00±8.03 p=0.837**
Have you received training from your physician and nurse about the relationship	Yes	23.00±4.02	16.31±2.74	19.37±3.70	35.68±6.36
	No	19.92±6.01 p=0.001**	12.95±3.56 p<0.001**	14.49±4.02 p<0.001**	27.40±7.06 p<0.001**

between COVID-19 and heart failure?				
Time to follow news about COVID-19, hours	< 1	20.17±5.66	13.41±3.63	15.41±4.33	28.83±7.59
	1–2	24.66±5.15	16.80±2.30	19.53±3.77	36.33±5.70
	≥ 3	20.75±2.06	13.50±4.50	12.50±4.20	26.00±8.28
		p=0.024*	p=0.002*	p=0.001*	p=0.001*

[a] * – Kruskal Wallis test, ** – Mann Whitney-U test

Table 4 shows that there was a moderate positive correlation between the COVID-19 fear scale and the self-care scale treatment adherence sub-dimension (r=0.667), the counselling sub-dimension (r=0.681), and the total score (r=0.707) (p<0.05).

Table 4. The relationship between COVID-19 fear and self-care sub-dimensions and total scores[a]

	Fear of COVID-19	**Adherence regimen**	**Consulting behaviour**	**Total scores of EHFScB scale-9**
	r	r	r	R
Fear of COVID-19 tool	1	0.667**	0.681**	0.707*
Adherence regimen		1	0.818**	0.943**
Consulting behaviour			1	0.962**
Total scores of EHFScB scale-9				1

[a] * – p<0.05, ** – p<0.001, r – Pearson correlation coefficient, EHFScB – the European Heart Failure Self-care Behavior Scale

Discussion

Many studies investigated the relationship between chronic diseases and COVID-19 during the pandemic. In a study published in the USA, including 8438 patients diagnosed with COVID-19, cardiovascular diseases were the leading comorbidities associated with COVID-19, 28.2% of the patients were diagnosed with hypertension, 8.6% had coronary artery disease, and 6.9% had HF.[16] In another study, 23% of patients hospitalized for COVID-19 were diagnosed with HF.[17] Individuals with cardiovascular disease diagnosed with COVID-19 have elevated overall and in-hospital mortality rates, patients with a history of HF have

prolonged hospital stay the length of hospital stay in patients with a previous diagnosis of HF, and the risk of 30-day death is higher.[18,19]

Compliance with pharmacological treatment is essential in the self-care of cardiovascular diseases. A systematic review published by Ruksakulpiwat et al. in 2022 discussed the impact of COVID-19 on drug compliance. Concerns about COVID-19, medication shortage, travel restriction, financial restriction, and substance use have been reported as barriers to drug compliance, whereas compliance with health guidelines and health information has been reported to facilitate drug compliance.[20] In this study, the finding that patients who received training related to COVID-19 from their physician or nurse had higher drug compliance scores and self-care scores supports this situation.

In a study of diabetes and hypertension patients at risk of HF, the rate of poor drug compliance was reported as 72% during the pandemic period. In the same study, treatment adherence, going to a health centre, presence of comorbidity, and history of current substance use were strongly associated with drug non-adherence.[21] In this study, being 60 years of age or older, having a low level of education, having a diagnosis of HF for seven years or more, not receiving psychological support, and not receiving training from a doctor or nurse were determinants of poor drug compliance.

Psychosocial risk factors are known triggers of acute cardiovascular events.[22] Therefore, we discussed the relationship between perceived fear of COVID-19 and self-care management in HF patients is discussed. In the study, there was a moderate positive correlation between perceived COVID-19 fear levels and self-care levels in HF patients. Lifelong self-management is important in reducing the effects of the disease in patients with HF.[23] The presence of depressive symptoms may prevent patients with HF from participating in self-care.[24] In 2023, Kim et al. included 162 patients with coronary artery disease and investigated the relationship between fear of COVID-19 and healthcare behaviors. That study found that gender and the presence of comorbidities were found to be significant influential factors of fear of COVID-19.[25]

Studies examining the impact of COVID-19 on chronic diseases indicated that COVID-19 accounts for the observed psychosocial results. Bansal et al. found that during the COVID-19, the 30-day all-cause readmissions were higher in patients with psychosocial risk factors, and myocardial infarction-related readmissions were significantly higher in patients with psychosocial risk factors and acute myocardial infarction. The same study emphasized that early identification and reduction of psychosocial risk factors in patients with MI could reduce readmissions, especially during the pandemic.[26]

Alkouri et al. found that about half of HF patients were afraid of COVID-19, and increasing age, presence of angina, and having chronic lung disease in patients with HF were associated with fear of COVID-19 and coronavirus anxiety.[27] A study examining the fear of COVID-19 in patients with acute myocardial infarction found a positive correlation between age and the level of total fear of COVID-19.[28] In contrast, the present study determined that the fear of COVID-19 was higher in those under 40 years.

Moreover, it has been emphasized that undergoing self-care training via telemedicine and telenursing applications during the COVID-19 period may affect disease management positively.[29] The support of the monitoring step, an integral aspect of self-care, through telemedicine, telenursing, telerehabilitation, virtual home visits, and structured phone calls is crucial.[30] In addition, in a study, cardiology nurses stated that heart failure patients preferred telehealth applications by reducing clinic visits during the pandemic period, but patients' self-care abilities decreased. The study also highlighted challenges faced by nurses in collecting objective data.[31] Our study revealed that 72.2% of participants did not receive training from physicians or nurses and the self-care scores of the individuals who received training were higher. This suggests the potential benefits of considering telehealth applications for future periods.

A certain level of fear is beneficial in coping with the disease, but it becomes problematic when the fear is more than the actual threat.[28] Despite this, HF can increase the risk of contracting the virus and experiencing severe symptoms and complications.[27] The level of fear of the patients in this study is similar to the literature. Particularly in the younger population (40 years and under), those with a bachelor's degree, and patients who received training from their physician and nurse about COVID-19, the high level of fear may be associated with an increase in awareness. In addition, adaptation problems experienced during symptom management, the disease and treatment process in the early stages of the disease, and the overlap between HF and COVID-19 symptoms may have caused increased fear in patients.

Study limitations

This study was limited by the fact that it was a survey and was, therefore, prone to selection bias. Secondly, the study was carried out in a single center, and as a result, the findings may not be applicable to a broader context. Moreover, the research data were gathered using subjective data collection tools, which means objective assessment was not undertaken. Lastly, it should be noted that certain unexamined factors in this study could potentially influence the state of self-care.

Conclusion

This study determined a positive correlation between mean scores of the COVID-19 fear scale and the self-care scale. It found high levels of fear of COVID-19 and self-care management in the participants who were below 40 years, had a bachelor's degree, had a disease duration of 1–3 years, received psychological support during the pandemic, received training from a physician and nurse about COVID-19, and followed the news about COVID 19 for 1–2 hours. The findings of this study can help healthcare providers develop interventions for psychological support and self-management and may guide future pandemic processes.

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Author contributions

Conceptualization, T.Y. and M.Y.A.; Methodology, T.Y., E.B., S.E., S.T., M.Y.A., and A.H.; Software, T.Y., S.E., and S.T., ; Validation, S.T., E.B., and S.E., ; Formal Analysis, A.H., T.Y.; Investigation, A.H., and T.Y.; Resources, T.Y., M.Y.A., and E.B.; Data Curation, A.H., T.Y., and S.T.; Writing – Original Draft Preparation, T.Y., S.E., S.T.; Writing – Review & Editing, S.E., and S.T.; Visualization, T.Y.; Supervision, S.T.; Project Administration, T.Y.

Conflicts of interest

None declared.

Data availability

The data that support the findings of this study are available from the corresponding author, TY, upon reasonable request.

Ethics approval

The Scientific Research Ethics Committee approved this research under the decision numbered 2021-40034-30, dated 12 July 2021. Participation was voluntary, anonymous, and did not involve any compensation. Informed consent was obtained from all the patients who were willing to participate in the study.

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