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Factors Affecting Quality of Life in Heart Failure Patients: Nutrition, Anthropometric Measurements and Individual Variables

Kalp Yetmezliği Hastalarında Yaşam Kalitesini Etkileyen Faktörler: Beslenme, Antropometrik Ölçümler ve Bireysel Değişkenler

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ABSTRACT

Aim: The study aims to examine the relationship between nutritional behaviors, anthropometric measurements, and individual characteristics of heart failure patients and their quality of life.

Methods: The study has a cross-sectional, descriptive and correlational design was conducted with 54 patients who applied to or were hospitalized in the cardiology clinic of a hospital in Turkey between April and August 2023. The study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist. The data obtained from the study were evaluated by frequency, percentage and descriptive statistical methods. "Mann-Whitney U" test, "Kruskal-Wallis H" test, and "Spearman Correlation" analysis were applied during the analysis.

Results: No significant relationship was found between patients' anthropometric measurements (upper arm and waist circumference) and their quality of life ($p>0.05$). Patients who demonstrated nutritional behaviors aimed at preventing fluid retention had significantly higher cardiac quality of life scores in both the physical subscale ($r=0.368$, $p<0.05$), the emotional subscale ($r=0.394$, $p<0.05$), and the total score ($r=0.453$, $p<0.001$).

Conclusion: Instilling nutritional habits to prevent fluid retention in patients with heart failure can improve their quality of life. In this context, nurses should serve as consultants and educators. Furthermore, the use of nutritional scales specifically developed for patients with heart failure and frequent monitoring of their anthropometric values are recommended to identify nutritional problems in these patients.

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ÖZ

Amaç: Çalışmanın amacı kalp yetmezliği hastalarının beslenme davranışları, antropometrik ölçümleri ve bireysel özellikleri ile yaşam kalitesi arasındaki ilişkiyi incelemektir.
Yöntem: Kesitsel, tanımlayıcı ve ilişki arayıcı tipte olan çalışma, Nisan-Ağustos 2023 tarihleri arasında Türkiye'deki bir hastanenin kardiyoloji kliniğine başvuran veya yatan, kalp yetmezliği tanısı olan 54 hasta ile yürütülmüştür. Çalışma, Epidemiyolojide Gözlemsel Çalışmaların Raporlanmasının Güçlendirilmesi (STROBE) kontrol listesine uygun olarak yürütülmüştür. Çalışmadan elde edilen veriler frekans, yüzde ve tanımlayıcı istatistiksel yöntemlerle değerlendirilmiştir. Analizlerde Mann-Whitney U testi, Kruskal-Wallis H testi ve Spearman Korelasyon testi uygulanmıştır.
Bulgular: Hastaların antropometrik ölçüm değerleri (üst kol ve bel çevresi) ile yaşam kaliteleri arasında anlamlı bir ilişki olmadığı ($p>0.05$) belirlenmiştir. Sıvı retansiyonunun önlenmesine yönelik beslenme davranışları gösteren hastaların kalp yaşam kalitesi puanının; hem fiziksel altboyutta ($r=0.368$, $p<0.05$) hem duygusal alt boyutta ($r=0.394$, $p<0.05$) hem de toplam puanda ($r=0.453$, $p<0.001$) anlamlı düzeyde daha yüksek olduğu saptanmıştır.

Sonuç: Kalp yetmezliği olan hastalarda sıvı retansiyonunu önleyici beslenme alışkanlıklarının kazandırılması, hastaların yaşam kalitelerini artırabilir. Bu bağlamda hemşireler danışman ve eğitimci olarak görev yapmalıdır. Ayrıca, kalp yetmezliği olan hastaların beslenme sorunlarını belirlemek için bu hastalara özel olarak geliştirilmiş beslenme ölçeklerinin kullanılması ve antropometrik değerlerinin sık aralıklarla izlenmesi önerilmektedir.

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INTRODUCTION

In Turkiye, the average age of onset of heart failure (HF) is 60, and the annual mortality rate in individuals diagnosed with HF is 8-12% (Alkan and Nural, 2017). According to a large-scale study on HF (Heart Failure Prevalence and Predictors in Turkey- HAPPY), over two million people live with HF (Turkish Cardiology Association, 2022). It is predicted that this number may increase by approximately 46% by 2030 (Turkish Cardiology Association, 2022). Although it is not possible to completely get rid of HF with medical treatment, symptoms related to the disease can be controlled with lifestyle changes and self-care practices. In this context, the primary goal of care and treatment in HF patients should be to reduce the patients' symptoms and improve their quality of life (Akdemir and Canlı Özer, 2021).

Progressive HF often negatively affects patients' nutrition-related behaviors, leading to a decrease in quality of life. Patients frequently lose weight, or experience edema without weight loss or loss of muscle mass due to accumulation of lean mass (Turkish Cardiology Association, 2022). This situation is associated with decreased independence in patients' daily life activities (Güler et al., 2021; Rahman et al., 2016). Size et al. (2018) found that 50% of heart failure patients categorized as obese presented with or were at risk of developing malnutrition.

According to The European Society of Cardiology has been drawing attention to the need to periodically assess the nutritional status of patients with HF since 2016 and to increase the patients' self-skills for maintaining optimum nutritional status (McDonagh et al., 2021). In this regard, it is thought that health professionals' early identification of negative nutritional behaviors of HF patients, creation of diet programs for patients and monitoring of nutritional parameters may contribute to improving the quality of life of HF patients.

Background

It is stated that most of the studies related to the nutritional status of patients with HF have focused on weight loss and the number of meals, but edema due to extracellular fluid retention makes weight monitoring difficult and misleading (Honda et al., 2016; Asil and Yıldız, 2017). Recent studies in the literature suggest that the nutritional status of patients with heart failure should be assessed not only by measurements of food intake and prevalence of malnutrition, but also by changes in body composition and nutritional behaviors (Huang, et al., 2022; Jarosz et al., 2025; Iida et al., 2023). Therefore, a holistic evaluation of all aspects of the nutritional behaviors of HF patients is needed (Boy and Enç, 2022). In addition, the use of different data scales in studies on the subject requires further research to obtain evidence-based information. To fill the gap in the literature, this study aims to examine the relationship between individual characteristics, nutritional habits, and body measurements and the quality of life experienced by heart failure patients.

Research Questions

1. How do individual characteristics affect quality of life in heart failure patients?
2. Is there a significant relationship between general nutritional behaviors and quality of life in patients with heart failure?
3. What is the relationship between anthropometric measurements and quality of life in heart failure patients?

METHODS

Participants

This study included both hospitalized patients and outpatients of the cardiology clinic at a city hospital in the Mediterranean Region of Turkey. The study population consisted of consenting individuals aged 18 and above with a diagnosis of heart failure and no communication impairments. The sample size estimate was calculated using the GPower 3.1.9.7 program, with 80% power, a 0.15 effect size, 19 estimator parameters, and a 5% margin of error to represent the universe. According to the calculation, the required sample size was determined as 44 and it was aimed to reach at least 48 individuals considering 10% data loss. Fifty-four individuals chose to participate in the study. All participants completed the study.

Data Collection

The data of the study were collected by the researchers using a face-to-face survey technique. In data collection, the “Personal Information Form”, “Heart Quality of Life Scale” and “Nutritional Behaviors in Heart Failure Scale” were used. At the same time, the researchers also carried out anthropometric measurements on the patients. Researchers collected data while patients were waiting to be examined in the outpatient clinic and during inpatient rest periods when they were not receiving treatment or care. Upper arm and waist circumferences were measured with a tape measure. The body mass index (BMI) was calculated using the patient's reported height and weight.

Personal Information Form

This form, prepared by the researchers based on the literature (Asil and Yıldız, 2017; Boy and Enç, 2022), includes data on the sociodemographic characteristics, disease information, nutritional habits and anthropometric measurements of the patients.

Heart Quality of Life Scale (HeartQoL)

Developed for measuring quality of life, this scale is intended for use with individuals who have ischemic heart disease. In the original scale study, individuals with angina pectoris, myocardial infarction, and ischemic HF were included in the sample. The scale is composed of 14 items, categorized into two sub-dimensions: physical characteristics (10 items) and emotional characteristics (4 items). In the Heart Quality of Life Scale (HeartQoL), each item is scored between 0-3, with 3 being "no discomfort" and 0 being "very discomfort". The scale can be applied to individuals aged 18 and over in clinical and community-based studies. In evaluating the scale, high scores indicate no dysfunction and a high quality of life, while low scores indicate high dysfunction and low health levels (Oldridge et al., 2014). The scale was translated into 15 languages and applied in a total of 22 countries within the scope of the HeartQoL Project between 2002-2011. Duğan and Bektaş (2020) translated and culturally adapted the scale for the Turkish context. Cronbach's alpha reliability coefficient was determined as 0.88 for the overall scale, 0.74 and 0.87 for the sub-dimensions. The Cronbach's alpha total score value in this study was 0.915.

Scale for Dietary Behaviors in Heart Failure (SDBHF)

Scale for Dietary Behaviors in Heart Failure (SDBHF) developed by Boy and Enç (2022) consists of four sub-dimensions (healthy habits, salt restriction, sugar restriction, prevention of fluid retention) and 19 items. Items 1, 2, 4, 5, 8, 11, 12, 13, 14, 16, 17, and 18 of the scale are positive, while Items 3, 6, 7, 9, 10, 15, and 19 are negative. Each item is scored between 1 and 4, with 1 being "never," 2 being "sometimes," 3 being "often," and 4 being "always." The lowest score that can be obtained from the scale is 19, and the highest score is 76. A score of 46 or below suggests that heart failure patients are not following recommended dietary guidelines. The increase in the scale score was associated with HF patients' diets in accordance with the recommendations of the guidelines. The overall scale demonstrated good reliability, with a Cronbach's alpha of 0.72. In the present study, the scale's reliability was also strong, as evidenced by a Cronbach's alpha of 0.788.

Ethical Consideration

Before starting the study, we obtained two key approvals. First, we received ethical approval from the university's ethics committee on 16.09.2022 (Decision No. 51). Second, we secured permission from the health institution where the data were collected. This study was conducted with strict adherence to ethical principles, including those concerning plagiarism, informed consent, data fabrication and falsification, and duplicate publication. The Declaration of Helsinki guided the data collection process. Scale authors were contacted via email to obtain permission for their work to be used. Eligible patients were fully informed about the study, and data collection forms were completed after receiving their verbal consent.

Data Analyses

Descriptive statistical methods and frequency distributions were employed in the interpretation of the study findings. Non-parametric methods were used for measurement values that were not normally distributed. In accordance with non-parametric methods, the Mann-Whitney U test (Z-table value) was used to compare the measurement values of two independent groups, and the Kruskal-Wallis H test ($\chi 2$-table value) was used to compare the measurement values of three or more independent groups. Bonferroni correction was applied for pairwise comparisons of variables with significant differences for three or more groups. The "Spearman" correlation coefficient was used to examine the relationships between two quantitative variables that did not have a normal distribution. Statistical significance was determined as $p \leq 0.05$.

RESULTS

The mean age of the patients was 68.70±10.91, 68.5% were male, 48.1% were primary and secondary school graduates, 51.9% were retired, and 85.2% were unemployed. 72.2% of the patients were married, 42.6% had been diagnosed with HF for more than five years, all (100%) had been hospitalized before, and 59.3% reported that a first-degree relative had been diagnosed with HF before. Patients diagnosed with chronic diseases other than HF constituted 92.6% of the sample. The most common chronic disease was diabetes with a rate of 70.4%. 51.9% of the patients had a history of surgery/trauma, and all (100%) reported that they were taking regular medications (Table 1).

Table 1. Distribution of Descriptive Characteristics Related to the Study

Variable (n=54)	n	%
Age class [$\overline{X} \pm$ SD→68.70±10.91 (age)]		
≤64	14	25.9
65-69	11	20.4
70-74	16	29.6
≥75	13	24.1
Gender		
Male	37	68.5
Female	17	31.5
Level of education		
Illiterate	17	31.5
Primary and secondary school	26	48.1
High school and above	11	20.4
Occupation		
Housewife	14	25.9
Retired	28	51.9
Self-employed	9	16.6
Unemployed	3	5.6
Working status		
Yes	4	7.4
No	50	92.6
Marital status	39	72.2
Married	15	27.8
Single		
Heart failure diagnosis duration		
Less than 6 months	10	18.5
6 months – 1 year	4	7.4
1 – 5 years	17	31.5
More than 5 years	23	42.6
Heart disease in first degree relative		
Yes	32	59.3
No	22	40.7
Chronic disease other than heart failure		
Yes	50	92.6
No	4	7.4
Additional chronic diseases*		
Kidney diseases	16	29.6
Hypertension	35	64.8
Diabetes	38	70.4
Other endocrine system diseases	7	13.0
Neurological system diseases	3	5.6
Genitor urinary diseases	4	7.4
GIS diseases	14	25.9
Surgery/trauma history		
Yes	28	51.9
No	26	48.1
Regular medication use		
Yes	54	100.0

*More than one answer was given to the question and percentages were determined on a row-by-row basis according to the changing number of samples.

83.3% of the patients reported using heart medication, 46.3% were on an HF diet, and 90.3% were advised to do so by a physician. It was determined that 57.4% of the patients ate two main meals, 57.4% did not skip meals, 78.3% skipped lunch, and 47.9% skipped meals due to loss of appetite. 79.6% of the patients participating in the study had snacks and 53.7% did not experience any change in appetite after HF diagnosis. Half of the patients (50%) experienced weight loss and constipation after receiving HF diagnosis (Table 2).

Table 2. Distribution of Introductory Characteristics Related to the Research

Variable (n=54)	n	%
Regularly used medications*		
Heart medication	45	83.3
Diuretic	27	50.0
Diabetic medications	16	29.6

Anticoagulant	37	68.5
Antidepressant	6	11.1
Antihypertensive	31	57.4
Thyroid medication	5	9.3
Respiratory medications	9	16.7
Diet status		
Yes	31	57.4
No	23	42.6
Diet applied*		
Heart failure diet	25	46.3
Diabetic diet	20	37.0
Person recommending the diet		
Doctor	28	90.3
Dietitian	1	3.2
Family and relatives	2	6.5
Number of main meals		
2	23	42.6
3	31	57.4
Skipping meals		
Yes	23	42.6
No	31	57.4
Skipped meal		
Breakfast	4	17.4
Lunch	18	78.3
Dinner	1	4.3
Reason for skipping meals		
Loss of appetite	11	47.9
Not having a habit	5	21.7
Because it was not prepared	2	8.7
Lack of time	5	21.7
Avoid snacking		
Yes	43	79.6
No	11	20.4
Snacks consumed*		
Breakfast - lunch break	10	18.5
Afternoon	31	57.4
Night	25	46.3
Appetite status after heart failure diagnosis		
Increased appetite	4	7.4
Decreased appetite	21	38.9
No change	29	53.7
Weight status after heart failure diagnosis		
Increase	7	13.0
Decrease	27	50.0
No change	20	37.0
Problems after heart failure*		
Difficulty chewing	5	9.3
Difficulty swallowing	7	13.0
Indigestion - bloating	26	48.1
Diarrhea	8	14.8
Constipation	27	50.0

*More than one answer was given to the question and percentages were determined on a row-by-row basis according to the changing number of samples.

It is seen in Table 3 that the responses given by the patients to the scales are generally at a high level of reliability. It was also found that patients' average scores for physical quality of life (3.42±6.29), emotional quality of life (4.24±2.82), and overall quality of life (7.67±8.34) were all lower than the average score on the measurement scale. The mean scores for the sub-dimensions of SDBHF were determined as; healthy habits 11.37±2.94, salt restriction 18.91±4.21, sugar restriction 8.65±2.32, and fluid retention prevention 8.06±2.49. The mean scores for the overall scale and each sub-dimension were all greater than the scale's mean. The general mean score of SDBHF (46.98±7.54) is above the cut-off value (46) determined for the scale. This finding shows that patients with HF act in accordance with the nutritional recommendations of the guidelines.

Table 3. Distribution of Scores and Reliability Coefficients for the Scales

Scale (n=54)		Mean	SD	Median	Min.	Max.	Cronbach-α
HeartQoL	physical quality	3.42	6.29	0.0	0.0	25.0	0.939
	emotional quality	4.24	2.82	4.0	0.0	12.0	0.810
	HeartQoL	7.67	8.34	4.0	0.0	37.0	0.915
SDBHF	healthy eating habits	11.37	2.94	11.5	6.0	20.0	0.767
	salt restriction	18.91	4.21	19.5	7.0	24.0	0.783
	sugar restriction	8.65	2.32	9.0	3.0	12.0	0.749
	preventing fluid retention	8.06	2.49	8.0	5.0	16.0	0.703
	SDBHF	46.98	7.54	47.0	32.0	68.0	0.788

SDBHF: Scale for Dietary Behaviors in Heart Failure

It was determined that there was no statistically significant difference in the total HeartQoL scores according to the age groups of the patients, duration of HF diagnosis, diet status, number of main meals, snack consumption status, appetite status after diagnosis and weight status after diagnosis ($p>0.05$). HeartQoL score of men was significantly higher than that of women ($Z=-3.209$; $p=0.001$). It was determined that the HeartQoL scores showed significant differences according to the level of education ($\chi2=7.716$; $p=0.021$). Accordingly, HeartQoL score of those with high school/above graduation level was significantly higher than that of the illiterate and primary/secondary school graduates. It was determined that the HeartQoL score of the married was higher than that of the singles ($Z=-2.656$; $p=0.008$) (Table 4).

Table 4. Comparison of Cardiac Quality of Life Scale Scores According to Some Independent Findings

		HeartQoL		Statistical analysis*
Variable	**n**	**$\bar{X} \pm$ SD**	**Median [IQR]**	**Probability**
Age class				
≤64	14	8.64±10.79	3.0 [7.8]	
65-69	11	8.36±8.96	5.0 [5.0]	$\chi^2=3.212$
70-74	16	9.18±8.17	6.5 [12.0]	p=0.360
≥75	13	4.15±3.50	4.0 [2.5]	
Gender				
Male	37	9.71±9.28	5.0 [12.0]	Z=-3.209
Female	17	3.23±2.46	3.0 [3.5]	**p=0.001**
Level of education				
Illiterate (1)	17	5.52±7.65	4.0 [4.5]	$\chi^2=7.716$
Primary and secondary school (2)	26	6.30±5.68	4.0 [5.5]	**p=0.021**
High school and above (3)	11	14.18±11.74	9.0 [21.0]	**[1,2-3]**
Marital status				
Married	39	8.92±8.72	5.0 [11.0]	Z=-2.656
Single	15	4.40±6.40	3.0 [4.0]	**p=0.008**
Heart failure diagnosis				
Less than 1 year	14	10.85±10.74	5.0 [15.3]	$\chi^2=1.676$
1 – 5 years	17	6.05±6.49	3.0 [5.5]	p=0.433
More than 5 years	23	6.91±7.72	4.0 [5.0]	
Dieting				
Yes	31	6.84±7.11	4.0 [6.0]	Z=-0.626
No	23	8.78±9.82	4.0 [12.0]	p=0.532
Number of main meals				
2	23	8.22±9.70	4.0 [6.0]	Z=-0.070
3	31	7.26±7.31	4.0 [6.0]	p=0.944
Snack consumption				
Yes	43	7.37±7.85	4.0 [6.0]	Z=-0.519
No	11	8.82±10.39	6.0 [5.0]	p=0.604
Appetite after diagnosis				
Change (+/-)	25	8.24±9.72	4.0 [5.5]	Z=-0.157
No change (+/-)	29	7.17±7.09	4.0 [8.5]	p=0.875
Weight after diagnosis				
Increase	7	5.71±4.72	4.0 [3.0]	$\chi^2=0.461$
Decrease	27	8.00±8.81	5.0 [6.0]	p=0.794
No change	20	7.90±8.90	3.5 [12.3]	

*In data that do not have a normal distribution, the "Mann-Whitney U" test (Z-table value) was used to compare the measurement values of two independent groups; and the "Kruskall-Wallis H" test ($\chi2$-table value) statistics were used to compare three or more independent groups. (+/-): increased appetite, decreased appetite

The patients' mean BMI was 28.95±5.91 kg/m², the mean upper arm circumference was 27.62±4.85 cm, and the mean waist circumference was 110.94±12.95 cm. It was determined that there was no statistically significant relationship between these values and the physical, emotional and general quality of life of the patients (p>0.05) (Table 4).

Table 5. Examination of the Relationships Between the Scale for Dietary Behaviors in Heart Failure and the Heart Quality of Life Scale Scores

Correlation* (n=54)		healthy eating habits	salt restriction	sugar restriction	preventing fluid	SDBHF	Physical	Emotional	**HeartQoL**
healthy eating	*r*	1.000	**0.353**	0.151	0.073	0.695	0.202	-0.003	0.048
habits	*p*	-	**0.009**	0.277	0.601	**<0.001**	0.142	0.983	0.732
salt restriction	*r*	0.353	1.000	**0.336**	-0.115	0.744	0.095	-0.062	-0.066
	p	**0.009**	-	**0.013**	0.406	**<0.001**	0.495	0.657	0.637
sugar	*r*	0.151	0.336	1.000	0.019	0.569	-0.050	-0.065	-0.114
restriction	*p*	0.277	**0.013**	-	0.890	**<0.001**	0.817	0.639	0.412
preventing fluid	*r*	0.073	-0.115	0.019	1.000	0.256	**0.368**	**0.394**	**0.453**
retention	*p*	0.601	0.406	0.890	-	0.060	**0.006**	**0.003**	**<0.001**
SDBHF	*r*	**0.695**	**0.744**	**0.569**	0.256	1.000	0.225	0.064	0.088
	p	**<0.001**	**<0.001**	**<0.001**	0.060	-	0.102	0.648	0.526
Physical	*r*	0.202	0.095	-0.050	**0.368**	0.225	1.000	0.468	0.768
	p	0.142	0.495	0.817	**0.006**	0.102	-	**<0.001**	**<0.001**
Emotional	*r*	-0.003	-0.062	-0.065	**0.394**	0.064	0.468	1.000	0.866
	p	0.983	0.567	0.639	**0.003**	0.648	**<0.001**	-	**<0.001**
HeartQoL	*r*	0.048	-0.066	-0.114	**0.453**	0.088	0.768	0.866	1.000
	p	0.732	0.637	0.412	**<0.001**	0.526	**<0.001**	**<0.001**	-

*In cases where at least one of the two quantitative variables was not normally distributed, the "Spearman" correlation coefficient was used. SDBHF: Scale for Dietary Behaviors in Heart Failure

In this study, the relationship between the total score of the SDBHF and the total HeartQoL score was first examined, and no statistically significant association was identified (r=0.088, p>0.05). The table also presents the correlations between the subdimensions of the SDBHF and the physical, emotional, and total scores of the HeartQoL scale using Spearman's correlation coefficients. The findings indicate that the SDBHF total score is strongly and positively correlated with the healthy eating habits (r=0.695, p<0.001), salt restriction (r=0.744, p<0.001), and sugar restriction (r=0.569, p<0.001) subdimensions. The fluid retention prevention subdimension, on the other hand, shows significant positive correlations with the HeartQoL physical (r=0.368, p=0.006), emotional (r=0.394, p=0.003), and total scores (r=0.453, p<0.001). The strong correlations observed among the physical, emotional, and total HeartQoL scores (r=0.768 and r=0.866, both p<0.001) support the internal consistency of the scale. Overall, the results demonstrate that although no association was found between the total scores of the two scales, the fluid retention prevention behavior is significantly related to indicators of heart failure–specific quality of life (Table 5).

DISCUSSION

The fact that all patients participating in the study were 65 years of age or older and had additional chronic diseases other than HF, and that nearly half of the patients had been diagnosed with HF for at least five years was associated with the progression of the degree of HF (Betancourt-Peña et al., 2024). Nearly half of the patients experienced a change in their appetite after being diagnosed with HF, more than half experienced a change in their weight. Patients stated that they skipped the main meal during their daily diet due to loss of appetite. In addition to loss of appetite, the patients most frequently complained of indigestion, bloating, and constipation related to the gastrointestinal system (GIS). Various neurohormonal changes that develop in patients due to HF, fatigue due to increased heart and lung function, stress, and conditions such as diuretic use also lead to absorption problems in GIS. This condition can cause a decrease in appetite and weight loss in patients (Mahdavi-Roshan et al., 2021; Wawrzeńczyk et al., 2019). However, it has been explained that some drugs used especially in elderly individuals can negatively affect nutrition by changing the sense of taste and intestinal absorption (Fenton et al., 2016). According to a recent study, nearly half of HF patients (49%) experienced a decrease in appetite and food consumption (Andrea et al., 2021). It is seen that the findings obtained from the study are consistent with the literature.

Both physical and emotional quality of life were found to be lower than average among the participating patients. The physical sub-dimension of the HeartQoL addresses the physical difficulties experienced by patients due to HF in the last month. Accordingly, it was determined that patients had difficulty in activities such as walking, daily tasks, exercise and carrying loads in the last month. The emotional sub-dimension of the scale examines the emotional difficulties experienced by patients due to HF in the last month. Accordingly, patients reported experiencing shortness of breath, fatigue, stress, depression, disappointment and feeling restricted in doing sports, exercise, housework and

gardening in the last month. It is stated that in HF, due to the decrease in the rate and amount of blood flow to the tissues, the muscles of the patients do not work properly and this leads to loss of muscle strength (Sant'Anna et al., 2017). The decrease in muscle strength and endurance causes an increase in the feeling of fatigue and can further limit the performance of activities that especially involve the upper extremities (Silva et al., 2018). Studies have determined that patients experience a decrease in oxygen saturation during their daily living activities and therefore the most common symptom of dyspnea. However, it has been emphasized that patients' limitations in performing their daily living activities cause negative feelings such as social isolation, decreased self-esteem, disappointment and decreased enthusiasm for life, and negatively affect the psychological resilience of patients (Apaydın et al., 2024; Roy et al., 2022). This information in the literature confirms that the physical strain experienced by the patients in the study while performing their daily living activities also brings with it some psychological difficulties.

Both the overall SDBHF score and all sub-dimension scores exceeded the scale's average. This shows that the patients comply with the healthy eating habits included in the nutrition guidelines, restrict salt and sugar in their diet, and exhibit nutritional behaviors aimed at preventing fluid retention. On the other hand, the finding of a positive significant relationship between the nutritional behaviors of the patients aimed at preventing fluid retention and the level of cardiac quality of life draws attention to the importance of preventing fluid retention in HF. The fluid accumulated in the tissues and organs due to HF often causes symptoms such as shortness of breath, cough, weight gain, disruption in night sleep, bloating in the legs and abdomen, abdominal pain, loss of appetite, and nausea, thereby reducing the quality of life of the patients (Uysal et al., 2020). Accordingly, it is expected that the interventions implemented to prevent fluid accumulation around the tissues and organs of the patients will be effective in increasing the quality of life of HF patients. In the fluid retention prevention sub-dimension of the SDBHF; There are items that include nutritional behaviors such as “adding non-liquid but high-water foods to daily fluid consumption calculations”, “consuming sufficient amounts of fish and quenching thirst with different methods instead of water”. Behaviors related to trying to quench thirst by circling ice in the mouth, chewing gum or eating cold fruit are not frequently encountered in the literature. Increasing the number of studies conducted on the use of these methods is important in terms of providing evidence-based information to the relevant literature. On the other hand, the inclusion of behaviors such as “patients recording solid foods containing high amounts of liquid, such as fruit, instead of only recording liquid foods” in the sub-dimension of the scale aimed at preventing fluid retention draws attention to the importance of patients’ awareness levels on this issue. Indeed, studies have indicated that HF patients, despite their high compliance with drug treatment, do not show sufficient care and compliance with diet, fluid restriction, edema and weight monitoring (Şabanoğlu et al., 2023; Van der Wal, 2006). At this point, it is thought that there is a need to increase patients' awareness of HF and their self-care skills.

Among the patients studied, being male, having at least a high school education, and being married appeared to contribute positively to quality of life. It is stated that there is a positive relationship between the increase in the level of education and the implementation of health promotion behaviors (Bayrak et al., 2019). It is hypothesized that individuals with advanced education will exhibit increased receptiveness to health promotion initiatives and a higher degree of self-efficacy in the regulation of nutritional behaviors. In addition, the significantly higher quality of life in the male patients in the study may be due to the fact that the household activities performed by women in daily life are more frequent and difficult compared to men. It is thought that the housework that female patients are responsible for doing during the day causes patients to experience symptoms such as dyspnea, pain, and weakness due to HF more severely. This results in women having a lower quality of life.

Statistical analysis indicated no significant relationship between anthropometric variables (BMI, upper arm circumference, and waist circumference) and patient quality of life. While low BMI is associated with a decrease in the survival rate in patients with HF, it is also stated that high BMI carries a high risk for cardiovascular diseases (Nishikido et al., 2019). This situation is referred to as the "Obesity Paradox" in the literature (Lavie et al., 2009). It is thought that the main thing in HF patients is to follow the change in BMI over time rather than measuring BMI at any time. Although there is not enough evidence in the literature regarding the relationship between the anthropometric values of HF patients and the disease, it is stated that waist circumference measurement is much easier than BMI (Sözmen et al., 2016). At the same time, the frequent changes in the weight of the patients due to edema caused by HF affect the reliability of the measurement. It has been stated that skinfold thickness is an important parameter in calculating the body's fat mass distribution (Sözmen et al., 2016). While other measurements are important, researchers have also pointed out the value of waist-height ratio, waist-hip ratio, body shape index, and body adiposity index in assessing cardiovascular disease risk (Haghighatdoost et al., 2014; Kinugasa et al., 2013). Although the waist circumference, arm circumference and BMI of the patients included in the study were above the values considered normal according to the World Health Organization data, it was observed that the quality of life of the patients was above average (World Health Organization-WHO, 2024). Considering that this result may be due to personal characteristics and different factors related to the patients, it is recommended that the nutritional status, behaviors and anthropometric values of the patients in HF be monitored and evaluated together.

Limitations

This study was conducted with inpatient and outpatient heart failure patients in a city hospital in a specific region (Mediterranean Region). Therefore, the findings are limited to this study group only and have limited generalizability.

CONCLUSION

This study examined the effects of individual characteristics, nutritional behaviors, and anthropometric measurements on cardiac quality of life in HF patients. It was found that male, married, and individuals with high school/above education had significantly higher quality of life scores. In addition, the fluid retention prevention subscale of SDBHF showed a significant positive correlation with the physical, emotional, and total scores of the HeartQoL. Lifestyle factors, including diet, meal patterns, snacking, and weight fluctuations, did not significantly impact quality of life. Instead of evaluating the nutritional status of patients with HF with a single method, it is recommended to evaluate the nutritional status of patients using nutritional scales developed specifically for the disease and its symptoms. In addition, anthropometric measurements of patients should be performed at recommended intervals and these values should be monitored. Healthcare professionals should provide HF-specific nutritional education and counseling services to patients and help them gain behaviors aimed at preventing fluid retention. In addition, patients' self-care behaviors should be supported by including their families in the process. In the future, longitudinal studies with larger samples should be conducted to increase the generalizability of these findings and the effects of psychosocial factors on quality of life should be examined in detail.

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