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Thirst in Patients With Heart Failure in Sweden, the Netherlands, and Japan

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Background: Thirst is a distressing symptom and influences quality of life of patients with heart failure (HF). Knowledge about thirst in HF is insufficient; therefore, the aim of this study was to describe factors related to thirst, self-reported reasons for thirst, and interventions to relieve thirst in 3 different countries. **Methods:** A cross-sectional study was conducted in Sweden, the Netherlands, and Japan. Patients were recruited at the HF clinic or during HF hospitalization. Thirst was assessed by a visual analog scale (0–100); reasons for thirst and interventions to relieve thirst were assessed by an open-ended questionnaire. Patients were divided into low and high thirst based on the first and third tertiles of the visual analog scale. **Results:** Two hundred sixty-nine patients participated in the study (age, 72 ± 12 years). Mean thirst intensity was 24 ± 24, with a mean thirst of 53 ± 15 in the highest tertile. No significant differences in thirst among the 3 countries were found. Multivariable logistic regression analysis showed that a higher dose of loop diuretics (odds ratio, 3.47; 95% confidence interval, 1.49–8.06) and fluid restriction (odds ratio, 2.21; 95% confidence interval, 1.08–4.32) were related to thirst. The most reported reasons for thirst were salty/spicy food (20%) and low fluid intake (18%). Most of the patients (56%) drank more in case of thirst; 20% only drank a little bit, probably related to a fluid restriction. **Conclusions:** Thirst in patients with HF was related to a higher dose of loop diuretics and fluid restriction. Healthcare providers should realize that it is important to assess thirst regularly and reconsider the need of a fluid restriction and the amount of loop diuretics in case of thirst.

KEY WORDS: cardiovascular nursing, fluid restriction, heart failure, thirst

During the last decades, there is much improvement in treatment and care for patients with heart failure (HF), affecting morbidity, mortality, and quality of life.[1] However, HF still is a serious chronic disease with a worse prognosis. Patients can have many typical HF symptoms such as breathlessness, fatigue, and reduced exercise tolerance.[1] They can also experience other symptoms such as thirst.[2]

Thirst in healthy persons is described as "a deep sensation or desire for water that cannot be ignored and causes a powerful behavioral strive to drink water."[3] Thirst in patients with HF was already described throughout the Middle Ages and Renaissance.[4] A relationship between thirst and "dropsy" was reported in ancient medicine, where dropsy was indicating different conditions characterized by edema ("water under the skin") and ascites ("a feeling of swollen up"). In later times, this condition was called *chronic HF*.

For patients with HF, thirst can be distressing[2] and can decrease quality of life.[5] A secondary analysis of the COACH study (Coordination study evaluating Outcomes of Advising and Counselling in Chronic Heart failure) on education and counseling in patients with HF in the Netherlands showed that thirst was related to fluid restriction, level of urea, HF symptoms, and male gender.[6] Almost 20% of the 1023 included patients with HF experienced persistent thirst during 18 months of follow-up, meaning that it is a serious problem for many patients. In this study, however, thirst itself was not directly measured,

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but patients were asked what the reason was for being nonadherent with fluid restriction. Twenty percent of the patients reported thirst as the main reason. A study on thirst in patients with HF in Sweden showed that plasma urea level and fluid restriction were independently associated with high thirst intensity.[7] Another study also showed that thirst was associated with New York Heart Association (NYHA) class and anxiety.[8]

Although there is some knowledge on thirst in patients with HF, thirst was only measured in rather small populations ranging from 23 to 66 patients.[6–9] Furthermore, most of the previous studies on thirst among patients with HF were performed in Western countries, and it is therefore unknown whether there are differences in the findings regarding patients' thirst between Western and Asian countries.

Finally, there is only 1 small intervention study using chewing gum to relieve thirst in patients with HF. In this study (N = 71), patients with severe HF and high thirst intensity were randomized to using chewing gum or usual care.[10] Thirst in patients in the intervention group significantly decreased on the short term (after 4 and 14 days) compared with thirst in the control group.

Because thirst is an important, distressing symptom in patients with HF, effective interventions are needed to decrease thirst and, with that, improve quality of life. Therefore, more data are needed to get information on factors related to thirst, including patients' own reported reasons for thirst and thirst-relieving interventions they undertake. When we have more knowledge on thirst in patients with HF, effective interventions to prevent and decrease thirst in this highly symptomatic group of chronically ill patients can be developed.

The aim of this study therefore was to describe (1) factors related to thirst in patients with HF in different countries, (2) self-reported reasons for thirst, and (3) thirst-relieving interventions patients undertake in Sweden, the Netherlands, and Japan.

Method

A cross-sectional observational study was conducted among patients with HF in 3 countries (Sweden, the Netherlands, and Japan) between 2012 and 2016. Inclusion criteria were a diagnosis of HF and being older than 20 years. Patients were excluded if receiving palliative care for end-stage HF, if on hemodialysis, or if they experienced dementia or another psychiatric disease, making it impossible to complete questionnaires.

Patients in the Netherlands were recruited from 1 hospital during a visit at the HF clinic; patients in Japan were also recruited from 1 hospital during a visit at the HF clinic or during a home visit. In Sweden, patients were recruited during a visit at the HF clinic in 3 different hospitals. All patients assessed thirst intensity on a visual analog scale (VAS) ranging from 0 (no thirst) to 100 (worst possible thirst). The scale was previously validated in a population with HF.[11]

Furthermore, data on the most important reasons for thirst according to the patients were collected in the Netherlands and Japan by the open-ended question: "When you are thirsty, what in your opinion causes your thirst?" Patients were asked to write down their answers after they rated their thirst intensity. Patients in the Netherlands were also asked at what time of the day they were most thirsty ("morning," "afternoon," "evening," "night," or "the whole day"). After we collected data from Sweden and Japan, we noticed the importance of the time on which patients were most thirsty. We therefore collected the data only in the Netherlands. Finally, all patients in the study were asked, "What do you do when you are thirsty?" Patients were asked to write down thirst-relieving interventions they undertook.

Responses on the open-ended questions about reasons for thirst and thirst-relieving interventions were coded into categories by 2 researchers who were knowledgeable of HF. They discussed the process of categorizations together to get agreement about the coding. Results of the coding were examined whether they were consistent between the 2 researchers. The interrater reliability was assessed using the formula by Miles and Huberman.[12]

Baseline characteristics such as dose of loop diuretics and prescribed fluid restriction were collected from the patients' medical chart. Dose of loop diuretics was calculated as an equivalent dose of furosemide with a cutoff point of 40 mg for a low dose of diuretics. Because the measurement of thirst intensity and NYHA functional class at the same moment were needed, the HF nurse assessed the NYHA functional class during the visit at the HF clinic, during hospitalization, or during a home visit when patients were included in the study.

The sample size was determined as follows. The main study was designed to examine psychometric properties of the 9-item Thirst Distress Scale.[13] In the COSMIN Risk of Bias checklist,[14] 7 times of the number of items are recommended to perform factor analysis. Accordingly, at least 63 patients from each country were assumed to be necessary. Because we expected the response rate to be 80%, around 80 patients from each country were considered to be necessary.

This work is part of a thirst project in patients with HF by a research group working together in 3 countries (Sweden, the Netherlands, and Japan). This study is a secondary analysis of the study designed to examine the psychometric properties of the 9-item Thirst Distress Scale, which was previously published.[13] The study conformed to the principles outlined in the Declaration of Helsinki. All patients signed written informed consent. The study in Sweden was approved by the Swedish Regional Ethical Review Board (dnr 2011/232-31/1 and 2012/42-32); and that in Japan, by the

institutional review board at the University of Tokyo Hospital (10422). In the Netherlands, the Medical Ethical Committee of the University Medical Centre Groningen concluded that no additional approval of the committee was needed (METC 2015/366).

Statistical Analysis

Descriptive statistics were used to characterize the study sample. To assess differences among the 3 countries, analysis of variance or χ^2 tests were performed as appropriate. When there was a statistical significance, post hoc comparison was conducted, using Bonferroni correction ($P < .017$). Because we wanted a deeper insight into the patients' thirst sensation and related factors, patients were divided into low and high thirst intensity based on the first and third tertiles of the VAS. To assess differences in patients with low and high thirst intensity, χ^2 tests and Student *t* test were used. A $P < .05$ was considered to be statistically significant. Multivariable logistic regression analysis was performed to assess which factors were independently associated with high thirst intensity. Variables with a $P < .05$ were inserted in the regression model by using backward analysis. SPSS Statistics 23 was used for all analyses.

Results

A total of 269 patients with HF participated in the study: 102 of 154 patients (66%) in the Netherlands, 95 of 110 patients (86%) in Sweden, and 72 of 127 patients (57%) in Japan. The mean age of the study population was 72 years, with significantly younger patients in Japan compared with Sweden and the Netherlands (mean ages of 67, 75, and 73 years, respectively; $P < .01$). Patients were predominantly male; most of them (66%) were in NYHA class I or II and were prescribed a low dose of loop diuretics (66% had a dose of ≤40 mg furosemide). A total of 155 patients (58%) were prescribed a fluid restriction. Significantly, more Dutch patients (95%) had a fluid restriction compared with Japanese (24%) and Swedish (43%) patients ($P < .01$). Furthermore, Swedish patients were more often recruited during hospitalization, were in a higher NYHA functional class, and were prescribed a higher dose of loop diuretics (Table 1).

The mean thirst intensity in the whole study population was 24 ± 24 (VAS, 0–100). Patients were divided into low and high thirst based on the first and third tertiles of the VAS. The mean thirst intensity was 2 ± 2 (range, 0–6) in the lowest tertile and 53 ± 15 (range, 30–100) in the highest tertile. There were no significant differences in thirst intensity among patients in Sweden, Japan, and the Netherlands.

Patients in the Netherlands were asked at what time of the day they were most thirsty. Twenty percent were most thirsty in the morning, 18% were most thirsty in the afternoon, 11% were most thirsty in the evening, and 16% were most thirsty during the night. Five percent of the patients reported to be thirsty the whole day, and the other patients reported not to be thirsty on a specific time.

Factors Associated With Higher Thirst

Patients (N = 85) in the group with low thirst intensity, which is the lowest tertile, had a thirst score of 6 or less; patients with high thirst intensity (N = 85) had a score of 31 or greater. Patients with high thirst intensity were significantly more often female, were in a higher NYHA class, were prescribed a higher dose of loop diuretics, more often had a fluid restriction, and were more often hospitalized compared with patients with low thirst intensity. Although there were fewer Japanese patients with high thirst intensity compared with Dutch and Swedish patients, these differences were not statistically significant (Table 2). A multivariable logistic regression analysis however showed that only a higher dose of loop

TABLE 1 Baseline Characteristics of the Study Population in the Netherlands, Sweden, and Japan

	All (N = 269)	The Netherlands (n = 102)	Sweden (n = 95)	Japan (n = 72)	*P*
Age, y	72 ± 12	73 ± 9	75 ± 8	67 ± 16	< .01
Female	88 (33%)	46 (45%)	24 (25%)	18 (25%)	< .01
NYHA class					
I–II	166 (62%)	68 (67%)	37 (39%)	61 (85%)	< .01
III–IV	95 (35%)	27 (26%)	58 (61%)	10 (14%)	
Dose of furosemide, mg					
≤ 40	178 (66%)	81 (79%)	35 (37%)	62 (86%)	< .01
> 40	68 (25%)	21 (21%)	39 (41%)	8 (11%)	
Fluid restriction					
Yes	155 (58%)	97 (95%)	41 (43%)	17 (24%)	< .01
No	111 (41%)	4 (4%)	54 (57%)	53 (74%)	
Hospitalized patients	33 (12%)	—	26 (27%)	7 (10%)	< .01
Thirst intensity	24 ± 24	24 ± 23	26 ± 23	22 ± 26	.51

Abbreviation: NYHA, New York Heart Association.

TABLE 2 Differences Between Patients With Low and High Thirst Intensity

	Low Thirst (≤ 6; n = 85)	High Thirst (≥ 31; n = 85)	*P*
Age, y	71 ± 11	72 ± 11	.53
Female	21%	35%	.041
NYHA class			
III–IV	27%	47%	.009
Dose of furosemide, mg			
> 40	13%	40%	<.001
Fluid restriction			
Yes	42 (49%)	56 (66%)	.02
No	43 (51%)	28 (33%)	
Hospitalized patients	7%	22%	.005
Country			
The Netherlands	39%	40%	.07
Sweden	28%	41%	
Japan	33%	19%	

Abbreviation: NYHA, New York Heart Association.

diuretics (odds ratio, 3.47; 95% confidence interval, 1.49–8.06) and a prescribed fluid restriction (odds ratio, 2.21; 95% confidence interval, 1.08–4.32) were significantly related to thirst intensity (Table 3). Patients who were recruited during hospitalization for HF tended to be more thirsty compared with patients from the HF outpatient clinics ($P = .052$) (Table 3).

Self-reported Reasons for Thirst

A total of 128 patients in the Netherlands and Japan gave 1 or more reasons for their thirst. The most reported reasons in both countries were salty or spicy food (20%, n = 26), a low fluid intake (18%, n = 23), and dry air, heat, or exhaustion (16%, n = 20) (Figure). Other reasons were, for example, "sleep with open mouth," "diabetes," "stress," and "because of the heart condition." Patients in the Netherlands more often reported a low fluid intake as the reason for thirst, but they also more often were prescribed a fluid restriction, compared with Japanese patients (Table 1).

Self-reported Thirst-Relieving Interventions

Eighty percent of the included patients (n = 218) reported, in total, 291 thirst-relieving interventions. As shown in Table 4, these interventions were grouped into 13 categories. During the process, there were no disagreements about the coding between the 2 researchers. The interrater reliability by the formula of Miles and Huberman[12] was therefore 100%.

Most of the patients (56%, n = 121) reported to drink more when they were thirsty, and 21% (n = 45) only drank a little bit. Patients in Japan more often reported to drink more, compared with those in the other countries. Twelve percent of the patients did nothing to decrease their thirst. Other interventions were using ice cubes, rinsing the mouth, using chewing gum or candy, or taking saliva-stimulating tablets (only in Sweden). For the most frequently reported interventions to decrease thirst, see Table 4. Interventions that were mentioned by 1 or 2 patients were, for example, "brushing teeth" or "take isotonic drink."

Discussion

This is the first study examining patients' interventions toward their thirst and clarifying factors associated with thirst measured by the VAS. This article also adds new insight into patients' perceived reasons for thirst, which gives information that can be of importance for education of patients with HF in clinical practice.

The mean thirst intensity in the study population was rather low with a mean score of 24 ± 24 (on a scale ranging from 0 to 100) and no significant differences among the 3 countries. However, the mean thirst score in patients in the highest tertile was 53 ± 15 (range, 30–100; N = 85), which is a rather high score of clinical significance. Patients who reported high thirst intensity significantly more often were prescribed a higher dose of loop diuretics and more often had a fluid restriction compared with patients with low thirst intensity. Similarly, Waldréus et al[7] have reported that a fluid restriction was related to thirst in patients with HF. It was also found that hospitalized patients with HF were more thirsty compared with other elderly hospitalized patients.[8]

The most reported reasons for thirst were salty or spicy food and a low fluid intake. The most common intervention to relieve thirst was drinking more. The most common cause of thirst is dehydration, which can lead to intracellular or extracellular dehydration[15] Intracellular dehydration increases the plasma osmotic pressure and stimulates osmoreceptors in the hypothalamus, which stimulate the thirst centers in the brain. Extracellular dehydration is caused by a decrease in plasma leading to a decrease in blood pressure. This stimulates specialized volume receptors in vessels and the heart, which stimulate the thirst centers in the brain. The low blood pressure also increases angiotensin-II secretion, which in turn stimulates the thirst centers. Patients with decompensated HF in general have an increased neurohormonal activation, leading to activation of the renin-angiotensin-aldosterone system and an

TABLE 3 Variables Independently Associated With Higher Thirst in Patients With Heart Failure

	Odds Ratio	95% Confidence Interval	*P*
Higher dose of loop diuretics	3.47	1.49–8.06	.004
Prescribed fluid restriction	2.21	1.08–4.32	.03
Being hospitalized	2.91	0.99–8.56	.052

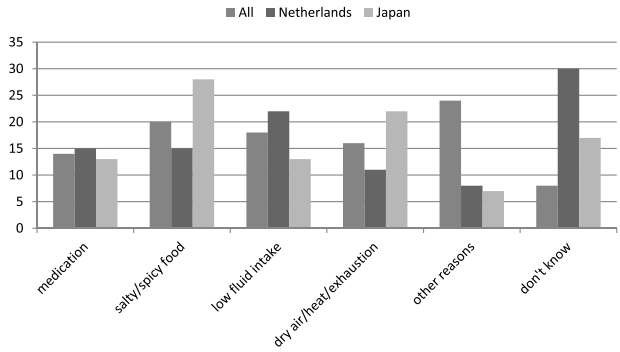

FIGURE. *Self-reported reasons for thirst in the Netherlands and Japan in percentage (N = 128) (some patients reported more than 1 reason).*

increase of angiotensin II, which will activate the thirst centers in the brain, leading to increased feelings of thirst. It is not surprising that patients in our study who were most thirsty were also those patients with a higher dose of loop diuretics and a prescribed fluid restriction, treatments that cause dehydration, which in daily practice are more often prescribed in patients with acute or severe HF.

In a discussion article on fluid restriction in patients with HF,[16] there were only 3 studies measuring thirst.[9,17,18] In a study of 52 patients with HF hospitalized for HF and suffering from hyponatremia, no significant differences in thirst were found between patients who were randomized to an intervention with a fluid restriction of 1000 mL, a sodium restriction, and specific instructions on how to deal with the restrictions, compared with a control group with a restriction of 2000 mL. The actual fluid intake of patients in both groups, however, was not measured during the study.[17] Authors of a Brazilian study in patients with acute decompensated HF reported that patients randomized to a fluid restriction of 1000 mL were more thirsty compared with patients with free fluid intake. Patients in the stringent fluid restriction consumed a mean of 1077 mL/d; whereas patients in the free fluid group, 1467 mL/d.[18] The third study in stable patients with HF at the HF clinic found that patients with a fluid restriction of 1500 mL were more thirsty compared with those with a liberal intake of 30 to 35 mL/kg of body weight per day. Patients with a fluid restriction of 1500 mL reported more problems with adherence to their prescription.[9]

The most reported reasons for thirst in the Netherlands and Japan were salty or spicy food (20%) and a low fluid intake (18%). Patients in Japan significantly more often reported salty or spicy food as an important factor (28%) compared with Dutch patients (15%). Salt intake in some parts of Japan, however, is higher with a mean intake of 10 to 14 g/d and a higher intake in the northeast part of the country.[19] In the Netherlands, the mean salt intake was 9 g/d.[20] However, no significant differences in thirst intensity were found between both countries in the study, although we do not have information on the actual salt intake of the participants.

Fourteen percent of the patients reported that they thought that medication was the most important reason for their thirst; however, we did not ask which medication they thought was responsible for the thirst sensation.

Only 18% reported a low fluid intake as the main reason for thirst. Although we found a significant relationship between thirst intensity and prescribed fluid restriction, we do not know what the actual fluid intake of the participants was. Because this is an elderly population, it is possible that many patients, regardless of the prescribed restriction, do not drink very much. In a recent European study on fluid intake, it was found that especially elderly patients are at risk for a low fluid intake and, with that, have a risk of dehydration.[20] Another problem in elderly patients is that feelings of thirst can be decreased because of aging.[21] Other risk factors for dehydration are a decreased kidney function,

TABLE 4 Self-reported Thirst-Relieving Interventions in Patients With Heart Failure in 3 Countries (N = 218)[a]

	All Patients (N = 216)	The Netherlands (N = 81)	Sweden (N = 72)	Japan (N = 63)
Drink more	121 (56%)	50 (62%)	18 (25%)	53 (84%)
Drink a little bit	45 (21%)	24 (30%)	13 (18%)	8 (13%)
Do nothing	27 (12%)	1 (1%)	26 (36%)	—
Drink tea	21 (10%)	6 (7%)	1 (1%)	14 (22%)
Rinse mouth	15 (7%)	6 (7%)	5 (7%)	4 (6%)
Ice cubes	10 (4%)	1 (1%)	6 (8%)	3 (4%)
Saliva-stimulating tablets	7 (3%)	—	7 (10%)	—
Chewing gum	3 (1%)	3 (4%)	—	—
Candy	4 (2%)	3 (4%)	—	1 (2%)
Use lemon	9 (4%)	2 (2%)	7 (10%)	—
Brush teeth	2 (1%)	2 (2%)	—	—
Take fruit	6 (3%)	5 (5%)	2 (3%)	—
Other interventions	26 (12%)	12 (15%)	8 (11%)	6 (10%)

[a]Some patients mentioned more than 1 intervention.

depression, and dependency of providing drinking in elderly persons.[22]

Because thirst is an important problem in patients with HF, influencing quality of life, it is important to know which interventions can help to decrease thirst. Most of the patients in our study reported that they would drink more when they are thirsty (77%, n = 166). Twenty percent of those patients only drank a little bit, probably because of their fluid restriction, and 12% did nothing when they were thirsty. Interventions that were only reported by a few patients were, for example, using chewing gum or candy, rinsing the mouth, or using saliva-stimulating tablets. The last intervention, however, was only used in Sweden.

A recent survey was conducted among healthcare professionals (most of them are nurses or specialized nurses) on strategies used to alleviate thirst in patients with HF and to identify the perceived usefulness of these strategies.[23] The most frequently advised intervention to decrease thirst was using ice chips, which was reported by 95% of the participants (n = 36). This is in strong contrast with interventions patients in our study population undertook with only 4% of them (n = 10) using ice cubes in case of thirst. The same differences were found in the use of chewing gum; 61% of the healthcare professionals advised chewing gum, but in our study, only 1% (n = 3) actually used chewing gum to relieve thirst. It is possible that patients did not know that those interventions might reduce thirst, but it is also possible that they found the interventions not successful in relieving thirst.

On the European Society of Cardiology website (www.heartfailurematters.org), there are also several advised interventions to decrease thirst, for example, taking ice cubes, restricting caffeine-containing beverages, chewing a gum, and eating frozen fruits.

At this moment, there are only a few studies on the effect of interventions to decrease thirst. There is 1 crossover intervention study in patients undergoing hemodialysis that found that artificial saliva reduced perceived thirst but chewing gum did not.[24] Authors of another study in 38 patients undergoing hemodialysis did not find differences in self-reported thirst after regular use of chewing gum.[25] There is only 1 intervention study using chewing gum in patients with HF, resulting in a decrease of thirst in patients in the intervention group.[10] No other interventions to reduce thirst have been studied in patients with HF.

Because thirst in our study was related to a fluid restriction and more than half of the patients were prescribed a fluid restriction (ranging from 700 to 2000 mL), it can be concluded that there is a need for reassessment of the actual need to have a fluid restriction prescribed in concordance with the guidelines. In recent HF guidelines,[1] a fluid restriction of 1500 to 2000 mL "may be considered in patients with severe HF to relieve symptoms and congestion." In our study, however, most patients (62%) are in NYHA class I or II, so a fluid restriction will, according to the guidelines, not be needed. Johansson et al[16] concluded that a tailored fluid restriction based on body weight[9] seems to be most reasonable with the lowest effect on thirst intensity. A (temporary) fluid restriction can be considered in patients with severe decompensated HF or patients with hyponatremia. In daily practice, it is possible that many patients with HF are prescribed a fluid restriction that is not justified. Therefore, in our opinion, the first important intervention to reduce thirst in patients with HF is to take a critical look at their prescribed fluid restriction.

When a fluid restriction is needed, it is important to develop effective interventions to decrease thirst and to test these interventions in a real-life population with HF.

Because thirst was also related to the dose of loop diuretics, it could be of importance to reconsider the amount of prescribed loop diuretics for individual patients in case of thirst. In this study, we looked at a limited number of possible factors related to thirst, because no more data were collected from the patients' medical chart. It is therefore possible that other factors also are related to thirst intensity. Another limitation is that no validated questionnaires were available to measure reasons for thirst and interventions to relieve thirst and that we do not have information at what time of the day patients completed the assessment of thirst intensity. Finally, it is a limitation that this was a secondary analysis of data from a study examining the psychometric properties of the Thirst Distress Scale.

However, in this study, we gained more insight in thirst in patients with HF. Future research should especially focus on effective interventions to relieve thirst in patients with HF.

In our study, there were no significant differences in thirst intensity among the 3 countries. However, some of the self-reported reasons for thirst and some thirst-relieving interventions were different for the 3 countries. The findings suggest that the thirst intensity and the interventions might be influenced by cultural differences and climate, in addition to the physical characteristics of patients with HF. Further research is therefore needed to examine the thirst intensity, the related factors, and thirst-relieving interventions among patients of diverse cultures and climates.

Conclusions and Implications for Practice

In this study, we found that thirst was significantly related to dose of loop diuretics and prescribed fluid restriction. In daily practice, it is important that healthcare providers realize that thirst can be an important problem in patients with HF and that they need to assess thirst in their patients on a regularly basis. They also should reconsider the need of a fluid restriction in

What's New and Important

- Thirst is a serious problem in patients with HF, with 33% reporting a mean thirst score of 53 (on a VAS from 0 to 100) with no differences in thirst among patients in Sweden, the Netherlands, and Japan
- Thirst is related to loop diuretics and prescribed fluid restriction, although salty/spicy food was the main self-reported reason for thirst. The most important intervention patients undertook to relieve thirst was drink (a little bit) more.
- Fluid restriction and adjustment of the dose of loop diuretics in patients with HF should be reconsidered to prevent thirst.

their patients with HF. It can also be important to reconsider the dose of loop diuretics in case of thirst.

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