RESEARCH ARTICLE

CYPRUS
JOURNAL OF MEDICAL SCIENCES

DOI: 10.4274/cjms.2026.2025-118
Cyprus J Med Sci 2026;11(2):136-143

Thirst Distress in Patients with Heart Failure

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Abstract

BACKGROUND/AIMS: This study aimed to determine the prevalence of thirst distress and its predictors in patients with heart failure (HF).

MATERIALS AND METHODS: The study was conducted between April 1, 2024, and July 15, 2025, and included 281 patients hospitalized in the cardiology wards of a training and research hospital in İstanbul, Türkiye.

RESULTS: Thirst distress was severe in 26.69% of patients, high in 31.67%, moderate in 30.25%, mild in 8.19%, and absent in 3.2%. The mean thirst distress scale score was 26.15±8.07, and the mean visual analog scale (VAS) thirst severity score was 5.53±2.30. Thirst was experienced almost daily by 34.16% of patients and several days per week by 28.47% of patients. 40.21% of patients reported feeling thirsty for one hour or less. The mean thirst distress scores were 29.48±7.35 for the New York Heart Association (NYHA) IV, 27.38±7.25 for NYHA III, 24.52±8.21 for NYHA II, and 22.11±10.29 for NYHA I patients. A strong positive correlation was observed between thirst-distress scores and VAS. Multiple regression analysis identified longer duration since HF diagnosis, the presence of diabetes and hypertension, and NYHA class III-IV as statistically significant positive predictors of thirst distress. These variables explained 10.2% of the total variance in thirst distress (adjusted R^2=0.102).

CONCLUSION: Thirst distress is highly prevalent in patients with HF. Longer duration since HF diagnosis, comorbid diabetes and hypertension, and higher NYHA class were predictors of thirst distress.

Keywords: Heart failure, thirst, prevalence, risk factors

INTRODUCTION

Chronic heart failure (CHF) is a progressive disease associated with high morbidity and mortality, and it impairs quality of life. Despite advances in care and treatment, the prognosis of heart failure (HF) remains poor.[1,2] An estimated 64.3 million people worldwide live with HF.[3] In Europe, the incidence of HF has been reported to be approximately 5 per 1,000 adults and 3 per 1,000 across all age groups. The prevalence of HF is 1-2% among adults. Since studies generally include only diagnosed cases of HF, the true prevalence is likely higher.[2] According to the Heart Failure Prevalence and Predictors in Türkiye study conducted in our country, the absolute prevalence of HF was 2.9%.[4]

Patients with HF experience numerous symptoms, such as dyspnea, fatigue, and exercise intolerance. However, they may also experience other symptoms, including thirst.[5-7] Thirst is a distressing and common symptom in patients with HF, as demonstrated in numerous studies. It is defined as a sensation that generates a strong desire to drink and can cause significant distress in patients with HF.[7] Several factors contribute to thirst in CHF. The first mechanism is the prolonged activation of the renin-angiotensin-aldosterone system (RAAS) in the pathophysiology of HF, which stimulates the thirst center via hormonal activation.[8] In HF, reduced cardiac output and decreased effective arterial blood volume lead to diminished renal perfusion, which in turn stimulates the release of renin from the juxtaglomerular cells of the kidneys. This process initiates a cascade of reactions resulting in increased production of angiotensin II and aldosterone. Angiotensin II plays a central role in the regulation of thirst by directly activating thirst centers in the hypothalamus. In addition, angiotensin II promotes sodium retention and vasoconstriction, thereby exacerbating fluid imbalance. Aldosterone increases renal sodium and water reabsorption, which may paradoxically worsen congestion while sustaining neurohormonal activation. The persistent activation of the RAAS in HF leads to continuous stimulation

To cite this article: Çamcı G, Oğuz S. Thirst distress in patients with heart failure. Cyprus J Med Sci. 2026;11(2):136-143

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Received: 03.10.2025
Accepted: 01.03.2026
Publication Date: 22.04.2026

of central thirst mechanisms, contributing to increased thirst perception and heightened thirst-related distress in affected patients.[9] Second, patients with HF often receive high-dose diuretic therapy to manage fluid retention. This treatment can cause dry mouth and body fluid loss, which further intensifies thirst. Third, fluid restriction, recommended to prevent fluid overload, can also increase the patient's perceived thirst.[8,10,11] The patient's psychological state (anxiety, depression) can contribute to thirst.[8,12] Thirst can lead to dry mouth, which negatively affects the patient's oral health. Additionally, it may cause dysphagia and pose challenges for patients who use dentures, thereby affecting activities of daily living.[13]

In patients with HF, thirst is not merely a subjective discomfort but is closely associated with significant clinical outcomes. In particular, an increased perception of thirst in patients receiving fluid restriction and diuretic therapy has been reported to adversely affect adherence to treatment and medications.[10] Patients experiencing severe thirst have difficulty adhering to fluid restriction, and such nonadherence may lead to volume overload and subsequent worsening of symptoms. Furthermore, thirst distress has been shown to reduce patients' quality of life by diminishing physical comfort, disrupting sleep patterns, and limiting activities of daily living.[8,12] Inadequate identification and management of thirst increase overall symptom burden and complicate disease self-management, which, in turn, are associated with higher rates of emergency department visits and hospital readmissions. In this context, thirst should be considered an important yet often overlooked symptom in HF that may indirectly influence clinical prognosis.[14,15]

A study conducted in China found that patients with HF experienced intense thirst. The study identified associations between thirst and omeprazole use, renal failure, and coronary heart disease, as well as higher New York Heart Association (NYHA) class and low ambient humidity.[13] A study conducted in Spain found that 47% of patients experienced thirst.[6] A study conducted in Sweden, the Netherlands, and Japan reported that 33% of patients with HF experienced moderate thirst.[7] Studies have found that thirst is most often associated with high-dose loop diuretics[7] and fluid restriction.[16,17] Thirst may be perceived differently in various countries, depending on climate, diet, and cultural habits.[6]

Although thirst is frequently experienced by patients with HF, it is often overlooked in clinical practice, despite the fact that it has significant effects on patient comfort, treatment adherence, and activities of daily living. While the literature includes studies addressing the presence of thirst, research evaluating the prevalence and clinical significance of thirst distress remains limited. The lack of sufficient data on this issue in our country demonstrates the need for this study. This study aims to determine the prevalence of thirst distress among patients with HF and increase awareness of symptom management. In this context, the findings are expected to contribute to the early identification and effective management of thirst distress in clinical practice, and to underscore the importance of holistic symptom assessment in nursing care. Furthermore, the results are expected to inform the development of nursing interventions, including oral care, strategies to manage thirst, patient education, and counseling. This study aimed to determine the prevalence and predictors of thirst distress in patients with HF.

Research Questions

What is the level of thirst distress in patients with heart failure?

Which variables predict thirst distress in patients with heart failure?

MATERIALS AND METHODS

Study Objective

This descriptive and analytical cross-sectional study was conducted to determine the prevalence of thirst distress and to identify its predictors in patients with HF.

Study Setting and Period

The study was conducted between April 1, 2024, and July 15, 2025, in the cardiology wards of a training and research hospital in İstanbul, Türkiye.

Study Sample

The sample size was calculated using G*Power 3.1.9.7.[18] The calculation was performed using F tests (linear multiple regression: fixed model, R^2 deviation from zero). An effect size of $f^2=0.15$,[19,20] $\alpha=0.05$, power =0.95, and 3 predictors were used, resulting in a required sample size of 119. However, the study aimed to include the largest possible sample. Post-hoc power analysis indicated that, with an effect size of $f^2=0.07$, $\alpha=0.05$, 3 predictors, and a total sample of 281, the statistical power was 0.972. The sample size was considered sufficient. Patients were selected using convenience sampling. Only those who agreed to participate during the data collection process were included.

Inclusion Criteria

- Patients who voluntarily agreed to participate in the study and who signed the informed consent form were included.
- No visual or hearing impairments.
- Age over 18 years.
- At least literate (able to read and write but without completion of formal primary education).
- Diagnosed with HF for a minimum of six months.

Exclusion Criteria

- Patients who withdrew from the study voluntarily during the study period.
- Health conditions that would prevent the patient from answering the questions (e.g., dyspnea, pain).
- Patients receiving hemodialysis.

Data Collection Method and Instruments

The data collection instruments used were the Patient Information Form, the Thirst Severity Form, and the thirst distress scale. Data were collected face-to-face by the researchers in the patients' rooms, taking approximately 20 minutes per patient.

Patient Information Form

The patient information form was developed based on a literature review[7,13,21-23] and consists of 23 questions. It includes items on the patient's demographics (age, height, sex, smoking , alcohol use, medications, comorbidities) and on thirst-related factors (e.g., frequency of thirst episodes per month, times of day when thirst is most intense).

Thirst Severity: a single item in which the patient rates the intensity of their thirst on a visual analog scale (VAS) from 0 to 10.[24]

Thirst Distress Scale in Patients with Heart Failure: This scale was developed by Waldréus et al.[25] to measure thirst distress in patients with HF. It has a single subscale comprising eight items. The scale's internal consistency, as measured by Cronbach's alpha, was reported to be 0.90. It is a 5-point Likert-type scale designed to assess patients' thirst experiences over the past two to three days. Total scores range from 0 to 40, with 0-8 indicating no thirst distress, 9-16 indicating mild distress, 17-24 indicating moderate distress, 25-32 indicating high distress, and 33-40 indicating severe thirst distress.[25] The Turkish adaptation of the scale was conducted by Yakar et al.[26] The scale's Cronbach's alpha was found to be 0.90, indicating that it is reliable for use in Türkiye.[26] In this study, the Cronbach's α for the scale was found to be 0.911.

Ethical Considerations

Verbal and written informed consent was obtained from all participants. Ethical approval was granted by the Marmara University Non-Interventional Clinical Research Ethics Committee (approval number: 04, date; 25.01.2024). Institutional permission was obtained from the İstanbul Provincial Health Directorate (number: E-15916306-604.01-241397249/decision no: 2024/06, date: 28.03.2024). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Data were analyzed using statistical software. Frequencies and percentages were used to describe participants' characteristics, while means and standard deviations were used to examine the scales. Skewness and Kurtosis values were assessed to determine whether the variables were normally distributed. Variables with Skewness and Kurtosis values between ±1.5 and ±2.0 were considered to be normally distributed.[27] The variables were found to be normally distributed, and parametric methods were used for data analysis. Relationships between two variables were examined using the Pearson correlation. Multiple linear regression analysis (enter model) was conducted to determine the effects of certain variables on thirst distress. Variables included in the regression models were selected based on factors known, clinically and theoretically, to be associated with thirst distress in patients with HF, consistent with the existing literature.[6,7,13,15,23] In addition, variables significantly associated with thirst distress in univariable analyses were included in the multivariable models.

RESULTS

Of the patients, 67.62% were male, 70.11% were married, and 58.36% had completed primary or middle school. A total of 75.09% were not employed, and 90.39% lived with their families. Active smoking was reported by 15.3% of patients. Nearly half (49.82%) had an income lower than their expenses, and 54.80% could perform activities of daily living independently. Fluid restriction was applied in 91.1% of patients, salt restriction was applied in 94.66% of patients, and 7.12% of patients had a diagnosis of depression. Comorbidities included hypertension in 64.77% of patients, coronary artery disease in 56.58% of patients, and diabetes in 48.04% of patients. Medication use included furosemide (95.73%) and beta-blockers (83.99%). According to the NYHA classification, 48.75% of patients were classified as NYHA II and 32.38% as NYHA III. The mean age of patients was 66.67±13.74 years, the mean duration since HF diagnosis was 5.23±4.85 years, the mean hospitalization frequency within one year was 2.36±1.91 times, and the mean length of hospital stay was 6.75±8.57 days (Table 1).

Among the patients, 26.69% reported severe thirst distress, 31.67% reported high thirst distress, 30.25% reported moderate thirst distress, 8.19% reported mild thirst distress, and 3.2% reported no thirst distress. The mean thirst distress scale score was 26.15±8.07. The mean VAS thirst severity score was 5.53±2.30. A significant positive correlation was found between thirst distress and thirst severity measured by the VAS (Table 2).

Among the patients, 34.16% experienced thirst almost daily, and 28.47% experienced it several times per week. Thirst lasted one hour or less in 40.21% of patients. The mean thirst distress scale scores were 29.48±7.35 for NYHA IV, 27.38±7.25 for NYHA III, 24.52±8.21 for NYHA II, and 22.11±10.29 for NYHA I patients (Figure 1).

In 45.55% of patients, the timing of thirst during the day was irregular. Patients who experienced thirst daily had higher thirst distress scores (Figure 2).

Table 1. Descriptive characteristics of patients (n=281)

Variables		n	%
Gender	Female	190	67.62
	Male	91	32.38
Marital status	Married	197	70.11
	Single	84	29.89
Educational status	Literate	57	20.28
	Primary-middle school	164	58.36
	High school/university	60	21.36
Working status	Unemployed	211	75.09
	Employed	70	24.91
Who live with	With family	254	90.39
	Alone	27	9.61
Smoking status	No	238	84.7
	Yes	43	15.3
Economic situation	Income less than expenses	140	49.82
	Income expense balanced	121	43.06
	Income more than expenses	20	7.12
Daily living activities	Can do it alone	154	54.80
	Can do it with help	101	35.95
	Cannot	26	9.25
Fluid restriction	Yes	256	91.1
	No	25	8.9
Salt restriction	Yes	266	94.66
	No	15	5.34

Table 1. Continued

Variables		n	%
Depression	No	261	92.88
	Yes	20	7.12
Comorbidities*	Hypertension	182	64.77
	Coronary artery disease	159	56.58
	Diabetes mellitus	135	48.04
	Atrial fibrillation	53	18.86
	Chronic kidney disease	37	13.17
	Chronic obstructive pulmonary disease	26	9.25
	Serebrovascular accident	16	5.69
	Cancer	3	1.07
Medications*	Furosemide	269	95.73
	Beta-blocker	236	83.99
	Gastroprotective	220	78.29
	SGLT2	163	58.01
	Spironolactone	128	45.55
	Statin	97	34.52
	ACEI	95	33.81
NYHA	I	9	3.20
	II	137	48.75
	III	91	32.38
	IV	44	15.66
Age mean ± SD (min-max)	66.67±13.74 (22-96)		
Duration of heart failure diagnosis mean ± SD (min-max)	5.23±4.85 (1-30)		
Frequency of hospitalization within a year mean ± SD (min-max)	2.36±1.91 (0-20)		
Days of hospitalization mean ± SD (min-max)	6.75±8.57 (1-70)		

*Multiple answers were selected.
SD: Standard deviation, NYHA: New York Heart Association, min-max: Minumum-maximum.

In Model 1, multiple linear regression analysis was conducted to examine the effects of time since HF diagnosis and the presence of diabetes and hypertension on thirst distress. The model was statistically significant ($F(3,277)=7.599$, $p<0.001$). These variables explained 6.6% of the total variance in thirst distress (Adjusted $R^2=0.066$). Longer duration since HF diagnosis, the presence of diabetes, and the presence of hypertension were identified as statistically significant positive predictors of thirst distress (Table 3).

In Model 2, multiple linear regression was used to examine the effects of the duration since HF diagnosis, diabetes, hypertension, and NYHA classification on thirst distress. The model was statistically significant ($F(6,274)=6.274$, $p<0.001$). These variables explained 10.2% of the total variance in thirst distress (Adjusted $R^2=0.102$). A longer duration since HF diagnosis, the presence of diabetes and hypertension, and NYHA class III or IV were identified as statistically significant positive predictors of thirst distress (Table 3).

In Model 3, the effects of furosemide use, salt and fluid restriction, and the presence of depression on thirst distress were not statistically significant($F(4,276)=1.914$, $p=0.108$).

DISCUSSION

In this study, the mean thirst distress score was high. A total of 88.61% of patients experienced moderate or severe thirst (Table 2). In a study by Younes et al.,[23] among patients with HF, the mean thirst distress score was at a moderate level, and 68% of patients reported moderate or severe distress. In the study by van der Wal et al.,[10] one-quarter of the patients reported experiencing severe thirst. In a study conducted in China, thirst distress was found to be moderate, with 75% of patients experiencing moderate-to-severe thirst.[13] A study conducted in Spain found that approximately half of patients with HF experienced thirst.[6] In a study conducted in Sweden, the Netherlands, and Japan, thirst distress was found to be moderate. No significant differences in thirst were observed among the three countries.[7] In another study, two-thirds of patients experienced moderate-to-severe thirst distress.[16] Our findings align with previous studies, confirming that thirst is common among patients with HF and therefore represents an important symptom that warrants careful consideration.

In this study, the mean VAS thirst severity score was 5.53±2.30 (on a 0-10 scale). In the study by Younes et al.,[23] the mean VAS score in patients with HF was 3.81±2.17 (on a 0-10 scale). In another study, the VAS score was reported as 47±22 (0-100 mm).[13] In a study including three countries, the VAS score in patients with HF was 53±15.[7] These studies indicate that VAS thirst severity scores are moderate in patients with HF. Additionally, the VAS is a simple and practical tool for routinely assessing thirst.

In this study, most patients experienced thirst almost daily or several times per week (Figure 1). For the majority of participants, the sensation of thirst lasted for one hour or less and the timing of peak thirst was irregular (Figure 2). In the study by Gong et al.,[13] most patients reported experiencing thirst several times per week or per month. Thirst typically lasted one hour or less, with the highest intensity occurring in the morning and afternoon.[13] In the study by Younes et al.,[23] nearly half of the patients reported experiencing thirst several times per week, one-third reported it several times per month, and most reported experiencing it in the morning. About 28% of patients indicated that a thirst episode lasted several hours.[23] In our study and in others, most patients reported thirst several times per week, typically lasting approximately one hour. These findings indicate that patients with HF frequently experience thirst throughout the day.

In this study, longer duration since HF diagnosis, presence of diabetes and hypertension, and NYHA class III or IV were identified as predictors of thirst distress. The use of furosemide, the restriction of salt and fluids, and the presence of depression were not statistically significant predictors of thirst distress (Table 3). In the study by Younes et al.,[23] salt restriction, use of statins, antidepressants, and any RAAS blocker were identified as predictors of thirst. van der Wal et al.[10] found a relationship between the use of high-dose diuretics, salt intake, and thirst intensity. In another study, factors associated with thirst included

Table 2. Patients' thirst distress levels (n=281)		
Variable	**n**	**%**
Thirst distress		
No	9	3.20
Mild	23	8.19
Moderate	85	30.25
High	89	31.67
Severe	75	26.69
Thirst distress mean ± SD (min-max)	26.15±8.07 (8-40)	
VAS mean ± SD (min-max)	5.53±2.30 (0-10)	
	VAS	
Thirst distress score	r	0.807
	p	**<0.001**

r: Pearson correlation, VAS: Visual analog scale, SD: Standard deviation, min-max: Minumum-maximum.

omeprazole use, renal failure, coronary heart disease, higher NYHA class, and low ambient humidity.[13] In the study by Eng et al.,[6] predictors of thirst were identified as lower use of angiotensin receptor blockers (ARBs), diuretic use >40 mg/day, depression, male sex, and worse NYHA class. In a systematic review, demographic characteristics, disease severity, psycho-environmental factors, medications, fluid restriction, and homeostasis were identified as risk factors for thirst. Conversely, increased fluid intake, sodium restriction, and the use of ARBs were identified as protective factors against thirst.[28] Several studies have found that fluid restriction is associated with both the severity of thirst and thirst distress.[7,16] The studies described above have identified numerous predictors of thirst. However, high NYHA class and fluid restriction are among the most commonly reported predictors. In our study, NYHA class was also found to be an important predictor. Non-pharmacological interventions can be applied to prevent thirst in patients with a high NYHA class who are on fluid restriction. These include implementing standardized oral care protocols, controlling the use of ice chips, chewing sugar-free gum, using oral moisturizers, and providing individualized education regarding fluid restriction and personalized fluid distribution. Systematic application of these interventions by nurses may help reduce perceived thirst and associated distress, particularly among patients with HF who are subject to fluid restriction. Although the model is statistically significant in this study, the relatively low adjusted R^2 indicates that thirst distress is multifactorial and complex, and cannot be fully explained by the variables included in this model alone. To achieve a more comprehensive understanding of thirst distress, environmental, psychosocial, and behavioral factors should be examined in greater detail in future studies.

In this study, diabetes mellitus and hypertension were identified as positive predictors of thirst distress. Diabetes and hypertension are important comorbid conditions that may contribute to increased thirst perception in patients with HF. In diabetes, particularly in cases of poor glycemic control, elevated blood glucose levels increase plasma osmolality, thereby stimulating hypothalamic osmoreceptors and triggering thirst. In addition, hyperglycemia-induced glucosuria leads to osmotic diuresis and increased urine output, resulting in intravascular volume depletion and further increase in thirst. Diabetes-associated xerostomia and reduced salivary secretion may also enhance thirst perception by decreasing oral moisture.[29,30]

Hypertension, on the other hand, may increase thirst indirectly through related pathophysiological processes and treatment-related factors. The widespread use of diuretic therapy, in particular, may induce mild hypovolemia and electrolyte disturbances that trigger thirst. Moreover,

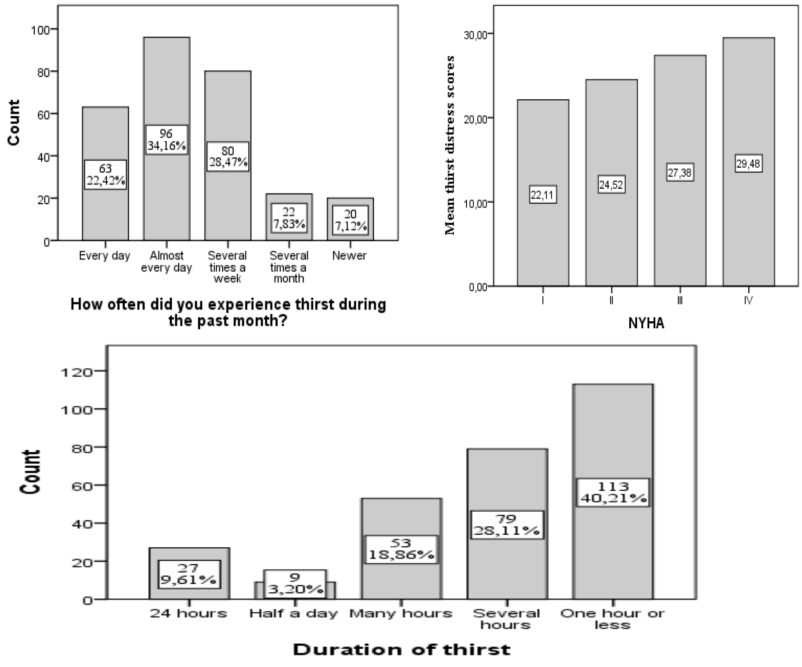

Figure 1. Frequency, duration of thirst, and levels of thirst distress according to NYHA classification among patients (n=281).
NYHA: New York Heart Association.

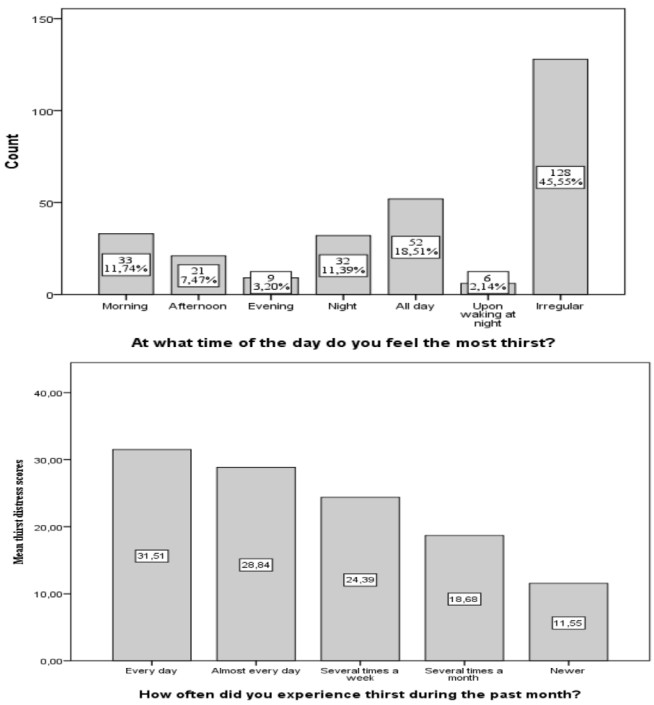

Figure 2. Timing and frequency of thirst experience among patients (n=281).

Table 3. Effects of selected variables on thirst distress							
Variable	**B**	**SE**	**β**	**t**	**p**	**95% CI**	**VIF**
Model 1							
(Constant)	22.04	0.98		22.47	<0.001	20.11-23.97	
Heart failure diagnosis time	0.23	0.10	0.14	2.43	**0.016**	0.04-0.42	1.01
Diabetes	2.28	0.95	0.14	2.42	**0.016**	0.42-4.15	1.03
Hypertension	2.75	0.99	0.16	2.78	**0.006**	0.80-4.70	1.04
F(3,277)=7,599, p<0.001, R^2=0.076, Adjusted R^2=0.066							
Model 2							
(Constant)	17.76	2.83		6.27	<0.001	12.18-23.34	
Heart failure diagnosis time	0.16	0.10	0.10	1.58	**0.115**	-0.04-0.37	1.20
Diabetes	2.23	0.93	0.14	2.40	**0.017**	0.40-4.06	1.03
Hypertension	2.60	0.97	0.15	2.68	**0.008**	0.69-4.52	1.04
NYHA II	3.49	2.71	0.22	1.29	0.199	-1.85-8.82	1.20
NYHA III	5.96	2.71	0.35	2.20	**0.029**	0.62-11.30	1.20
NYHA IV	7.35	2.80	0.33	2.62	**0.009**	1.83-12.86	1.20
F(6,274)=6,274, p<0.001, R^2=0.121, Adjusted R^2=0.102							
Model 3							
(Intercept)	21.02	3.07	0.00	6.85	<0.001	14.98-27.05	
Furosemide	2.31	2.45	0.06	0.94	0.346	-2.51-7.13	1.07
Salt restriction	-0.83	2.24	-0.02	-0.37	0.711	-5.25-3.59	1.11
Fluid restriction	4.09	1.83	0.14	2.24	0.026	0.50-7.69	1.18
Depression	-0.34	1.87	-0.01	-0.18	0.856	-4.01-3.33	1.01
F(4,276)=1,914, p=0.108, R^2=0.0270, Adjusted R^2=0.0129							

Dependent Variable: Thirst distress score, B: Unstandardized coefficient, SE: Standard error,
β: Standardized regression coefficient, VIF: Variance inflation factor, CI: Confidence interval, NYHA: New York Heart Association.

alterations in sodium balance and activation of the RAAS system influence central thirst mechanisms, with angiotensin II playing a key role in amplifying thirst responses. In patients with HF who also have hypertension, the convergence of these mechanisms may lead to a greater burden of thirst distress.[9] Therefore, diabetes and hypertension should be considered important clinical determinants in assessing and managing thirst distress among patients with HF.

Study Limitations

A limitation of this study is that the exact amounts of sodium and fluid intake were not measured. The dose of furosemide was not assessed, and patients' laboratory values, blood pressure, and pulse were not examined. Environmental temperature and humidity were not considered in this study. Future studies could evaluate patients' self-care behaviors. Our study included only hospitalized patients, which may limit the generalizability of the findings to all patients with HF. The relationship between neuroendocrine hormones and thirst could be explored in future research to better understand the mechanisms underlying HF.

This study has several notable strengths. First, it provides up-to-date data on the prevalence and severity of thirst distress in hospitalized patients with HF, an under-recognized yet clinically important symptom. Second, the use of both the thirst distress scale and the visual analog scale enabled a comprehensive assessment of thirst by capturing subjective distress and perceived severity; the strong correlation between these measures supports the robustness of the findings. Third, the inclusion of a relatively large sample from a tertiary training and research hospital enhances the reliability of the results and reflects real-world clinical practice. Fourth, this study is among the few to simultaneously examine clinical predictors, including the duration of HF, comorbid diabetes mellitus and hypertension, and NYHA functional class, thereby providing novel evidence to identify high-risk patient groups who may benefit from targeted symptom management strategies. To the best of our knowledge, this is the first study in Türkiye to examine the relationship between HF and thirst distress.

CONCLUSION

In this study, patients with HF experienced high thirst distress and moderate thirst severity. Longer duration since HF diagnosis, the presence of diabetes and hypertension, and NYHA class III or IV were identified as predictors of thirst distress. This study demonstrates the clinical importance of thirst as a symptom.

Thirst distress can negatively affect not only patients' quality of life, but also their adherence to treatment and their prognosis. It should not be overlooked during clinical assessments. Patients with comorbidities such as diabetes and hypertension were found to be at higher risk of experiencing thirst, and therefore should be monitored more closely. Because thirst distress is pronounced in patients with NYHA class III-IV, specific intervention protocols should be developed for this group. Non-pharmacological approaches to managing thirst, such as oral moisturizing techniques, ice chips, chewing gum, and ice sprays, can be incorporated into patient care.

Nurses' and other healthcare professionals' knowledge and awareness regarding the assessment and management of thirst distress should be enhanced. Structured education should be provided to patients and their caregivers on the purpose of fluid restriction, strategies for evenly distributing fluid intake throughout the day, and coping methods for reducing thirst. In addition, it is recommended that nursing education programs strengthen their content related to the assessment and management of thirst distress.

The relatively low proportion of variance explained by the regression models in this study suggests that thirst distress has a multidimensional and complex nature. Future studies should examine environmental, psychosocial, and behavioral factors, as well as cultural characteristics and patient experiences, in greater detail. Furthermore, planning randomized controlled trials and other interventional studies to evaluate the effectiveness of nursing interventions aimed at reducing thirst distress would contribute to the development of evidence-based clinical practice.

Nurses should integrate the assessment of thirst distress into routine patient evaluations, particularly for individuals subject to fluid restriction or with chronic conditions associated with thirst. This assessment should not be limited to the intensity of thirst alone; it should encompass multiple dimensions, including the patient's level of discomfort, the frequency of thirst throughout the day, and its impact on sleep and daily functioning. The use of valid and reliable thirst assessment instruments may facilitate the early identification of patients at risk and support the development of individualized care plans. In addition, factors such as oral dryness, medication use, environmental conditions, psychosocial stressors, and patients' knowledge and beliefs regarding fluid intake should be systematically evaluated.

Throughout the care process, nurses should reassess thirst distress at regular intervals, monitor the effectiveness of implemented interventions, and observe patients' adherence to fluid restriction regimens. Continuous clinical follow-up enables the early recognition of patient difficulties, treatment nonadherence, or deterioration in quality of life, thereby allowing care plans to be adjusted according to individual needs. Structured education for patients and their caregivers constitutes a fundamental nursing intervention in the management of thirst distress. Nurses should clearly explain the purpose of fluid restriction and its significance in disease management. Educational interventions should be individualized, culturally sensitive, and designed to enhance patients' self-management skills.

MAIN POINTS

- Thirst distress was highly prevalent among patients with heart failure (HF), with more than 88% experiencing at least moderate levels .
- The mean thirst-distress score was high, whereas the mean thirst-severity (visual analog scale) score was moderate, indicating a substantial symptom burden.
- A strong positive correlation was identified between thirst distress and thirst severity.
- Longer duration since diagnosis of HF, diabetes mellitus, hypertension, and New York Heart Association class III-IV were significant predictors of thirst distress.

- Thirst should be recognized as a significant and underappreciated symptom in HF management, with important implications for patient comfort and quality of life.

ETHICS

Ethics Committee Approval: Ethical approval was granted by the Marmara University Non-Interventional Clinical Research Ethics Committee (approval number: 04, date; 25.01.2024).

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

Acknowledgements

We would like to thank all participants who took part in our study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: G.Ç., S.O., Concept: G.Ç., S.O., Design: G.Ç., S.O., Data Collection and/or Processing: G.Ç., Analysis and/or Interpretation: G.Ç., Literature Search: G.Ç., S.O., Writing: G.Ç., S.O.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

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

REFERENCES

1. Tomasoni D, Adamo M, Lombardi CM, Metra M. Highlights in heart failure. ESC Heart Fail. 2019; 6(6): 1105-27.
2. Authors/Task Force Members:; McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: developed by the task force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). With the special contribution of the Heart Failure Association (HFA) of the ESC. Eur J Heart Fail. 2022; 24(1): 4-131.
3. Groenewegen A, Rutten FH, Mosterd A, Hoes AW. Epidemiology of heart failure. Eur J Heart Fail. 2020; 22(8): 1342-56.
4. Değertekin M, Erol C, Ergene O, Tokgözoğlu L, Aksoy M, Erol MK, et al. Heart failure prevalence and predictors in Turkey: HAPPY study. Turk Kardiyol Dern Ars. 2012; 40(4): 298-308. [in Turkish]
5. Chen Y, Ding J, Xi Y, Huo M, Mou Y, Song Y, et al. Thirst in heart failure: a scoping review. Nurs Open. 2023; 10(8): 4948-58.
6. Eng SH, Jaarsma T, Lupón J, González B, Ehrlin J, Díaz V, Bayes-Genis A, et al. Thirst and factors associated with frequent thirst in patients with heart failure in Spain. Heart Lung. 2021; 50(1): 86-91.
7. van der Wal MHL, Waldréus N, Jaarsma T, Kato NP. Thirst in patients with heart failure in Sweden, the Netherlands, and Japan. J Cardiovasc Nurs. 2020; 35(1): 19-25.
8. Allida SM, Inglis SC, Davidson PM, Lal S, Hayward CS, Newton PJ. Thirst in chronic heart failure: a review. J Clin Nurs. 2015; 24(7-8): 916-26.
9. Pugliese NR, Masi S, Taddei S. The renin-angiotensin-aldosterone system: a crossroad from arterial hypertension to heart failure. Heart Fail Rev. 2020; 25(1): 31-42.
10. van der Wal MHL, Jaarsma T, Jenneboer LC, Linssen GCM. Thirst in stable heart failure patients; time to reconsider fluid restriction and prescribed diuretics. ESC Heart Fail. 2022; 9(4): 2181-8.
11. Wefer F, Krüger L, Waldréus N, Köpke S. Non-pharmacological interventions to reduce thirst in patients with heart failure or hemodialysis: a systematic review and meta-analysis. Heart Lung. 2024; 67: 33-45.
12. Allida SM, Hayward CS, Newton PJ. Thirst in heart failure: what do we know so far? Curr Opin Support Palliat Care. 2018; 12(1): 4-9.
13. Gong J, Waldréus N, Hu S, Luo Z, Xu M, Zhu L. Thirst and factors associated with thirst in hospitalized patients with heart failure in China. Heart Lung. 2022; 53: 83-8.
14. van der Wal MHL, Waldréus N, Jaarsma T, Kato NP. Thirst in Patients with heart failure in Sweden, the Netherlands, and Japan. J Cardiovasc Nurs. 2020; 35(1): 19-25.
15. Waldréus N, van der Wal MH, Hahn RG, van Veldhuisen DJ, Jaarsma T. Thirst trajectory and factors associated with persistent thirst in patients with heart failure. J Card Fail. 2014; 20(9): 689-95.
16. Thapa K, Das S, Pathak P, Singh S. Assessment of thirst intensity and thirst distress and the practices for its management among heart failure patients admitted to the cardiology unit. Journal of the Practice of Cardiovascular Sciences. 2021; 7(1): 36-40.
17. Waldréus N, Chung ML, van der Wal MH, Jaarsma T. Trajectory of thirst intensity and distress from admission to 4-weeks follow up at home in patients with heart failure. Patient Prefer Adherence. 2018; 12: 2223-31.
18. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods. 2007; 39(2): 175-91.
19. Cohen J. Statistical power analysis for the behavioral sciences: Routledge; 1988.
20. Polit DF, Beck CT. Nursing research : generating and assessing evidence for nursing practice. 8th ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins, 2008. Print.
21. Allida SM, Shehab S, Inglis SC, Davidson PM, Hayward CS, Newton PJ. A RandomisEd controLled trIal of ChEwing gum to relieVE thirst in Chronic Heart Failure (RELIEVE-CHF). Heart Lung Circ. 2021; 30(4): 516-24.
22. Çamcı G, Oğuz S, Özdemir E. Thirst distress in palliative care patients. J Palliat Care. 2025; 40(4): 336-43.
23. Younes K, Massouh A, Deek H, Nasreddine L, Waldréus N, Noureddine S. Prevalence and predictors of thirst in patients with heart failure. J Cardiovasc Nurs. 2025; 40(5): 431-40.
24. Aydın A, Araz A, Asan A. Visual analog scale and emotion grid: an adaptation study to our culture. Turkish Psychologists Articles. 2011; 14(27): 1-13.
25. Waldréus N, Jaarsma T, van der Wal MH, Kato NP. Development and psychometric evaluation of the Thirst Distress Scale for patients with heart failure. Eur J Cardiovasc Nurs. 2018; 17(3): 226-34.
26. Yakar HK, Oguz S, Waldreus N. Reliability and validity of the Turkish version of the thirst distress scale-heart failure. Curr Psychol. 2024; 43:20111-20.
27. George D, Mallery P. IBM SPSS statistics 26 step by step: a simple guide and reference: Routledge; 2019.
28. Zheng Y, Chen Q, Xia C, Liu H. Thirst symptoms in patients with heart failure: an integrative review. J Adv Nurs. 2025; 81(1): 35-52.
29. Dwivedi M, Pandey AR. Diabetes mellitus and its treatment: an overview. CR Journals. 2020;1(1):48-58.
30. Szczepanska-Sadowska E. Neurochemical aspects of the role of thirst in body fluid homeostasis and their significance in health and disease: a literature review. Int J Mol Sci. 2025; 26(16): 785.