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Thirst Distress and Associated Factors in Hospitalized Internal Medicine Patients: A Descriptive Study

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Abstract

Background: Thirst is a distressing yet often overlooked symptom in hospitalized patients, particularly those under fluid or oral intake restrictions. Despite its relevance to patient comfort, its clinical determinants remain insufficiently studied in internal medicine settings. Nurses, as primary providers of symptom management, play a critical role in recognizing and addressing thirst.

Aim: This study aimed to evaluate the level of thirst distress among patients hospitalized in internal medicine units and to identify demographic and clinical factors associated with thirst.

Methods: A descriptive cross-sectional design was employed in the internal medicine units of a tertiary hospital between July and December 2024. Using the known population formula at a 95% confidence level, 271 patients meeting inclusion criteria were recruited. Data were collected through a Demographic Characteristics Questionnaire and the Thirst Discomfort Scale (TDS). Data were analyzed using independent t-tests, one-way analysis of variance (ANOVA), and multiple linear regression.

Results: According to the results of the study, among the patients, 52.4% were male, and the participants had a mean age of 65.92±14.63 years and a mean Body Mass Index (BMI) of 25.47±4.78 kg/m^2. Most patients had no dietary restrictions, with 91.5% reporting no oral restriction, 93.4% no fluid restriction, and 50.6% no salt restriction. The mean total TDS score was 26.36±11.04, reflecting a low-to-moderate level of thirst distress. Higher levels of thirst distress were observed among patients who were female, consumed alcohol, had oral or fluid restrictions, were diagnosed with hypertension, or used opioids ($p<0.05$). Multiple linear regression analysis identified female gender (B=4.75, p=0.004) and oral restriction (B=8.04, p=0.02) as independent predictors of thirst distress.

Conclusion: Although thirst distress was generally low to moderate, certain groups—specifically those with oral or fluid restrictions, alcohol use, hypertension, or opioid therapy—reported significantly higher discomfort. Integrating routine thirst assessment, oral care, and individualized fluid management into nursing protocols may improve patient outcomes and enhance comfort.

Keywords: Fluid restriction, hospitalized patients, internal medicine, thirst, thirst distress

Introduction

Thirst is a fundamental physiological sensation that plays a vital role in maintaining fluid balance and homeostasis. It is often described not only as a biological need but also as a subjective experience influenced by various factors, such as dry mouth, taste perception, psychological stress, and social habits.[1,2] In hospitalized patients, particularly those undergoing treatment regimens that restrict oral or fluid intake, thirst may become a source of significant distress, negatively impacting comfort, recovery, and emotional well-being.[3,4] Despite its frequent occurrence, thirst is commonly overlooked in clinical practice and underprioritized in nursing care plans.[5]

Thirst distress can be categorized into osmotic and hypovolemic types, each regulated by complex physiological mechanisms involving antidiuretic hormone release and the restoration of fluid volume.[6] Studies have shown that thirst intensity may increase in the presence of comorbidities such as heart failure, diabetes, or hypertension, and may be further exacerbated by the use of diuretics or opioids.[6–8] Moreover, psychological outcomes such as anxiety, helplessness, and fatigue have been associated with unrelieved thirst in hospitalized patients, especially those in critical or palliative care units.[9,10]

Although thirst has been widely investigated in intensive care, surgical, and palliative care settings.[11,12] there remains a notable gap in research focusing on general internal medicine units. A previous study indicated that thirst prevalence may reach 70% in intensive care patients,[13] while in surgical populations the prevalence of moderate to severe thirst has been reported between 53.2% and 69.8%, and among patients with heart failure, approximately 66.7% have reported experiencing moderate to severe thirst distress.[14,15] However, the literature lacks studies assessing thirst distress using validated measurement tools in patients hospitalized in standard internal medicine wards, particularly those with chronic diseases and complex medication regimens. In Türkiye, there are no comprehensive studies evaluating thirst distress among hospitalized patients in internal medicine units using structured assessment tools. Given the potential for thirst to disrupt patients' comfort and physiological stability, it is essential for nursing professionals to systematically evaluate and manage this symptom. Nurses play a central role in recognizing and alleviating thirst through routine symp-

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tom assessments, oral care practices, fluid management, and individualized comfort interventions. By integrating thirst assessment into nursing protocols, they can help reduce symptom burden, improve patient satisfaction, and support recovery. This study aims to address this gap by assessing thirst distress and identifying its associated factors among patients hospitalized in internal medicine units. The results are expected to inform clinical practice and provide evidence for future intervention strategies to enhance patient comfort and care outcomes.

Research Question

1. What is the level of thirst distress among patients hospitalized in internal medicine units?
2. Which sociodemographic and clinical factors are associated with the thirst experience of patients hospitalized in internal medicine units?

Materials and Methods

Study Design

The study was designed and conducted as a descriptive study.

Population and Sample

The study population consisted of patients hospitalized in the internal medicine subunits, including neurology, cardiology, chest diseases, infectious diseases, nephrology, endocrinology, oncology, and gastroenterology, of the hospital. These internal medicine units operate within the hospital's total bed capacity of 550. Data collection was conducted between July and December 2024. The required sample size was calculated using the known population formula ($n = N \cdot t^2 \cdot p \cdot q \,/\, [d^2 (N-1) + t^2 \cdot p \cdot q]$) at a 95% confidence level with a 0.05 margin of error, yielding a required sample of 235 patients. To account for potential dropouts, the sample size was increased by 15%, resulting in a final study group of 271 patients who met the inclusion criteria.

Inclusion Criteria

Patients who met the following criteria were included in the study:

- Aged 18 years or older,
- Hospitalized in internal medicine units,
- Conscious and able to communicate,
- Provided informed consent to participate.

Exclusion Criteria

Patients were excluded if they:

- Had altered consciousness (unable to cooperate),
- Had a psychiatric diagnosis.

Data Collection Instruments

Data were collected using the Demographic Characteristics Questionnaire and the Thirst Discomfort Scale (TDS).

Demographic Characteristics Questionnaire

This questionnaire, developed based on a review of the literature, includes items assessing participants' demographic characteristics such as age, gender, marital status, educational level, employment status, and daily fluid intake habits.[5,9,11,16–18]

Thirst Discomfort Scale (TDS)

The TDS was developed by Çiftçi et al.[19] in 2023. The scale consists of 12 items grouped into three subdimensions: intraoral movements (items 1–5), psychological movements (items 6–8), and extraoral movements (items 9–12). The scale is structured as a five-point Likert-type scale (1=Not at all disturbing, 2=Slightly disturbing, 3=Moderately disturbing, 4=Very disturbing, 5=Extremely disturbing). Higher scores indicate higher levels of thirst discomfort. The overall Cronbach's alpha reliability coefficient of the scale was reported as 0.88, while in this study, the reliability coefficient was calculated as 0.91.

Implementation of Data Collection Instruments

Data were collected through face-to-face interviews conducted by the researchers, following confirmation that each participant met the inclusion criteria. The data collection process took place on weekdays between 09:00 and 16:00 and lasted approximately 15–20 minutes per participant. Patients were approached in their rooms after obtaining verbal consent. To ensure consistency and reliability, data collectors received standardized training on how to conduct interviews in a neutral and non-leading manner. A pilot study was conducted with 10 patients to evaluate the clarity and feasibility of the data collection tools. Feedback from the pilot was used to make minor adjustments, and data from these participants were excluded from the final analysis.

Data Analysis

The collected data were analyzed using SPSS Statistics for Windows, Version 27.0 (IBM Corp., Armonk, NY, USA). Normality tests were performed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Descriptive statistics were presented as mean±standard deviation (SD) and minimum–maximum values for continuous variables, while categorical variables were presented as frequency and percentage. Independent t-tests were used to compare normally distributed continuous variables between two independent groups. One-way analysis of variance (ANOVA) was applied to compare normally distributed continuous variables across three or more independent groups. Multiple linear regression analysis was conducted to determine the independent effects of sociodemographic and clinical factors on patients' thirst distress levels. Variables found to be significant in the bivariate analyses were included in the regression model. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

Prior to the study, ethical approval was obtained from Çanakkale Onsekiz Mart University Graduate Education Institute Scientific Research and Publication Ethics Committee (Approval Number: E-84026528-050.99-2400174506, Decision Number: 10/04, Date: 04.07.2024). Permission to use the Thirst Discomfort Scale was granted via email correspondence with the scale's developer. All participants were informed about the study's aim and methods, and written informed consent was obtained. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

Results

Among the patients, 52.4% were male, and 52% had completed primary or secondary education. The participants had a mean age of 65.92±14.63 years and a mean Body Mass Index (BMI) of 25.47±4.78 kg/m^2. Nearly half (47.2%) had never smoked, and 62.7% reported no alcohol consumption. Most patients had no dietary restrictions, with 91.5% reporting no oral restriction, 93.4% no fluid restriction, and 50.6% no salt restriction. Regarding comorbidities, 36.9% were diagnosed with hypertension, and 26.8% were receiving diuretic therapy. The average length of hospital stay was 5.38±4.76 days (Table 1).

The mean total score on the TDS was 26.36±11.04. Subscale analyses revealed the following mean scores: *Intraoral Movements* – 11.05±5.20, *Psychological Movements* – 8.80±4.01, *Extraoral Movements* – 6.50±3.52 (Table 2).

A statistically significant difference was found in total TDS scores based on alcohol consumption, fluid restriction, presence of comorbidities, and medication use ($p<0.05$). In contrast, age, gender, educational level, BMI, smoking status, salt restriction, and length of hospital stay were not significantly associated with TDS scores ($p>0.05$). Patients who actively consumed alcohol had significantly higher TDS scores (28.17±11.27) compared to those who had never consumed alcohol (22.40±9.47) or had ceased consumption (23.58±10.14) ($p<0.05$). Patients with oral and fluid restrictions exhibited significantly higher TDS scores compared to those without such restrictions ($p<0.05$), whereas no significant difference was observed in relation to salt restriction ($p>0.05$). Among comorbid conditions, only patients with hypertension had significantly higher TDS scores ($p<0.05$); patients with diabetes mellitus or other diseases did not differ significantly in terms of thirst discomfort ($p>0.05$). Regarding medication use, opioid users reported significantly higher TDS scores compared to non-users ($p<0.05$). No significant differences were observed among patients using diuretics, antidepressants, inhalers, or antihypertensive medications ($p>0.05$) (Table 3).

Multiple linear regression analysis revealed that female gender and oral restriction were significant independent predictors of thirst distress among hospitalized patients. Female patients and those with oral intake restrictions had higher TDS scores, while other variables were not significant predictors (Table 4).

Table 1. Distribution of patients' descriptive characteristics (n=271)

Descriptive characteristics	Mean±SD	Min	Max
Age	65.92±14.63	24.00	91.00
Body mass index (BMI)	25.47±4.78	15.92	46.88
Length of hospital stay	5.38±4.76	1.00	24.00
	n	**%**	
Gender			
Female	129	47.6	
Male	142	52.4	
Educational level			
Illiterate	24	8.9	
Literate	38	14	
Primary/Secondary School	141	52	
High School	38	14.0	
University	30	11.1	
Smoking/alcohol consumption			
Never used	128–170	47.2–62.7	
Quit	106–79	39.1–29.2	
Active user	37–22	13.7–8.1	
	n	**%**	
Oral restriction			
Yes	23	8.5	
No	248	91.5	
Fluid restriction			
Yes	18	6.6	
No	253	93.4	
Salt Restriction			
Yes	134	49.4	
No	137	50.6	
Comorbid conditions*			
Hypertension	100	36.9	
Diabetes mellitus	75	27.7	
Other**	96	35.4	
Medications used*			
Diuretic	38	26.8	
Antidepressant	32	22.5	
Inhaler	28	19.7	
Opioid	23	16.2	
Antihypertensive	21	14.8	

*: Participants selected more than one option, **: Other: chronic obstructive pulmonary disease, coronary artery disease, chronic kidney disease, cancer, liver disease, cerebrovascular disease, rheumatologic conditions, dementia. SD: Standard deviation, Min: Minumum, Max: Maximum.

Discussion

Thirst is a common yet often underrecognized symptom in hospitalized patients, and understanding its associated factors is essential for improving patient comfort and guiding nursing interventions. This study revealed that patients hospitalized in internal medicine units generally experienced low-to-moderate levels of thirst distress, and that this condition was particularly associated with alcohol use, oral or fluid restriction, hypertension, and opioid use. As a result of the study, the mean TDS score indicated that patients experienced a low-to-moderate level of thirst distress. Considering that the minimum score obtainable from the scale is 12 and the maximum is 60, it can be stated that the overall level of thirst experienced by the patients was low. Although this result may be perceived as positive, once symptoms of thirst emerge, a challenging condition arises for each patient. Regardless of its degree, thirst should be considered an important symptom that causes both physiological and psychological distress and is often associated with other symptoms.[7] In a study conducted by Waldréus et al.[10] with patients diagnosed with heart failure, it was reported that one in five patients experienced low-to-moderate levels of thirst. Nevertheless, other studies in the literature conducted with patients with heart failure and intensive care patients have reported considerably higher levels of thirst.[8,20] The relatively low mean TDS score in this study compared to previous research may be attributed to the inclusion of clinically stable patients in general internal medicine units, most of whom did not undergo invasive procedures or strict fluid restrictions, which likely reduced overall thirst distress.

It was found that the mean score of the intraoral movements subdimension of the TDS was higher than that of the other subdimensions. This finding is associated with a reduction in saliva and changes caused by friction in the oral mucosa, which are detected by specific receptors and subsequently activate the thirst center.[16] Although dry mouth resulting from reduced saliva may seem insignificant, it can progress to more serious conditions accompanied by oral irritation in later stages.[21] Another subdimension of the TDS is the psychological subdimension. According to the study results, this subdimension received the second highest score after the intraoral movements subdimension. In the literature, it has been suggested that thirst affects neurophysiological systems and leads to psychological fatigue in patients.[22,23] These findings suggest that the primary discomfort caused by thirst in hospitalized patients is driven by oral dryness and its psychological impact, highlighting the need for targeted oral care interventions to reduce thirst distress.

Table 2. Mean scores of the thirst distress scale total and subdimensions

Scale total and subdimensions	Mean±SD	Min	Max
Intraoral movements	11.05±5.20	5.00	25.00
Psychological movements	8.80±4.01	4.00	20.00
Extraoral movements	6.50±3.52	3.00	15.00
TDS total score	26.36±11.04	12.00	60.00

SD: Standard deviation, TDS: Thirst Discomfort Scale.

In the present study, women experienced higher levels of thirst distress than men. This finding is consistent with previous studies by Eng et al.[8] and Younes et al.,[24] which also reported higher thirst distress levels among female patients. These results suggest that gender-related physiological or hormonal factors, as well as differences in symptom perception and expression, may influence the thirst experience. In contrast, patients' age and BMI did not appear to influence thirst distress. Similarly, Sato et al.[3] and Zhao et al.[25] reported no association between age, BMI, and thirst among hospitalized patients, whereas Adams et al.[26] found that thirst distress increased with higher BMI values.[3,26,27] Such discrepancies in the literature may stem from differences in sample characteristics, patient populations, and the measurement tools used to assess thirst.

In this study, alcohol consumption appeared to be associated with higher levels of thirst distress, whereas smoking did not seem to influence it. Similarly, in the study conducted by Güngör et al.[11] with patients hospitalized in a surgical intensive care unit, a significant association was found between alcohol use and thirst, consistent with the findings of the present study. However, in the study by Zhao et al.,[25] no association was found between thirst and either smoking or alcohol consumption.[25] Alcohol consumption reduces the release of vasopressin from the nerve terminals of the posterior pituitary, leading to increased urine production.[28] Through diuresis, alcohol reduces the body's fluid volume, which in turn causes dry mouth and thirst.[29]

In this study, oral-fluid restrictions appeared to increase thirst distress, whereas salt restriction did not seem to have a noticeable effect. Similarly, in the study conducted by Lin et al.[4] across four different intensive care units, a significant differ-

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Table 3. Comparison of Thirst Distress Scale scores according to descriptive characteristics

	Descriptive characteristics[1]	Thirst Distress Scale (mean±SD)	F/t	p
Age				
≥60	206	27.02±11.09	t=-1.746	0.082
<60	65	24.29±10.68		
Gender				
Male	142	23.52±9.68	t=4.606	0.001
Female	129	29.49±11.62		
Educational level				
Primary/Secondary School	141	26.67±10.97	F=0.348	0.846
Literate	38	26.10±10.78		
High School	38	25.63±12.14		
University	30	24.86±10.53		
Illiterate	24	28.04±11.27		
BMI				
18.5–24.9	131	26.60±10.61	F=0.925	0.450
25–29.9	87	26.34±11.08		
30–34.9	27	24.00±12.31		
≥35	14	30.57±12.40		
0–18.4	12	24.41±10.86		
Smoking				
Never used	128	28.38±11.61	F=5.069	**0.007**
Quit	106	23.83±9.93		**ph=1>2***
Active user	37	26.64±10.84		
Alcohol consumption				
Never used[1]	170	22.40±9.47	F=6.458	**0.002***
Quit[2]	79	23.58±10.14		**ph=1>2***
Alcohol consumption				
Active user[3]	22	28.17±11.27		
Oral restriction				
No	248	25.50±10.45	t=4.35	**<0.001***
Yes	23	35.65±13.06		
Fluid restriction				
No	253	25.71±10.67	t=3.716	**<0.001***
Yes	18	35.50±12.36		
Salt restriction				
No	137	25.88±10.69	t=0.732	
Yes	134	36.86±12.40		
0.465				
Length of hospital stay				
0–9 days	229	26.06±10.90	F=0.569	0.567
10–19 days	33	27.78±10.99		
≥20 days	9	28.77±15.08		
Comorbid conditions*				
Hypertension	100	28.10±11.65	t=1.984	**0.048***
Other**	96	26.29±10.81	t=-0.085	0.932
Diabetes mellitus	75	25.36±11.29	t=-0.930	0.353
Medications used*				
Diuretic	38	26.36±10.18	t=0.000	1.000
Antidepressant	32	21.39±8.25	t=0.651	0.515
Inhaler	28	25.67±10.38	t=-0.349	0.728
Opioid	23	27.46±12.04	t=-2.923	**0.024***
Antihypertensive	21	24.47±8.32	t=0.668	0.414

*: p<0.05, **. Other comorbidities include chronic obstructive pulmonary disease, coronary artery disease, chronic kidney disease, cancer, liver disease, cerebrovascular disease, rheumatologic conditions, and dementia. [1:] Never used, [2:] Quit, [3:] Active user. Chronic obstructive pulmonary disease, coronary artery disease, chronic kidney disease, cancer, liver disease, cerebrovascular disease, rheumatologic conditions, dementia. ph: Post-hoc test (Tukey). SD: Standard deviation, F: ANOVA value, t: Independent t-test value, BMI: Body mass index

Table 4. Multiple linear regression analysis of predictors of thirst distress

Predictor variables	Estimate (B)	SE	95% CI (lower–upper)	t	p
Intercept (constant)	23.29	6.56	10.37–36.21	3.55	<0.001
Age (>60 vs. <60 years)	1.97	1.67	-1.31–5.25	1.18	0.240
Gender (female vs. male)	4.75	1.61	1.58–7.93	2.95	**0.004***
Educational level	–	–	–	–	>0.050
BMI	–	–	–	–	>0.050
Smoking (quit/active vs. never)	–	–	–	–	>0.050
Alcohol (quit/active vs. never)	–	–	–	–	>0.050
Oral restriction (yes vs. no)	8.04	3.35	1.44–14.64	2.40	**0.020***
Fluid restriction (yes vs. no)	1.84	3.79	-5.62–9.30	0.49	0.630
Salt restriction (yes vs. no)	0.95	1.35	-1.70–3.61	0.71	0.480
Hypertension (yes vs. no)	–2.21	1.40	-4.97–0.56	-1.57	0.120
Diabetes mellitus (yes vs. no)	1.58	1.51	-1.39–4.56	1.05	0.300
Opioid use (yes vs. no)	2.37	2.52	-2.60–7.34	0.94	0.350

Model Summary: F=14.594, p<0.001; Durbin-Watson=2.11 (no autocorrelation detected). B: Unstandardized regression coefficient, SE: Standard error, CI: Confidence interval, t: t-statistic for regression analysis, BMI: Body mass index.

ence was found between patients subjected to oral-fluid restriction and their levels of thirst. In addition, Armstrong et al.[30] also concluded that oral-fluid restrictions were associated with increased thirst distress. The sensation of thirst resulting from oral-fluid restriction occurs via osmotic and hypovolemic mechanisms. The finding in this study that patients subjected to oral-fluid restriction had higher thirst scores is consistent with these physiological mechanisms described in the litera-

ture. Contrary to expectations, the absence of a relationship between salt restriction and thirst in this study may be attributed to individual differences in patients' salt consumption habits and a lack of strict adherence to salt restriction. In contrast to the present findings, Younes et al.[24] reported a significant relationship between salt restriction and thirst. Similarly, the study by van der van der Wal et al.[31] found that the consumption of salty foods increased thirst.

In this study, patients with hypertension tended to experience higher levels of thirst distress compared with those without this condition. Similarly, the study conducted by Flim et al.[20] also reported a relationship between thirst and hypertension. In contrast, the study by Gong et al.[32] found no association between thirst and hypertension. Hypertension may contribute to increased levels of thirst by causing hyposalivation,[33] which leads to dry mouth. For this reason, patients with hypertension should be supported in terms of fluid intake.

In this study, opioid use appeared to be associated with increased thirst distress, whereas diuretics, antidepressants, and antihypertensive medications did not seem to have a notable effect. Similarly, studies in the literature indicate that certain medications affect thirst.[7,27] In the study conducted by Lin et al.,[4] no association was found between diuretic use and thirst, while in the study by Negro et al.,[5] a relationship was reported between high-dose diuretic use and thirst. [4,5] The effect of diuretics on thirst is explained by dehydration resulting from fluid loss through the kidneys. There is a correlation between the degree of thirst and the dosage of diuretics used–the higher the dose, the greater the thirst distress experienced.[8] In this study, 28.8% of patients were using diuretics; however, since diuretic dosage was not assessed, this may have influenced the findings. Similar to the present study, Ho et al.[34] also found no association between antidepressant use and thirst. Nevertheless, in the study by Eng et al.,[16] a significant relationship between antidepressant use and thirst was reported. Although stress, anxiety, and depression are known to significantly reduce salivary flow and cause dry mouth,[33] in this study, variations in the type and dosage of antidepressants used by patients, as well as their daily fluid intake, may have led to differing levels of thirst. The finding of a significant relationship between opioid use and thirst in this study is consistent with the results reported by Ho et al.[34] There are two main mechanisms by which opioid use is thought to influence thirst: first, opioids act on the thirst center in the hypothalamus, activating inhibitory pathways that stimulate thirst; and second, they exert a diuretic effect, leading to dehydration, which in turn contributes to increased thirst.[35] This study further revealed, through multiple linear regression analysis, that female gender and oral-fluid restriction were independent predictors of thirst distress, whereas other factors such as age, BMI, alcohol consumption, hypertension, and medication use were not significant predictors when analyzed together.

Study Limitations

This study has several limitations. First, it was conducted in a single center, which may limit the generalizability of the results. Second, its descriptive nature does not allow for establishing causal relationships between variables. Lastly, the seasonal distribution of patient recruitment (July–December) was not analyzed, which may have influenced patients' thirst perception.

Conclusion

The results of this study revealed that patients hospitalized in internal medicine units experience low-to-moderate levels of thirst distress. However, it was determined that patients who consume alcohol daily, have a diagnosis of hypertension, are subject to oral or fluid restriction, and use opioid medications experience higher levels of thirst. These findings emphasize the importance of incorporating thirst assessment as a routine part of nursing care in internal medicine settings. Targeted interventions such as frequent oral care, customized fluid allowances, and reviewing medication plans can improve patient comfort and reduce symptom burden. This highlights the need for nurses to implement more systematic monitoring of fluid intake, oral care, and thirst assessment, especially for these patient groups. In line with the study's findings, it is recommended that future research evaluate the effectiveness of interventions aimed at improving fluid monitoring in patients with oral and fluid restrictions and examine the dose-dependent effects of opioids and other medications on thirst. Furthermore, it is important that these findings be supported by multicenter and longitudinal studies. Implementation of nursing protocols addressing thirst could ultimately lead to enhanced patient satisfaction and better health outcomes.

Ethics Committee Approval: The study was approved by the Çanakkale Onsekiz Mart University Graduate Education Institute Scientific Research and Publication Ethics Committee (Approval Number: E-84026528-050.99-2400174506, Decision Number: 10/04, Date: 04.07.2024).

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